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INTOLERANCE OF UNCERTAINTY AND TIME PERSPECTIVE PROFILE AS MEDIATORS OF POST-TRAUMATIC STRESS SYMPTOMS

Abstract. The development of post-traumatic stress symptoms in response to traumatic events is determined by many factors. One of them is intolerance of uncertainty (IU), which is defined as the tendency to react to surprises and uncertainty as to a threat and respond to them with anxiety. IU underlies a number of affective disorders and it is a recovery-complicating factor. On the other hand, many studies have shown that attitude toward one's lifetime is also depended on the ability to respond to stressful events, adaptively or maladaptively. The theory of time perspective (TP) is based on the fact that people distribute attention differently between the past, present and future. A balanced time perspective profile helps a person to respond flexibly to circumstances, while an imbalance in an emergency is associated with different psychopathology. **The aim of this study** is to analyze the role of IU and TP profile as mediators between adverse childhood experience and post-traumatic stress symptoms. **Methods.** Respondents (n = 177) completed a pool of questionnaires: Adverse Childhood Experiences International Questionnaire (ACE-IQ), Intolerance of Uncertainty scale, short form (IUS-12), Zimbardo Time Perspective Inventory (ZPTI) and PTSD Checklist for DSM-5 (PCL-5). **Results.** Both intolerance of uncertainty and deviation from a balanced time profile proved to be significant mediators between negative childhood experiences and signs of post-traumatic stress. **Conclusions:** Traumatic childhood experiences to some extent determine the attitude to time and uncertainty, which in turn increase the tendency to develop symptoms of post-traumatic stress. **Further research** is needed to examine more closely the correlation between intolerance of uncertainty and time perspective scales.

Keywords: intolerance of uncertainty, time perspective, PTSD, structural equation modeling.

Problem statement. The response to a stressful event, which often happens in everyone's life, depends on many factors. General tolerance to distress is defined as the ability to withstand unpleasant physical and psychological conditions and, according to Zvolenski, consists of five components: intolerance of uncertainty, intolerance of ambiguity, frustration, and inability to withstand emotional and physical discomfort [1]. Among the listed factors, intolerance of uncertainty is the most important predictor of person's level of stress reaction on event [2]. The belief "I do not know how to act effectively in conditions of uncertainty and surprises" is an important part of a negative attitude to surprises and to some extent determines how a person will perceive a crisis as unpleasant, difficult and exhausting.

Among other factors, that affect the experiencing of crisis life circumstances and traumatic events is the time attitude. The time perspective (TP) describes the variety of beliefs and habits inherent in people who perceive and differentiate the movement of time differently. F. Zimbardo defined five (later six) temporal dimensions: Past Negative (PN), Past Positive (PP), Present Hedonistic (PH), Present Fatalistic (PF), and Future (F). Imbalanced time perspective profile is associated with different psychological stress and mental disease symptoms. Optimal configuration is related to psychological and physical health [3].

Traumatic events, by Zimbardo's definition, are those that exceed the processing ability of the psyche, narrowing attention focus on the current moment [4]. The ability for temporal integration is declining. Time perception disintegration interrupts the natural process of differentiation and decomposition of experience into categories of past, present and future [5, 6]. And although, objectively, a traumatic event eventually becomes part of the past, subjectively it continues as an eternal present.

But how do traumatic events relate to IU levels? Does the time attitude depend on the traumatic childhood events number? What is the relationship between the uncertainty attitude and the time perspective? The relevance of the uncertainty attitude topic and the need to study in more detail its role in the formation of post-traumatic stress signs determined the choice of research topic.

Analysis of recent studies and publications. In 1998, V. Felitti in his study of 17,500 respondents found an association between the adverse childhood experiences and adult physical and mental health [7]. The answers to the test questions about different types of physical, sexual and verbal violence were compared with the data of medical records and medical history. V. Felitti's study showed that adverse childhood experiences have a cumulative harmful potential for mental and physical health. The basic questionnaire consists of ten questions, and 4 or more positive answers increase the risk of depression, anxiety, alcoholism, antisocial behavior tendency and even earlier death. [7, 8]. The founded correlation between childhood experiences and problems in adulthood has given impetus to study the factors that complicate or facilitate adaptation and recovery after psychological trauma. Among other, intolerance of uncertainty and time attitude can be considered as important

factors mediating the impact of a traumatic event on the symptoms of post-traumatic stress development.

The attitude to the unknown in psychology is studied within the framework of the construct of uncertainty tolerance/intolerance. In our study, intolerance of uncertainty (IU) is understood as an individual ability to perceive the situation of uncertainty as undesirable and respond to it as on a threat [9]. High intolerance of uncertainty is seen currently as a transdiagnostic factor that complicates the treatment of emotional disorders and prevents personal post-traumatic recovery [9, 10]. For example, the hypothesis that a high level of IU is a factor that increases vulnerability to stress was tested on students in two independent studies [11, 12]. Level of IU, anxiety and PTSD symptoms were measured before and after negative life events. An analysis confirmed that IU was a significant predictor of the post-traumatic stress symptoms development.

On the other hand, time perspective studies indicate that people with a time-oriented focus on the past had a higher level of distress than people with a time-oriented focus on the present or future after one year from stressful events [5]. People with PTSD have a time perspective profile with high scores on the Past Negative scale and low scores on the Past Positive and the Future scales. The Present Fatalistic and the Past Negative correlate with the severity of traumatic events, anxiety, depression and PTSD symptoms [4, 13, 14].

The optimal time perspective is calculated, related to mental and physical health, the ability to adapt to changes easily and the ability to receive support through a social contacts network. There are optimal characteristics of the time perspective profile. It assumes a high score on the Past Positive scale, medium scores on the Present Hedonistic and Future, and low scores on the Past Negative and Present Fatalistic scales [15,16]. The coefficient of deviation from the balanced TP profile shows how much a person's perception of time differs from the adaptive-optimal, and therefore is the basis for difficulties in recovery after traumatic events.

With a significant number of research on intolerance of uncertainty and its association with various mental states and symptoms, there are only a few works finding a link between IU, traumatic experiences, and signs of PTSD. How exactly do traumatic events affect PTSD according to the level of IU and the time perspective profile? How does a negative childhood experience affect attitudes toward uncertainty and time? Moreover, because of this, how much does it increase the risk of developing symptoms of post-traumatic stress, complicate recovery and reduce the adaptive capacity? The **article purpose** is to examine the role of IU and TP as mediators in the development of post-traumatic stress symptoms determined of traumatic childhood events.

Research results. A set of tests has been used to investigate the relationship between traumatic childhood experiences and the development of post-traumatic stress symptoms. The sample consisted of 177 people, 82 (46.3%) women, 95

(53.7%) men. The average age was 38 years (SD = 9.9; min = 19; max = 59).

Research methods. *The Adverse Childhood Experiences International Questionnaire (ACE-IQ).* The ACE score, originally developed by J. Felitti [7], consists of questions that are divided thematically into 10 categories. Violence is divided into emotional, physical, and sexual. Adverse family circumstances include: evidence of violence against the mother, having a family member with alcohol or drug addiction, having a family member with mental illness, the divorce of the parents, having a prisoner in family. The experience of rejection includes emotional coldness (lack of emotional support) and physical neglect (you did not have enough cared; you were hungry; you wore dirty clothes, etc.). When the respondent answers positively to one of the questions, it is concluded that he has a negative experience of this type. The study used an extended version of ACE-IQ with 23 questions [17], which added questions on bullying and the observation of violence in society.

Intolerance of uncertainty scale, short form (IUS-12). The short version (IUS-12) of the Intolerance of Uncertainty Scale was created by N. Carleton [9] and has 12 items. It has total score and two subscales: Perspective anxiety (Perspective IU) and Inhibitory anxiety (Inhibitory IU). Respondents are asked to answer the Likert scale questions to what extent they agree with each question, where 1 - completely disagree, 5 - completely agree. Maximum total score is 60. The test has adapted Ukrainian version and good psychometric indicators ($\alpha = 0.81$; $\chi^2 = 88.47$; $df = 42$; $\chi^2/df = 2.1$; CFI = 0.92; RMSEA = 0.059), it has been tested for convergent and discriminant validity [18]. In the present study Cronbach's alpha for total score was 0.89; Prospective IU $\alpha=0.83$ and Inhibitory IU $\alpha=0.85$. For general sample ($n=177$) Mean=35.76, Median=36, SD=9.22, min=12, max=60.

Zimbardo Time Perspective Inventory (ZPTI). ZPTI [19, 20] is a self-report questionnaire that consists of 56 questions grouped into five scales: the Past Negative (PN), the Past Positive (PP), the Present Hedonistic (PH), the Present Fatalistic (PF) and the Future (F). The respondents were asked to answer questions on a Likert scale from 1 (not typical) to 5 (very typical). In the present sample Cronbach's alpha of the ZPTI was 0.85 for PN, 0.63 for PP, 0.75 for PH, 0.76 for PF and 0.68 for F. For further analysis, the revised deviation from the balanced time profile coefficients (DBPT-r) was calculated according to the proposed formula [16] and was determined for each respondent.

PTSD Checklist for DSM-5 (PCL-5). PCL-5 is a 20-item self-report evaluated PTSD symptom severity [21, 22]. Respondents answered questions on a Likert scale from 0 (not at all) to 4 (extremely), referencing the most traumatic life event they could remember. In the current study Cronbach's alpha for total score was 0.96, for cluster "B" $\alpha=0.91$, for "C" $\alpha=0.87$, for "D" $\alpha=0.91$ and for cluster "E" $\alpha=0.91$. Since criterion A and an interview (which was not planned during data collection) are required to make a diagnosis of PTSD, the results from the PCL-5 questionnaire will be referred to in the future as symptoms of post-traumatic stress (PTS symptoms).

Using the program PROCESS v.3.5, we have done the mediation analysis and tested the role of intolerance of uncertainty and a balanced time perspective profile in mediating the symptoms of post-traumatic stress. Mediation analysis allows finding out to what extent the variable that is considered a mediator has an impact on the dependent variable. This helps to describe and predict the behavior or manifestation of a trait more accurately. A mediator is a variable that to some extent depends on an independent variable and, at the same time, to some extent affects the dependent variable. A *parallel* mediation model [23] was used to test the extent to which intolerance of uncertainty and attitudes toward time mediate the relationship between traumatic childhood experiences and PTS symptoms. The results are presented in Fig. 1.

The results of the calculations confirm the significance of all the assumed correlations. *The total effect* of children's experience on the formation of PTS symptoms is positive and significant ($b=0.34$, $s.e.=0.11$, $t=4.83$, $p<0.001$; $CI: 0.3168; 0.7545$). This means that with an increase in adverse childhood experiences by one standard deviation, the risk of developing post-traumatic stress symptoms increases by 0.34 standard deviation. At the same time, this increase is partly determined by personal level of time attitude and intolerance of uncertainty. The overall indirect effect of adverse childhood experiences on symptoms of post-traumatic stress is significant and has the following indicators: $IE = 0.13$; $CI (0.0691; 0.2053)$

Fig. 1 Parallel mediation model of the adverse childhood experience influence on the PTS symptoms formation (standardized coefficients)

The contribution of the variables considered in the model to the manifestations of PTS symptoms is as follows: 61.15% of the risk of developing PTS symptoms are affected by the presence of negative childhood experience directly and 38.84% - indirectly, through the attitude to uncertainty (13.8%) and the degree of deviation

from the balanced time profile (25.04%).

We should notice that the childhood traumatic events largely affect the level of deviation from the balanced time profile, in particular, the time perspectives of the Past Negative and the Present Fatalistic. The adverse childhood experience makes a less significant contribution to uncertainty attitude, and it is associated with an Inhibitory IU scale. The child's experience of confusion and helplessness has been remembered and it grows in automatic stress response to surprises.

Conclusions. The results of our study are in line with other studies of adverse childhood experience correlation with negative consequences for mental and physical health in adulthood [7] and clarify the mechanism of post-traumatic stress symptoms development. Understanding the role of time perspective and intolerance of uncertainty in forming the stress response allows us to plan preventive and therapeutic interventions better to prevent and/or correct a maladaptive response to complicated life events.

The study has certain **limitations**. First, the cross-sectional study design limits the ability to draw (final) inferences about causal relationships. Second, the low alpha-Cronbach coefficient on the scales of Past Positive (0.63) and Future (0.68) may distort to some extent the pattern of the relationship between these scales and uncertainty intolerance. The scale of the Past Positive regularly shows a low coefficient of alpha-Cronbach in other studies [24], but low coherence with the Future scale could be the result of a pandemic that has changed the texture of a person's relationship with the self-prediction of their life [25]. Therefore, additional research is needed using other questionnaires to determine the time attitude and to investigate the connections between IU, vision of the past and the future and reaction on traumatic life events.

Perspective directions for further research are the study of the relationship between IU and time attitude, longitudinal study clarifying the sources such effects as perception of unknown formation and deviations from the balanced profile of the time perspective.

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