

# Trauma, PTSD and post-traumatic stress spectrum: 15 years' experience on a multidimensional approach to trauma related psychopathology

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## SUMMARY

### Objectives

The purpose of this article is to provide an overview of the studies conducted using the Trauma and Loss Spectrum-Self Report (TALS-SR) since its validation, also summarizing the structure of this psychometric instrument and the underlying dimensional approach.

### Methods

In this article we revise the results obtained across several studies in which the TALS-SR has been used. The Trauma and Loss Spectrum (TALS), also known as post-traumatic stress spectrum, was developed in the framework of the Spectrum Project, an Italy-USA research collaboration project aimed at developing and validating tools designed to assess the spectrum of clinical manifestations related to DSM mental disorders. It represents a multidimensional approach to Post-Traumatic Stress Disorder and includes: potentially traumatic and/or loss events to which one can be exposed across his/her lifetime; a spectrum of acute peri-traumatic reactions; a broad range of post-traumatic stress and/or Complicated Grief (CG) spectrum symptoms. Both a clinical interview and self-report instrument were developed, namely the: Structured Clinical Interview for Trauma and Loss Spectrum (SCI-TALS), and Trauma and Loss Spectrum-Self Report (TALS-SR). Both instruments consist of 116 items, coded dichotomously (yes/no) and grouped in 9 domains. Two out of nine domains explore symptoms related to the pathologic grief reactions related to the loss of a loved one, also named as CG or Persistent Complex Bereavement Disorder (PCBD), this latter to date first included in the DSM-5, in the Section III of disorders that deserve further clinical attention.

### Results

The instruments were validated and adopted in clinical samples, such as patients with PTSD, CG, affected by medical conditions (such as fibromyalgia), caregivers of children with chronic illnesses, Emergency Unit personell, as well as in general population samples (e.g. survivors to the April 2009 L'Aquila earthquake) and healthy controls. Studies comparing full and partial symptomatological PTSD, in accordance to either the DSM-IV or DSM-5 criteria, were also possible, due to the wide spectrum of trauma related symptoms encompassed by the TALS, including the DSM-5 ones. Furthermore, the relationships between post-traumatic stress spectrum and other psychopathological dimensions, such as mood, eating and adult subthreshold autism spectrum, were explored.

### Conclusions

The use of the TALS-SR allows a valid exploration of the trauma and loss spectrum, in itself and in relation to other psychopathological dimensions. Moreover, it represents a valuable tool in clinical practice, for the diagnosis and management of PTSD.

**Key words:** PTSD, trauma, spectrum, loss, grief

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The Authors declare no conflict of interest.

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## Introduction

Trauma related and post-traumatic stress syndromes have been subject of increasing attention in psychiatric research in most recent decades. Although introduced in modern psychiatric nosography with the publication of DSM-III, nosographic autonomy with respect to anxiety disorders was recognized only in the recently published DSM-5 where it was defined in a separate chapter (Trauma and Stress Related Disorders) along with: Reactive Attachment Disorder, Disinhibited Social Engagement Disorder, Acute Stress Disorder, Adjustment Disorder, Trauma-or-Stressor-Related Disorder Not Elsewhere Classified.

PTSD was, in effect, introduced in the DSM-III on the impulse of the evidence of substantial psychopathological conditions reported by Vietnam war veterans. Since then, clinical and neurobiological research has shown a growing interest in these topics: this has led to demonstrate increasing prevalence rates, at present at around 12% in the civilian populations of Western countries, therefore not directly exposed to war events<sup>1,2</sup>. Indeed, although PTSD was initially investigated mainly in military contexts, over the years other particular population subgroups have been taken into account – such as rape victims, survivors of terrorist attacks, first of all the one in N.Y. (USA) on 11<sup>th</sup> September 2001, or natural catastrophes - reporting a progressive increase in the prevalence of the disorder with a close relationship also to the changes of the diagnostic criteria through the various editions of the DSM. Major changes in PTSD diagnostic criteria were in fact acknowledged in the latest version of the DSM that included: changes in the definition of the trauma; a broadening of the three symptomatological cluster criteria, defined in the DSM-IV-TR, into a four-criteria structure; and the introduction of three new symptoms.

The last decades have been characterized by the debate about the opportunity to adopt a broadening or narrowing approach both to the definition of the trauma and related post-traumatic stress symptoms. In the framework of the international joint research project named *Spectrum Project*, the Trauma and Loss Spectrum was developed<sup>3,4</sup>, taking into account both the evidence of the importance of partial and/or sub-threshold PTSD “subthreshold” or “subsyndromal”<sup>5,6</sup> and the potentially debilitating impact of various traumatic and loss events, including those which, being less extreme, do not meet criterion A of the DSM. This is consistent with the aim of the spectrum approach, which places atypical and sub-threshold forms along a *continuum*, from stable personality traits up to the full-blown disorder identified by DSM criteria. Therefore, the Trauma and Loss Spectrum<sup>3,4,7</sup> adopts a multidimensional approach which considers the dimension of potentially traumatic events, includ-

ing the so-called “low magnitude” events (e.g., minor severity) and loss events, the features of acute or peri-traumatic stress reaction and a wide range of post-traumatic symptoms, including the so-called maladaptive behaviors. This approach has been successfully applied to a wide range of mental illnesses, such as Anxiety and Mood Disorders and, more recently, to Autism Spectrum Disorders. It is of interest how the simultaneous use of specifically developed psychometric tools (available at [www.spectrum-project.org](http://www.spectrum-project.org)) makes it possible to analyse the relationships between these dimensions.

## The Structured Clinical Interview for the Trauma and Loss Spectrum (SCI-TALS) and the Trauma and Loss Spectrum-Self Report (TALS-SR)

The Structured Clinical Interview for the Trauma and Loss Spectrum (SCI-TALS) and its related questionnaire (Trauma and Loss Spectrum-Self Report, TALS-SR) were developed to investigate the post-traumatic stress spectrum<sup>4</sup>. The SCI-TALS and TALS-SR are both made up of 116 items with a dichotomous answer (yes/no) investigating, on one hand, the exposure to a series of potentially traumatic and / or loss events to which a subject may have been exposed throughout his/her lifespan and, on the other hand, the spectrum of trauma and loss related symptoms, including maladaptive behaviors and personological features which may constitute manifestations and/or risk factors of a related stress syndrome. The items of SCI-TALS and TALS-SR are grouped into nine domains which are listed below:

1. loss events (items 1-10);
2. grief reactions (items 11-37);
3. potentially traumatic events (items 38-58);
4. reactions to losses or upsetting events (items 59-76);
5. re-experiencing (items 77-85);
6. avoidance & numbing (items 86-96);
7. maladaptive coping (items 97-104);
8. arousal (items 105-109);
9. personal characteristics/risk factors (items 110-116).

In the validation study excellent validity and reliability of the SCI-TALS were demonstrated<sup>3</sup>. The domain scores resulted significantly higher in patients with PTSD or CG than in healthy control subjects. High correlations emerged between the specific SCI-TALS domains and the corresponding scores on validated scales of similar constructs. Participants in the validation study reporting loss events and mourning symptoms had similar scores in all instruments except those with CGs, who had significantly higher scores in Domain II. A substantial consistency between SCI-TALS and TALS-SR was also demonstrated, confirming the reliability of this latter. The intra-class correlation coefficients of SCI-TALS, which

is administered by the clinician in the form of an interview, and TALS-SR, which patients fill in autonomously, ranged between 0.934 and 0.994, always exceeding the threshold of 0.90; in addition, TALS-SR has the advantage of a shorter time in administration (about 20-30 minutes) compared to the structured clinical interview. Similarly to the other spectrum instruments, both SCI-TALS and TALS-SR cannot be taken to substitute the Structured Clinical Interview (DSM-IV Axis-I disorders, SCID I/P), since they do not investigate the duration and severity of the symptomatology, which must be taken into account in order to diagnose PTSD in accordance to the DSM criteria. On the contrary, they are proposed as tools supporting the SCID in order to detect not only the full-blown disorder but also the sub-threshold symptoms and any atypical manifestations that, considered all-together, constitute the specific clinical phenotype of each patient- which SCID fails to grasp due to its strictly categorical nature<sup>3,4</sup>.

### The concepts of trauma and traumatic loss

For what concerns the traumatic experiences and loss events, the TALS-SR and SCI-TALS, consistently with the aim of the aforementioned dimensional approach, investigate a broad spectrum of traumatic (Domain III) and loss events (Domain I). In doing so, these instruments encompass a wide and heterogenous spectrum of life-events, ranging from the death of a loved one to the end of a meaningful relationship, to the loss of reference figures in childhood or adolescence, to unwanted changes in economic or social status, or of physical integrity. In addition, the TALS-SR explores a new concept of trauma, including also the so named "low magnitude events" (Domain III) that have been cut-off, ignored or marginalised by the narrowing DSM 5 approach.

The Domain II explores the symptoms related to possible exposure to one or more of the loss events listed in Domain I. Typical, atypical or sub-threshold symptoms are reported in this domain, namely those which are relevant to the diagnosis of complicated or traumatic grief, recently introduced under the name of Persistent Complex Bereavement Disorder (PCBD) in the third section of the DSM-5, namely *disorders that deserve further clinical attention*<sup>8,9</sup>. The post-traumatic stress spectrum also includes a possible reaction by CG that may occur in the aftermath of a loss event. As a matter of fact, in the last decades several studies have been developed with the aim to validate the nosographic autonomy of pathological grief reactions. These conditions, once also called traumatic grief (Traumatic Grief, TG) or Prolonged Grief Disorder (PGD), have been shown to be associated with a significant and persistent impairment of social and working functioning, as well as with a high suicidal risk<sup>10-14</sup>. Hence, a number of clinical and

neurobiological evidence emerged in the last decade, leading researchers to introduce in the DSM-5 for the first time the diagnosis of PCBD (Post-traumatic and dissociative disorders sub-group). The proposed diagnostic criteria include symptoms such as: the desire and the search for the loved one; the need to remember her and/or spend time with the objects that belonged to her or are associated to her; frequent, intense feelings of guilt and sadness related to the loss; recurring intrusive and/or unpleasant images; avoidance of stimuli that recall loss and the inability to adapt to it (difficulty accepting death, guilt or remorse, feeling that life no longer has a purpose and functional impediment). In accordance to the concept of spectrum, the TALS Domain II explores these symptoms together with seven additional items (experiencing pleasure or satisfaction in taking care of people"; "Feel the need to take care of others"; "Having difficulty asking for help"; "Create very close ties with people and things"; "Having the feeling of not being able to live without loved ones") investigating the attachment style of the bereaved subjects, which is hypothesized as a potential risk factor for PCBD development. The administration of the TALS-SR to a large sample from the general population of L'Aquila allowed us to analyze the relationship between PCBD and PTSD, the results enlightened the substantial impact of grieving on post-traumatic symptoms burden, as well as on PTSD development<sup>15,8</sup>.

Domain III enlists the potentially traumatic events to which the subject may have been exposed throughout her life. It includes both the traumas acknowledged by either the DSM-5 and DSM-IV-TR (e.g., natural disasters, sexual abuse, serious accidents, repeated exposure to creepy details due to employment) and a series of so-called low-magnitude events which, though not being considered in the DSM to have such features as to be able to fulfill criterion A, have been related by some authors to the development of post-traumatic stress symptoms (e.g., failures in the school or work environment, legal issues, rupture of meaningful relationships, sexual harassment, abortions). In this regard, several studies have been emphasizing how, taking into account these potentially traumatic events, there is a significant increase in PTSD prevalence<sup>16</sup>. On the other hand, several studies have shown the presence of substantial subgroups of subjects (around 3.7%) who, after being exposed to extremely severe trauma (DSM-IV-TR), may manifest invalidating forms of PTSD, albeit subsyndromic, subclinical or partial ones (i.e. characterized by a number of symptoms lower than those required by the DSM-IV-TR to make the diagnosis). To date, the DSM-5 adopts a more restrictive definition of trauma thus recognizing PTSD when it is linked to direct or indirect exposure to specific set of traumatic

events, including death or threat of death, serious injury or sexual assault, while it does not include Criterion A2 of DSM-IV-TR (having experienced “feelings of intense fear, helplessness, horror”).

Following this research path, TALS has been extensively used in order to detect post-traumatic spectrum symptoms in various settings, such as on caregivers of children with chronic illnesses, people working as emergency personell and people exposed to L'Aquila earthquake.

For what concerns the first one of the aforementioned research paths, epilepsy has gained clinical attention in as much as its phenotypic expression, i.e. seizures, have as peculiar features the unpredictability, the drama of the clinical picture, the impossibility to control the event. All this given, facing child epilepsy may represent a traumatic experience for parents, who often experience feelings of helplessness and inadequacy. Despite these considerations, DSM 5 narrowed the approach to the illness of one's child from “threatening disease in one's child” to “a medical catastrophe concerning one's child”. Researches conducted on sample of parents of epileptic children showed a significant rate of full and partial PTSD, ranging from 10 to 15% and about 37% respectively <sup>17</sup>. The design of these studies, which have been conducted on couples of parents, allowed to deepen the inquiry into the issue of gender differences: consistently with literature, women showed higher rate of both partial and full-blown PTSD <sup>17</sup>. The overall consistency between the diagnosis of PTSD according to the DSM-IV and DSM-5 criteria was 92.9% in this group <sup>18</sup>.

It is also interesting to inquire into the prevalence of post-traumatic spectrum symptoms and their impact on social and work functioning among people chronically exposed to traumatic experiences due to their work activity. This is the aim of a study conducted on a sample of 110 subjects employed at the emergency unit, whose results showed a PTSD prevalence of 15.7%, with higher prevalence of PTSD symptoms among female gender and a higher prevalence of maladaptative behavior among males <sup>19</sup>.

### Post-traumatic spectrum symptoms

Domain IV is the first among the spectrum domains specifically related to PTSD. It explores the characteristics of the acute response to trauma, that is a set of emotional, physical and cognitive responses to both loss and traumatic events, arising in moments immediately following exposure and often related to the subsequent onset of PTSD. Symptoms of criterion A2 of the DSM-IV-TR that characterized the traumatic event (having experienced feelings of fear, impotence and horror at the time of exposure to the trauma) were also included

in this domain. These symptoms were object of extensive debate in the drafting of the DSM-5, since many authors have argued for their scarce diagnostic contribution through clinical and epidemiological studies <sup>20,21</sup>. In accordance to these works, they were eliminated from characterizing DSM-5 trauma criteria (the so called A2 criterion); hence, they were listed along with the symptomatological criteria, constituting a symptom (Persistent negative emotional state) of the new criterion D, which investigates the Negative Alterations in Cognitions and Mood <sup>22</sup>.

Domains V, VI and VIII explore post-traumatic stress spectrum symptoms related to the three symptomatic criteria for PTSD diagnosis that were provided by the DSM-IV-TR, which are respectively: evocation of the traumatic event (eg nightmares, flashbacks, intrusive memories); persistent avoidance (e.g., of thoughts, discussions, places, activities or situations reminiscent of the traumatic event or loss) and numbing (e.g., considering unpurpose any activity that had been important in the past, feeling deprived of emotions and detached from other people, having difficulty to trust the others); increased arousal (e.g., concentration problems, feeling like you can't let your guard down, over-reactivity to unexpected stimuli, increased irritability and tendency to lose control for futile reasons, difficulty in falling and staying asleep). As already mentioned, it is noteworthy that one of the main changes introduced by the DSM-5 is the shift from the previous three symptomatological criteria (evocation, avoidance and numbing, increased arousal) to a four criteria structure: B) Intrusion symptoms; C) Persistent avoidance; D) Negative alterations in cognitions and mood; E) Alterations in arousal and activity. Moreover, the new symptoms added within the latter two criteria were already included in the TALS-SR, in accordance with the underlying dimensional approach. As a matter of fact, there is a correspondence between the new PTSD symptoms introduced in the DSM-5 and some TALS items, in particular between the new symptom D3 (to blame himself or others in a distorted way) and item 85 (It was never heard at fault for what happened?), and between D4 (persistent negative emotional state) and item 96 (... as if his life had changed forever? Did you ever think that things would never be the same again?). The new E2 symptom of the DSM-5 is instead reported within Domain VII of TALS. This correspondence allowed us to perform one of the first studies in literature comparing prevalence rates of the symptomatic diagnosis carried out in accordance to the DSM-IV-TR criteria and those obtained according to the the DSM-5 <sup>22,23</sup>, also taking into account gender differences in the same sample <sup>24</sup>. A significant gender gap emerged, with women endorsing in higher percentage each DSM-5 symptom including the newly

introduced ones. The item exploring persistent negative emotional state (D4), resulted to be the more frequently endorsed in the female gender and, in general, the most endorsed item in the entire sample of survivors with PTSD. Conversely, men showed significantly higher rates as to the DSM-5 symptom exploring maladaptive or self-destructive behaviors (E2).

Domain VII investigates the so-called maladaptive behaviors (e.g., ceasing to take care of oneself, to take prescribed therapies, substance and alcohol use, undertake risky behavior, suicidal ideation, attempted suicide, self-harm)<sup>25</sup>. As already mentioned, some of these behaviors listed in TALS-SR are today included among the PTSD diagnostic symptoms accordingly with DSM-5. As a matter of fact, what was previously considered a complication of PTSD is to date recognized as a nuclear aspect of PTSD. The importance of such behaviors has been emerging from several studies conducted mainly on military personnel of Iraq and Afghanistan with PTSD, that showed a high prevalence of reckless driving<sup>26</sup>, aggressions towards human beings or things, high rates of alcohol and substance abuse and violent attitudes<sup>27-29</sup> among these patients. These results are in line with other studies conducted on adolescents and young adults with PTSD survived to terrorist attacks or fires<sup>30</sup>. As in the case of Domains V, VI and VIII, there is a correspondence between the new symptom E2 (Maladaptive or self-destructive behavior) and the following items: 100 (Have you ever taken alcohol or drugs to alleviate psychological suffering?); 101 (Did you ever engage in risk-taking behaviors, such as driving fast, promiscuous sex?); 103 (Did you ever think about ending your life?); 104 (Did you ever intentionally scratch, cut, burned or hurt yourself?); and 105 (Did you ever attempt suicide?).

As mentioned above, a wide-scale and effective application of the TALS-SR took place in the context of studies conducted on the population affected by the L'Aquila earthquake in April 2009. In the framework of several studies developed in collaboration with the University of L'Aquila, the TALS-SR was administered to population samples exposed directly and /or indirectly to this event, at different time from exposure (10 and 21 months apart) and to survivors located at various distances from the epicentre. These researches enlightened a significant percentage of partial and full-blown PTSD, respectively up to 29.9 and 37.5% in a sample of 512 students at 10 months observation<sup>31</sup>. These studies also pointed out not only a remarkable gender gap in PTSD prevalence, with a risk peak of PTSD development among young women<sup>32</sup> but also some gender specific clinical features<sup>33-36</sup>.

Finally, Domain IX includes 6 items that investigate personality characteristics and/or risk factors that may

be related to the development of post-traumatic stress symptoms. They include feeling sensitive to stress and loss; being provocative; having the pleasure of being at the center of attention; feeling attracted by danger; undertaking risky activities. On other hand, in another study based on the use of TALS-SR, religiousness and spirituality emerged as protective factors with respect to the psychological difficulties deriving from the natural disaster<sup>37</sup>.

### **Correlations between the trauma and loss spectrum and the mood and adult autism subthreshold spectrum**

As mentioned above, different studies were carried out with the aim of exploring the relationships between different psychopathological dimensions, in particular between post-traumatic stress spectrum and mood disorders and autism spectrum disorders.

Researches that have been investigating the correlation between the TALS-SR and the MOODS-SR enlightened a strong interplay between these two dimensions, consistently with scientific literature<sup>38</sup>. Among the main achievements of these studies are worthmentioning the findings of a strong link between some of the mood components, such as depressive cognition and manic energy, and an increased risk of PTSD<sup>39</sup>. High PTSD prevalence rates among bipolar patients were also reported, with a substantial anamnestic gap for what concerns traumatic exposure with respect to healthy controls. Furthermore, lifetime manic spectrum symptoms resulted to be strongly related to the TALS-SR "potentially traumatic events" and "maladaptive coping" domains and constituted a significant risk factor for PTSD development, with hyperarousal and higher anxiety sensitivity potentially mediating this association<sup>32</sup>. In addition, a research on the impact of mood spectrum comorbidity on suicidality, explored by the MOODS-SR<sup>40</sup>, in patients with PTSD, highlighted a significant correlation between mood spectrum and increased suicidality in PTSD. The existence of a significant correlation between mood alterations and PTSD symptoms has also been confirmed by studies conducted on caregivers: these studies pointed out that on one hand PTSD confers susceptibility to develop Major Depressive Disorder<sup>41</sup> while, on the other, a higher lifetime mood symptom burden reduces the PTSD gender gap, since it constitutes a predisposing factor to PTSD<sup>17</sup>.

In recent years, growing interest has been focusing on adult autism disorder, with an increasing push towards a dimensional perspective<sup>42</sup>. In this framework, the development and validation of a self-report questionnaire, Adult Autism Subthreshold Spectrum (AdAS Spectrum), aimed to identify subthreshold autism spectrum symptoms

along a dimensional *continuum*<sup>43</sup>, further widened the view in the field of post-traumatic research. The results of these studies have shown that high autistic traits (AT) on the one hand are linked to increased exposure to trauma, while at the same time confer a susceptibility to the development not only of trauma and stressor related disorders, but also of mood disorders<sup>44</sup>. Further studies have deepened the research into the motivations underlying such relationships, enlightening a major mediating role of rumination<sup>45</sup>: a study on 178 students indicated that a high AdAS score was associated to higher TALS-SR, MOODS-SR and Ruminative Response (RSS) scores and that the relationship between AT and mood spectrum resulted to be partially mediated by ruminations and trauma-stressor related symptomatology<sup>45</sup>. In addition, a subsequent study on the same sample showed how the relationship between AT and trauma and stress related symptoms prevailed on gender differences among high risk subjects, with females scoring significantly higher than males only among AdAS low scorers<sup>46</sup>. The results of a study analyzing the relationship between post-traumatic stress spectrum and subthreshold autism spectrum symptoms in a sample of parents of pediatric patients suffering from epilepsy went in the same direction, since it highlighted noteworthy correlations between AdAS and TALS score only in the subgroup of fathers<sup>44</sup>. In this perspective, trauma can act as a pathology booster in subject with undetected autism spectrum disorder, who are characterized by a marked tendency to rumination, as has been highlighted in a recent case report illustrating the clinical picture of a 35-years old woman with multiple psychiatric diagnosis and suicidal ideation who reported an history of childhood trauma<sup>47</sup>.

### The role of new emerging trauma related symptoms

The relation between circadian/seasonal rhythms and vegetative function (both being key features in bipolar diathesis) and suicidality has been explored in patients with PTSD. This issue, in fact, is still largely unexplored. The findings emerged from one of the studies suggested that lifetime dysregulations in rhythmicity and vegeta-

tive functions may represent correlates of suicidality in patients with DSM-5 PTSD, even eliminating confounding factors such as co-occurrent mood disorders<sup>48</sup>. Increasing research is however warranted as a promising research path suicide and non-suicidal self-injuring focuses on the mediating role of dissociative symptoms<sup>49</sup>, whose clinical relevance has been recognized by DSM-5, through the introduction of the dissociative subtype<sup>50</sup>.

The combined use of TALS-SR and MOODS-SR has also allowed us to examine the impact of Post-traumatic spectrum symptoms on altered eating behaviours, suggesting a wide range of abnormal eating habits among PTSD sufferers, as well as the existence of a strong link between PTSD and somatic symptoms burden<sup>51,52</sup>. On the other hand, exploring TALS-SR scores in patients suffering from fibromyalgia<sup>15</sup>, a statistically significant correlation between lifetime exposure to potentially traumatic events, in particular loss events, post-traumatic stress symptoms and severity of fibromyalgia, was detected.

### Conclusions

In recent years, PTSD and stress related syndromes have been object of a interest<sup>53</sup>. Thanks to an increasing number of neurobiological, epidemiological and clinical studies, significant innovations have been introduced in the DSM-5, not only recognizing the autonomy of these forms within the wider field of anxiety disorders, but also acknowledging the clinical relevance of pathological reactions to grief. In this framework, the dimensional approach, exploited by a wide-scale use of the TALS-SR, has played an important role in this progress, allowing for an insightful exploration of post-traumatic stress syndromes and providing a robust contribution to the studies upon the new DSM-5 criteria. On the other hand, while the assessment and clinical relevance of partial and sub-threshold forms are still debated and the DSM-5 endorses a more restrictive notion of trauma, the use of TALS provides an important contribution to research not only into the clinical features of PTSD, but also into its etiopathogenetic factors and into the development of new and more effective intervention strategies.

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