

# Emotive and Metacognitive Processes in Post-Traumatic Growth of University Students

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**Abstract.** The purpose of the article was to find out the role of emotional and metacognitive processes in the post-traumatic growth of student youth. For this purpose, an online survey was conducted using the following methods: Emotion Regulation Questionnaire (ERQ), AAQ-II, Post Traumatic Growth Inventory (PTGI), The Changes in Outlook Questionnaire (CiOQ). The point-biserial correlation coefficient was used for the mathematical analysis of the data. As a result of the theoretical analysis, it was found that the prevailing theoretical models of posttraumatic growth are fundamentally cognitive. However, there are studies that have examined the relationship between PTG and metacognitive beliefs. A metacognitive way of thinking allows people to take a more critical stance on their cognitive capacities and can help facilitate PTG. It has also been found that emotivity as a linguistic embodiment of emotionality can play an important role in the development of PTG. The empirical study found that after 1 year of full-scale war in Ukraine, the average values of PTG indicators among the surveyed youth are quite high. Young people show positive changes in the perception of their own self, the emergence of new opportunities, an increase in personality strength, and a sense of inner integrity. We did not find a relationship between emotional expression and PTG. However, we did find a relationship between expression suppression and cognitive reappraisal, as well as significant relationships between cognitive reappraisal and PTG with all its components. These findings suggest that cognitive reappraisal can also be performed in relation to one's emotional reactions to traumatic events, helping young people to make sense of their traumatic experiences.

**Keywords:** *post-traumatic growth, emotivity, metacognitive processes, suppression of expression, emotive flexibility, cognitive reappraisal, University students.*

**Матласевич Оксана, Балашов Едуард, Котовська Юлія. Емотивні та метакогнітивні процеси у посттравматичному зростанні студентської молоді.**

**Анотація.** Метою статті було з'ясувати роль емотивних та метакогнітивних процесів у посттравматичному зростанні студентської молоді. Для цього було проведено онлайно-опитування із використанням методик: шкала емоційної регуляції Гросса (ERQ), шкала емоційної гнучкості Хейса (AAQ-II), опитувальник посттравматичного зростання (PTGI), опитувальник змін у перспективі (CiOQ). Для математичного аналізу даних було використано точково-бісеріальний коефіцієнт кореляції. У результаті теоретичного аналізу з'ясовано, що переважаючі теоретичні моделі посттравматичного росту є фундаментально когнітивними. Проте є дослідження, які вивчали зв'язок PTG з метакогнітивними переконаннями. Метакогнітивний шлях мислення дозволяє людям зайняти більш критичну

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позицію щодо своїх пізнавальних можливостей та може допомогти полегшити РТГ. З'ясовано також, що у розвитку РТГ важливу роль може відіграти емотивність як мовне втілення емоційності. У результаті проведеного емпіричного дослідження з'ясовано, що після 1 року повномасштабної війни в Україні середні значення показників РТГ серед опитаної молоді є досить високими. Молодь проявляє позитивні зміни у сфері сприйняття власного "Я", появу нових можливостей, збільшення сили особистості та появу відчуття внутрішньої цілісності. Ми не виявили зв'язку між вираженням емоцій (експресією) та РТГ. Проте виявили зв'язок між придушенням експресії та когнітивною переоцінкою, а також значні зв'язки між когнітивною переоцінкою та РТГ з усіма його компонентами. Отримані результати дають підстави для висновку, що когнітивна переоцінка може здійснюватися і щодо своїх емоційних реакцій на травматичні події, допомагаючи молодим людям витягувати сенс із свого травматичного досвіду. Почата нами спроба проаналізувати роль емотивних та метакогнітивних процесів у РТГ студентської молоді під час війни вказує на необхідність проведення подальших психолінгвістичних досліджень у цьому напрямку, використовуючи метод наративу з подальшим аналізом емоційної лексики, особливостей поєднання слів тощо.

**Ключові слова:** *посттравматичне зростання, емотивність, метакогнітивні процеси, придушення експресії, емоційна гнучкість, когнітивна переоцінка, студентська молодь.*

## Introduction

Traumatic events, of which the war is the most profound and devastating and which Ukrainian society is currently experiencing, are a severe problem not only in the present but also in the long-term emotional perspective. Traumatic events seriously "shake, challenge, or sometimes destroy" a person's perception of the world (Calhoun et al., 2012). There are many potential negative consequences of traumatic events, such as post-traumatic stress disorder, depression, dissociation, and substance abuse. However, over the past decades, trauma researchers have become increasingly interested in post-traumatic growth (PTG), a concept that suggests that some people develop as a result of exposure to traumatic or difficult events (Tedeschi, 2004; 2018; Dewey, 2021).

In order to thrive, not just survive, after a traumatic life event, it is essential to understand the psychological mechanisms that will facilitate adaptation and personal development. To date, it has been established that gratitude, intentional reflection, sharing negative emotions or experiences, adaptive coping styles such as positive reappraisal, and mindfulness practices have a positive impact on PTG (Henson et al., 2021; Ochoa et al., 2016). There are studies aimed at understanding the impact of metacognitive strategies on the ability to respond to negative emotions after traumatic events (Li et al., 2020). They showed that high internal attention to one's emotions helps to maintain emotive balance during the recovery process and improves the ability to cope with adversity. Radini-Tedeschi and Calhoun investigated the relationship between metacognitive processes and self-efficacy in the context of PTG (Radini-Tedeschi & Calhoun, 2018). They found that student's ability to analyze their capabilities and develop coping strategies helps them to believe in their abilities and respond more effectively to stressful situations. They also found that certain personality traits can influence PTG. In particular, extroverts are more likely to

demonstrate PTG because of their active responses and tendency to seek help and communication (Collier, 2016). Expressing one's own emotions (positive or negative) in a safe and supportive environment can reduce the risk of developing depression after a traumatic event, as well as promote the development of PTG (Baños et al., 2022). In addition, the volume of gray matter in the brain regions associated with empathy and emotive intelligence increases in individuals who demonstrate PTG (Nakagawa et al., 2016; Ord et al., 2020). Interestingly, these neurological effects occur in the same brain regions as trauma and stress but in opposite ways.

Although the interest in PTG and its mechanisms is growing every year, there is still very little empirical research aimed at clarifying the role of emotive and metacognitive processes in the post-traumatic growth of student youth. We decided to focus our attention on students because the student period is a stage of intense changes in a young person, which, in turn, will depend on how young people analyze and evaluate traumatic events, how aware they are of their thoughts, feelings, and strategies for regulating their emotions, and whether they find constructive ways to express them. In addition, student youth are more open to change, as their views of the world are usually still in development. Research suggests that PTG may “disintegrate” over time more quickly in children and adolescents than in adults, indicating that the opportunity for growth may be optimal during the student years (Meyerson et al., 2011). Another study found that older adolescents were more capable of developing higher levels of PTG than younger participants (Zhou et al., 2019). It is because students are more interested in connecting with the world, which means building more interpersonal relationships and seeking social support.

## **Theoretical Basis**

PTG is considered a positive psychological effect that can occur after an individual has experienced a significant traumatic event. A systematic review and meta-analysis conducted in 2019 analyzed 26 articles focusing on specific types of trauma and PTG that individuals demonstrated (Wuetal, 2019). As a result of the analysis, the authors concluded that nearly half of the survivors of traumatic events showed moderate to high levels of PTG. PTGs were also found in refugees who witnessed the death of family members or friends, sexual violence or torture, and who were forced to flee their home country after facing various dangers and overwhelming experiences along the way (Acar et al., 2021). A study of PTG among veterans found that 50.1% had moderate or higher levels of PTG (Tsai et al., 2015). The most essential factors in PTG among veterans are social connections and purposefulness. These statistics show great hope for injured veterans while serving their country.

Early concepts of PTG identified three categories that help measure it: perceived changes in oneself, changes in interpersonal relationships, and changed philosophy of life (Tedeschi & Calhoun, 1996). *Changes in self-perception* reflect an improved perception of one's strengths and abilities, improving one's self-assessment of

competence. If these people experience traumatic events in the future, they will have a source of confidence that they can draw on from their past. Living with such confidence is like having a superpower. Improvements in both depth and quality characterize *changes in interpersonal relationships* due to the realization of their importance and how quickly they can potentially dissipate. Certain traumatic events may prompt a person to be more emotively expressive in order to talk through the events or ask for help. It can lead to using new or more resources (which is interesting in the context of our study). A *changed philosophy of life* involves the struggle to understand the traumatic event and the search for new meaning in life. Making sense is a cognitive process that allows a person to integrate new life events into existing mental structures (Mangelsdorf & Eid, 2015). The researchers argue that “gaining a new perspective on the altered reality may facilitate the use of adaptive coping strategies and stimulation of PTG after ABI” (Grace et al., 2015, p. 12).

When it comes to PTG, the scale of the challenge matters. “PTG theory states that an event must be so upsetting that it challenges a person’s goals, beliefs, and coping abilities or causes a change in their view of the world or themselves for growth to occur” (Shakespeare-Finch et al., 2020, p. 45). This term emphasizes the idea that traumatic events can give people new purpose and strength, pushing them to find ways to cope with complex challenges beyond their capabilities. This kind of thinking makes it possible to find and realize what makes life worth living and, in the process, inspires people to live lives they are proud of.

Some studies provide an approach according to which the conceptualization of post-traumatic development is considered in terms of the dialectical unity of the processes of post-traumatic stress disorder (PTSD) and post-traumatic growth (PTG). The results of the study indicate that the process of personality development is paradoxical, irreversible, and hardly predictable. In the dialectical perspective, the attractor of change is not the content of temporary forms (such as trauma, success, and flow) but the stabilization of their change: thesis-antithesis-synthesis. Compared to PTG, the result of PTD is a systemic transition to a new (not better or positive) identity. PTSD and PTG are minor cycles within the primary PTD cycle (Lushyn & Sukhenko, 2021). The authors concluded that from the point of view of the presented model:

1. A traumatic event can be a prerequisite for irreversible personality changes.
2. The post-traumatic process is ambiguous and manifests itself in a flow of relatively positive and negative transitional forms.
3. One of the manifestations is the experience of a complete dead end or blocking of the facilitation process.
4. People may demonstrate sensitivity to random events and the rhythm of their change.

Some researchers also argue that PTG should be understood and evaluated regarding personality change. This view suggests that PTG means personality changes of great depth and significance (Jayawickreme & Blackie, 2020). As long as we define a personality as an open psychosocial system that communicates with the environment for its self-recovery and self-development, development itself can be

understood as a process of constant, spontaneous realization of the potential of the personality system in the form of emergent properties.

Research shows that sharing information with a person or group can help them feel more “normal” about their feelings and experiences (Richardson, 2016). Other researchers argue that for proper growth to occur, both growth cognition and growth action must occur (Hobfoll et al., 2007). In another study, the authors state: “Only when people were deeply engaged in transforming cognitive growth processes into growth actions did we find positive benefits in post-traumatic growth.” (Henson et al., 2021, p. 54).

Thus, the literature review revealed that PTG is related to the ability to express and talk through emotions, as well as to reflect on one’s thoughts about traumatic events.

In this article, we focus on emotive and metacognitive processes.

Emotivity is the subject of psycholinguistic research and means both a linguistic embodiment of emotivity and a linguistic category where emotions are expressed verbally. Shabat-Savka associates emotivity with the realization of the speaker’s intention, in particular, the speaker’s desire to convey their emotive state or to react to what they see, verbalizing it through units of different language levels – lexical and grammatical (Shabat-Savka, 2014). Shynkaruk interprets the term emotivity both in a narrow and broad sense. According to the researcher, in the narrow sense, emotivity correlates with expressive emotive vocabulary or is identified with connotation. In contrast, in the broad sense, it covers all linguistic means that express emotions, i.e., it is realized by units of different language levels (Shynkaruk, 2011).

This understanding of emotivity suggests that its functions are closely related to socio-emotive competence, which is defined as a person’s cognitive and behavioral ability to perceive and express emotions, as well as to understand and use emotions in different situations (Mayer et al., 1993). Social and emotive competence covers five critical skills for developing cognitive, emotive, and behavioral abilities: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (Bridgeland et al., 2013). Some have concluded that socio-emotive competence is one of the factors that influence PTG, and a high level of it can enhance post-traumatic adaptive functioning and contribute to the development of PTG (Thomas et al., 2020). Studies compared COVID-19 adolescents’ emotive competence during and after isolation and found that increased social-emotive competence promoted PTG in adolescents (Tang et al., 2022).

Therefore, the role of emotivity in the development of PTG is a promising area of research and can shed light on understanding the conditions and factors that contribute to the development of PTG.

In general, there are few psycholinguistic studies of trauma and its consequences. The first study of pandemic narratives markers of traumatic experience showed there are markers of time, depersonalization, and affective processes. The psychological marker of affective processes indicates immersion in the traumatic event. It emerges in the manifestation of negative emotions through the words “bad”, “problems”, “critical”, and “difficult” (Kostruba, 2021). The second study studied the

use of language in the narratives of Holodomor survivors as psycholinguistic markers of psychological trauma and post-traumatic stress disorder (Zasiekina, 2020). Researchers investigated the psycholinguistic structure of autobiographical and traumatic narratives representing positive emotive and stressful traumatic life events. The results showed that there are significant differences between the pronoun “they” as an external agent of the sentence and the psychological categories of negative emotions and anxiety in traumatic and autobiographical narratives. The frequency of these categories is higher in traumatic narratives than in autobiographical narratives. The main theoretical conclusion of this study is that traumatic memory can be studied using psycholinguistic markers represented by sentence structures and psychologically significant categories of traumatic narratives (Zasiekina et al., 2019). The third study investigated the linguistic markers of the manifestation in modern non-institutional military poetry discourse of the consequences of combat stress experienced by Ukrainian army personnel during hostilities. This study focuses on an integrated approach that combines pragmatic and cognitive approaches within the discourse analysis framework. The analysis of military poetic discourse has shown that combat stress manifests in the poetry of military personnel in the form of signs of an emotive and psychological state that demonstrate post-traumatic stress disorder. To protect the psyche from the destructive effects of a psycho-traumatic situation, servicemen use such a self-regulation strategy as engaging in artistic creativity, in which poetry acts as a form of social and psychological rehabilitation (Khraban, 2021).

The fourth study focused explicitly on PTG. Based on the theoretical and methodological assumptions of Pennebaker’s differential emotion model and McAdams’ narrative identity model, the autobiographical sequences (word means = 1095) of 40 patients with mixed cancer were codified. The authors found that 26% used words with both positive and negative emotions, 37% used more words with positive emotions, and the other 37% used more words with negative emotions. Surprisingly, only memories with more negative emotions correlated with linguistic measures of cognitive change ( $r = .82$ ) (i.e., true PTG). In contrast, memories with more positive emotions did not correlate with linguistic measures of cognitive and emotive processes. These results emphasized the crucial role of cognitive processes in facilitating the authentic PTG process (Scrignaro et al., 2012).

The predominant theoretical models of PTG are fundamentally cognitive. However, a few studies have examined the relationship of PTG to metacognitive beliefs, self-focused attention, and trauma-related attitudes toward the world and self. There is evidence that these cognitive constructs can influence the development of PTG (Marqueses et al., 2022).

Tedeschi notes that for PTG to occur, a traumatic event must challenge existing positive cognitive schemas by overturning a person’s assumptions that the world is a fair place where people can predict and control what happens, that most people are inherently good, that the person has value, and that the world makes sense. Questioning these beliefs or attitudes leads a person to a cognitive state of trying to understand what happened and the nature of the world and themselves. In other

words, these traumatized people engage in a cognitive struggle to restore their cognitive functions and schemas about the world and themselves (Tedeschi et al., 2018). A *person's metacognitive beliefs* are defined as beliefs about their thought processes. Such beliefs reflect a metacognitive way of processing information when thoughts are not mere descriptions but mental events that deserve consideration (Wells, 2000). A metacognitive way of thinking allows individuals to take a more critical stance on their cognitive capacities and may help facilitate PTG. For example, metacognition may allow traumatized individuals to compare different versions of themselves from “before” and “after” the traumatic event, a thought process that may allow them to recognize their own PTG (Taku et al., 2012, p. 415).

A characteristic feature of metacognitive processes is that they are both cognitive and regulatory (Balashov, 2020). They determine the individual's knowledge of their cognitive processes and activity, as well as perform the functions of control, regulation, and organization of metacognitive processes of a person in achieving specific learning goals.

## Research Questions and Hypotheses

This study will address three research questions.

RQ1: What are the indicators of post-traumatic growth in student youth after one year of war in Ukraine?

RQ2: What is the role of emotive and metacognitive processes in the post-traumatic growth of student youth?

RQ3: What is the relation between cognitive reappraisal, emotivity, emotive regulation, and emotive flexibility and the PTG in groups of students during the war?

Based on the previous discussion, we formulated three hypotheses in this study.

**Hypothesis 1.** We hypothesize that the suppression of emotive expression and feelings has a negative correlation with students' PTG;

**Hypothesis 2.** Cognitive reappraisal of one's thoughts about the traumatic event has a positive correlation with students' PTG;

**Hypothesis 3.** Psychological flexibility mediates the relationship between emotive expression and cognitive reappraisal with students' PTG.

## Method

The study was conducted in the format of an online survey using the Google Forms tool, and the survey period covered the period from December 2022 to February 2023.

For the current data analysis, four methods were used, namely: Gross Emotive Regulation Questionnaire (ERQ), the Hayes Emotive Flexibility Scale (AAQ-II), the Post Traumatic Growth Inventory (PTGI), and the Changes in Outlook Questionnaire (CiOQ).

The ERQ (Emotion Regulation Questionnaire) was developed based on the process model of emotive regulation and is aimed at diagnosing two emotive regulation strategies – cognitive reappraisal and expressive suppression. The first subscale of the questionnaire – cognitive reappraisal – corresponds to what we reasonably call “metacognitive processes” in theory; the second subscale – expressive suppression – serves as an empirical indicator of the emotive process in posttraumatic personality growth. Our study used the Ukrainian version of the questionnaire. The internal validity coefficient of this questionnaire version is  $\alpha_{ERQ} = .81$  for both subscales.

The Hayes EmotiveFlexibility Scale (AAQ-II) is taken from the Acceptance&Action Questionnaire (AAQ-II), developed by Bond, F. W. et al. (2011). According to its provisions, psychological flexibility means the willingness to experience and not interfere with undesirable personal experiences, fully connecting with the present moment to pursue one’s goals and values. This questionnaire is designed to measure the level of experience avoidance and psychological flexibility of the individual, which, in the context of our study, is an indicator of emotive processes in posttraumatic growth. The AAQ-II showed good internal consistency with Cronbach’s  $\alpha$  coefficient in 9 samples between .89-.95. It also demonstrated an acceptable test-retest reliability ( $r = 0.85$ ) in three weeks. The AAQ-II had good convergent validity with another measure of psychological flexibility (CompACT) ( $r = .65$ ) (Shyroka et al., 2021).

In addition to the unit on emotive and metacognitive processes, our study also included two questionnaires to assess and analyze the characteristics of posttraumatic growth.

The Posttraumatic Growth Inventory (PTGI) (Tedeschi & Calhoun, 1996) measures a general index of posttraumatic growth based on data on five subscale factors: attitudes toward others (relationships with others), new opportunities, personal strength, spiritual changes, and appreciation of life. Retest reliability is high (Pearson’s correlation coefficient is .71). The study used the Ukrainian questionnaire developed by Novak and Gukovsky.

The Change in Outlook Questionnaire (CiOQ) supplements the previous questionnaire. The analysis of the factor structure of the questionnaire showed that a two-factor model best describes the scales included in the questionnaire: positive and negative changes after a traumatic experience (Joseph et al., 2005). The internal reliability indicators for the Ukrainian-language version of the questionnaire are high: Cronbach’s  $\alpha$  coefficient - .79; Spearman-Brown’s coefficient - .71; Guttman’s coefficient - .71. (Zubrovskyi, 2018).

For the mathematical analysis of the data, we used the point-biserial correlation coefficient, which is suitable for working with dichotomous and interval scales. In our study, the gender scale was dichotomous; all other scales were interval scales, respectively. When interpreting the correlation coefficient, we were guided by the recommendations proposed by Cohen, according to which: .00 - .10 – insignificant; .10 - .30 – small; .30 - .50 – medium; .50 - 1.00 – large. At the same time, we did not consider the results below .3 when analyzing and interpreting the data.

The participants of the study were 1st and 2nd-year students of the National University of Ostroh Academy who expressed a desire to take part in the survey. The total number of students surveyed was 206 (average age=17.6 years; range=16–24 years).

To collect primary data, the researcher used a purposive sampling technique and considered the students' course of study. The rest of the demographical and other types of information (such as sex or gender, region of residence ) was not crucial when forming the sample but were taken into account during the analysis of the obtained data. To ensure privacy, respondents filled in the online Google form without collecting any personal data. We did not apply to the Ethics Committee for the approval of the research procedure; however, we explained in detail to the participants their rights, how the obtained information would be used, and guaranteed the confidentiality and anonymity of their data. The participants of the study gave their voluntary consent to participate in the study and did not receive any remuneration or any other material incentives for this.

Among the students surveyed, the vast majority were 17 years old (58.3%); more than 34% of students were 18 years old; 4.9% of students were 19 years old; 2 respondents were 20 years old, as well as one person aged 16 and 24.

More than 78.5% of the surveyed students indicated their gender as female, and the remaining 21.5% as male. 89% of students are in their first year of study, and over 10% are in their second year. Among the surveyed students were representatives of various specialties, namely Psychology, Roman and Germanic languages, Law, Economic Cybernetics, Public Health, Primary Education, Computer Science, Finance and Credit, Management, Journalism, National Security, DATA Marketing and Analytics, International Relations, and Political Science.

The studied students came from different regions of Ukraine. The largest share of 55.8% was from the Rivne region, followed by 17% from Khmelnytskyi, 7.3% from Volyn, 4.9% from Zhytomyr, and 2.9% from Ternopil. Five people were from the Lviv Oblasts, and three were from Kyiv and Dnipropetrovsk Oblasts. The remaining respondents in the number of 1–2 people (0.5–1% each), were from other regions of Ukraine, such as Sumy, Kherson, Mykolaiv, Cherkasy, Chernihiv, Vinnytsia, Donetsk, Ivano-Frankivsk, and Poltava Oblasts.

Most people surveyed kept their residences the same after the start of a full-scale Russian invasion of Ukraine (89.8%). At the same time, some became internally displaced within Ukraine (6.8%) or moved abroad (3.4%). At the same time, most student respondents do not plan to move soon (82.5%) or have not decided on their position on this issue (13.6%).

## Results

The data obtained during the survey were processed qualitatively and quantitatively using computer versions of Microsoft Excel 2021 and SPSS 22.0 for Windows 10.

## Level and Features of PTG

Our research has shown that the majority of respondents, after a year of full-scale war in Ukraine, have a high (50%) or medium (33%) level of PTG (Mean=59.1). The scores on the individual scales of the questionnaire are presented in Table 1.

Table 1  
*The Level of PTG of Students (% , n=206)*

Scales	Levels		
	high	medium	low
New opportunities	49	29	22
Attitude towards others	30	39	32
Personality strength	32	50	19
Spiritual changes	21	38	41
Increasing the value of life	46	33	21
<i>Overall PTG score</i>	<i>50</i>	<i>33</i>	<i>17</i>

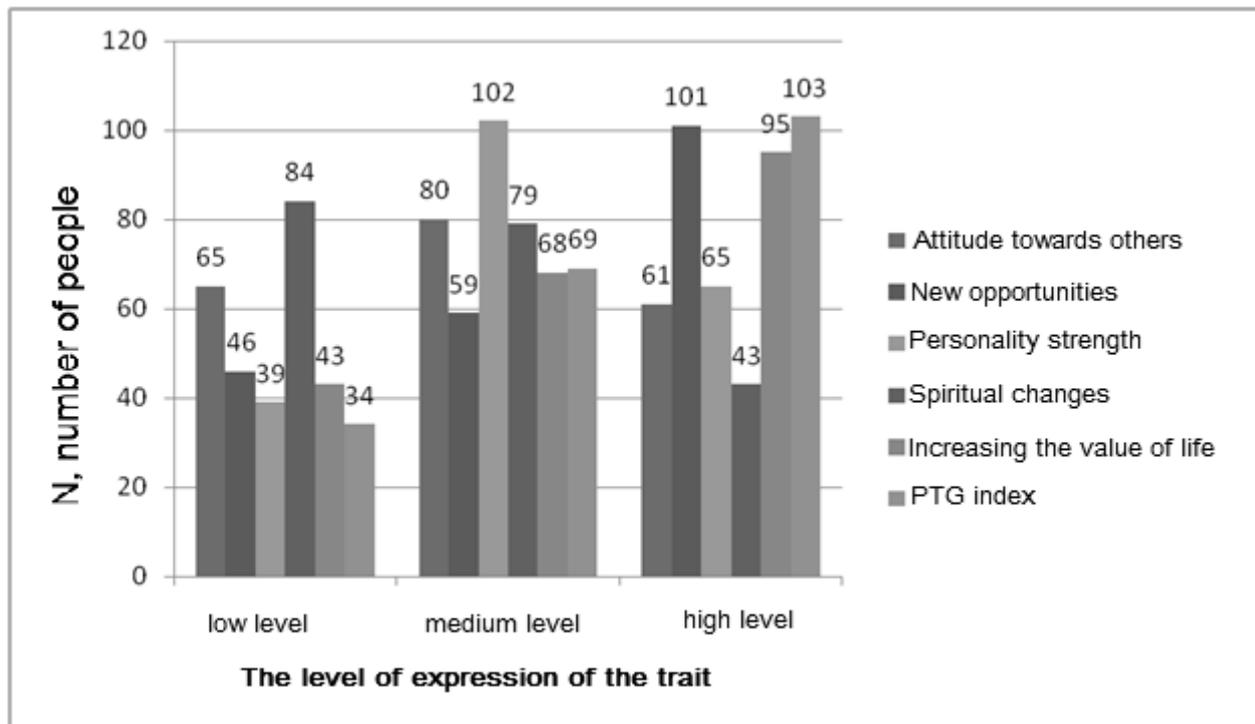
As we can see, the most significant number of people with high and medium scores were found on the scales of “new opportunities”, “personality strength”, and “increasing the value of life”. It indicates positive changes in students’ perception of their self, the emergence of new opportunities, an increase in personal strength, and a sense of inner integrity. Changes in self-perception are a relatively common consequence of the destruction of basic ideas about the world, which is entirely consistent with the social and cognitive theory of trauma (Janoff-Bulman, 1998). In particular, significant life challenges, such as war, can produce a growing sense that a person coped with a test for their strength and resilience. After weighing up everything that has happened, a person can realize that they have experienced the worst and that now there are unlikely to be situations in their life that they are unable to cope with. A third of the respondents changed their attitude towards others and began to value the existence of certain relationships in their lives and clearly understand who their true friends are.

The smallest percentage of students with high scores was on the “spiritual changes” scale (21%). Experiences related to this growth area reflect an increased sense of meaning and purpose in life, more satisfaction, and clarity in answering fundamental existential questions. Probably, such changes are more typical for the older age group.

Figure 1 shows the distribution of respondents by the scales of the Post Traumatic Growth Inventory according to the levels of expression of the studied characteristics.

Figure 1

*Distribution of Respondents by the Scales of the Post Traumatic Growth Inventory According to the Levels of Expression of the Studied Characteristics*



Regarding changes in personal attitudes as a result of PTG, the majority of respondents reported positive changes (59.2%), and slightly less reported negative changes (39.8%). Two people stated that the same number of both positive and negative changes occurred in their lives.

The second task of the empirical study was to find out the role of emotive and metacognitive processes in the PTG of students.

### Emotive Processes

On the emotive suppression scale, the mean value of the sample is 15.73, which corresponds to a low level of use of this emotive regulation strategy. This type of emotive regulation occurred in only 3% of the respondents. The data obtained indicate that most students under study express their feelings and emotions verbally or non-verbally. We consider this to be a positive aspect since, without the ability to share their emotions and experiences, a person can become depressed and feel lost and lonely.

The average value of the emotive flexibility indicator in the sample of respondents is 21.6, which corresponds to a score below the norm according to the questionnaire (Figure 1). According to the methodology, the average score (31 points) indicates mental health. Accordingly, a score below 25 indicates the likelihood of depression, mental disorder, and poor quality of life. Thus, 64.1% of respondents have scores below the conditional norm, and 23.8% have above-norm

scores. At the same time, 12.1% of the survey respondents are in the range between 25 and 31 points.

Figure 2

*Distribution of Respondents According to the Conditional Norm of the Emotive Flexibility Questionnaire (AAQ-II)*



### Metacognitive Processes

According to the cognitive reappraisal scale, the average value of the sample is 27.95, which corresponds to the average level of use of this emotive regulation strategy. Cognitive reappraisal involves changing thoughts caused by a situation and changing the assessment of the ability to cope with a given situation, including it in a broader context, which in the adaptive case leads to an increase or decrease in the intensity of the current emotion or its replacement with another emotion. The frequency with which this type occurs among the sample is 94.7%, making it the dominant way of emotive regulation compared to suppressing expression.

### Correlation Analysis of Data

The use of the point-biserial correlation coefficient suggests that there is a medium-strength relationship between cognitive reappraisal and suppression of expression ( $R=.325$ ), attitude toward others ( $R=.395$ ), and new opportunities ( $R=.404$ ), personality strength ( $R=.405$ ), spiritual changes ( $R=.334$ ), increasing the value of life ( $R=.342$ ), positive changes in attitudes ( $R=.451$ ), and overall PTG index ( $R=.443$ ).

In addition, the point-biserial correlation coefficient demonstrates a strong relationship between emotive inflexibility and negative changes in attitudes ( $R=.546$ ), between positive changes and attitudes towards others ( $R=.623$ ) and new opportunities ( $R=.563$ ), personality strength ( $R=.547$ ), increasing the value of life ( $R=.667$ ), and the overall PTG index ( $R=.679$ ).

All empirical values of the point-biserial correlation coefficient are presented in Table 1.

Table 1  
*An Inter-item Correlation Matrix with Empirical Values of the Point-biserial Correlation Coefficient, R*

	Cognitive reappraisal	Expression suppression	Emotive inflexibility	Attitude to others	New oport.	Pers. str.	Sp. changes	Incr. value of life	PTG index	Neg. changes	Pos. changes
Cognitive reappraisal	1	.325	.065	.395	.404	.405	.334	.342	.443	-.165	.451
Expression suppression		1	.126	-.019	.096	.09	.053	.028	.049	.093	.105
Emotive inflexibility			1	.126	.07	-.006	.13	.103	.098	.546	.016
Attitude towards others				1	.699	.663	.637	.694	.903	-.097	.623
New opportunities					1	.823	.598	.702	.899	-.058	.563
Personality strength						1	.552	.674	.868	-.095	.547
Spiritual changes							1	.59	.736	-.043	.503
Increasing the value of life								1	.839	-.04	.667
PTG index									1	-.085	.679
Negative changes										1	-.101
Positive changes											1

## Analysis of Gender Differences in the Expression of Specific Traits

The data analysis revealed some insignificant differences between gender and some variables, which can be considered features that require further study. The Mann-Whitney U test was used for possible statistical differences in the studied indicators by gender (Table 2). We justified this criterion by the impossibility of applying the parametric Student's T-test for independent samples due to the discrepancy between the distributions of the group of men (n=44) and women (n=162) to the law of normal distribution. Since at least one of the study groups presented has a small size (n<50), the Shapiro-Wilk test was used to check the normality of the distribution, as well as additional analysis of such indicators as mean, median, kurtosis, skewness, and standard error of skewness and kurtosis.

Table 2

*Results of the Mann-Whitney U Test for Individual Scales in the Group of Men and Women*

	Cognitive reappraisal	Emotive inflexibility	Attitude to others	New opportunities	Personality strength	Spiritual changes	Incr. value of life	PTG index	Positive changes
aver man age (n=44)	82.07	86.91	88.38	87.03	9.84	83.95	7.25	82.9	76.42
rank women (n=162)	109.32	108.01	107.61	107.97	106.94	108.81	112.53	109.1	11.85
Mann-Whitney U	2621.000	2834.000	2898.500	2839.500	3007.000	2704.000	2101.000	2657.50	2372.500
Wilcoxon	3611.000	3824.000	3888.500	3829.500	3997.000	3694.000	3091.000	3647.50	3362.500
Z	-2.693	-2.083	-1.899	-2.069	-1.592	-2.471	-4.192	-2.586	-3.401
Asymptotic significance (2-sided). p	.007	.037	.058	.039	.111	.013	.000	.010	.001
Effect size. r	-.188	-.145	-.132	-.144	-.111	-.172	-.292	-.180	-.237

The presented data indicate that there is no significant difference between the group of men and women in the indicators of “attitude towards others” (U=2898.5; Z=-1.899; p=.058) and “personality strength” (U=3007.0; Z=-1.592; p=.111). At the same time, the results of the Mann-Whitney U-test indicate the existence of a statistically significant difference between the group of men and women in terms of cognitive reappraisal (U=2621; Z=-2.693; p=.007), emotive inflexibility (U=2834; Z=-2.083; p=.037), “new opportunities” (U=2839.5; Z=-2.069; p=.039), “spiritual changes” (U=2704; Z=-2.471; p=.013), “increasing the value of life” (U=2101; Z=-

4.192;  $p=.000$ ), PTG index ( $U=2657.5$ ;  $Z=-2.586$ ;  $p=.010$ ) and positive life changes ( $U=2372.5$ ;  $Z=-3.401$ ;  $p=.001$ ). In particular, women demonstrated slightly higher scores on these scales.

We can explain this result by associating it with greater women's involvement and general societal processes in Ukrainian society. As we can see from Table 2, women demonstrated higher indicators of emotional inflexibility compared to men, which indicates a more direct and immediate expression of one's emotions. Furthermore, although detecting gender differences was not the goal of our study, this aspect can provide a new outlook on understanding the conditions and factors of PTG.

The data suggest that our hypothesis was partially confirmed. In particular, we found no connection between expression suppression and PTG. At the same time, we found that emotive inflexibility is associated with negative life changes, and we also recorded links between cognitive reappraisal and PTG with all its components

## Discussion

Results in this research correlate with other studies. In particular, intentional thinking can influence PTG and is generally associated with higher levels of PTG after trauma (Henson et al., 2021). Continuous cognitive processing through intentional thinking signaled higher levels of growth over time (Taku et al., 2009).

Some studies investigating PTG in children who have lost one or both parents to COVID-19 showed that PTG is related to several factors, one of which was intentional reflection, talking through emotions related to traumatic experiences (Gray et al., 2022; Ikizer et al., 2021). A study explicitly conducted among American medical students during the COVID-19 pandemic provided exciting data on PTG. These future physicians often directly cared for patients with COVID-19, engaged in building a supportive social network, used cognitive flexibility or demonstrated other ways to volunteer and serve others. These behaviors indicated higher levels of PTG in students throughout the COVID-19 pandemic (Luo et al., 2022).

A study involving 176 college students found that individuals who desire to be in touch with their emotions and memories show higher levels of PTG (Kashdan & Kane, 2011). The study also found that higher levels of distress combined with a low resistance to the experience of avoiding one's own emotions resulted in the highest PTG scores. Thus, this evidence proves that emotive and metacognitive processes improve the PTG.

As known, emotive regulation typically involves reducing negative affect by engaging (e.g., reappraisal) or disengaging (e.g., distraction) with emotive content. Analysis of the latent growth curve showed that an increase in the choice of reappraisal from low to high intensity of the subjective stimulus predicted a higher PTG (Orejuela-Dávila et al., 2019). Research examining the relationship between emotive regulation and PTG shows that strategies that involve dealing with emotive stimuli, such as reappraisal, can influence PTG by helping people extract meaning from their traumatic experiences (Larsen & Berenbaum, 2015). The strategy of reappraisal, which focuses on

interacting with and changing the meaning of emotive content, has been consistently associated with PTG. However, recent research supports a more nuanced, context-dependent view. Specifically, reappraisal seems to be preferred when dealing with low-intensity traumatic events, and focus/distraction is preferred for dealing with high-intensity difficult emotions (Taubman-Ben-Ari et al., 2021).

A recent Ukrainian study on the psychological factors of mental resilience of young spouses during the war showed that young people in the sixth month of the war can cope and recover from stressful and traumatic events due to high levels of emotive flexibility and the regulatory strategy of cognitive reappraisal (Author & Mykolaychuk, 2023).

The results suggest that cognitive reappraisal of negative stimuli after a traumatic event may be a critical factor in PTG.

## Conclusion

Thus, the study made it possible to find out that after one year of full-scale war in Ukraine, student youth shows PTG. The analysis of the results of the empirical study showed that the average PTG indicators among the surveyed youth are high. It indicates positive changes in how students perceive themselves, the emergence of new opportunities, increased personal strength, and a sense of inner integrity.

We assumed that the PTG of students would be associated with emotive and metacognitive processes. This hypothesis was partially confirmed. In particular, we did not find a relation between emotive expression and PTG. At the same time, we found a relation between expression suppression and cognitive reappraisal, as well as significant relations between cognitive reappraisal and PTG with all its components. The findings suggest that cognitive reappraisal of negative stimuli (and possibly of one's emotive reactions to traumatic events) may be a critical factor in PTG, helping young people to make sense of their traumatic experiences. In this case, it is essential to consider the intensity of emotions.

Traumatic events lead many people to be more emotionally expressive in order to talk about their emotional reactions caused by a specific event. Talking about one's emotions is closely related to cognitive processing of traumatic experiences, which may serve as a facilitating factor for PTG, helping young people make sense of their traumatic experiences. However, the correlation between suppression of expression and cognitive reappraisal, as well as the absence of such correlation between expression and PTG, can be explained by the functioning of mental defense mechanisms. Under challenging circumstances, emotions can blunt, while cognitive and metacognitive processes become activated.

Our attempt to analyze the role of emotive and metacognitive processes in the PTG of students during the war indicates the need for further psycholinguistic research in this area, using the narrative method with further analysis of emotive vocabulary peculiarities of word combinations. In particular, it could be beneficial to search for linguistic markers of PTG or consider a cognitive approach in combination

with ethno- and linguistic-cultural approaches. Thus, it will make it possible to reveal the national and cultural characteristics of PTG and contribute to the development of effective programs to overcome PTSD and facilitate PTG.

The benefits of PTG seem promising and give hope to those who have experienced traumatic events. Some studies show results that indicate not only the long-term benefits of PTG but also an increase in these benefits over time. Therefore, a separate promising area for our further research is monitoring PTG among students during their studies at universities.

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No potential conflict of interest was reported by the authors.

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