



# Psychometric Properties of the Turkish Version of the Posttraumatic Cognitions Inventory (PTCI) in a Non-Clinical Sample

## Travma Sonrası Bilişler Envanteri'nin (TSBE) Türkçe Formu'nun Klinik Olmayan Örneklemde Psikometrik Özellikleri

Mustafa GÜLEÇ<sup>1</sup>, Temel KALAFAT<sup>2</sup>, Murat BOYSAN<sup>3</sup>, Yaşar BARUT<sup>4</sup>

<sup>1</sup>Atatürk University Medical Faculty, Department of Psychiatry, Erzurum, Turkey

<sup>2</sup>Ankara University Faculty of Educational Sciences, Department of Psychological Counseling and Guidance, Ankara, Turkey

<sup>3</sup>Yüzüncü Yıl University Faculty of Humanities, Department of Psychology, Van, Turkey

<sup>4</sup>Ondokuz Mayıs University Faculty of Education, Department of Psychological Counseling and Guidance, Samsun, Turkey

### ABSTRACT

**Background:** Cognitive theories of posttraumatic stress disorder have increasingly been recognised. The Posttraumatic Cognitions Inventory is a promising self-report instrument to assess negative cognitions associated with posttraumatic distress.

**Method:** In this study, we examined the psychometric properties of the Posttraumatic Cognitions Inventory in 653 non-clinical Turkish college students. 185 participants reported having experienced various types of trauma.

**Results:** Confirmatory factor analyses replicated the original three-factor structure without excluding any items. Total and subscale scores of the instrument revealed strong connections with severity of depression, anxiety, and dissociative symptoms. Concurrent validity of the Self-Blame subscale was specific to subtype of trauma. The total and the subscales of the instrument had high internal consistency and adequate temporal stability over a two-week interval with an exception of the Self-Blame subscale. The correlation coefficient between the two applications was extremely low for the subscale.

**Conclusion:** We assume that the Self-Blame subscale fails to perform well among individuals who had experienced an aversive event other than interpersonal trauma. The PTCI revealed adequate reliability and validity in a non-clinical Turkish sample. (*Archives of Neuropsychiatry, 2013; 50: 147-153*)

**Key words:** Posttraumatic cognitions, posttraumatic symptoms, assessment, confirmatory factor analysis

### ÖZET

**Amaç:** Travma sonrası stres bozukluğuna ilişkin bilişsel yaklaşımlar gün geçtikçe daha fazla kabul görmektedir. Travma sonrası stresle ilişkili olumsuz bilişlerin değerlendirilmesinde kullanılan umut vadeden bir öz değerlendirme ölçeğidir.

**Yöntem:** Bu çalışmada Travma Sonrası Bilişler Envanteri'nin psikometrik özellikleri 653 klinik olmayan Türk üniversite öğrencisinde değerlendirilmiştir. Örneklem içinde 185 katılımcı geçmişte çeşitli travmatik yaşantıları olduğunu belirtmiştir.

**Bulgular:** Doğrulayıcı faktör analizinde orijinal üç faktörlü yapının hiçbir maddeyi çıkarmadan geçerli olduğu bulunmuştur. Ölçeğin toplam ve alt ölçek puanlarıyla depresyon, anksiyete ve disosiyatif belirtiler arasında yüksek ilişkiler elde edilmiştir. Kendini Suçlama alt ölçeğinin ayırt edici geçerliliğinin travma tipine göre değiştiği görülmüştür. Ölçme aracının toplam ve alt ölçekleri için iç tutarlılıklar yüksek ve Kendini Suçlama alt ölçeği dışında alt ölçekler ve toplam puanlar için yeterli kararlılık düzeyleri elde edilmiştir. Kendini suçlama alt ölçeği için tekrarlı ölçümler için hesaplanan korelasyon düzeyi çok düşük çıkmıştır.

**Sonuç:** Kişiler arası travmatik yaşantılar bildiren katılımcılar dışında Kendini Suçlama alt ölçeği yeterli düzeyde performans göstermemiştir. Travma Sonrası Bilişler Envanterinin genel olarak klinik olmayan Türk örneklemde yeterli düzeyde geçerlik ve güvenilirliğe sahip olduğu söylenebilir. (*Nöropsikiyatri Arşivi, 2013; 50: 147-153*)

**Anahtar kelimeler:** Travma sonrası bilişler, travma sonrası belirtiler, değerlendirme, doğrulayıcı faktör analizi

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### Introduction

The role of negative cognitions in the development and maintenance of PTSD symptoms have long been recognized (1,2). The subjective perception of threat is generally a more influential

antecedent of experienced distress and further outcomes of the treatment (3,4). However, subjective meaning of and further interpretations about the traumatic experience are believed to be much more important than objective content of the event. It has been reported that negative beliefs about self, others, and the

world increases in individuals with PTSD compared to those in individuals not suffering from PTSD (5,6,7).

Accordingly, assessment of negative cognitions is central in therapeutic process and treatment of PTSD. Several cognitive models concerning the development and maintenance of posttraumatic symptoms have been proposed (2,8,9). The Posttraumatic Cognitions Inventory (PTCI) is one the most promising psychometric instruments developed in a treatment-seeking population of PTSD patients who had been the victims of various aversive life experiences (10). The instrument includes 33 negative cognitions clustered in three subscales: Negative Cognitions about Self, Negative Cognitions about the World, and Self-Blame. In the further studies on psychometric properties of the instrument, that translated into Dutch, German, Chinese, and Hebrew languages, have been examined in non-English speaking samples (11,12,13,14). In the initial validation study and further psychometric studies, the total scale and subscales of the PTCI generally revealed high internal consistency (Cronbach's alphas for TOTAL  $\alpha = .93 - .97$ , for SELF  $\alpha = .92 - .97$ , for WORLD  $\alpha = .83 - .89$ , and for BLAME  $\alpha = .77 - .86$ ), high temporal stability and convergent validity.

Various results have been found pertaining to validity of the original three-factor structure of the PTCI. The original three-factor structure based on Foa et al. was replicated in Dutch sample. However, Beck, Coffey, Palyo, Gudmundsdottir, and Miller, and Colder found poor fit for the original three-factor model with data collected from victims of a motor-vehicle accident (15). Model fit of the three-factor structure was achieved after removing four complex items from the SELF dimension. Further studies conducted with German, Chinese, and Hebrew translations of the PTCI reported similar results that three-factor structure could be replicated only after removing four items from the SELF subscale.

Scholars have noted that Self-Blame subscale of the instrument do not discriminate between individuals with and without PTSD contrary to subscales measuring negative cognitions about self and the world. Weak or insignificant linkages were found between the Self-Blame subscale and measures of psychological variables pertaining to miscellaneous psychological symptoms elevating in the aftermath of traumatic experiences (14,15,16). This may be attributed to the sample characteristics of these studies and it seems that self-blame is a pertinent factor among individuals who experienced interpersonal trauma (10,11). The research studies conducted among individuals, who had experienced aversive events other than interpersonal trauma, have found weak support for the Self-blame subscale. In the further analyses, findings concerning construct validity of the Self-Blame dimension of the instrument have varied among individuals reporting different types of trauma (12,13).

The aims of the present study can be described as follows: i) to examine validity of the three-factor structure in a non-clinical Turkish sample; ii) to examine the construct validity of the instrument by assessing concurrent and divergent validity; iii) to assess the reliability of the scale by computing internal consistency and test-retest correlations between two applications.

## Participants

Turkish college students (n=653) completed a set of questionnaires. 103 participants had experienced an accident-related event; 88 participants had experienced physical assault, and 40 participants had experienced sexual assault. 65 participants did not respond to questions inquiring traumatic experiences. 403 participants reported not having had any type of traumatic experiences. Detailed descriptions of demographic characteristics are presented in Table 1.

## Instruments

### Posttraumatic Cognitions Inventory (PTCI) (10)

The PTCI includes 33 items, assessing trauma-related negative cognitions, rated on a seven-point Likert type scale ranging from "1-Completely disagree" to "7-Completely agree". The scale is comprised of three subscales: negative cognitions about self, negative cognitions about the world, and self-blame. The total and subscales of the instrument demonstrated high internal reliability in the initial validation study that Cronbach's alphas were .97, .88, and .97, respectively.

### Beck Depression Inventory (BDI) (17)

The BDI consists of 21 items; each item offers four descriptions of different intensity (rated from 0 to 3) for specified depressive symptoms. Accordingly, the BDI score can range between 0 and 63. The Turkish version of the BDI demonstrated good psychometric properties (18).

### Beck Anxiety Inventory (BAI) (19)

The BAI consists of 21 items; each item offers four descriptions for a symptom of anxiety with different intensity (rated from 0 to 3). Total BAI scores range between 0 and 63. The Turkish version of the BAI demonstrated good psychometric properties (20).

### Dissociative Experiences Scale (DES) (21)

This 28-item self-report scale was originally developed by Bernstein and Putnam (21). It was designed to measure dissociation in both general and psychiatric populations. The DES has adequate temporal reliability, with test-retest correlation coefficients between .79 and .84 (22). The Turkish version of the DES is a reliable and valid measure. The Turkish version has an alpha coefficient of .97 and has high test-retest reliability ( $r = .77$ ). The convergent validity of the instrument with the Dissociation Questionnaire (DIS-Q) was  $r = .90$  in a Turkish population (23).

**Table 1.** Demographic characteristics of the sample (n=653)

Variable	Total Sample
Age	21.48 (1.52)
Women	65.85%
Accident †	15.77%
Physical assault †	13.48%
Sexual assault †	6.13%
Non-traumatized †	69.57%

† Percentages of reported trauma do not constitute 100% since some individuals reported more than one type of trauma and trauma type is unknown for 10.11% of the sample

Participants are asked to respond to items on a scale ranging from 0 to 100. Total DES scores are calculated by averaging the sum of all items.

### Procedure

The Posttraumatic Cognitions Inventory was translated into Turkish by three scholars who were fluent in English. Turkish translations of the PTCI were compared for each item whether Turkish statements were coherent with each other or not. It was discussed on the items translated differentlyseperately until a consensus was assured.

The participants completed the Posttraumatic Cognitions Inventory (PTCI), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and the Dissociative Experiences Scale (DES). In the course of the study, the participants were undergraduates enrolled in different education programs. Each volunteer signed a written consent.

### Statistical Analysis

In the first step, the item discrimination characteristic of each item was assessed by computing the item-total correlation coefficient. The data collected for the Turkish version of the PTCI were submitted to confirmatory factor analysis to test validity of the original three-factor structure based on the study by Foa et al. (1999). In the further analyses, we computed mean differences by t-tests between individuals who had experienced trauma and non-traumatized controls to examine the concurrent validity and considered zero-order correlations to examine the convergent validity of the PTCI. Reliability of the instrument was assessed by calculating Cronbach's alpha coefficients and test-retest correlations between two applications with a 15-day interval. Significance threshold was held at  $p < .05$ .

### Results

To examine the psychometric properties of the PTCI, we began by computing corrected item-total correlations for the scale. Item discriminations of the instrument ranged from .39 to .65. Item-total correlation coefficients are presented in Figure 1.

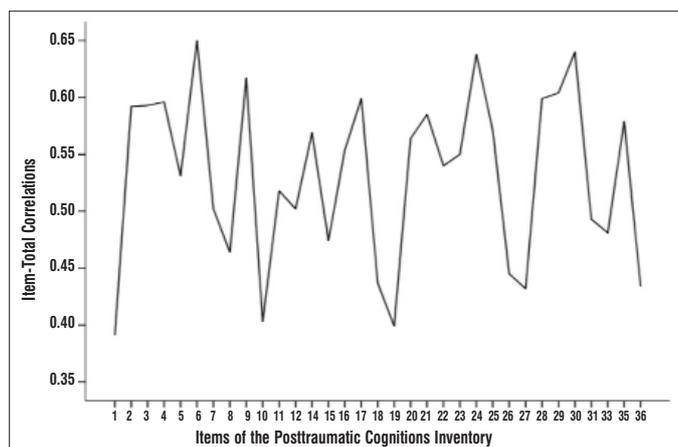


Figure 1. Distribution of items-total correlation coefficients

We specified a three-factor model based on the initial validation study of the PTCI with 21 items indicating negative cognitions about self, 7 items indicating negative cognitions about the world, and 5 items indicating self-blame (10). The three-factor original model had a Satorra-Bentler scaled chi-square value of 846.57 with 492 degrees of freedom, a Root Mean Square Error of Approximation (RMSEA) value of .03, a Tucker-Levis Index (TLI) of .99, a Comparative Fit Index (CFI) of .99, a Standardized RMR value of .08. The model had a satisfactory fit to the data (24). An identical model representing the original three-factor structure specified for 185 individuals who had experienced at least one type of trauma. All standardized factor loadings were significant. The model had a Satorra-Bentler scaled chi-square value of 699.39 with 492 degrees of freedom, a Root Mean Square Error of Approximation (RMSEA) value of .05, a Tucker-Levis Index (TLI) of .98, a Comparative Fit Index (CFI) of .98, a Standardized RMR value of .11. Goodness of fit

Table 2. Maximum likelihood estimates of standardized factor loadings for the PTCI items (n=653)

Items	Factor Loadings	R <sup>2</sup> s	Critical Values
<b>Negative Cognitions About Self</b>			
2	.65	.42	16.52
3	.65	.42	18.45
4	.68	.46	17.76
5	.62	.38	15.09
6	.73	.53	21.21
9	.67	.45	20.85
12	.43	.19	12.17
14	.61	.38	17.03
16	.61	.37	14.16
17	.68	.46	16.98
20	.57	.33	17.43
21	.66	.44	15.48
24	.67	.44	23.38
25	.65	.42	12.12
26	.46	.21	12.31
28	.66	.44	18.58
29	.66	.44	18.81
30	.72	.51	17.01
33	.52	.27	12.90
35	.64	.40	17.39
36	.37	.13	8.94
<b>Negative Cognitions About the World</b>			
7	.79	.63	30.40
8	.66	.44	19.65
10	.50	.25	11.61
11	.51	.26	12.72
18	.61	.37	18.20
23	.78	.61	26.42
27	.61	.38	16.63
<b>Self-Blame</b>			
1	.61	.37	16.45
15	.63	.40	17.30
19	.41	.16	9.96
22	.65	.42	16.37
31	.71	.50	20.92

**Table 3.** Comparisons of the PTCI total and subscale scores between groups

	Accident		t(504)	P	Non-traumatized		t(489)	P	Sexual Assault		t(441)	P
	M (SD)	M (SD)			M (SD)	M (SD)			M (SD)	M (SD)		
Negative Cognitions about Self	2.50 (1.35)	2.06 (0.98)	3.717	.000	2.52 (1.31)	2.06 (0.98)	3.730	.000	3.08 (1.41)	2.06 (0.98)	5.961	.000
Negative Cognitions about the World	4.41 (1.92)	3.92 (1.52)	2.798	.005	4.69 (1.96)	3.92 (1.52)	4.098	.000	4.68 (1.47)	3.92 (1.52)	3.034	.003
Self-Blame	2.80 (1.34)	2.66 (1.28)	1.022	.307	2.95 (1.29)	2.66 (1.28)	1.967	.049	3.58 (1.32)	2.66 (1.28)	4.329	.000
Posttraumatic Cognitions Inventory	2.95 (1.27)	2.55 (0.97)	3.550	.000	3.05 (1.22)	2.55 (0.97)	4.189	.000	3.49 (1.22)	2.55 (0.97)	5.751	.000
Beck Depression Inventory	14.10 (9.78)	10.74 (7.38)	3.792	.000	16.67 (14.85)	10.74 (7.38)	5.404	.000	21.23 (18.84)	10.74 (7.38)	6.945	.000
Beck Anxiety Inventory	16.21 (10.90)	13.27 (11.17)	2.371	.018	16.89 (12.50)	13.27 (11.17)	2.663	.008	18.85 (13.05)	13.27 (11.17)	2.957	.003
Dissociative Experiences Scale	23.23 (16.60)	19.81 (13.17)	2.211	.028	27.69 (16.90)	19.81 (13.17)	4.787	.000	29.06 (14.80)	19.81 (13.17)	4.131	.000

**Table 4.** Pearson correlations between psychological variables

	1	2	3	4
1. Negative Cognitions about Self	-			
2. Negative Cognitions about the World	0.53**	-		
3. Self-Blame	0.61**	0.40**	-	
4. Posttraumatic Cognitions Inventory	0.95**	0.75**	0.72**	-
5. Beck Depression Inventory	0.58**	0.28**	0.36**	0.54**
6. Beck Anxiety Inventory	0.54**	0.30**	0.34**	0.52**
7. Dissociative Experiences Scale	0.54**	0.35**	0.33**	0.53**

\*\*: $p < .01$ 

statistics indicated almost a satisfactory fit to the data in participants having traumatic experiences with an exception of Standardized RMR which was higher than .10 (24). All standardized factor loadings were significant as well. Further analyses were performed based on this three-factor model. Maximum likelihood estimates of the standardized factor loadings for overall sample are presented in Table 2.

We compared the total and subscale scores between individuals who reported traumatic experiences and individuals who did not report a traumatic event. Individuals who reported accident-related traumatic experiences had higher scores of posttraumatic cognitions than normal controls with an exception of self-blame subscale. The mean difference between groups in self-blame score was not significant ( $t(504)=1.022$ ;  $p > .05$ ). Participants having experienced previous accident-related events reported elevated PTSD, depression, anxiety, and dissociation scores compared to participants in non-traumatized group. Individuals, who reported physical assault, had significantly higher scores on total and subscales of the PTCI than individuals who did not report traumatic experience. It was found significant differences in the BDI, BAI and DES scores that

physically assaulted individuals had significantly elevated depression, anxiety and dissociation. Sexually assaulted participants also scored significantly higher on total and subscales of the PTCI than controls. Sexually assaulted group also reported elevated psychological distress reflecting posttraumatic symptoms in terms of depression, anxiety and dissociative scores. Findings are presented in Table 3.

To examine the convergent validity of the PTCI, Pearson's product-moment correlation coefficients were computed between the psychological variables. All subscales of the PTCI were significantly correlated with the total scores ( $p < .01$ ). Significant associations of total and subscales of the PTCI with posttraumatic symptoms, depression, anxiety, and dissociation were found. Correlation coefficients between PTCI total scores and depression, anxiety, and dissociation scores were high. Similar connections were found between negative cognitions about self and other psychological variables. Both negative cognitions about the world and self-blame subscales revealed mediocre correlations with depression, anxiety, and dissociation. Associations between the variables are presented in Table 4.

To examine the reliability of the overall and subscales of the PTCI, internal consistency and 15-day interval temporal stability of the instrument were computed. Cronbach's alpha coefficients for the total and subscales ranged from .73 to .93 that internal consistency of the instrument was high. Internal consistency ranged between .69 and .91 among individuals who had experienced at least one type of trauma and between .75 and .93 among individual who did not report a traumatic experience. However, the instrument demonstrated just adequate temporal reliability except for the Self-blame subscale. The correlation coefficient between two applications for the Self-blame was extremely low ( $r=.39$ ). Descriptions for the reliability of the instrument are given in Table 5.

**Table 5.** Reliability of the PTCI total and subscales

	Total Sample Cronbach $\alpha$	Traumatized Cronbach $\alpha$	Non-traumatized Cronbach $\alpha$	Temporal Stability r
Negative Cognitions about Self	.92	.91	.93	.60
Negative Cognitions about the World	.82	.71	.87	.66
Self-Blame	.73	.69	.75	.39
Posttraumatic Cognitions Inventory	.93	.91	.93	.60

## Discussion

Cognitive models accounting for onset and maintenance of PTSD symptoms have been increasingly more recognizable. Accordingly, the Posttraumatic Cognitions Inventory is a promising instrument developed to assess negative beliefs that lead to exacerbation of distress experienced in the aftermath of trauma (10). The present study includes a psychometric evaluation of the PTCI in a non-clinical Turkish sample. A modification of excluding four items from SELF subscale was proposed since the complexity of these items loading more than one factor (15). Three-factor structure of the scale has generally been validated in most of the psychometric studies after excluding these four items (12,13,14,16). Regarding the current data, the three-factor original structure based on initial validation study conducted by Foa et al. replicated in both overall sample and the group (n=185) which was comprised of individuals who had experienced at least one type of trauma (10). Three-factor solutions fit the data without excluding any items. The findings supported original validation study conducted by Foa et al. (10) and data collected from Dutch sample (11) The PTCI total and its three subscales demonstrated high internal consistency among individuals who had experienced at least one type of trauma and in individuals who were non-traumatized. Current findings provided further support for the validity of three dimensions of trauma-related negative cognitions. Test-retest reliability of the total and subscales of the PTCI was adequate with an exception of the Self-Blame subscale. Contrary to SELF and WORLD subscales, temporal stability of the BLAME scale was extremely low.

Convergent validity was demonstrated by significant connections of dimensions of posttraumatic negative cognitions with PTSD, depression, anxiety, and dissociation symptoms ranging from mediocre to high. Negative cognitions about self subscale indicated highest correlations with measures of psychological distress. Furthermore, the Self-Blame subscale also revealed strong correlations with PTSD, anxiety, depression and dissociation symptoms. Obtained linkages between psychological variables confirmed construct validity of the instrument.

Regarding the concurrent validity of the PTCI, the mean scores of the subscales were compared between individuals who had experienced traumatic events and those who did not report such an experience. It has been reported that the Self-Blame subscale fails to discriminate between individuals with and without PTSD and was not significantly associated with measures of psychological distress elevating in the aftermath of traumatic events (15,16). A possible reason for the weak construct validity of the BLAME subscale may be the sample characteristics included in the studies. The initial

validation study contained individuals who had experienced a sexual assault that negative cognitions pertaining to self-blame revealed good psychometric properties (10). However, it was found that the psychometric properties of the BLAME subscale differed among individuals owing to trauma subtype. The subscale performed poorly among individuals who had experienced some type of traumatic events such as vehicle accident in contrast to interpersonal trauma (12,13). In the current study, our findings provided further evidence in line with the previous findings. Although the BLAME subscale satisfied at discriminating between individuals, who had experienced physical or sexual assault from non-traumatized participants, self-blame cognitions poorly performed at discriminating between individuals who had experienced an accident-related aversive event and non-traumatized controls.

This study has several limitations. First, although our sample was relatively large, we selected volunteers only from university students. The psychometric properties of the PTCI in adult population and early adolescents need attention by conducting further studies. Also we conducted this study in a non-clinical population and we did not clinically assess mental health status of the participants, especially whether individuals suffering with PTSD or not. Features of the instrument should be assessed in clinical samples. Second, it seems that the PTCI, particularly the Self-Blame subscale, is substantial to type of traumatic event that we used a self-report approach in assessing traumatic events which had been experienced by participants. Besides, individuals, who had experienced aversive events, were not pure victims of one type of trauma. Some of the participants reported more than one type of trauma. Concurrent validity of the subscales of the PTCI was likely to be more accurately evaluated if individuals were assigned in trauma subgroups due to a criterion of having experienced only one type of trauma. However, since victims often report more than one type of aversive events especially in interpersonal traumatic experiences (25,26,27), it seems hard to accomplish such a firm dissociation among individuals owing to experienced traumatic events. Finally, among individuals, who experienced at least one type of trauma, the time passed after the traumatic experience was not recorded.

This study generally confirmed and extended previous information about the PTCI. The subscales of the instrument revealed good construct validity. All dimensions of the scale strongly correlated with various measures of distress which may probably be observed among individuals in the aftermath of traumatic experiences such as anxiety, depression, and dissociative symptoms. However, the Self-Blame subscale failed to discriminate between individuals who had experienced accident-

related aversive events and those who had experienced physical or sexual assault. On the contrary, subscales reflecting negative cognitions about self and the world satisfied at discerning individuals who experienced trauma. Internal consistency of the instrument was high. 15-day interval temporal stability of the SELF and the WORLD subscales was also adequate whereas test-retest correlation for the BLAME subscale was unexceptionally low.

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