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Educational Research Association
The International Journal of
Educational Researchers 2015, 6 (1) : 31-35
ISSN: 1308-9501

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The Adaptation and Validation of the Turkish Version of the Critical Thinking Disposition Scale (CTDS)

(Eleştirel Düşünme Eğilimi Ölçeğinin Türkçe Uyarlamasının Geçerlilik ve Güvenirliği)

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Abstract

The aim of this research is to examine the validity and reliability of the Turkish version of the Critical Thinking Disposition Scale (CTDS; Sosu, 2013). Participants were 212 university students. The results of confirmatory factor analysis demonstrated that the 11 items loaded on two factors (critical openness and reflective scepticism) and the two-dimensional model was well fit (x^2=53.24, df= 40, RMSEA=.040, NFI=.90, NNFI=.96, GFI=.96, AGFI=.93, CFI=.97, IFI=.97, and SRMR=.046). The internal consistency coefficients were .68 for critical openness subscale, .75 for reflective scepticism subscale, and .78 for the overall scale. The corrected item-total correlations of CTDS ranged from .25 to .57. Overall findings demonstrated that this scale is a valid and reliable instrument for measuring individuals' disposition to critical thinking.

Keywords: Critical thinking, validity, reliability, confirmatory factor analysis

Özet

Bu çalışmanın amacı Eleştirel Düşünme Eğilimi Ölçeğini (Sosu, 2013) Türkçeye uyarlamak ve ölçeğin geçerlik ve güvenirliğini incelemektir. Araştırma 212 üniversite öğrencisi üzerinde yürütülmüştür. Doğrulayıcı faktör analizinde iki boyutlu modelin iyi uyum verdiği görülmüştür (x^2=53.24, df= 40, RMSEA=.040, NFI=.90, NNFI=.96, GFI=.96, AGFI=.93, CFI=.97, IFI=.97, and SRMR=.046) .Ölçeğin Cronbach Alpha iç tutarlılık güvenirlik katsayıları ölçeğin bütünü için .78, yansıtıcı şüphecilik alt ölçeği için. 75, eleştirel açıklık alt ölçeği için. 68 olarak bulunmuştur. Ölçeğin madde toplam puan korelasyon katsayılarının. 25 ile .57 arasında değiştiği görülmüştür. Bu sonuçlar, Eleştirel Düşünme Eğilimi Ölçeğinin Türkçe formunun geçerli ve güvenilir bir ölçme aracı olarak kullanılabileceğini göstermektedir.

Anahtar Kelimeler: Eleştirel düşünme, geçerlik, güvenirlik, doğrulayıcı faktör analizi

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Introduction

Critical thinking, is a thinking style, which covers cognitive processes like reasoning, analyzing, and evaluating. According to McPeck (1983) critical thinking is a thinking process that has scientific basis and a method of problem analysis. Critical thinking also includes the concrete and abstract thinking processes in order to draw conclusion about explicit provisions that are in accordance with common sense and scientific evidences. It can be considered as an evaluation and explanation process of existing information in order to understand the problem clearly, before making decision about the problem and taking action. Moreover, critical thinking can be defined as an active, organized, and functional cognitive process that is actualized in order to understand the thoughts of ourselves clearly and to expand our abilities of explaining thoughts (Chaffee, 1994). Researchers working on education programs have emphasized four components of critical thinking: Content knowledge (disciplinary field), procedure knowledge (thinking ability), observation skill, and controlling and using thinking ability (Chaffe,1992).

Halpern (1992, 1996) explained significant features of critical thinking as follows: Making a deduction: Intellectualizing and analyzing given conditions, events, and facts in order to acquire valid outcomes. If obtained outcome keeps up with logical deduction it will be accepted as valid. Analyzing: It is the resolution of the accuracy of obtained outcomes. In order to achieve this, causes should be acceptable and consistent, they should support the outcome, and the missing components (hypothesis, discussion, limitations etc.) should be taken into consideration. Testing the hypothesis: Testing of the accuracy of the hypothesis, based on the observations. Hypothesis can be related to an individual's thoughts and beliefs and s/he tries to test their accuracy.Considering probabilities: The occurrence of a certain output divided by the number of possible outputs (when all outputs are similar) is called the probability. Considering probabilities means identifying possible conditions about the causes or solution of a problem. Decision making: It is an active process that begins with forming a series of options related to a problem. Researchers in education area indicated that main process of critical thinking is consisted of the cognitive components. Cognitive components can be classified as comparing and contrasting, evaluating, synthesis, making deduction, defining prejudices, generalizing results, perceiving, analyzing, decision making process, problem solving, induction, and deduction (Arslan, 2012).

Critical thinking is an intellectual ability which plays a crucial role on both academic and educational life of every human being. And thus it is so important to measure as valid and reliable manner to this construct. Critical thinking was assessed using Critical Thinking Disposition Scale (CTDS; Sosu, 2013). This scale is a 11-item, five-point Likert scale (1= strongly disagree, 5= strongly agree) and has two subscales (reflective skepticism and critical openness). The results of confirmatory factor analysis indicated that two-dimensional Critical Thinking Model model was well fit ($x^2(97)= 158.82$, TLI= .91, CFI= .92, RMSEA= .059 with 90% CI .042–.075, SRMR= .064.). The only existing instruments specifically developed to measure thinking disposition is the California Critical Thinking Dispositional Inventory (CCTDI: Facione & Facione, 1992). This instrument has 75 items measuring seven dispositions. Results show that inconsistencies in the pattern of item loadings, excessive cross loading of items, overlap of constructs, and instability of the hypothesised factor structure, calling into question the validity and reliability for the CCTDI subscales (Sosu, 2013; Walsh et al., 2007). The aim of this research is to adapt the Critical thinking Disposition Scale to Turkish and to examine its psychometric properties.

Method

Participants

The sample of this study consisted of 212 university students from Sakarya university, Turkey. Of the participants 109 were female, 103 were male. Their ages ranged between 17-27 and GPA scores between 1.87-3.90.

Procedure

The CTDS was translated into Turkish by taking the following steps: Firstly, three specialists translated English version into Turkish. Discrepancies in initial translations were addressed with the assistance of a third independent translator. The Turkish version of the CTDS was then translated back into English by two English-speaking language specialists who were blinded to the original scale and the objective of the study. The differences between translated versions were evaluated and a satisfactory compliance with the original scale was achieved by consensus of the translators. The completed Turkish version was evaluated for cultural appropriateness by three academicians from department of English Language and Literature, controversial items were determined and necessary modifications were done. The updated version was reevaluated by the original group of expert reviewers, to finalize the Turkish version used in this study.

After the validity and reliability analyses of the scale were examined. In this study confirmatory factor analysis (CFA) was executed to confirm the original scale's structure in Turkish culture. Also internal consistency reliability and the item-total correlations were examined. Data were analyzed using LISREL 8.54 and SPSS 17.0 package programs.

Results

Construct Validity

Confirmatory Factor Analysis (CFA) is useful when researchers have clear (or competing) hypotheses about a scale – the number of factors or dimensions underlying its items, the links between specific items and specific factors, and the association between factors. That is, CFA allows researchers to evaluate the degree to which their measurement hypotheses are consistent with actual data produced by respondents using the scale (Furr & Bacharach 2008). The results of confirmatory factor analysis indicated that the two-dimensional model was well fit (x^2=53.24, *df*= 40, RMSEA=.040, NFI=.90, NNFI=.96, GFI=.96, AGFI=.93, CFI=.97, IFI=.97, and SRMR=.046). Factor loadings and path diagram of Turkish version of CTDS are presented in Figure 1.1

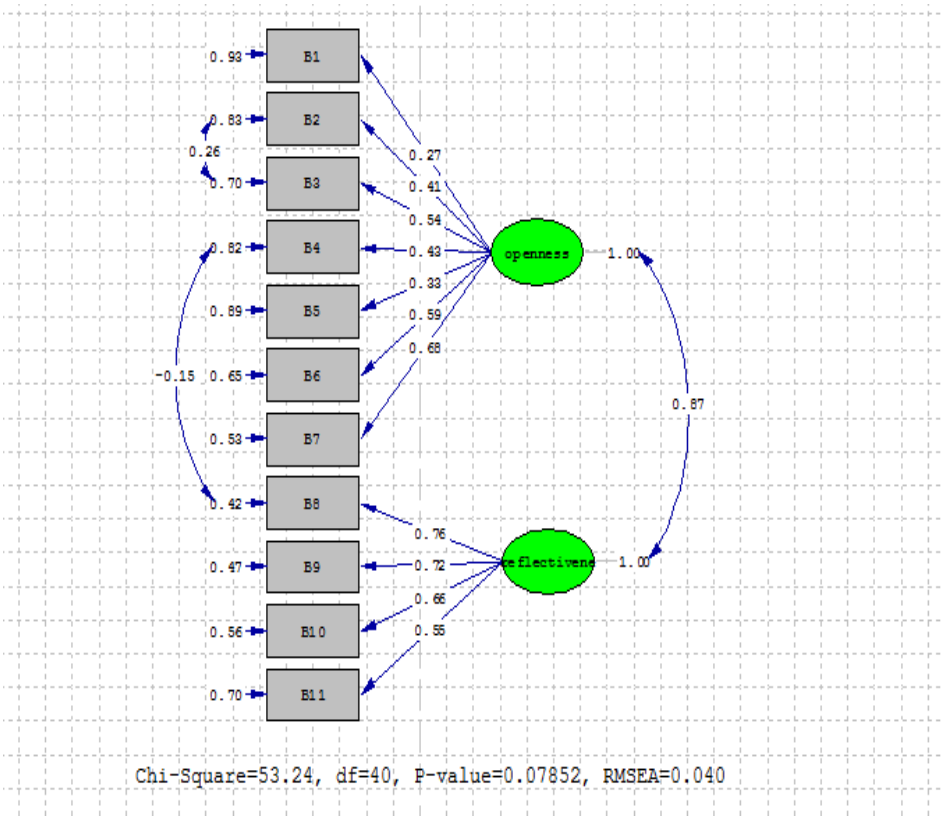

Figure 1.1 Factor Loadings and Path Diagram for the CTDS

Reliability

The Cronbach's Alpha internal consistency reliability coefficients of the scale were found as .68 for critical openness, .75 for reflective scepticism sub-scale, and .78 for whole scale. The corrected item-total correlations of CTDS ranged from .25 to .57. Values for an item- total correlation between 0 and 0.19 may indicate that the question is not discriminating well, values between 0.2 and 0.39 indicate good discrimination, and values 0.4 and above indicate very good discrimination (Büyüköztürk, 2010).

Discussion

The purpose of this study was to adapt the CTDS into Turkish and examine its psychometric properties. Confirmatory factor analysis demonstrated that the factor structure was harmonized with the factor structure of the original scale. Thus, it can be said that the structural model of the CTDS which consists of two factors was well fit to the Turkish culture (Bentler & Bonett, 1980; Hu & Bentler, 1999; Schermelleh-Engel & Moosbrugger, 2003). The internal consistency reliability coefficients of the scale were high (Büyüköztürk, 2010; Kline, 2000). Considering that item total correlations having a value of .30 (Büyüköztürk, 2010). The results of confirmatory factor analysis demonstrated that the 11 items loaded on two factors (critical openness and reflective scepticism) and the two-dimensional model was well fit (*x^2=53.24, df= 40, RMSEA=.040, NFI=.90, NNFI=.96, GFI=.96, AGFI=.93, CFI=.97, IFI=.97, and SRMR=.046*). The internal consistency coefficients were .68 for critical openness subscale, .75 for reflective scepticism subscale, and .78 for the overall scale. The corrected item-total correlations of CTDS ranged from .25 to .57

The present study has some limitations. One limitations of the current study is its sample size. In other words, future studies should investigate the same research question with a larger sample size. A larger sample size may clarify some correlations and thus increase the validity of the findings. Moreover, conducting this

study in various rural areas of Turkey may represent whether these results could be generalized to a wider population. Another limitation of the current study is that the sample was composed of university students, which restricted the generalizability of the findings. Hence, it could be important to investigate the relationship of these variables in other sample groups. Overall findings demonstrated that this scale had high validity and reliability scores and that it may be used as a valid and reliable instrument in order to measure the individuals' disposition to critical thinking. Nevertheless, further studies that will use CTDS are important for its measurement effectiveness.

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