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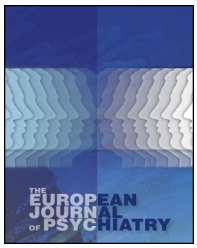

ORIGINAL ARTICLE

Disturbed subjective time experience in post-traumatic stress disorder

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Abstract
Background and objectives: Disturbance of subjective time experience in PTSD has not heretofore constituted a subject of focused empirical research, in spite of previous theoretical insights concerning the phenomenological importance of subjective time distortions in PTSD. Aim of the study was confirming the presumption that an alteration in subjective time experience is an essential feature of PTSD.
Methods: Sets of instruments for diagnostic assessment of PTSD and other psychiatric disorders, and for assessing subjective time experience, have been used to investigate the differences between the subjects with PTSD ($n = 58$), subjects with other psychiatric disorders ($n = 34$) and healthy participants ($n = 135$).
Results: On average, subjects with PTSD differ significantly from the remaining two groups in succession and goal directedness aspects of subjective time experience, while PTSD group differs from healthy group in all aspects except future and past temporal extension. As expected, the covariates adjusted means on the *Succession, Integration, Temporal Distinction* and *Goal Directedness* scales are lowest in subjects with PTSD, higher in other disorders and highest among healthy individuals.
Conclusions: Most aspects of the subjective time experience in subjects with PTSD show significant alterations compared to healthy ones. Moreover, disturbed succession and goal directedness aspects are most specific because they also significantly differentiate the group with PTSD from the group of those with other disorders. Increased intensity of PTSD symptoms is associated with stronger alteration of time experience. There is a stronger association of temporal disorganization with avoidance/numbing and hyper-arousal than with intrusions.

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Introduction

Strangely enough, a review of available literature cannot find a single empirical study specifically exploring the issue of disturbed subjective time experience in post-traumatic stress disorder, albeit that there are quite a considerable number of research papers generally addressing this subject in stress disorders. This is even more unusual considering the importance otherwise attributed to subjective time alterations in other psychiatric disorders – depression[1,2] schizophrenia,[3] during marihuana intoxication,[4] in heroin[5] and alcohol[6] addicts, in persons with personality disorders,[7] eventually with emphasis on its heuristic capacity as a possible general paradigm of psychopathology conceptualization. The Gooddy's article[8] is an early attempt to explain all ''neuropsychiatric disorders'', at least in principle, by ''disorientation'' in space–time. In one of the first comprehensive books, Gorman and Wessman[9] overviewed general results of empirical investigations of this subject. However, they justifiably noticed that simple catalogue of findings without theoretical foundation would result in storage of isolated data not likely to improve our knowledge about time.

Notwithstanding that clinical phenomena of disturbed time experience in adults and children after psychological trauma have long since been described,[10] and that powerful *theoretical* emphasis placed on temporal categories in some influential models of PTSD conceptualizations is clearly discernible,[11] e.g. accentuating that ''disturbances in a sense of reality and time characterize many psychiatric conditions, but are most prevalent and dramatic in trauma-induced disorders'',[12] empirical research of this subject in PTSD is lacking. A possible explanation for this may be given by the fact that the concept of time and its disturbances, even when appearing as a theme relative to PTSD, usually was expressed in terms of cognitive distortions caused by a traumatic experience,[13] or non-differentially included in a model of dissociation.[14,15] On the other hand, studies have described alterations of subjective time in specific populations of people exposed to various stressors – war veterans, victims of sexual violence, and fire,[16] refugees,[17] torture victims,[18] spouses of patients with severe somatic illnesses,[19] helping professionals,[20] though consistently failing to specify the PTSD diagnosis in observed samples. Van der Kolk[11] pointed out the temporal features as essential in the comprehension of PTSD, where traumatized people display a repeated tendency to get stuck in the past over and over again, experiencing current stressors with intensity of emotions that belongs to the past, and has little value in the present. *Therapeutic* implications arising from the accentuation of temporal characteristics of PTSD are that giving trauma the meaning, which is the core of therapy, should prevent it from being part of present experience and appropriately consign it to the past. The comprehensive meta-analysis[21] indicated certain advantage of therapeutic techniques focused on past (trauma-focused cognitive-behavioural therapy and EMDR), related to stress management and other therapies focused on the present. Despite such findings and theoretical standings, in practice ''...clinicians show consistently greater endorsement for present- than for past-focused PTSD treatment.''[22]

Cognitive models of time include various approaches, from Ornstein's[23] ''storage-size metaphor'', in which duration is attributed to cognitive analysis of information with no ''time basis'' postulated, to results showing that future-oriented thinking and memory draw upon shared systems mediating mental time travel.[24] Within a cognitive frame Posner tried[25] to achieve the synthesis of qualitative phenomenological and quantitative physiological functioning of psyche, in a discipline he named ''mental chronometry''. Accordingly, time was here given the role of *via regia* to the human psyche, which Freud earlier ascribed to dreams. In an attempt to integrate *neurobiological* and cognitive paradigm Wittmann explicitly evokes the classical concept of relation between succession and integration because ''perceptual mechanism seems to exist that integrates separate successive events into a unit or perceptual *gestalt*'', while ''time distortions are stress related as they are often experienced during dangerous or life-threatening situations.''[26]

In view of numerous current *theoretical* emphases laid on specificity of time-dimension in origin, phenomenology and therapy of post-traumatic stress disorder, although usually identified with dissociation, or vaguely included in cognitive phenomena, we assumed that *empirical* investigation of subjective time experience *per se* in that disorder would be justified at least as much as long-term explorations of this subject in other psychiatric disorders have been. The primary goal of this paper is to investigate differences in subjective time experience between individuals with PTSD and those with other psychiatric disorders as well as those with no disorder. A secondary goal is twofold: to explore the relationships of subjective time experience with specific clusters as well as intensity of PTSD symptoms.

Methods

Participants

The research was conducted from March 2000 till July 2002, as a separate part of a polycentric study aimed to psychological consequences of war in former Yugoslavia, which was approved by the Research Ethics Committee of the Institute of Psychiatry, King's College, University of London.[27] The sample included individuals from the following populations: people with combat experience, victims of torture, refugees, expelled and internally displaced persons from the 1991–1995 wars in former Yugoslavia and 1999 war in Kosovo and Metohija, as well as persons exposed to the 1999 bombardment in Serbia. The sample comprised subjects from clinical and general population, fulfilling the following inclusion criteria:

- age from 18 to 65 years;
- minimum 8 years of education;
- without organic mental disorder;
- without an current or former psychotic episode.

Subjects were recruited to the study via the ''snowball'' technique. The sample was preliminary closed with 237 examinees while the final number entered into statistical

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