Adaptation of the Cognitive Triad Inventory into Turkish: a Validity and Reliability Study

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ABSTRACT

Introduction: The aim of this study was to assess psychometric properties of the Turkish version of The Cognitive Triad Inventory developed to use cognitive triad based on Beck's depression model.

Methods: The study sample included 337 (female 72.2%, male 27.8%) students from Hacettepe University. Reliability was evaluated by test-retest analysis and internal consistency coefficients. For validity, explanatory and confirmatory factor analyses were performed. In addition, the scales which are assumed to measure similar cognitive structures were used to examine convergent validity. The Cognitive Triad Inventory, Beck Depression Inventory and The Hopelessness Scale were administered to the participants.

Results: The Cronbach Alpha coefficient reliability of The Cognitive Triad Inventory (r=0.91) showed that internal consistency reliability of

inventory is high. It was found that test-retest reliability coefficients range from 0.74 to 0.94 and are high for an interval of 4 weeks (p<0.005). Confirmatory factor analysis has supported three factor structure of the inventory: "view of self", "view of world" and "view of future". The analysis showed that the model has high goodness of fit. Comparison with three self-report measures released that Cognitive Triad Inventory and its subscales have good convergent validity.

Conclusion: The Turkish version of the Cognitive Triad Inventory has been found to be a valid and reliable measure that can be used for the university students of Turkey.

Keywords: The cognitive triad inventory, beck's depression model, negative cognitive triad, reliability and validity

INTRODUCTION

World Health Organization lists depression as the fourth leading cause of incapacity for disease worldwide, predicting that depression will be the second leading cause by 2020 (1). One of the scientifically supported and widely accepted theories explaining the development and maintenance of depression was developed by Beck, Rush, Shaw and Emery (2).

In Beck's cognitive model (3), schemas, cognitive errors, cognitive triad and automatic thoughts are central in the development and maintenance of depression. Schemas are highly persistent and organized structures that guide situational information processing. Schemas causing depression are negative and include immature, absolute and rigid attitudes about self and the relationship of self with the world. These stress-driven schemas lead to cognitive errors which are the next step in the causal pathway to depression. Cognitive errors lead to a negative, unrealistic, excessive and distorted perception and thought. As a result, a depressive individual (a) predicts that current difficulties or suffering will continue

indefinitely, making long-term predictions (negative view of the future), (b) attributes adverse events to personal psychological, moral, or physical defects (negative view of self) and (c) tends to see the world as over-demanding and / or providing insurmountable obstacles to achieve life goals (negative view of world). Totally, these three cognitive views are known as the cognitive triad (2).

The cognitive triad consists of negative views of the self, the world and the future. The person with the negative cognitive triad considers him/herself to be inadequate and believes that unpleasant experiences are the result of his/her behaviors or characteristics. The individual considers the world as full of obstacles and interprets the interactions with the environment in a negative way. Furthermore, the future is seen as full of challenges and it is believed that the current difficulties will continue indefinitely. In addition to being susceptible to depression, the cognitive triad also plays a role in maintaining depression (4).

Many studies conducted to date have shown the relationship between negative view of the self and depression (5-8). Although views of the world and the future have not been studied as much as self view, negative views of the world and the future and depresive symptoms has also been supported (9,10). The Beck Depression Inventory (11) has items that measure all three aspects of the cognitive triad but it was not systematically designed to measure the cognitive triad. The Cognitive Triad Inventory was developed to assess all aspects of the cognitive triad in a systematic manner (12). The findings have supported the utility of classification of depressogenic cognitions into three structures (self, world and future) and the notion that different cognitive processes and response styles can be obtained from positive and negative items (10).

Pössel (13) conducted an adaptation study to obtain a reliable and valid German version of the American Cognitive Triad Inventory. The findings supported the generalizability of Beck's model to different cultures.

In addition to the development of the Cognitive Triad Inventory, adaptation to different cultures and validity-reliability studies, there are also studies examining the relationship between cognitive triad with depression and anxiety. Previous studies have emphasized that cognition plays an important role in anxiety.

In this respect, Wong (14) investigated the relations of the cognitive triad, dysfunctional attitudes, automatic thoughts, and irrational beliefs with test anxiety. Multiple regression analyses showed that only the cognitive triad was an important predictor of anxiety. Specially, negative view of self was found as an important predictor of anxiety.

Mak and his colleagues (15) tested the assumption that the relationship between psychological resilience, life satisfaction and depression could be explained by a positive view to the self, the world and the future (positive cognitive triad). The results of structural equation model and mediator analysis showed that psychological resilience was significantly related to positive cognitions about self, world and future. Individuals with positive cognitions reported higher life satisfaction and lower depression. It has been supported that positive cognitive triad can be utilized to increase overall well-being.

Despite the importance of the cognitive triad in the development, maintenance and treatment of depression, there is no measurement tool to examine the cognitive triad in adult sample in Turkey. Güloğlu and Aydın (15) adapted the Cognitive Triad Inventory for Children which measures automatic thoughts reflecting the cognitive error tendency in children. However, no studies have been conducted with adults so far. In order to fill this gap in the literature, it was aimed to adapt the Cognitive Triad Inventory developed by Beckham and his colleagues (12) into Turkish and to evaluate the psychometric properties in non-clinical adult sample.

METHOD

Sample
The study included 334 (female 72.2%, male 27.8%) students from Hacettepe University. The mean age of the sample was 21,19 years (S=3,82). The test-retest study of the scale was conducted on 35 participants after four week interval.

Measurements

The Cognitive Triad Inventory (CTI)
The Cognitive Triad Inventory (12) is composed of substances that measure both positive and negative cognitions of individuals. It includes cognitions about self (e.g. "I can do a lot of things well."), world (e.g. "The

world is a very hostile place.") and future (e.g. "There is nothing to expect from the future"). Four of the items measure positive self view and six of the items measure negative self view. Five items each are used to measure positive and negative world views and positive and negative future views. The remaining six items are filler items that ara not included in scoring (item numbers are 1, 2, 4, 7, 14, 22). Individuals are asked to rate the items on a 7-point Likert scale from 1 ("total agree") to 7 ("totally disagree"). For scoring, all of the positive items are reversed and the low scores from the scale represent the positive cognitive triad and the high scores represent the negative cognitive triad.

Initially, the reliability and validity statistics of American Cognitive Triad Inventory were examined in the sample of 26 patients with depression and the items that did not correlate with their own subscale were excluded. The reliability and validity of the inventory was reevaluated in a separate sample of 28 patients with depression. The scale and its subscales were found to have high internal consistency. The Cronbach Alpha coefficient reliability of overall CTI was 0,95 (12). The total CTI correlated highly (r=0,77) with Beck Depression Inventory (11), self view subscale correlated highly (r=0,90) with Rosernberg Self Esteem Scale (17) and future view subscale correlated highly (r=0,90) with Hopelessness Scale (18).

The Beck Depression Inventory (BDI)
The Beck Depression Inventory (BDI) adapted by Teğin (19) was used to evaluate the level of depressive symptoms in this research. It measures somatic, emotional, cognitive and motivational symptoms in depression and includes 21-symptom categories. The high score of the scale represents the severity of depression. According to the reliability analysis of the Turkish version of the scale, split half reliability coefficients were found to be 0,78 and 0,61, respectively for students and for a group of 30 patients with depression. Test-retest reliability of the scale was found to be 0,65 (19).

The Beck Hopelessness Scale (BHS)
The Beck Hopelessness Scale (BHS) was used to evaluate negative expectations of the person about the future (18). The scale is a 20-item scale that includes emotions, thoughts and motives about the future. Scores range from 0 to 20 and high scores represent high level of hopelessness (20). In the reliability and validity study of the scale (21), the scale was applied to the patient and control groups and a significant difference between the groups was found. The reliability and validity analysis was also conducted by Durak (22) and The Cronbach Alpha reliability coefficient was found as 0,86.

Item 12 of The Beck Hopelessness Scale was not included in the scoring in the analysis phase of this study because of misspelling.

The Coopersmith Self-esteem Inventory (SEI)
The Coopersmith Self-esteem Inventory developed by Stanley Coopersmith (23) was used to evaluate person's self attitudes about various areas. There are two separate forms for children and adults. The adult form has two types as a short form with 25 items and long form with 58 items. In this study, the short form was used. The high scores indicate high self-esteem and the low scores indicate low self-esteem (24). The validity and reliability study of the Coopersmith Self-esteem Inventory was performed by Turan and Tufan (25) and the test-retest coefficient was found to be 0,65.

The Dysfunctional Attitudes Scale (DAS)
The Dysfunctional Attitudes Scale developed by Weismann and Beck (26) was used to measure the frequency of dysfunctional attitudes about

depression. The 40-item scale is rated on 7-point Likert scale from 1 to 7. Higher scores represent more frequency of dysfunctional attitudes of person (20). The scale was adapted by Hisli-Şahin and Şahin (27) and the Cronbach Alpha coefficient reliability was found as 0,79.

Procedures

The adaptation study of the the scale was based on the recommendations of Hambleton and Patsula (28) and Savaşır (29) regarding the cross-cultural scale adaptation. After the original scale was translated into Turkish, it was examined by three experts in both psychology field and translation. The scale was applied to 10 participants before the implementation of the validity and reliability of the scale and it was observed that all items are understandable. Following the permission from Hacettepe University Ethics Committee, the applications were carried out with students from different departments of Hacettepe University. The test-retest study of the scale was conducted on 35 participants after four week interval.

Data Anaysis

The goodness of fit indices were evaluated based on the Lisrel program. The data collected from the participants were analyzed using Statistical Package for the Social Sciences (SPSS) 18.0 and LISREL 8.54. Descriptive statistics, Cronbach alpha technique, Pearson Correlation Coefficient analysis, explanatory factor analysis, confirmatory factor analysis, multiple linear regression analysis and goodness of fit statistics were used for the evaluation of the data.

FINDINGS

In the Turkish version of the scale, Cronbach Alpha coefficients of self-view, world-view and future-view subscales were found as 0.85, 0.72 and 0.87, respectively. The internal consistency coefficients based on the Cronbach's alpha values indicated that the reliability level of the responses to the Cognitive Triad Inventory is above the acceptable limit of 0.70 (30). The Cronbach Alpha coefficient reliability of The Cognitive Triad Inventory (r=0.91) showed that internal consistency reliability of

inventory is high. It was found that test-retest reliability coefficients range from 0.74 to 0.94 and are high for an interval of 4 weeks (p<0.005). The consistency of the scale over time was supported (Table 1).

The explanatory factor analysis was performed to examine the construct validity of the scale. The value of Kaiser Meyer Olkin (KMO) was found as 0,909 in the Principle Component Analysis. The range of 0,80 and 0,90 of the value of KMO is thought as very good in the literature (31). Bartlett test statistic was found as 4481,735 (p<0,05). These findings indicated that the data are suitable for factor analysis (32). Factors with the eigenvalue greater than 1.00 were evaluated to determine the number of factors. As a result of the analysis, the 9-factor structure of the scale was found. Since the original scale consists of three factors, it was reanalyzed by the principle component analysis and varimax rotation method using three

factor limitation. While the factor with an eigenvalue of 5,63 explained 18,75% of the total variance, the factor with an eigenvalue of 4,83 explained 16,08% of the total variance and the factor with an eigenvalue of 2,43 explained 8,1% of the total variance.

The findings of EFA revealed that all of the items under the sub-scales do not show a distribution according to the sub-scales in the original form. It was found that some items are loaded on other factor as distinct from the original scale or they are loaded on two factors with similar factor loading. At this stage, item-total correlations were examined for each item to determine the item distinctiveness of the inventory. The item-total correlation more than 0.30 would be regarded as the criteria for item retention (33). Based upon the 0.30 item-to-total correlation standard, all but item 27 (r=0,28) had an item-to-total correlation of more than 0,30. However, to keep the Turkish CTI version as similar as possible to the American original, all following analyses were calculated with item 27 as part of the scale view of world. The findings of explanatory factor analysis, item-total correlations of the items and Cronbach Alpha values when the item deleted were presented on Table 2.

In order to test how well the three-factor structure applied to the Turkish CTI with the sample of university students, confirmatory factor analysis was performed. Goodness of fit indeces were used as a criterion in assessing the degree to which the factorial model of the scale was valid for Turkish culture.

In this study, fit indeces were analyzed based on generalized value ranges. One of the values required for a good model fit is the ratio of chi-square to degree of freedom. Accordingly, for a good model fit, the ratio of chi-square to degree of freedom should be 3 or smaller than 3 (34). In this study, this ratio was determined as (1142,980/402) 2,84 that showed a good fit of the model to the data. Comparative Fit Index (CFI), The Normed Fit Index (NFI) and Non-normed Fit Index (NNFI) were examined as incremental fit indeces. CFI values of ≥0,95 indicate a good model fit and values between 0,90 and 0,95 are regarded as acceptable (35). In this study, CFI value was found as 0,94. Values of NFI and NNFI were determined as 0,91 and 0,93, respectively and these values of ≥0,90 were regarded as acceptable (35).

Goodness of Fit Index (GFI), The Adjusted Goodness of Fit Index (AGFI), Root Mean Square Residual (RMR) and Root Mean Square Error of Approximation (RMSEA) were also evaluated as absolute fit indeces. These values that are close to 1 indicate a good fit of the model to the data (36). GFI and AGFI values were determined to be 0.79 and 0.76, respectively. These values ≤0,90 did not meet the criteria for good model fit (36). These low values were accepted because of the low effect on the study. The other fit index, RMSEA, was found as 0,08 and it was at the acceptable limit (37). SRMR value was determined as 0,07 and the value of ≤ 0,10 was regarded as acceptable (37). As a result, CFA confirmed that the scale was composed of three factors: "self-view", "world view" and

Table 1. Pearson moments correlation coefficients for test – retest reliability of the scale

	Self view (retest)	World view (retest)	Future view (retest)	CTI total score (retest)
Self view	0.94**			
World view		0.74**		
Future view			0.81**	
CTI total score				0.90**

** p<0.01

Table 2. Factor loadings of items, item-total correlations and Cronbach Alpha values when item deleted*

İtem	Factor loadings F1 F2 F3**	Item-total correlation	Cronbach alpha values when item deleted	Mean	Standard deviation
CTI 6	**0.57** 0.24 0.10	0.53	0.91	2.13	1.17
CTI 9	**0.72** 0.16 0.22	0.62	0.91	2.64	1.29
CTI 11	**0.72** 0.14 0.15	0.58	0.91	2.67	1.22
CTI 15	**0.41** 0.45 0.10	0.55	0.91	1.76	1.11
CTI 16	**0.14** 0.44 0.17	0.40	0.91	3.73	1.72
CTI 19	**0.52** 0.50 0.18	0.68	0.91	2.00	1.35
CTI 26	**0.50** 0.55 0.14	0.68	0.91	1.83	1.21
CTI 28	**0.72** 0.18 0.04	0.56	0.91	2.64	1.22
CTI 32	**0.55** 0.44 0.05	0.61	0.91	1.71	1.24
CTI 36	**0.66** 0.04 0.08	0.45	0.91	2.74	1.33
CTI 5	0.46 **0.48** 0.14	0.62	0.91	2.29	1.39
CTI 10	0.16 **0.64** 0.05	0.50	0.91	2.51	1.49
CTI 13	0.36 **0.60** 0.08	0.60	0.91	1.98	1.17
CTI 17	0.48 **0.10** 0.12	0.39	0.91	2.66	1.28
CTI 21	0.33 **0.62** -0.00	0.58	0.91	1.88	1.43
CTI 25	0.60 **0.21** 0.03	0.50	0.91	2.48	1.13
CTI 29	0.20 **0.65** 0.09	0.54	0.91	2.54	1.50
CTI 31	0.61 **0.30** -0.01	0.56	0.91	2.18	1.17
CTI 33	0.57 **0.18** 0.15	0.51	0.91	2.96	1.51
CTI 35	0.30 **0.61** 0.03	0.57	0.91	2.52	1.50
CTI 3	0.01 -0.12 **0.62**	0.13	0.92	4.19	1.46
CTI 8	0.18 -0.01 **0.69**	0.32	0.91	2.45	1.25
CTI 12	0.43 0.07 **0.32**	0.41	0.91	3.74	1.49
CTI 18	0.10 0.33 **0.49**	0.42	0.91	3.97	1.80
CTI 20	0.28 0.24 **0.54**	0.48	0.91	2.23	1.16
CTI 23	0.14 0.50 **0.35**	0.51	0.91	3.50	1.57
CTI 24	0.30 0.12 **0.42**	0.38	0.91	2.46	1.57
CTI 27	0.05 0.48 **-0.07**	0.28	0.91	1.55	1.24
CTI 30	0.02 0.52 **0.44**	0.46	0.91	2.99	1.51
CTI 34	-0.07 0.48 **0.42**	0.38	0.91	4.55	1.52

*Items 1, 2, 4, 7, 14 and 22 were not inclued in analysis.
**F1: future view subscale, F2:self view subcsale, F3: world view subscale The numbers in bold are the items loaded on the specific factors in the original study

"future view". The goodness fit indeces showed a good fit of the model to the data. The values of goodness fit indeces were presented in detail on Table 3.

It was investigated whether three factors, including self-view, world-view, and future-view, explain the cognitive triad latent variable. It was found that all factors explain the cognitive triad latent variable significantly and proposed model is in accordance with the data. The t values of the model showed that all items are significantly predicted by their sub-scales.

For all items in the scale, it was found that all t values are significant and their standardized loadings are high (Figure 1).

Table 3. Results of good fit indeces

Fit index	Good fit	Acceptable limit	Results of good fit
Chi square/ sd	0< Chi-square / sd <2	2< Chi-square / sd <3	Chi-square / sd=2.84
RMSEA	0<RMSEA <0.05	0.05<RMSEA <0.08	0.08 (CI%90=0.08; 0.09)
SRMR	0<SRMR <0.05	0.05<SRMR <0.10	0.07
NFI	0.95<NFI <1.00	0.90<NFI <0.95	0.91
NNFI	0.95<NNFI <1.00	0.90<NNFI <0.95	0.93
CFI	0.95<CFI <1.00	0.90<CFI <1.00	0.94
RFI	0.90<RFI <1.00	0.90<RFI <0.95	0.90

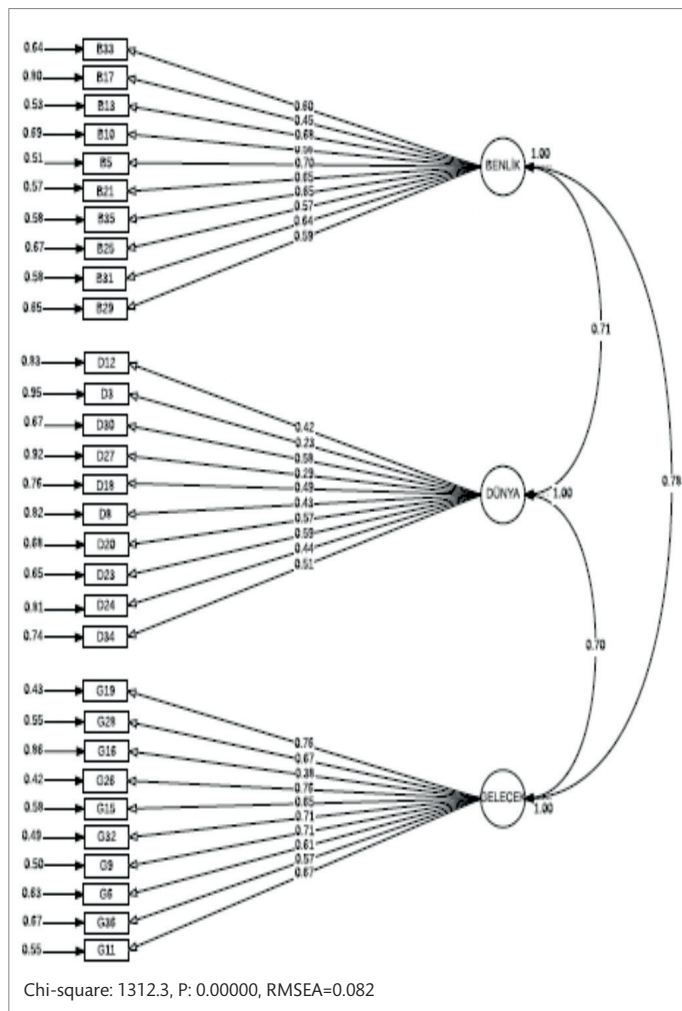Chi-square: 1312.3, P: 0.00000, RMSEA=0.082

Figure 1. Structural equation model.

In this study, multiple linear regression analysis was applied for predictive validity. It was examined to what extent sub-scales of CTI predict depressive symptoms. Findings of multiple linear regression analysis for predicting depression of self, world and future subscales were presented on Table 4.

The results showed that all independent variables explain 45% of the total variance of depression. A significantly result was obtained with F test (F=83,79, p<0,01).

According to standardized regression coefficient (β), order of importance of predictive variables on depression was in the form of world-view, self-view and future-view. T test results showed that world-view and self-view have a significant effect on depression.

Convergent validity was also evaluated within the scope of validity of the scale. Statistically significant correlations between CTI and its subscales and BDI, BHI, SEI, DAS were obtained (Table 5). A significant positive correlation between BDI and CTI total score was found (r=0,66, p<0,01). Similarly, a significant positive correlation between CTI total score and BHS was detected (r=0,70, p<0,01). It was found that there is a higher correlation between BHS and future-view subscale than other subscales (r=0,72, p<0,01). A significant negative correlation between SEI and CTI total score was determined (r=- 0,64, p<0,01). It was found that there is a higher correlation between SEI and self-view subscale than other subscales (r=-0,66, p<0,01). Lastly, a significant negative correlation between DAS and CTI total score was found (r=-0,40, p<0,01). Comparision with the self-report measures released that Cognitive Triad Inventory and its subscales have good convergent validity.

DISCUSSION

The aim of this study was to translate and evaluate the American Cognitive Triad Inventory (12) in order to obtain a reliable and valid Turkish version of the CTI to measure the cognitive triad explaining the development and maintenance of depression.

The Cronbach Alpha coefficient reliability of The Cognitive Triad Inventory (r=0.91) showed that internal consistency reliability of inventory is high. Its subscales were also found to have high internal consistency. The reliability and validity of American version of the inventory was evaluated in a sample of 28 individuals with depression. The scale and its subscales were found to have high internal consistency. The internal reliabilities of the subscales were found to be 0,91, 0,81 and 0,93, respectively for view of self, view of world, and view of future (12). In this study, it was observed that the internal reliability of the Turkish version is similar to the internal reliability of the American CTI.

When the test-retest reliability coefficients were examined, the consistency of the scale over time was supported. Four-week retest reliability was also used to determine the reliability of the German CTI version (13). It was found that test-retest reliability coefficients range from 0,82 to 0,86. Test retest reliability coefficient was also found as 0,90 for the total scale. It was found that the reliability coefficients of the Turkish CTI are similar to the reliability coefficients of both the American CTI and the German CTI.

Explanatory factor analysis and comfirmatory factor analysis were performed to examine the construct validity of the scale. At first, 9 factors were observed with an eigenvalue greater than 1,00. As a result of the literature review, it was found that there were inconsistencies in the adaptation of the scale to different cultures (10,13,38).

A six-factor structure was observed in the German adaptation of the scale and it was suggested that this structure may be caused by the negative and positive decomposition of items (13). Also, it was claimed that inconsistency of factor structure in different studies can be derived

Table 4. Results of multiple linear regression analysis for predicting depression

Variable	B	Sd	β	t	Sig.
Instant	-9.5	1.43		-6.66	0.000*
Self view	0.30	0.05	0.33	5.52	0.000*
World view	0.38	0.05	0.37	6.89	0.000*
Future view	0.06	0.05	0.07	1.18	0.24

Model (R=0.67, R²=0.45, F (3, 304)=83.79, p=0.000*)
*p<0.001

Table 5. Correlation coefficients between variables

	Self-view	**World-view**	**Future-view**	**CTI total score**
BDI	0.59**	0.60**	0.52**	0.66**
BHS	0.57**	0.49**	0.72**	0.70**
SEI	-0.66**	-0.53**	-0.48**	-0.64**
DAS	-0.42**	-0.35**	-0.29**	-0.40**

BDI: Beck depression scale; BHS: Beck hopelessness scale, SEI: Coopersmith self esteem inventory, DAS: Dysfunctional attitudes scale, CTI: Cognitive triad inventory
**p<0.01

from methodological factors rather than conceptual problems in the model (2). Since the original scale consists of three factors, the principle component analysis was repeated using three factor limitation. The findings of EFA showed that all items under the sub-scales do not show a distribution according to the sub-scales in the original form. At this stage, item-total correlations were examined for items loaded on other factor as distinct from the original scale or loaded on two factors with similar factor loading. Item 27 (r=0,28) had an item-to-total correlation of less than 0,30. However, to keep the Turkish CTI version as similar as possible to the American original, all following analyses were calculated with item 27 as part of the scale view of world. In the German version, a similar process was carried out for the item 12, which was loaded on a different factor (13). Nonetheless, the highest correlation between item 12 and the view of future, not like expected with the view of world was defined as a problem.

In order to test how well the three-factor structure applied to the Turkish CTI, confirmatory factor analysis was performed. As a result, CFA confirmed that the scale was composed of three factors: "self-view", "world view" and "future view". The goodness fit indeces showed a good fit of the model to the data.

In this study, multiple linear regression analysis was applied for predictive validity and it was examined to what extent sub-scales of CTI predict depressive symptoms. The findings revealed that all independent variables explain 45% of the total variance of depression. It was found that world-view and self-view have a significant effect on depression. Accordingly, it can be said that there is an increase in depressive symptoms of people with negative world and self-views. The lack of a significant effect of the future view on depression did not show consistency with studies supporting the relationship between depression and negative future view in the literature (39,40). As Beckham et al. (12) and Pössel (13) did not report the findings of predictive validity, it is not possible to compare the findings of predictive validity in this study with the findings in original CTI and the German CTI.

Comparison with the self-report measures released that Cognitive Triad Inventory and its subscales have good convergent validity. The correlations between CTI and BDI, BHI, SEI were very similar to those found in the original study (12). The findings suggested that the future view can be measured by BHI and the self view can be measured by SEI. As CTI is different from these measurements in terms of systematic evaluation of the cognitive triad structure, it was suggested that the use of CTI in depression studies will give better results (12). In this study, instead of the CEQ (Cognitive Error Questionnaire) used in the German version of CTI, the DAS was used. The correlation between DAS and CTI was similar to the relationship between CEQ and CTI in German adaptation (13).

Consequently, The Turkish version of the Cognitive Triad Inventory has been found to be a valid and reliable measure. Therefore, The Cognitive Triad Inventory can be used to measure the cognitive triad explaining the development and maintenance of depression (2). It is thought that the Cognitive Triad Inventory which was developed based on the view that views of self, world and future in a negative way leads to depression can shed light on the studies on the cause and prevention of depression. Positive self-view has been found to be an important protective factor against the development of many psychological disorders, especially depression, anxiety, violence and substance abuse (41). It was found that self-esteem plays a mediator role between environmental risk factors and depression (42). It was observed that people with positive world view have a tendency to find solutions to problems and to see opportunities in difficult situations as people with positive self view (43). In the studies on the future view, it was found that people with positive future view are tend to less influenced by negative effects of stress, to have more problem solving skills, to use more active coping stratejies rather than passive ones and to be more resistant to stress (44,45). Conducting studies on the relationship between the cognitive triad and psychological disorders such as depression and anxiety may contribute to the development of treatments for these disorder in our country.

Previous studies have found that cognitive-behavioral components are effective in preventing and treating depression (46). In order to struggle negative beliefs about self, the world and the future, cognitive techniques and disaster reversal techniques can be applied and coping skills can be taught. In-session and between sessions exercises might help clients adapt these cognitive skills into daily life (47,48). In addition, preventive interventions can be developed with a good understanding of the cognitive triad structure. Especially, education programs that aim to teach positive thinking can be designed. These kinds of trainings can act as a preventive intervention that can equip individuals with positive expectations about the self, the world and the future (15).

The limitation of the study is related to the generalizability of the findings. The study sample included students from Hacettepe University. Therefore, it may not be possible to generalize the results of the study to all university students or those who do not have university education. Also, non-clinical sample of the study makes it difficult to generalize the findings to clinical sample. In addition, unlike the original study carried out with clinical sample, the use of non-clinical sample in this study is considered as a source of statistical differences. Psychometric properties of the inventory may differ by a clinical sample. As in the original study, it is recommended to carry out future studies related to the cognitive triad with individuals with depression. In addition, it is thought that the use of the clinical sample together with the non-clinical sample will provide a comparison and more comprehensive information.

The test-retest study of the scale was conducted on 35 participants after four week interval. Repeating the test-retest study with more participants is important for getting more accurate findings.

The discriminatory validity of the Turkish CTI was not tested. Beck et al. (2) proposed that the cognitive triad is specific for depression but no study with an adult sample has not been focused on this issue yet. Therefore, it may be important to test the discriminatory validity in future studies. In order to test the convergent validity of the scale, it is recommended to examine the relationship between the Cognitive Triad Inventory and various psychological structures (such as personality traits, metacognitive structures, automatic thoughts) related to depression. The adapted scale does not measure depression in all dimensions. As the characteristics measured by the cognitive triad inventory are limited to the dimensions of self, world and future views, it is important to carry out more comprehensive studies including other dimensions.

Despite its limitations, this study can be seen as a pioneer research in terms of systematic measurement of the cognitive triad structure and this study has provided a reliable and valid measurement tool for our literature. Evaluation of the validity and reliability of the scale in a larger sample with different cultural characteristics may contribute to the development of the scale. Investigating the relationship between the cognitive triad with psychological disorders such as depression and anxiety can also contribute to the development of preventive interventions and treatments for these disorders in our country.

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