Turkish Adaptation of Integrated Creativity Test-Preschooler- ICT-P: A Validity and Reliability Study[a]

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Abstract

The aim of the study is to investigate the psychometric characteristics of the "Integrated Creativity Test-Preschooler-ICT-P" (Creative Thinking Ability Domain) for Turkish children. The study included 104 Turkish children aged 4-5 from Sinop city center. The ICT-P (Creative Thinking Ability Section) has language and drawing sub-domains. The language domain consists of imagination, fluency, flexibility and originality factors. The drawing domain consists of continuation & connection, completion, new elements addition, theme, and unconventionality factors. The translation and back translation processes were conducted for the Turkish adaptation of the scale. Expert opinions were obtained for scope, semantic and conceptual equivalence. The validity and reliability analyzes were conducted to determine that the test was successful in fulfilling certain objectives related to the characteristics that fit wanted to measure. For the reliability assessment: To predict the stability of the test, Test-Retest Reliability and Pearson Moments Multiplication Correlation Coefficient were evaluated. For observer reliability, intra-observer consistency and the inter-measure consistency percentage were utilized. For internal consistency Cronbach's alpha reliability coefficient was calculated. For determining the validity of the test, content validity with expert opinions and construct validity with factor analysis were tested. Exploratory Factor Analysis projected that the scale has a two factor structure composed of 11 sub factors. Results of CFA clarified that the scale has a two factor structure. Inner consistency coefficients and test-retest values proved that the test is a reliable measurement tool. The results of the study confirmed that the test can be used in the assessment of the creative thinking ability of 4-5 year-old Turkish children.

Keywords: Creative thinking ability, drawing, language, validity, reliability

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Introduction

Since the first human being, the creative thought that can be traced in all areas of life. Since the 1960s, creativity has been discussed in many different aspects in the literature and since it has a complex structure in which many concepts are intertwined, a common definition could not be put forward. "Although it is not described definitely, the concept of creativity is very fascinating (Rouquette, 2007)." According to Rouquette, when a scientific concept becomes widespread, that is, from a limited group of experts to a wider community, it often loses its uniqueness, stability and certainty. In addition he emphasized that creativity is "one of the pillars of life" in the current order in the world.

Creativity is one of the general thinking processes and behaviors that can be created in every person and will be valid in human relations in life. Creativity can be developed through education and turned into an excellent ability (Çetin, 2010). May (2015) characterized creativity as "courage" and described it as bringing something new into existence.

Guilford defines creative thinking as an unconventional thinking and is defined by flexibility, originality and fluency. In other words, creativity is expressed by the fact that as a result of creative thinking process, a person presents a new and unusual product in the solution of a problem and many researchers such as Wallach - Kogan, May, Mumford and Gustafson have supported this as well (Turaşlı, 2010).

Hargreaves (2012) defines creative thinking as the prediction of real-life creativity, provided that ideal environmental conditions, the necessary level of motivation and persistence are provided. Fisher (2005) defined "creative thinking as a process of generating ideas that can be adapted to life in some way.

In his interview with Shaughnessy (Shaughnessy, 1998), Torrance described creative thinking as follows: Creative thinking is the process of perceiving difficulties, problems, gaps, missing parts, distortions in knowledge; making predictions and hypotheses about these deficiencies, evaluating and testing these hypotheses, reviewing and re-testing them as much as possible, and finally sharing the results. He emphasized that being able to respond to the situation in a constructivist way symbolizes high creative thinking in daily life.

Lee (2005) defines creative thinking as a unique thinking because of an intrinsic desire to find new and better things. Integrated Creativity Test for Preschoolers was developed in Korea, by Lee and Lee (2002) in order to measure creative thinking ability and creative personality of preschoolers. The test was revised in 2012, and the reliability of this instrument was mentioned as Cronbach's alpha .94. (Lee, 2002, 2014). The usage of this test becomes widespread all around the world as time passes, because of the increasing need for good measures for assessing the prominent domains of the important concept of creativity.

The purpose of the study was to examine the psychometric characteristics of the "Integrated Creativity Test-Preschooler- ICT-P" (Creative Thinking Ability Domain) for Turkish children. The test was being prepared to be used in a thesis study research together with other measurement tools assessing the children's creativity from different aspects. The researchers decided to work with children only, so, the Creative Personality Section, which

was to be filled out by parents or teachers of the children, was not taken into this reliability and validity study's scope. Thus, this study addresses the evaluation of reliability and validity of the Creative Thinking Ability Section of the ICT-P, Korea.

Literature Review

In an initial study, ICT-P, was used to investigate the creative thinking ability and creative personality traits of 716, four to five year old South Korean children (Lee, 2005). In a different study, ICT was conducted to test whether the creative thinking skills and creative personalities of primary school children differ from those of ordinary schools (Lee & Lew, 2013). In another study, 127, five-six-year-old children's creativity levels were evaluated in terms of home environment and internal-external motivation (Lew & Cho, 2013). The ICT Test was used in another study structured to examine the developmental dimension of creative personality and creative thinking skills with 2782 children aged six to eleven years randomly selected from across the country in South Korea (Lee & Jun, 2015).

The test becomes widespread day after day, as the researchers become interested in the all age groups of this test. The above mentioned research may only be a small part of the related research which could be reached yet.

Method

Research design

This study is a quantitative research designed to adapt Integrated Creativity Test-Preschooler- ICT-P" (Creative Thinking Ability Section) into Turkish. Quantitative research is an objective and systematic study of numerical data in order to obtain information about a property (Burns & Grove, 1993).

Participants

The study group consists of 104 preschool children; 44 girls and 60 boys living in Sinop city center. Mean age of the participants is 63,31 months. The youngest participant is 48 month-old, the oldest participant is 71 months old. Children were chosen from normally developing children attending volunteer three preschools. Implementations were made on a voluntary basis and data was not taken from involuntary families. Sociodemographic information related to parents and information on which age group of children parents filled up the participation and information forms.

The demographic characteristics of the preschooler participants who participated in this reliability and validity study are shown below in Table 1.

Table 1. Demographic characteristics of participants

General Characteristics	Category	Number	%
Gender	female	44	42.3
	male	60	57.7
	Total	104	100
Age – in months	48-59	19	18.3
	60-71	85	81.7
	Total	104	100
Number of children in the family	1 child	38	36.5
	2 children	47	45.3
	3 children	17	16.3
	4 children	2	1.9
	Total	104	100
Birth order	First child	57	54.8
	Hydrangea or one of the hydrabgeas	37	35.6
	Last child	10	9.6
	Total	104	100
Preschool attendance status	0-6 months – newly began	71	68.3
	7-12 months	23	22.1
	13-18 months	6	5.8
	19-24 months	4	3.8
	Total	104	100
Pre-Kindergarten Care Status	mother at home	70	67.3
	home caregiver	3	2.9
	eldest	6	5.8
	out-of-home care	25	24.0
	Total	104	100
Settlement unit where the child lives for the longest time	village	6	5.8
	town	2	1.9
	city center	96	92.3
	Total	104	100

Instrument

Integrated Creativity Test- Preschooler

In this paper, the Integrated Creativity Test- (S. D. Lee & K. H. Lee, 2002) was used and adapted to Turkish. Then, Lee (2014) revised the test. The section of The Creative Thinking Ability was studied in this research. This verbal answer and paper and pencil test consists of language and drawing domains. The language domain consists of 3 items and it takes 5 minutes. The sub-factors of creativity in language domain are imagination, fluency, flexibility and originality. The drawing domain consists of 1 item and it takes 10 minutes . The sub-factors of creativity in drawing domain are continuation & connection, completion, new elements addition, theme, and unconventionality.

Table 2. Sub-factors of creative thinking ability section of the ICT-P

Item	Section	Sub-factors
creative thinking ability	1-1	imagination, flexibility
creative thinking ability	1-2	fluency, originality
creative thinking ability	1-3	fluency, originality
creative thinking ability	2	1. originality of title 2. continuation &connection, completion, new elements addition, theme, and unconventionality

Data collection procedure

At the beginning, Hacettepe University Ethical Committee approval and official permission from Provincial Directorate for National Education was obtained. The proper three middle socioeconomic status preschools typical of Sinop city center were chosen. Three meetings were conducted with parents in these schools in order to inform them about the study. After that a letter summarizing the aim and the contents of the study, an informed consent form, and a preliminary information form were sent to parents via teachers. Voluntary parents filled up the forms and returned.

The volunteer parents' children were taken individually into test application in a familiar and quiet room in their preschool where possible distracting stimuli were limited. The researcher firstly thanked the child ,explained why he was there and stated that he could quit the application at any time if he feels uncomfortable. Then ICT-P Creative Thinking Ability section was applied. If the implementation directive is not fully understood, the directive was repeated at most two times. This test was finished when the child completed the unfinished picture, after telling about the first three pictures.

Data analysis

At the end of the study, general preliminary information forms of the children included in the study were evaluated and the descriptive characteristics were presented in percentages. Necessary statistical analyzes were performed with IBM SPSS 22 and IBM AMOS 21 package programs on computer.

Reliability and validity study

In this study, "Adapting an Abroad Developed Test to Turkish" (Şeker & Gençdoğan, 2006) steps were taken. Test's translation to Turkish, comparison and investigation of Turkish translations back translation method, giving the first form to the translated test, application of language validity, giving final form to the test translated into Turkish and reliability and validity analyzes were performed for the ICT-P.

The Integrated Creativity Test was translated to English by its developer Kyunghwa Lee and then a native English speaker controlled the translation and this study is based on its English translation.

The researcher first translated the test from English to Turkish. The original test was then translated into Turkish by two independent English instructors and a psychologist translator who knew both English and Turkish well.

In the second stage, the tests translated into Turkish were examined and compared with the translation made by the researcher. The different parts of the translation have been specifically considered whether the translations are appropriate in terms of meaning and the necessary changes and arrangements have been made.

In the third stage, the tests translated into Turkish were translated back into English by two different and independent English instructors and a psychological counselor academician. The test resulted from this back translation process and the items in the original test were compared one by one and necessary changes were made in order to arrange harmonization with each other.

At this stage, the application and evaluation booklet of the test was translated into Turkish by the researcher herself and by a professional psychologist and a counselor who knows English very well. Necessary controls and arrangements were conducted again.

In the fourth stage, after the Turkish translation process was completed, the test translated into Turkish was formatted in accordance with the format of the original test. The location and format of the directive, the location and format of the parts of the scale where the questions and answers to be written by the researcher were prepared and checked in accordance with the original of the test.

In the fifth stage, the opinions of twelve experts from the related fields were taken into consideration to determine the content validity, the suitability of the application criteria and the relevant criteria of the Turkish version of the test. The details of the expert opinions evaluation process are given in the scope validity section. At the end of this phase, the necessary changes were made with the approval of the developer of the test, especially with regard to ICT-P, which was adapted from Korea.

After the evaluation of expert opinions, in the sixth stage, a preliminary application study was conducted with 10 children willing to evaluate the comprehensibility of the items and pictures in the test and to make the researcher gain practicality. The tests were applied to 5 girls and 5 boys attending kindergarten. After these practices, again with the approval of the developer of ICT-P, it was decided to prepare and use the test images separately in A4 size. When the pre-application was carried out, the children were tested whether the expressions in the test questions and pictures were understandable. As a result of the pre-application, it was determined that the items and pictures in the test were understandable by children. Thus, the test was finalized.

In the seventh stage, applications for determining the validity and reliability of the test translated into Turkish in terms of psychometric properties, were conducted. Test was

carefully checked and reproduced before applications. The test materials were obtained in the required number and standards and made ready for use. In line with the information obtained from Turkish Statistical Institute, the number of children in the target audience in Sinop, the province where the study will be conducted, was determined and the number of working groups sufficient for validity and reliability studies was agreed with the statistical consultant and work was continued in this direction.

Results

The form which is obtained after adaptation of the test was applied to the children and its structure and psychometric characteristics in Turkey are revealed. Reliability and validity study of the data obtained in adaptation process is conducted and results are summarized.

The validity and reliability analyzes were conducted to determine that the test was successful in fulfilling the specific objectives related to the characteristics they wanted to measure. For the reliability of the test: Test-Retest Reliability and Pearson Moments Multiplication Correlation Coefficient to predict the stability of the scales; For observer reliability, intra-observer consistency and the inter-consistency percentage were calculated and for internal consistency Cronbach's alpha reliability coefficient was calculated. For the validity of the test, content validity and construct validity were tested with factor analysis.

Validity

In accordance with twelve expert opinions, In Creative Thinking Skills section, “Minsu” is named as “Ali” in terms of compatibility and intelligibility to Turkish Culture; “Doldolyi” name was changed to “Çomar”, “ Piyakyi ” name was changed to “ Çilli ” and “grape juice” was changed to “orange juice”. In addition, one of the pictures used in the garbage bin on the Korean letter was deleted, this text has been changed to Turkish "garbage". In the drawing part of the same test, it is considered appropriate that the unfinished image, which should be completed in practice, be given on a separate page, not on the same page as the original. All proposed changes and modifications were passed on to the tests.

Within the content validity, all items of the test were found to be suitable by the experts and were determined to remain viable only with minor grammatical changes. Therefore, it was not deemed necessary to remove any part from the test. Lawshe's Content Validity Ratio is one of the most commonly used methods to measure the agreement between expert opinions in the quantitative analysis of the results of the evaluations of the reviewers. The high or low Lawshe's coefficient is determined by the number of “appropriate” responses given to each statement by the arbitrators. A percentage value is obtained for each scale item and this coefficient ranges from -1 to +1. If all the referees have stated that a statement is necessary, the result will be 1.00 and for the content validity of a substance, more than half

of the referees should mark the "appropriate" option (Şencan, 2005). For the test used in this study, all experts used the term "appropriate" for all items included in the test. Consequently, there is no need to calculate the scope validity ratio for each item. At this stage, it was concluded that all items in the tests were required and the scope validity was ensured.

In order to test the structural validity of the scale, internal consistency analysis was performed and Cronbach's alpha value was determined. In addition, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) techniques were used to determine construct validity.

In order to determine factor structures within the scope of the validity study, exploratory factor analysis was conducted on the scores of 102 children. The Keiser-Meyer-Olkin (KMO) Sample Adequacy Measure and Bartlett's Sphericity Test were performed to determine whether the sample examined by the test was suitable for factor analysis. KMO ranges from 0 to 1 and is required to approach 1. The Bartlett Sphericity Test should also be statistically significant. As a result of the analysis, KMO test results were found to be significant. Results are obtained as KMO=0.67; and Bartlett Sphericity Test ($p < .01$). For a good factor analysis, KMO value above 0.50 is considered sufficient (Alpar, 2014). Factors and eigenvalues obtained as a result of the analysis are given in Table 3.

Table 3. EFA factors and eigenvalues related to ICT-P

	Factor1	Factor 2	Factor 3	Factor 4
Eigen Value	2.55	2.31	1.17	1.03

When Table 3 is analyzed, there are 4 factors with eigenvalues greater than 1. The variance explained by these four factors on the scale is 64.19%. The scree plot of these factors and their eigenvalues is given in Figure 1.

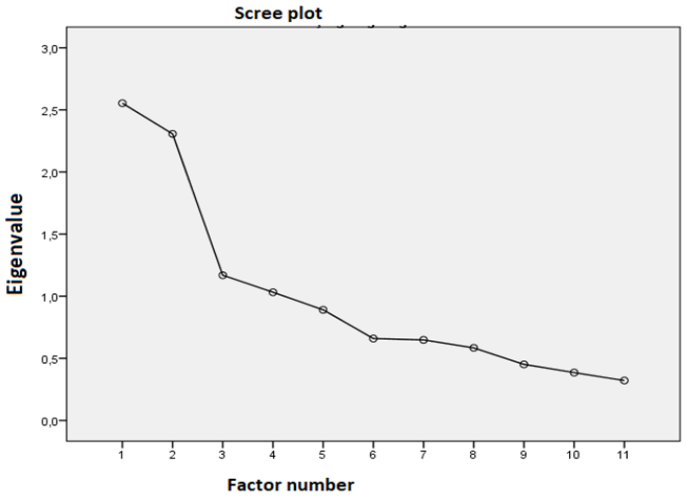

Figure 1. The scree plot of ICT-P factors and their eigenvalues

When Table 3 and Figure 1 are analyzed, the 2 factors are recognized to be dominant whose eigenvalues and explained variances are higher than the other factors. Therefore, the number of factors was limited to two factors and the analysis was repeated. Varimax vertical rotation technique was used to reveal the loaded materials in the dimensions of the test consisting of two factors.

The results of Exploratory Factor Analysis of ICT-P Creative Thinking Ability are given in Table 4.

Table 4. EFA results of ICT-P Creative Thinking Ability

Items	Factor Common Variance	After rotation load value	
		Factor-1	Factor-2
1-1 flexibility	.269	.407	
1-1 imagination	.190	.382	
1-2 fluency1	.566	.750	
1-2 originality1	.472	.686	
1-3 fluency2	.638	.798	
1-3 originality2	.504	.705	
2-1 continuation/connection	.488		.698
2-1 completion	.612		.776
2-1 new elements addition	.176		-.406
2-1 theme	.510		.713
2-1 unconventionality	.436		.658
Explained variance for Factor 1: 22.78%			
Explained variance for Factor 2: 21.40%			
Total explained variance: 44.19%			

According to the EFA results in Table 4., it is seen that the 11 dimensions in the ICT-P Creative Thinking Skills are grouped under two factors. As a result of the analysis, it was determined that this test consisted of two factors with an eigenvalue of 2.55 and 2.31. The variance explained by the verbal creativity subtest, which is the first factor, was 22.78%, while the variance explained by the second factor, the figurative creativity subtest, was 21.40%. The variance of the total factor dimensions of the test is 44.19%. It is accepted that the variance explained in social sciences is between .40 and .60 (Alpar, 2014). As a result of factor rotation, it is seen that the Verbal Creativity subtest consists of six dimensions and the Figural Creativity Sub-test consists of five dimensions. The factor load value of the dimensions constituting the Verbal Creativity subtest varied between 382 and 798; It is seen that the factor load values of the dimensions constituting the formal creativity subtest vary between .406 and .776. No dimensions with factor load values less than 30 were found, so no dimensions were removed from the test.

It can be said that the total variance (44.19%) explained by this test, which is structured as two factors, is sufficient and the validity of the test is high due to the high factor loadings

of the factors and dimensions.

Since the Creative Thinking Ability Section, which is one of the two parts of the original test, was used in the study, there are two factors and 11 structures tested in this section with four items. Verbal Creativity subtest, six structures and Figural Creativity subtest, which were determined by exploratory factor analysis, were examined with the first level Confirmatory Factor Analysis (CFA).

Since language and drawing are separate dimensions in the original of the ICT-P, in this study, the CFA results that will show whether the answers of the participants to the questions asked for language and drawing are compatible with the original of the model or in other words, how the model is compatible with the data are summarized as follows.

The confirmatory factor analysis model for ICT-P is presented in Figure 2, and the criteria of goodness of fit are presented in Table 5.

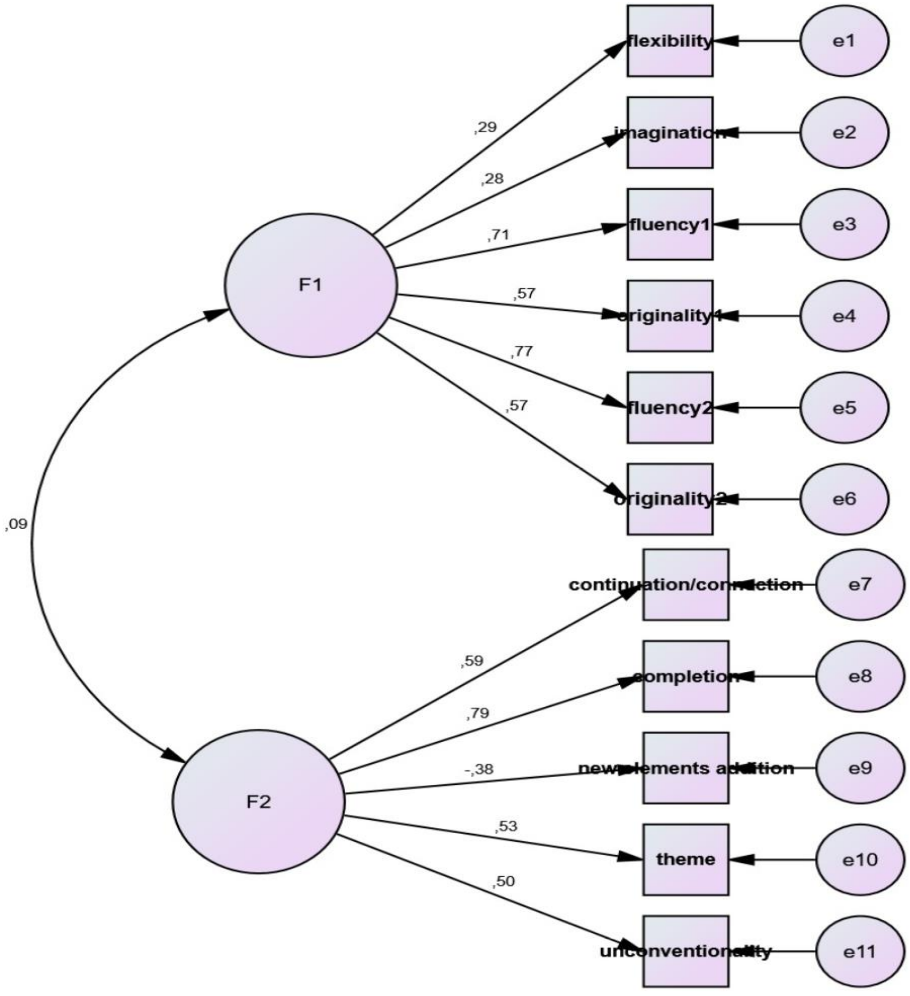

Figure 2. Confirmatory factor analysis model for ICT-P Creative Thinking Ability Section.

Table 5. Criteria of goodness of fit for ICT-P Creative Thinking Ability

$\chi 2$	Df	$\chi 2$/df	GFI	CFI	RMSEA
63.4	43	1.475	.898	.892	.069

Goodness of fit criteria is interpreted based on Çokluk, Şekercioğlu and Büyüköztürk (2016). The CMIN / DF value, the RMSEA value, are the basic measures of goodness of fit showing how well the model is compatible with the data. Tabachnick and Fidell (2015) emphasized that the fact that this ratio is less than 2 means perfect fit. In studies with small sample sizes, the CMIN / DF ($\chi 2$ / df) ratio below 3 indicates that the model is compatible with the data. For this test, this value was found to be less than 2 and 3 as requested and indicates perfect fit. In addition, RMSEA (Root Mean Square Error) is another measure of goodness of fit. The value is required to be less than 0,10 if the model is compatible with the data. In this analysis, the RMSEA value for the test was .07, indicating a good fit since it was found to be less than 08. GFI stands for Goodness of Fit Index. The GFI value ranges from 0 to 1 and exceeding 90 is considered a good model indicator. This value is 90 for BYT-OÖ and shows that GFI has a good fit.

CFI (Comparative Fit Index) is a model that predicts no relationship between latent variables. A value of 1 indicates a perfect fit and a value of 0 indicates a model mismatch. This value was .89 for the test. Compliance was considered positive because it was at the cut-off point for good.

Since the most commonly used goodness of fit criteria for CFA were acceptable, the Turkish version of the ICT-P was found to be compatible with the original model.

The indices of the 4-factor initial structure evaluation of the model can be summarized as follows: CMIN / DF: 1,376; RMSEA:, 061 GFI:, 911 and CFI:, 924 All of these values determined that the 4-factor structure of the model was perfectly compatible with the original model of the Turkish version of the scale.

Standardized regression coefficients and t-values are given in Table 6.

Table 6. Standardized regression coefficients and amount of explained variance

	Standardized regression coefficients	Amount Of explained variance	t values
LANGUAGE (FACTOR 1)			
1-1 flexibility	.286	.698	6.90
1-1 imagination	.278	.678	6.91
1-2 fluency1	.711	2.335	4.88
1-2 originality1	.571	.388	6.09
1-3 fluency2	.770	2.351	4.03
1-3 originality2	.565	.589	6.12

DRAWING (FACTOR 2)			
2-1 continuation/connection	.586	.459	5.73
2-1 completion	.794	.391	3.05
2-1 new elements addition	-.381	.648	6.67
2-1 theme	.533	.657	6.08
2-1 unconventionality	.502	.360	6.25

In Table 6, when t values are analyzed to see whether each value in the two-factor model is statistically significant, it is seen that all values are above the critical value of 1.96 and accordingly the standardized regression coefficients vary between 28 and 79. Accordingly, the dimensions in the factors are statistically significant.

It was concluded that the goodness of fit values calculated by CFA support the predetermined two-factor structure of the test in a statistically meaningful manner and generally adapt to this structure. According to this result, the obtained values of the study model show that the modeled factor structure is validated within the scope of standard compliance values. As a result of the validity study of the ICT-P Creative Thinking Ability, it was seen that the sub-tests and the items belonging to the sub-tests remained in the same place as the original scale.

Reliability

"Reliability is the measure of stability between independent measurements of a property in a measurement process and the invariance of measurement over time" (Alpar, 2014). Test-retest reliability was calculated for the test in order to examine the reliability. For test-retest reliability, 30 children were randomly selected from the study group. It is sufficient for 25-50% of the participants in the first measurement to take the test again (Alpar, 2006). The test was reapplied to the identified 32 children after four weeks. The correlation coefficient is expected to be significant and close to 1. These coefficients should be over 80 and not to fall below .70 (Alpar, 2006). As a result of the data analysis of the 30 children who took the test again, the correlation coefficient obtained for the test was .70; which expresses moderate and acceptable relationships at .001 level. Accordingly, it can be said that the test show a stable structure over time.

The alpha coefficient is a measure of the homogeneity of the items contained in the scale, and it provides information about whether these questions form a whole to explain a homogeneous structure. The lowest acceptable Cronbach's alpha value in the social sciences can be considered as .60 (Hair et al., 2009). Cronbach's Alpha reliability coefficient, which shows the overall reliability of the test, was found to be .777. This value shows that the test is very reliable for the case that it wants to measure.

Cronbach's Alpha values obtained by deleting the item were also examined and it was aimed to determine the reliability of the test. Overall reliability was found to be 78; It was determined that the Cronbach Alpha reliability coefficient of the scale would increase

from .777 to .789 if the tests new elements addition score and drawing total section score variables were removed.

Since both the reliability coefficient difference is very small and the two items are important items that are thought to be able to measure the test case; it was decided not to exclude these dimensions from the test and to continue the analysis with all items.

In this study, all scale scores were made by the researcher herself. In order to test the assessments in terms of the reliability of the measures, an intra-observer reliability test was conducted.

In the intra-observer fit test, two or more observations are made and scored by the same observer, where the percentage of consistency between measurements of the continuous data type is calculated by the intraclass correlation coefficients (ICC) for reliability and Cronbach's Alpha can be used to demonstrate harmony within (Peirce, 1995, as cited in Gözüm & Aksayan, 2003).

Intra-class correlation coefficient is actually a kind of variance analysis. Based on the assumption that the evaluator effect will not change, this study was tested with the "Two-Way Random Effect" model at this stage.

Accordingly, the test results of 10 randomly selected children were evaluated by the researcher 15 days after the first evaluation. Cronbach's Alpha was calculated to determine the fit for both measurements of the test. The ICC value calculated as the ratio of variances is expected to be between 0 and 1, and the closer the value is to 1, the higher the reliability (Can, 2016). Cronbach's Alpha and ICC values for the ICT-P are given in Table 7.

Table 7. Cronbach's alpha and ICC values for the ICT-P

Measure (n=10)	Intra-rater correlation coefficient	Cronbach's alpha
Creativity Total	.992	.996
Language Total	.999	.999
Drawing Total	.984	.991

Specifically, Cronbach's alpha values indicate that the fit of .90 and above is excellent. Since Pearson correlation coefficients were found to be quite high it can be stated that the consistency between the two tests was excellent.

In addition, the ICC, which is a measure of consistency between evaluations, especially, being .90 and above shows that the consistency between the evaluations is excellent, since the intra-class correlation coefficients for the test are quite high, the consistency between the evaluations can be interpreted as excellent.

As a result of all validity-reliability analyzes, the validity and reliability values of the ICT-P Creative Thinking Ability Section were found to be sufficient for use in the research. After this stage, implementation was started.

Discussion and conclusion

The aim of this study is to utilize a measurement tool to evaluate the creative thinking ability to preschooler children in Turkey. For this purpose, psychometric characteristics of ICT-P Creative Thinking Ability Section, developed by S. D. Lee and K. H. Lee (2002), and then revised by Lee (2012) was investigated and its appropriateness for using on Turkish children was examined using a series of validity and reliability analysis. Factor structure of the scale was measured using confirmatory factor analysis. Results of confirmatory factor analysis show that two-dimensional factor structure of the scale is confirmed. Within this context, it is seen that factor structure of the original scale is obtained in this study also. For reliability study of the scale, intraclass correlation coefficient and test-retest reliability is examined. Results obtained reflect that inner consistency is satisfactory and between acceptable limits for language, drawing and total creativity. The results of test-retest analysis reflected acceptable limits for the adaptation study.

In this study, creative thinking ability of four and five year old children are measured in language and drawing domains. For this reason, it is thought that the scale can be used in studies aiming to measure creative thinking ability levels of preschool children. It can be said that the ICT-P originally developed in Korea, which consists of 3 scenarios, with dimensions of flexibility, imagination, originality and elaboration, and figural creativity with dimensions of continuation-connection, completion, new elements addition, theme and unconventionality is appropriate for Turkish researchers to measure creative thinking ability of preschool children. However, this study is conducted with children living in Sinop city center. From this aspect, this condition can be accepted as a limitation to this study.

In addition, the adaptation of the second "Creative Personality" part of this scale, which is expected to be completed by parents or teachers, will increase the power of the preschooler creativity studies will be conducted in Turkey in the future. Also, adapting the other age levels of the ICT to Turkish will make other age groups of elementary, secondary and high school children take part in the future studies. These points can be taken into consideration by other cultures in order to increase the scope of creativity research conducted with this test. Cross cultural studies may be conducted in order to gain a wider vision.

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Korean Abstract

‘유아용 통합창의성 검사-ICT-P’의 터키 적용을 위한 타당도와 신뢰도 연구

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본 연구의 목적은 ‘유아용 통합창의성검사(ICT-P)’ 중 창의적 사고능력 영역의척도를 터키 유아에게 적용하기 위하여 검사의 심리측정학적 특성을 확인하는것이다. 연구대상은 터키의 Sinop시에 거주하는 104명의 4~5세 유아였으며, 본 연구에서 사용한 ‘유아용 통합창의성검사(ICT-P)’의 창의적 사고능력검사는언어와 도형영역에서의 창의성을 측정할 수 있도록 구성되었다. 언어영역은 상상력, 유창성, 융통성, 독창성 요인을 측정하도록 구성되어으며, 도형영역은 연속성과 연결성, 완성도, 새로운 요소의 첨가, 주제, 비관습성 요인을 측정하도록 구성되었다. 한국어가 원어인 검사를 터키어로 번역하기 위한 절차로 번역과 역 번역을 실시하였다. 그리고 전문가에 의해서 범위, 의미와 개념에 있어서의 내용타당도를 확인받았다. 검사의 측정학적 특성을 충족시키기 위하여 타당도와 신뢰도 분석을 실시하였다. 검사의 신뢰도를 확인함에 있어서 검사의 안정도를 예측하고자 하였는데, 이를 위하여 검사-재검사 신뢰도와 Pearson의상관관계 계수를 산출하여 평가하였다. 그리고 관찰자 신뢰도를 확인하기 위하여 관찰자 간 합치도와 문항 내적 합치도를 산출하여 활용하였다. 문항내적 합치도는 Cronbach’s α 를 산출하여 확인하였다. 또한 검사의 타당도를 확인하기 위하여 전문가에 의해 내용타당도를 확인하였으며, 요인분석을 통해 구인타당도를 검증하였다. 탐색적 요인분석(EFA) 결과에 의해 ‘유아용 통합창의성검사(ICT-P)’는 2개의 요인구조와 11개의 하위요인으로 구성되어 있음이 확인되었다.그리고 확인적 요인분석(CFA) 결과는 본 검사가 두 개의 하위구조로 구성되어있다는 것을 증명하였다. 내적 합치도 계수와 검사-재검사 결과에서 본 검사가매우 신뢰성 있는 측정도구라는 것을 확인할 수 있었다. 이와 같은 본 연구의결과에서 ’유아용 통합창의성검사(ICT-P)’ 중 창의적 사고능력검사는 4-5세 터키 유아의 창의적 사고능력을 측정하기 위하여 활용이 가능한 신뢰롭고 타당한 검사라는 것이 입증되었다.

주요어: 창의적 사고능력, 도형, 언어, 타당도, 신뢰도