

**Cognitive processing of trauma
—Polish adaptation
of the Cognitive Processing of Trauma Scale**

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The aim of the article is to present the results of research on the psychometric properties of the Polish version of the Cognitive Processing of Trauma Scale (CPOTS), used to assess cognitive trauma processing. The study involved 640 people aged 19–73 years ($M = 32.00$, $SD = 12.72$) who had experienced various traumatic events. 57% of the respondents were women and 43% were men. A factor analysis was run which confirmed the 5-factor structure of the scale. The factor Downward comparison explained the most of the variance (33%) and the factor Resolution/acceptance explained the least of the variance (6.1%). The reliability of the Polish version of CPOTS was satisfactory. Cronbach's *alpha* coefficients ranged from .56 to .89, and absolute stability (test-retest) values ranged from .65 to .82. Negative correlations between adaptive coping strategies (Downward Comparison, Positive Cognitive Restructuring, and Resolution/Acceptance) and PTSD symptoms and positive correlations between maladaptive coping strategies (Regrets, Denial) and PTSD symptoms confirmed the validity of the adapted instrument. The Cognitive Processing of Trauma Scale can be a useful tool both in scientific research and in clinical practice, especially for tracking changes during therapy.

Key words: trauma; Cognitive Processing of Trauma Scale; Polish adaptation.

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INTRODUCTION

Many people experience traumatic events in their lives. They are primarily associated with a threat or exposure to death or serious injury, violence, or a threat of sexual abuse (APA, 2013). As a rule, an experience of trauma entails the emergence of various mental health disorders, most often in the form of severe anxiety and depression, as well as symptoms which fall into the category of posttraumatic stress disorder (PTSD). These symptoms, according to the new classification, DSM-5 (APA, 2013), include intrusions, avoidance, negative changes in cognitive and emotional processes, as well as increased reactivity and arousal.

It should be emphasized, however, that an experience of a traumatic event and the related adaptation processes may also be associated with the occurrence of positive changes, referred to as posttraumatic growth (PTG). These positive changes are manifested first of all in three areas of human activity, namely, self-perception, relations with others, and the philosophy of life (Tedeschi and Calhoun, 1996; 2004; Ogińska-Bulik, 2013; 2015).

A traumatic event threatens the integrity of the individual's beliefs about the world as well as his own person and increases the risk of the occurrence of negative outcomes of trauma. These consequences depend primarily on the cognitive processes involved in dealing with the trauma one has experienced. Horowitz (1976) emphasizes that the information which an individual blocks out from his/her consciousness, cannot be assimilated, and so it manifests itself in the form of intrusions or causes the person to avoid thoughts, feelings or memories related to the situation.

In turn, Pennebaker (1993) suggests that refraining from expressing one's own thoughts related to the traumatic situation one has experienced increases one's sense of stress, makes adaptation difficult, and involves the risk of various types of disorders. Many researchers (e.g., Foa & Rothbaum, 1998; Foa, Ehlers, Clark, Tolin, and Orsillo, 1999; Ehlers & Clark, 2000) emphasize that maintaining dysfunctional beliefs (cognitive distortions) promotes the occurrence and persistence of PTSD symptoms.

A threat to the integrity of one's beliefs about oneself and the world prompts one to take action in the form of cognitive processing of trauma. It is one of the most important factors affecting the consequences, both negative and positive, that one has to confront (Tedeschi & Calhoun, 2004). The process of cognitive processing of trauma refers first of all to the integration of the information about the experienced event with already possessed, previously developed cognitive schemas (Janoff-Bulman, 2004; Williams, Davis, & Millsap, 2002).

Some of the indicators of effective processing of trauma, according to Williams, Davis and Millsap (2002), include reduced intensity of PTSD symptoms and negative emotions, in particular feelings of guilt and shame. Other hallmarks of effective processing are greater organization of thoughts, better assimilation of information about the experienced traumatic event, desensitization, manifested by a gradual reduction of distress and negative emotions

caused by recalling the event, acceptance of what has happened, and the ability to notice the positive sides of the situation.

Cognitive processing of trauma, the purpose of which is to endow the experienced event with sense and meaning, and as a consequence—to adapt to the new, changed reality, is often expressed in the form of cognitive coping strategies. This approach refers to Taylor's (1984, 1989) concept of cognitive adaptation and *de facto* relies on the cognitive distortion of reality. The author distinguishes three categories of effort an individual can make in a threatening situation to restore or extend the earlier level of psychological functioning. The first is the search for meaning, consisting in finding a causal explanation of the event and reformulating the assessment of the meaning of one's life, attitudes and goals from the perspective of current experiences. The second type of cognitive effort is to master the situation in order to gain control over events and increase the sense of personal influence on the course of events in general. Finally, the third type is the strengthening of one's own self, based on positive self-assessment, mainly by comparing oneself with people who are in an even worse situation.

Cognitive coping strategies are related to both the negative and the positive consequences of a trauma. Research carried out among railway employees who had been exposed to traumatic events showed that negative cognitive strategies, including denial and regret, played the role of predictors of PTSD (Pinarowicz, 2012). Similar results were obtained in studies of people who had experienced natural disasters (Nalipay, Mordeno and Saavedra, 2015). The importance of denial as a strategy conducive to the occurrence of PTSD symptoms has also been revealed in studies of people infected with HIV (Ogińska-Bulik and Kraska, 2017).

In turn, positive (adaptive) coping strategies favor the occurrence of positive posttraumatic changes. In studies of people with ischemic heart disease, there was a positive correlation between such strategies as positive reappraisal, positive refocusing and putting things into perspective, and posttraumatic growth after trauma (Garnefsky, Kraaij, Schroevers, and Somsen (2008). The role of positive reappraisal in the occurrence of positive posttraumatic changes has been confirmed in Polish studies of HIV patients (Ogińska-Bulik and Kraska, 2017). In Pinarowicz's study (2012), the railway workers's scores on the Cognitive Processing of Trauma Scale showed that positive coping strategies, such as cognitive restructuring, resolution/acceptance and downward comparison, were predictors of posttraumatic growth.

It should be noted that cognitive processing of trauma also involves other cognitive activities, including rumination and the ability to revise one's beliefs. What is more, these activities are related to the coping strategies (Ogińska-Bulik, 2017).

COGNITIVE PROCESSING OF TRAUMA SCALE—CPOTS

There are few instruments available which measure cognitive processing of trauma. One of them is the Cognitive Processing of Trauma Scale (CPOTS) (see Appendix), whose adaptation is presented below. The authors of the scale are Rhonda Williams from the University of Washington and Mary Davis and Roger Millsap from the University of Arizona. The scale consists of 17 items and is used to assess the cognitive processing of trauma in the form of cognitive strategies for dealing with a traumatic experience. According to the instructions, the participant first names the traumatic event he/she has experienced, and then responds to the 17 statements by rating them on a Likert-type scale:

- 3 strongly disagree
- 2 moderately disagree
- 1 slightly disagree
- 0 neither mainly agree nor disagree
- +1 slightly agree
- +2 moderately agree
- +3 strongly agree

When scoring, 3 points are added to each score, which results in an easier to-calculate distribution of scores from 0 to 6 points.

Validity studies of the original version of the scale (Williams, Davis, and Millsap, 2002) were based on scores of 229 people aged 18 to 48 who had reported an experience of a highly stressful or traumatic event. Multiple confirmatory factor analysis showed that a 5-factor model was the best fit ($\chi^2(109) = 185.57, p < .001, RMSEA = .056, CFI = .95$). The five factors representing cognitive strategies of coping with trauma were denial, positive cognitive restructuring, resolution/acceptance, regret and downward comparison. Two of these strategies, namely denial and regret, contribute to the negative processing of trauma (maladaptive strategies), the other three are part of the positive processing of trauma (adaptive strategies).

VALIDATION OF THE POLISH VERSION OF CPOTS

In our study, a total of 640 people aged from 19 to 73 years ($M = 32.00, SD = 12.72$) were examined; 43% were men and 57% were women. Individuals with secondary education prevailed. The participants were divided into several different groups by type of traumatic event (Table 1). The surveys were conducted in crisis intervention and support centers, in hospital wards, and in an emergency room. A group of students who reported an experience of at least one traumatic event was also examined. The most frequently cited events were experiences of a traffic accident and sudden (accidental) death.

Table 1.

Characteristics of the participants

Participantgroups	N	Gender (%)		Age (in years)	
		Men	Women	M	SD
Women—victims of domestic violence	90	0.0	100.0	43.19	13.91
Men with paraplegia	40	100.0	0.0	34.33	9.57
Parents of oncologically ill children	60	46.7	53.3	35.52	8.30
Parents of children with physical disabilities	30	33.3	66.7	42.07	9.65
People after transport accidents	150	48.7	51.3	36.52	12.81
Medical rescuers	60	53.3	46.7	31.53	6.92
Youth	60	46.7	53.3	16.72	0.49
Students	150	48.7	51.3	22.03	2.27
Total	640	43.0	57.0	31.77	12.69

All the respondents completed the Cognitive Processing of Trauma Scale. Apart from CPOTS, several other tools were also used to assess the external validity of the adapted tool. The basic information about the instruments used in the study is given below.

The Posttraumatic Stress Disorder Checklist (PCL-5) by Weathers et al. PCL-5 contains descriptions of 20 PTSD symptoms assigned to 4 factors, i.e. intrusion, avoidance, negative changes in the cognitive and/or emotional sphere, and symptoms of increased arousal and reactivity. The subjects rate to what extent the problems described have worried them during the last month on a 5-point scale, from 0 (not at all) to 4 (extremely). A total symptoms severity score is the sum of the scores for each of the 20 PCL-5 items.

The Posttraumatic Growth Inventory (PTGI) by Tedeschi and Calhoun; Polish adaptation: Ogińska-Bulik and Juczyński (2010). The inventory contains 21 statements describing positive changes that occurred as a result of a traumatic experience. The degree of changes is assessed on a 6-point scale. The participants are asked to rate changes in self-perception, relationships with others, appreciation of life, and spiritual changes.

The Posttraumatic Cognitions Inventory (PTCI) by Foa et al.; Polish adaptation: Dragan, Gulcz and Wójtowicz (2005). The tool consists of 36 statements describing posttraumatic cognitions included in three scales, i.e. negative cognitions about the self, negative cognitions about the world, and self-blame. The participants respond to the statements on a 7-point scale. The higher the score, the higher the degree of negative cognitions.

The Core Beliefs Inventory (CBI) by Cann et al., adapted to Polish conditions by Juczyński and Ogińska-Bulik (2018). The tool consists of

9 statements about disruption in the assumptive world (one's beliefs). The higher the score, the greater the disruption of the participant's beliefs.

The Event Related Rumination Inventory (ERRI) by Cann et al.; Polish adaptation: Ogińska-Bulik and Juczyński (2015). The instrument contains two 10-item scales. A first scale relates to intrusive ruminations and a second to deliberate ruminations. The subjects rate the items on a 4-point Likert scale.

The Positive and Negative Affect Schedule (PANAS) by Watson and Clark; Polish adaptation by Brzozowski, Watson and Clark (2010). The scale is used to measure the intensity of negative and positive emotions. Based on a list of 20 adjectives, the subject rates his relatively constant affective characteristics ("I usually feel this way") on a scale from 1 ("not at all") to 5 ("very much").

RESULTS

Psychometric properties of the Cognitive Processing of Trauma Scale

The reliability of the Polish version of CPOTS, assessed by estimating the internal consistency of the scale measured using Cronbach's *alpha* coefficient, is satisfactory. The coefficients range from .89 to .56 and are higher for the positive trauma processing strategies than for the negative strategies. Detailed data are provided in Table 2. In the original version, Cronbach's *alpha* coefficients were .83, .81, and .72 for positive strategies, and .85 and .74 for negative ones (Williams et al., 2002).

Absolute stability, determined by four-week test-retest in a sample of 30 people, turned out to be satisfactory; it was higher for the positive trauma processing strategies (Downward comparison—.82, Positive cognitive restructuring—.78, Resolution/acceptance—.74) than for the negative strategies (Regret—.74, Denial—.65). All correlations were significant at $< .001$. In the original version, the consistency coefficients determined four weeks apart in a group of 67 subjects ranged from .70 (Downward comparison) to .85 (Positive restructuring) (Williams et al., 2002).

Factor analysis

CPOTS was developed on the basis of a preliminary version consisting of 53 items. By using factor analysis and eliminating weak items (below .40) or items which fell under more than one factor, the authors obtained a 17-item inventory with a five-factor structure.

In our study, the Bartlett sphericity index ($\chi^2 = 4975.03$, $df = 136$, $p < .001$) and the Kaiser-Meyer-Olkin test ($KMO = .86$) confirmed the adequacy of matrix analysis for the existence of common factors. Principal components analysis with variance-maximizing rotation (varimax) in our own study ($N = 320$), confirmed a 5-factor structure similar to that of the original version, but with a changed order. The first factor—(1) Downward comparison

(the last in the original version) explained 33% of the variance, and was followed by (2) Regret (fourth in the original version)—15.9%, (3) Positive cognitive restructuring (second in the original CPOTS)—7.2%, (4) Denial (first in the original CPOTS)—6.6%, and (5) Resolution/acceptance (third in the original version)—6.1%. In sum, all the factors explained 68.8% of the total variance. Factor loadings of the individual items of the scale (see Table 2) are high; the weakest two items (numbers 3 and 9) belong to the factor Denial.

Table 2.
Factor structure of the Cognitive Processing of Trauma Scale¹

Subscales and Cronbach's <i>alpha</i>	Item number and content
1. Downward comparison $\alpha = .89$	11. Other people have had worse experiences than mine (.81)
	13. Even though my experience was difficult, I can think of ways that it could have been worse (.81)
	14. My situation is not so bad compared to other people's situations (.82)
2. Regret $\alpha = .72$	7. I often think "If only I had done something different" (.78)
	8. I blame myself for what happened (.75)
	10. I wish I could have handled this differently (.75)
3. Positive cognitive restructuring $\alpha = .84$	1. There is ultimately more good than bad in this experience (.79)
	15. I am able to find positive aspects of this experience (.78)
	16. I have been able to find a „silver lining” in this event (.81)
4. Denial $\alpha = .56$	3. I say to myself this "this isn't real" (.45)
	9. I refuse to believe that this really happened to me (.43)
	12. I act as if this event never really happened (.61)
	17. I pretend this didn't really happen (.82)
5. Resolution/acceptance $\alpha = .82$	2. I have figured out how to cope (.53)
	4. I have moved on and left this event in the past (.80)
	5. Overall, this event feels resolved for me (.79)
	6. I have come to terms with this experience (.74)

In the next step, confirmatory factor analysis was used to test the reconstruction of the observed correlation matrix of the test scores of groups ($N = 300$) other than those for which the calculations were performed in the exploratory analysis. Several different models were tested to find the best fit. The models were compared using Akaike's information criterion ($AIC = 1.21$), Schwartz's Bayesian information criterion ($BIC = 1.53$), and the comparative

¹ Factor loadings are given in brackets.

fit index (CFI = .92). The highest model selection scores were obtained for the 5-factor model. Goodness of fit indexes such as GFI (.92), AGFI (.90), the Watkins index (5.87), and the RMSEA value (.08) indicated an acceptable fit.

Factors 1 (Downward comparison), 3 (Positive cognitive restructuring) and 5 (Resolution/acceptance) represent positive strategies of coping with trauma and show high correlations between each other (.52–.57, $p < .001$). In turn, factors 2 (Regret) and 4 (Denial) characterize strategies of negative trauma processing and are also quite strongly interrelated ($r = .45$, $p < .001$). By contrast, the relationships between positive and negative strategies are very low (–.05–.17).

Validity of the Cognitive Processing of Trauma Scale

The theoretical validity of the scale was estimated by comparing CPOTS scores with a measurement of those properties with which it should be associated, i.e. the negative and positive consequences of trauma. It was assumed that both strategies of negative processing of trauma would positively correlate with PTSD symptoms measured by PCL-5. In turn, the three positive CPOTS strategies were expected to correlate positively with posttraumatic growth, assessed by PTGI. Distributions of scale scores justified the use of parametric tests. Pearson's r was used to calculate the correlation coefficients. The results are presented in Table 3.

Positive strategies of coping with trauma correlated negatively with the severity of PTSD symptoms. In particular, the correlation coefficients of Resolution/acceptance with changes in the cognitive and emotional sphere as well as changes in stimulation and reactivity were high. It is worth mentioning that the latest diagnostic classification—DSM-5 (APA, 2013) clearly appreciates the importance of negative changes in the cognitive sphere in the diagnosis of PTSD as it includes them as a separate diagnostic criterion. Among negative strategies, Regret correlated positively with the symptoms of intrusion and avoidance.

Similarly, the occurrence of positive changes as a result of an experience of a traumatic event, especially in the form of greater appreciation of life and changes in the philosophy of life, is associated with cognitive processing of trauma, including primarily such strategies as Resolution/acceptance and Positive restructuring. Among the negative strategies of coping with trauma, only Denial is associated—albeit poorly—with positive posttraumatic changes.

The scores obtained for the five subscales (factors) confirm the theoretical assumptions regarding both convergent and discriminatory validity. The former is confirmed—on the one hand, by the close relationship between the positive coping strategies and a low severity of PTSD symptoms and high posttraumatic growth, and on the other hand—by the strong correlations between the negative coping strategies (Regret and Denial) and a high severity of PTSD symptoms. Discriminatory validity is confirmed by the weaker correlations between negative coping strategies and posttraumatic growth.

Table 3.
Correlation coefficients between trauma coping strategies (CPOTS) and PTSD symptoms and PTG

	Coping with trauma strategies				
	Downward compari- son	Positive		Negative	
		Positive cognitive restructuring	Resolution/ acceptance	Regret	Denial
PTSD (PCL-5; n = 310)					
Intrusion	-.26***	-.28***	-.37***	.27***	.17**
Avoidance	-.32***	-.28***	-.41***	.23***	.11*
Cognitive and emotional- changes	-.38***	-.32***	-.49***	.35**	.08
Changes in arousal	-.51***	-.49***	-.57***	.15	-.06
PCL-5 – Total	-.48***	-.41***	-.57***	.29***	.07
PTG (PTGI; n = 420)					
Self-perception	.05	.18**	.26***	-.06	.05
Relations with others	.03	.10*	.12*	.01	.10*
Appreciation of life	.18**	.22***	.27***	.06	.17**
Spiritual changes	.26***	.19***	.25***	.05	.14*
PTGI – Total	.15**	.21***	.29***	.01	.13**

Note. * < .05; ** < .01; *** < .001.

Criterion validity was confirmed by correlating CPOTS scores with the scores on other tests that measure similar properties. The correlations obtained on the basis of scores of several different groups of people are presented in Table 4.

The results show that the cognitive trauma processing strategies of Regret and Denial are positively correlated with negative assessment of the self and the world, and self-blame (PTCI) as well as the tendency to change previous beliefs related to trauma (CBI). Among the positive strategies, only comparing oneself with people in an even worse situation correlated negatively with negative self-assessment.

Table 4.

Correlation coefficients of CPOTS with other variables

	Coping with trauma strategies				
	Positive			Negative	
	Downward compari- son	Positive cognitive restructuring	Resolution/ acceptance	Regret	Denial
PTCI (<i>N</i> = 60)					
Self-blame	-.18	-.15	-.05	.47***	.28**
Negative cognitions about the self	-.27**	-.17	-.12	.48***	.30**
Negative cognitions about the world	.05	-.10	.01	.26**	.17
PTCI—total	-.03	.06	.13	.52***	.19
CBI (<i>N</i> = 380)					
Total	-.05	-.07	-.06	.28***	.16**
ERRI (<i>N</i> = 180)					
Intrusive ruminations	-.22**	-.09	-.25***	.31***	-.02
Deliberate ruminations	-.16*	.06	-.10	.23**	-.06
PANAS (<i>N</i> = 130)					
Positive affect	.52***	.58***	.67***	-.26**	.24**
Negative affect	-.50***	-.48***	-.65***	.31***	-.25**

It is believed that experiences of both negative and positive consequences of traumatic events are associated with the involvement of cognitive processes, in particular ruminations, understood as recurrent thoughts of an intrusive and repetitive nature, which occur without a clear cause. Deliberate ruminations are used to search for ways of dealing with a negative life event, while intrusive ruminations are dysfunctional cognitions about the situation one has experience. As can be seen from Table 4, intrusive ruminations correlate positively with Regret, and negatively with the positive strategies of Resolution/acceptance and Downward comparison. Deliberate rumination is associated with Regret (positively) and Downward comparison (negatively).

The results presented in Table 4 also indicate that there exists a relationship between the cognitive strategies of coping with trauma and positive and negative emotions. It turns out that these connections are stronger and more important than the previously discussed relationships with beliefs or ruminations. This mainly applies to positive strategies. Acceptance and resolution of a traumatic experience, seeing it in a positive light (positive restructuring), and comparing oneself with others to strengthen one's own "self" are associated positively with positive emotions. In turn, the relationships between

negative strategies of coping with trauma and emotions are more complex. Regret correlates negatively with positive affect, and positively with negative affect. The reverse is true of Denial: good mood is conducive to denying that a traumatic event really happened, or *vice versa*, denial as a cognitive strategy of coping with trauma enhances the mood. Because the PANAS uses the "as is usually felt" scale, i.e. it examines relatively constant affective characteristics, the first relationship seems more likely.

Normalization

Application of CPOTS as an instrument for identifying ways of cognitive processing of trauma, which may be especially useful in therapeutic settings, requires the establishment of norms based on the distribution of standardization group scores, or in the form of means cores for different groups, which can serve as reference values.

Table 5 shows the mean scores of several groups of subjects who experienced different traumatic events. Before the means were calculated, the scores for all five strategies were converted to a common denominator by dividing their sums by 4 or 3, depending on the number of items in a given strategy scale. Owing to this procedure, it is possible to compare the scores for the various strategies with each other and locate them on a 7-point scale from 0—"I strongly disagree" to 6—"I strongly agree".

Table 5.
Mean scores on the coping with trauma strategy scales of CPOTS in various groups of repondents

	Coping with trauma strategies										
	Downward comparison			Positive cognitive restructuring		Resolution/ acceptance		Regret		Denial	
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Women victims of domestic violence	90	3.98	1.99	2.68	1.79	3.63	1.60	3.29	1.95	2.25	1.57
Men with paraplegia	40	4.94	1.46	3.57	1.80	4.03	1.76	2.25	1.54	1.92	1.17
Parents of oncologically ill children	60	2.67	1.80	1.02	1.32	2.68	1.54	2.63	1.72	2.20	1.28
Parents of children with physical disabilities	30	5.11	1.04	3.80	1.48	3.74	1.38	3.07	1.42	2.08	1.49
Victims of traffic accidents	150	4.30	2.23	2.72	2.07	3.61	2.11	2.73	1.69	2.49	1.24
Paramedics	60	3.87	1.27	2.24	1.38	3.35	1.42	2.62	1.71	1.81	1.39
Adolescents	60	4.44	1.51	2.42	1.88	3.19	1.60	2.32	1.80	2.07	1.29
Students	150	4.32	1.66	2.48	1.98	3.75	1.48	2.24	1.52	1.87	1.20
Total	640	4.16	1.87	2.53	1.92	3.53	1.71	2.62	1.71	2.13	1.33

In general, the highest scores were obtained for adaptive cognitive processing strategies, in particular Downward comparison, i.e. interpretation of one's traumatic experiences as being less harmful than those experienced by others, and Resolution/acceptance, i.e. dealing and reconciliation with one's traumatic experience. The third adaptive strategy, Cognitive restructuring, i.e. finding positive aspects of a traumatic event, was less well expressed. Of the two maladaptive strategies, Denial of the occurrence of the incident was less frequent. The respondents were more likely to repeatedly think about what could have been done to avoid what had happened (Regret).

Sex significantly differentiated some of the strategies. Men scored lower than women on the Regret scale (men: $M = 2.34$, $SD = 1.59$, women: $M = 2.83$, $SD = 1.78$, $p < .001$). Conversely, women had lower scores on the Resolution/acceptance scale (men: $M = 3.70$, $SD = 1.73$, women: $M = 3.40$, $SD = 1.69$, $p < .01$) and Cognitive restructuring scale (men: $M = 3.40$, $SD = 1.69$, women: $M = 2.72$, $SD = 1.96$, $p < .01$). Age only differentiated the strategy of Regret. The level of this variable was higher in older people (over 30 years old) ($M = 2.82$, $SD = 1.71$, younger: $M = 2.47$, $SD = 1.70$, $p < .01$). Both maladaptive strategies of cognitive processing were more common in people with lower levels of education. The differences were statistically significant for both Regret (for primary and secondary education: $M = 3.18$, $SD = 1.70$, for higher education: $M = 2.42$, $SD = 1.70$, $p < .001$), and Denial (respectively: $M = 2.70$, $SD = 1.42$ and $M = 2.02$, $SD = 1.25$, $p < .001$).

An analysis of variance revealed significant differences in the intensity of cognitive processing of trauma between the examined groups. Parents of children with oncological diseases differed the most from the other groups in relation to the strategies of Cognitive restructuring ($F(7,632) = 10.30$, $p < .001$) and Downward comparisons ($F(7,632) = 9.02$, $p < .001$). Interestingly, while the parents of children suffering from cancer had the lowest scores on these two scales (1.02 and 2.67, respectively), parents of physically disabled children achieved the highest scores (3.80 and 5.11, respectively). The latter, as one may suppose, had already been able to adapt and find positive sides of the event, which they generally judged as being less harmful than other types of trauma. On the other hand, for parents of child cancer patients, the disease was probably a new experience which they had not yet completely come to terms with, to which they had not adapted and for which they do not find a proper comparison. The strategy of Resolution and acceptance, which also involves reconciliation with a traumatic experience, is most prominent in the paraplegic group (4.03), and the least so in parents of oncological patients (2.68). In turn, Regret is most strongly expressed by women victims of domestic violence.

DISCUSSION

CPOTS is used to assess cognitive processing of trauma construed as cognitive strategies of dealing with traumatic events. The results obtained so far prove that cognitive processing should be considered in the form of several separate

factors and not as a single construct. The results obtained for both the original version of the CPOTS scale and the Polish adaptation support the adoption of a 5-factor model, which provides the best fit, explaining regularities in the collected data. The scale has good psychometric properties both in terms of reliability and validity. In order to preserve face validity, the rating scale from -3 to +3 was preserved in the worksheet, even though it makes scoring slightly more difficult.

The five coping strategies of CPOTS have been classified as positive or negative trauma processing. However, while a positive meaning can be rather unambiguously attributed to strategies such as Resolution/acceptance and Cognitive restructuring, the Downward comparison strategy is not so easily evaluated. As Taylor (1989) argues, this last strategy is a distortion of reality, a form of illusion which—as she admits—also brings positive effects, enabling the individual to adapt. It is worth paying attention to the varied significance of the Regret strategy. It is associated with blame and represents negative emotions, but while regret expresses the sadness resulting from a failure to cope with the situation one has experienced, self-blame is more than that and can be related to self-aggressive behavior.

Cognitive processing of trauma is associated with PTSD symptoms. Negative coping strategies, such as Regret and Denial, correlate positively with PTSD symptoms. In turn, positive strategies for cognitive processing, such as Downward comparison, Positive cognitive restructuring and Resolution/acceptance are negatively related to PTSD symptoms. Such relationships confirm the assumptions of the model formulated by Ehlers and Clark (2000), according to which negative cognitive processing of information related to trauma (autobiographical memory) contributes to the production and formulation of negative cognitions concerning oneself and the world and plays a significant role in the occurrence of PTSD symptoms. The results of the present study confirm the positive relationships of maladaptive coping strategies involved in the cognitive processing of trauma with negative beliefs about the self and self-blame.

The relationship between cognitive processing and PTSD symptoms has been demonstrated in various studies conducted in groups of amputees (Phelps, Williams, Raichle, Turner, and Ehde, 2008), stroke patients (Gangstad, Norman, and Barton, 2009) as well as among students with various traumatic experiences (Boals and Schuettler, 2011; Williams et al., 2002). It is worth mentioning that what cognitive coping strategies are used depends to a large extent on the type of traumatic experience and causal attribution, i.e. the way one explains the causes of the event. For instance, if a person attributes a traumatic experience to external factors, which are fundamentally independent of them, as in the situation of natural disasters, they find it is easier to reduce intrusive or avoiding thoughts by seeking a solution, accepting the situation, restructuring it or comparing down. In turn searching for causes in oneself usually leads to excessive self-blame and feelings of regret.

A positive relationship between positive cognitive processing and post-traumatic growth has also been confirmed. Strategies such as Resolution/

acceptance, Positive cognitive restructuring or Downward comparison seem to favor the occurrence of positive consequences of trauma. The present results are confirmed by data reported in the literature (Garnefsky et al., 2008, Ogińska-Bulik and Kraska, 2017, Pinarowicz, 2012).

The consequences of traumatic events borne by the individual are connected with the involvement of cognitive processes, in particular ruminations. However, while deliberate ruminations are used to search for ways to cope with a negative life event, intrusive ruminations are manifestations of dysfunctional thoughts about a situation one has experienced, which may support the maintenance of PTSD symptoms (Cann et al., 2011). As demonstrated in the present study, intrusive ruminations, defined as dysfunctional thinking about oneself and reality, correlate positively with Regret and negatively with Resolution/acceptance and Downward comparison.

The results of our investigations also show there is a close connection between cognitive strategies of coping with trauma and the intensity of negative and positive emotions. Accepting a traumatic experience and perceiving some positive sides in it (positive restructuring) as well as comparing with others in order to strengthen one's own self is associated with positive emotions. In turn, Regret correlates negatively with positive affect, and positively with negative affect.

The CPOTS adapted to Polish conditions may be useful in scientific research as well as in clinical work, primarily in tracking changes during therapy. Outcomes of therapy conducted among rape victims (Iverson, King, Cunningham, and Resick, 2015), victims of torture (Kaysen, Lindgren, Zangana, Murray Bass, and Bolton, 2013), refugees (Schulz, Resick, Huber, and Griffin, 2006), and war veterans (Alvarez, McLean, Harris, Rosen, Ruzek, and Kimerling, 2011) confirm the importance of changes in cognitive processing in improving mental health, including the reduction of PTSD symptoms.

However, further research seems to be necessary, particularly for individuals who have experienced other types of events, to analyze the links between cognitive processing of trauma and behavioral coping strategies and personality predispositions.

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APPENDIX

Cognitive Processing of Trauma Scale—CPOTS

R. M. Williams, M. C. Davis and R. E. Millsap

Polish adaptation: N. Ogińska-Bulik and Z. Juczyński

..... Gender: M F Age:

People sometimes experience highly stressful life events. Remember the most stressful/traumatic event for you and write about what it involved:

Referring to this event, rate to what extent you agree with each of the following statements, using the following rating scale:

- 3. strongly disagree
- 2. moderately disagree
- 1. slightly disagree
- 0. neither mainly agree nor disagree
- 1. slightly agree
- 2. moderately agree
- 3. strongly agree

In each sentence, mark (surround the circle) only one number

1. There is ultimately more good than bad in this experience	-3	-2	-1	0	1	2	3
2. I have figured out how to cope	-3	-2	-1	0	1	2	3
3. I say myself 'this isn't real'	-3	-2	-1	0	1	2	3
4. I have moved on and left this event in the past	-3	-2	-1	0	1	2	3
5. Overall, this event feels resolved for me	-3	-2	-1	0	1	2	3
6. I have come to terms with this experience	-3	-2	-1	0	1	2	3
7. I often think 'if only I had done something different'	-3	-2	-1	0	1	2	3
8. I blame myself for what happened	-3	-2	-1	0	1	2	3
9. I refuse to believe that this really happened to me	-3	-2	-1	0	1	2	3
10. I wish I could have handled this differently	-3	-2	-1	0	1	2	3
11. Other people have had worse experiences than mine	-3	-2	-1	0	1	2	3
12. I act as if this event never really happened	-3	-2	-1	0	1	2	3
13. Even though my experience was difficult, I can think of ways that it could have been worse	-3	-2	-1	0	1	2	3
14. My situation is not so bad compared to other people's situations	-3	-2	-1	0	1	2	3
15. I am able to find positive aspects of this experience	-3	-2	-1	0	1	2	3
16. I have been able to find a 'silver lining' in this event	-3	-2	-1	0	1	2	3
17. I pretend this didn't really happen	-3	-2	-1	0	1	2	3