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Research Article

Developing of the Creative Thinking Task for Children[1]

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Abstract

In this study, it was aimed to examine the validity and reliability of the Creative Thinking Task for Children (CTTC) developed to evaluate creative thinking skills. The study group consists of 755 participants (aged 11-14) who are attending 5th, 6th, 7th and 8th grades in the central districts of Ankara. The data were obtained with the personal information form CTTC. CTTC has a structure that is scored between 0-3 and consists of tasks. Expert opinions, exploratory and confirmatory factor analyses were used to evaluate the validity of the measurement tool, and the Cronbach Alpha Internal Consistency Coefficient was used to determine its reliability. As a result of the analysis, it was determined that the model, which consists of originality, fluency, elaboration and divergent thinking sub-dimensions and 11 items, has a structure that fits very well. Internal consistency coefficients of CTTC; .73 in originality sub-dimension, .61 in fluency sub-dimension, elaboration sub-dimension. 60, .69 for divergent thinking sub-dimension and .67 for the whole. According to the findings of the study, it can be said that the Creative Thinking Task for Children is a valid and reliable measurement tool that can be used to evaluate creative thinking skills in Turkish culture.

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Introduction

Creativity is a comprehensive concept used in many different fields such as art, science, and education. The discussions on whether creativity is a product (Taylor, 1988), a process (Slyvan, 1997; Vernon, 1989), or both are important in explaining the concept. Torrance (1974) defined creativity as "sensitivity to problems, inadequacies, lack of information, non-existing elements, incompatibilities, identifying difficulties, searching for solutions, making predictions and hypothesizes about inadequacies or changing hypotheses, choosing one of the solutions and trying, retrying, then putting forward results." When different definitions are examined, it is seen that the common points are generating new ideas (Wegerif, 2007), making new connections (Marsh, Landau, and Hicks, 1996; Rawlinson, 1995), and multidimensional thinking (Kırışoğlu, 2002). It is stated that the concept of "creativity" is used primarily in the field of

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art. Creativity is considered as the creation of a product in the field of art or the interpretation of an existing product in a different way (San, 2008). However, as a cognitive process in education, it is more suitable to use it as "creative thinking" (Hickey & Webster, 2002). The cognitive approach also treats creativity as a thinking process and tries to understand it as a cognitive skill (Sternberg & Lubart, 1999).

Guilford (1950) explained the multifaceted structure of creative thinking skills with dimensions of fluency, flexibility, originality, and elaboration, and Torrance detailed these dimensions. Fluency can be considered as vocabulary, association, idea, and expression fluency, and it is essential to generate a great amount of ideas in the relevant area in all of them. Flexibility can be explained by "adaptability," which aims to solve a problem in different ways, "redefining" which comprises using known objects for various purposes, and "spontaneous flexibility," which includes finding other ideas about a problem (Chien & Hui, 2010). Originality is the ability to generate unusual, unique, or highly personalized responses or ideas. Elaboration, on the other hand, refers to expanding, developing and elaborating ideas (Gartenhaus, 2000). Also, Guilford (1967) refers to convergent and divergent thinking as two kinds of productive cognitive skills. While convergent thinking aims to reach the most known and correct answer, divergent thinking refers to searching for an infinite number of answers by evaluating different alternatives (Fautley & Savage, 2007). In addition, in Guilford's (1967) model, creativity is considered especially in relation to divergent thinking. Guilford creativity measures usually include divergent thinking measures.In the current study, cognitive approaches that consider creativity as a process and a cognitive skill are based and a measurement tool based on Guilford's (1967) model has been developed.

Creative thinking skills can be developed and thus prevented. Identifying and removing obstacles may pave the way for development (Rawlinson, 1995). Although creative thinking skills are essential in the education process (Katz, 2009), supporting this multifaceted structure cannot be achieved by routine teaching systems (Gow, 2000). Obstacles to creative thinking appear in the literature as emotional barriers (Özden, 2000), adoption of convergent thinking (Üstündağ, 2002), characteristics of schools (Kırışoğlu, 2002) and teachers (Chambers, 1973). Creating a structure that encourages research and questioning instead of an inflexible and oppressive attitude in educational settings will eliminate creative thinking obstacles. Cowley (2005) suggests strengthening divergent thinking, experiential learning, increasing motivation, and making learning fun to support creative thinking in the classroom. Creative thinking skills differ according to age, and findings related to this emphasize the importance of regulations in educational environments. In parallel with the cognitive skills that differ with age, creative thinking skills also change (Argun, 2004; Ayman-Nolley, 1999), and these skills, which started to be observed at the age of 3-5, decrease from the age of 11 according to some findings and increase significantly at the age of 14 (Öncü, 2003). While some of the different views that emerge when evaluated in terms of the whole life state that the creative thinking in the middle age period is at the highest level (Artut, 2004), there are also studies suggesting that there is a decrease with the advancement of age (McCrae, Costa, and Arenberg 1980; Runco, 1991). Runco (1991) argues that the decline in creativity with age is associated with more traditional thinking tendency as age increases in thinking styles. However, it is more common to consider changes in creative thinking skills with individual characteristics and differences rather than age (Wu et al., 2005). For instance, parental values, openness and education level are features that predict creativity (Deng, Wang, and Zahao, 2016).

The view that creative thinking is one of every person's general skills and that it can be developed (Kale, 1993) becomes even more important when taken together with the psychometric approach. This will enable planning to determine and develop the creative thinking skills of individuals. Although tools such as "How creative are you?" (Rausdepp, 1979) based on self-report are used in measuring creative thinking skills, the use of tasks is highly accepted due to the comprehensive structure of the concept (Chien and Hui, 2010). Torrance Tests of Creative Thinking (TTCT), developed as a task, consists of verbal test and figural test and allows many answers to be given to each activity. Scoring is done according to fluency, flexibility, originality, and elaboration criteria. Creativity Assessment Packet of Williams (1980) consists of the Thinking Different Test, the Feeling Different Test, and the Williams Scale in which parents and teachers evaluate children's creativity. The sub-dimensions of the different thinking tests are fluency, flexibility, originality, elaboration, and title. The Wallach and Kogan Test consists of verbal and non-verbal activities, and each item is scored according to fluency, elaboration, and originality (Wallach and Kogan, 1965). When the tests used in evaluating creative thinking skills are examined, it is observed that they generally measure divergent thinking (Karabey and Yürümezoğlu, 2015). A The Test for Creative Thinking - Drawing Production (TCT-DP; Jellen & Urban,

1986) was adapted into Turkish by Can-Yaşar (2009). The Khatena-Torrance Creative Perception Inventory was developed in 1998 with a sample that also evaluated gifted individuals (Aslan, 2005).

The CTTC developed in the current study is considered important for several reasons. The first of these reasons is the recommendation of the task structure instead of self-report measurements in creativity measurements (Chien and Hui, 2010). The Torrance Creativity Test, which is a measurement tool with a task structure, was developed in 1957 in American culture. It is seen that the other measurement tools mentioned above were developed in different cultures and adapted to Turkish. It is important that measurement tools are up-to-date and culture-specific (Anastasia, 1988). Self-report assessment tools have limitations such as respondents may have a tendency to show themselves better (Batson & Ventis, 1982), questions are not fully understood or alternative answers can be given (Dağ, 2005). Since creative thinking is considered as a skill, a performance-based measure was preferred. In addition to these, it is thought that developing a measurement tool suitable for group measurements and application in the school environment is economical in terms of time and labor.

Aim of Study

It is thought that the CTTC developed in this study has the advantages of including a task structure based on the individual's performance (Torrance, 1977; Wallach & Kogan, 1965; Williams, 1980) and being culture-specific (Anastasia, 1988; Cronbach, 1990). As far as we know, CTTC is the first measurement tool developed in Turkish culture to measure creative thinking skills. In this study, it is explained that the development process of CTTC includes advantages of creative thinking skills tests comprising task structure based on individual performance (Torrance, 1977; Wallach and Kogan, 1965; Williams, 1980) and culture-specific development (Anastasia, 1988; Cronbach, 1990). The aim of this study is to develop the "Creative Thinking Task for Children (CTTC), which examines the creative thinking levels of teenagers between the ages of 11-14.

Method

The present study is a descriptive study. The purpose of descriptive studies is to define individuals, events and conditions by examining them (Parkin & Bray, 2005).

Participants

A total of 668 (319 girls, 349 boys) children who attend 5th, 6th, 7th, and 8th grades (11-14 years old) in six different secondary schools in the central districts of Ankaraprovince in Turkey were participated in the study, and it was determined by convenience sampling. Class level distributions of the participants are as follows: 5th grade 215 (32.2%), 6th grade 161 (24.1%), 7th grade 118 (17.1%) and 8th grade 174 (26.0%). While determining the sample size, it was taken into consideration that there were five times the number of participants for factor analysis in the measurement tool development process (Tabachnik & Fidell, 2001).

Developed for individuals aged 11-14 years of CTTC. Considering it as a period when creative thinking skills begin to decline at the age of 11-14 (Öncü, 2003) seems important. In addition, the education programs of individuals attending secondary school at this age differ, and a period is passed from a process carried out by the classroom teacher to a period in which different branches are involved and therefore the student takes the responsibility of his own development. Educational environments have a role in developing creative thinking skills (Cowley, 2005; Katz, 2009), and for these reasons, a measurement tool has been developed for individuals aged 11-14.

Instruments

Creative Thinking Task for Children (CTTC)

The CTTC scale developed in the current study has a four-factor structure with 11 items scored between 0-3, developed with children aged 11-14. Sub-dimensions are originality, elaboration, fluency, and divergent thinking. While the Cronbach Alpha reliability coefficient of the total score of the measuring tool was found as .67, the Cronbach Alpha reliability coefficients of the sub-dimensions were; originality as .73, elaboration as .60, fluency as .61, divergent thinking as .69. Evaluation of CTTC is made according to scoring criteria. In this article, the development process of CTTC has been explained, and CCTS is omitted.

Personal Information Form. The form included questions about the participants' gender, age, grade level, school they attended, and the education level of their parents.

Process

Within the study's scope, after the sample was determined for the development of CTTC, permissions were obtained from the University Ethics Committee (19.12.2016/27/349) and the National Education Directorate. Volunteer students were reached by talking to school administrators, and the practice, which took an average of 40 minutes, was conducted in the students' classes.

Measurement Tool Development Stages. The development process of the measurement tool started with a literature review and the format of the measurement tool was decided by taking advantage of expert opinions (three assessment and evaluation, three educational psychology experts). An item pool was created by writing 18 items in the structure containing open-ended questions. While preparing the items; Care was taken to ensure that the items were simple and understandable, and that an item should not contain more than one judgment (Naresh, 2017). The prepared items were sent to 12 experts to get expert opinion. These experts; four of them work as classroom teachers in primary schools; Three experts have creative drama leadership, four experts carry out academic studies on creativity and one expert works in the field of assessment and evaluation. Experts were asked to read each item carefully, and they were asked to decide to what extent it contained the dimensions of creative thinking and to what extent that item was suitable for measuring the desired dimensions of creative thinking. Experts were asked to indicate whether the expression of each item was appropriate for the age levels within the scope of the study, if not, how it could be improved, and if there were additional item suggestions, they were asked to indicate. For the measurement tool, 3 out of 18 items were removed and the task statement in one item was changed, and the application was carried out by determining 15 items. Scope and face validity was ensured by expert evaluations (Büyüköztürk, 2018). Due to the open-ended nature of the items, expert opinions were sought to determine the evaluation criteria.

After the application, the answers for each item were determined as 0, 1, 2, 3 points and different criteria were created for each sub-dimension. All data were coded by three raters and the intraclass correlation coefficient was calculated. The responses received from the participants for the Originality sub-dimension were ranked according to the frequency, for the Elaboration sub-dimension, the responses were ranked according to the number of responses for the fluency sub-dimension, and were scored as 1,2,3 by dividing them into three groups. In all sub-dimensions, irrelevant answers were scored as zero. In the divergent thinking sub-dimension, the criteria are; single-function/limited response (1 point), multiple-functional response (2 points), and fictional response (3 points). The sample item evaluation for the rubric created for scoring is as seen in Table 1.For the full test and its final version, see Appendix 1.

Table 1.

Rubric Example and An Example of A Test Question

Item no	12	
Item content	Deniz lived far from her elderly grandmother. She loved to call her grandmother and tell her what had happened that day. Since her grandmother lived alone, she was very happy when Deniz called. However, she couldn't hear when the phone rang because her grandmother's ears were low. Deniz decided to design a phone so that her grandmother could recognize when the phone was ringing and pick it up. What kind of phone would you design for grandma? Write down the features of the phone you are designing.	
Point	0 point	No response or answers that do not contribute to the solution (Example: Do not talk on the phone).
	1 point	Single-function/limited response (Example: Auto-on when the phone rings. Setting certain hours to talk on the phone).
	2 points	Response with multiple functions (Example: Making a watch phone, connecting the phone to the house bell, attaching a vibration device to the arm, flashing light on the phone).
	3 points	Fictional/Storytelled) response (Example: Perfumed phone, vibrating clock phone, glasses vibrating when the phone rings, flashing lighted signs at home).

Data Analyses

Cronbach's Alpha analysis, Pearson correlation coefficient, and in-class correlation coefficient were calculated within the study's scope of reliability analysis. Invalidity analyses, the construct validity was examined by exploratory and

confirmatory factor analysis, and the content and face validity were examined by expert opinions. The analyses of the data wereconducted by statistical package programs (SPSS 22.0 and LISREL 8.7). Necessary assumptions were analysed before exploratory, and confirmatory factor analyses were performed.

Results

Construct Validity (Exploratory Factor Analysis)

520 data were drawn randomly from the data set of 668 people. Randomization was done by creating random sequence numbers in Excel. 520 data obtained before the Explanatory Factor Analysis (EFA) were analyzed in terms of the necessary assumptions. Kaiser-Meyer-Olkin (KMO) test was applied to test whether the sample size is suitable for factor analysis, and the KMO value was found .59. This value is seen as "bad" but sufficient (Leech, Barrett, & Morgan, 2005). The sample size was decided to be suitable for factoring taking into consideration different explanations due to the low KMO value. Comrey and Lee (1992) stated that the sample size above 500 for factor analysis was "very good," Kline (1994) explained that the sample size was 10 times of the number of items is sufficient, and the chi-square value was significant ($\chi^2_{(66)} = 1207{,}002$; $p > .01$) for factoring. After the examinations in terms of normality and other assumptions, 4 data were extracted, and the analysis continued with 516 data. The results showed that the factor design of the CTTC had 6 components with an eigenvalue above 1 for the 15 items included in the analysis. All results were evaluated together, and it was decided that the measurement tool could have four factors. The Explanatory Factor Analysis was repeated for four factors, it was observed that the factor loadings of the two items were below .30 (Floyd & Widaman, 1995) (9 and 10), and the two items were overlapped (11 and 15). These items were excluded from the analysis. With the remaining 11 items, it was determined that six factors that explains 63.3% of the total variance emerged and this six factors structure was also suitable for theoretical explanations.

Horn's parallel analysis was performed with the help of the Monte Carlo Program to verify the results of principal component analysis and scree plot (Figure 1), and according to the results, it was seen that only the principal component analysis eigenvalues of four factors were greater than the parallel analysis values, and the values of the other components were small (Watkins, 2000). With the Scree Plot, the graph needs to be examined to determine the point of separation between the principal components and the remaining components. However, in practice, it can sometimes cause subjective interpretations due to the absence of sharp decreases in the graph (Hayton, Allen, and Scarpello, 2004).

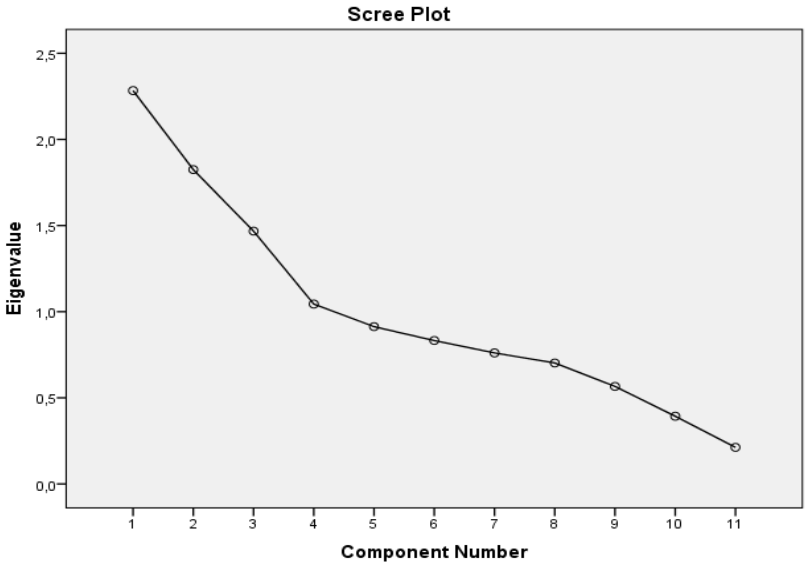

Figure 1

Scree Plot

The factor loadings and common factor variances of the items of the structure consisting of four factors, 11 items are given in Table 2.

Table 2

CTTC Factor Loadings and Common Factor Variances

Items	Originality	Fluency	Elaboration	Divergent Thinking	Common Factor Variance(h2)
1	.865				.754
2	.803				.653
3	.755				.594
6		.847			.484
7		.845			.543
4			.694		.504
5			.735		.717
6			.709		.717
12				.523	.327
13				.897	.820
14				.917	.851

The result of the analysis extracted four factors under theoretically defined items and accounted for 63.322% of the total variance. Originality sub-dimension has 21.11%, fluency sub-dimension 16.55%, elaboration sub-dimension 13.94% and divergent thinking sub-dimension has 11.70% explained variance. Loadings on the factor 1 (originality) are between .75 and .86, loadings on the factor 2 (fluency) are .84, loadings on the factor 3 (elaboration) are between .69 and .70 and loadings on the factor 4 (divergent thinking) between .52 and .91. The correlation coefficients between the total score and the sub-dimensions were between .07 and .68, while the correlation coefficients between items were between .03 and .70.

Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) was performed with 11 items obtained to confirm the structure obtained from EFA ($\chi^2_{(38)} = 38.50$, $p < .01$).CFA was carried out with 235 people randomly selected from the data set. As seen in Figure 2, according to the .01 significance level, the t values related to cases where latent variables explain observed variables are not significant, and according to these values, a perfect fit can be mentioned (Hoyle, 1995).

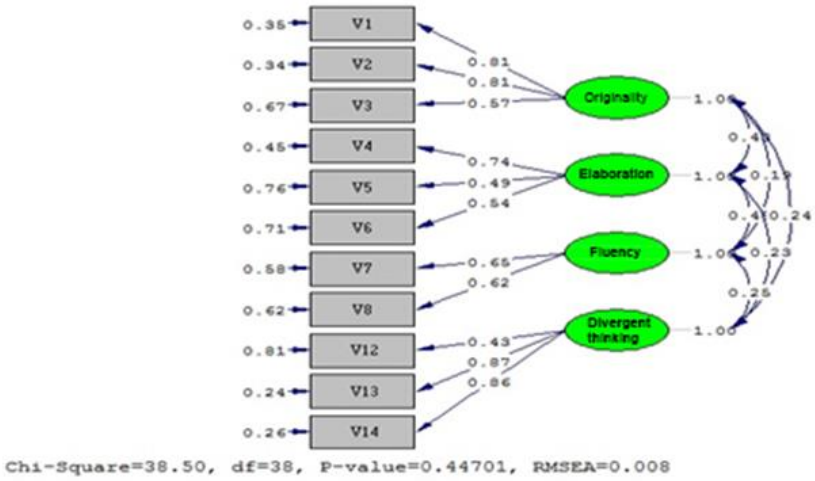

Figure 2.

CTTC 4-Dimensional Model Factor Analysis Standardized Factor Loadings

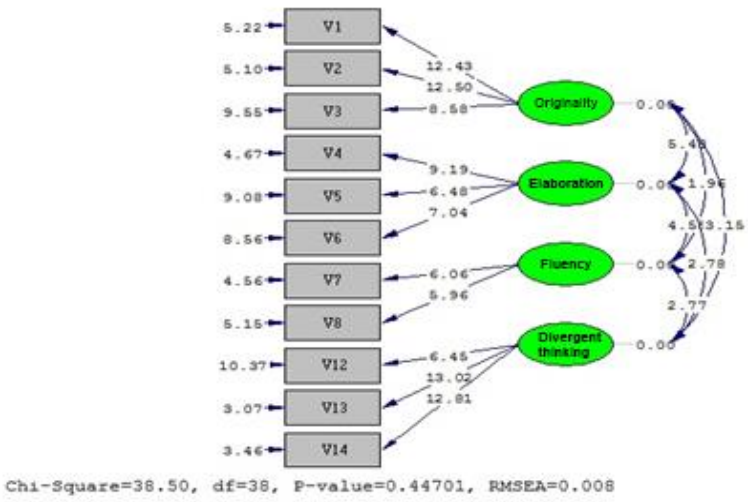

Figure 3

CTTC 4-Dimensional Model Factor Analysis t Values

When Figure 3 is examined, it is seen that no insignificant path is observed in the path diagram and the error variances of the items are below .90. General fit index results regarding the model of CTTC created the results of confirmatory factor analysis are given in Table 3.

Table 3

CTTC Values of Fit Indices

Reviewed indices of fit	Perfect fit criteria	Acceptable fit criteria	Achieved fit indexes	References	Conclusion
χ^2/sd	≤ 3	≤ 5	1.01	Tabachnick & Fidell (2013)	Perfect
RMSEA	≤ .05	≤ .08	.0075	Hu & Bentler (1999)	Perfect
SRMR	0	≤ .08	.044	Bryne (1994); Hu &Bentler (1999)	Accaptable
NFI	≥ 0.95	0.94-0.90	.95	Bryne (1994)	Perfect
NNFI	≥ .95	≥ .90	1.00	Schumacker & Lomax (1996)	Perfect
CFI	≥ .97	≥ .95	1.00	Hu & Bentler (1999)	Perfect
AGFI	≥ .90	≥ .85	.95	Marcholudis & Schumacher (2001)	Perfect

$\chi^2$38.50 Sd38 NFI

According to the CFA results, it was seen that the fit indexes of the Creative Thinking Task for Children, consisting of 11 items and four sub-dimensions, were in a structure that showed a very good fit. (Hooper, Coughlan, & Mullen, 2008; Hoyle, 2000; Tabachnick & Fidell, 2013; Thompson, 2007). In model fit, X2/sd value less than 5 is acceptable, while a value less than 3 indicates perfect fit of the model (Tabachnick & Fidell, 2013). However, for a model to fit well; The RMSEA value is expected to be less than .08, but a value less than .05 indicates a perfect fit (Hu & Bentler, 1998). In addition, NNFI and CFI values between .95 and 1.00 mean that the model fits perfectly (Hu & Bentler, 1999; Schumacker & Lomax, 1996). In line with this information, when the results in Table 2 are examined, it is seen that the fit indices are generally very good.

Reliability

The Cronbach-Alpha internal consistency coefficient for the total 11-item of CTTC is .67 Sub-dimensions are 73 for originality, .69 for divergent thinking, .60 for elaboration, and .61 for fluency (p <.01). A value of 0.6≤α<0.7 is acceptable, and 0.7≤α<0.9 is considered good (Cortina, 1993; George & Mallery, 2003). Accordingly, the findings indicated that the reliability of the scale is acceptable and good. It is stated in the literature that relatively low values may result from the small number of elements in the scale (Tavakol & Dennick, 2011). To determine the consistency between raters, it was seen that the intraclass correlation coefficient calculated on the scores obtained from three raters was .81 and this value is interpreted as high correlation (Kalaycı, 2014).

Item Statistics. In order to determine the discrimination levels of the items and to determine the predictive power of the total score, corrected item-total correlations were included (Table 4).

Table 4

Results of Item Analysis

Item no	Average	Standard deviation	Corrected item-total correlation	When the item is removed scale Alpha
1	1,72	.83	.354	.556
2	1.75	.87	.342	.558
3	1.54	.96	.333	.559
4	1.70	.73	.244	.580
5	1.75	.68	.246	.580
6	1.79	.73	.220	.585
7	1.48	.73	.142	.600
8	1.31	.85	.104	.612
12	1.23	.74	.272	.575
13	1.30	.85	.316	.564
14	1.33	.95	.317	.563

When the item-total correlations were examined, it was seen that the values of the two items (7 and 8) were below 0.20 and the values of "When the item is removed scale Alpha" were above the current Alpha coefficient. It was decided by expert opinions to keep these two items in the measurement tool. Item-total score correlations vary between 0.24 and 0.35 for other items. Items with an item-total correlation greater than 0.20 were considered discriminating or reliable (Doi & Minowa, 2003).

Conclusion and Discussion

The Creative Thinking Task for Children (CTTC), which was developed to investigate the creative thinking skills of children aged 11-14, was found to be a valid and reliable four-factor measurement tool in this study. Exploratory and confirmatory factor analysis was carried out for construct validity. Content and face validity was provided by expert opinions. The validity of a measurement tool expresses what the scale measures and how well it measures (Anastasi, 1988). It is recommended to obtain opinions from at least 5 field experts for the content and face validity, and the opinions of 12 experts were obtained in the current study (Cronbach, 1990; Lawshe, 1975).

Based on expert opinions, three items were removed, and the application was made with 15 items. Exploratory factor analysis (EFA) values were evaluated together with Horn's parallel analysis, and 11 items and a four-dimensional structure were obtained by removing two items due to factor loads below .30 and two items due to overlap. When the structure emerging in EFA was evaluated together with the significance levels and theoretical structure in the confirmatory factor analysis, 4 items were removed from the analysis, and CFA performed with 11 items (χ^2 = 38.50 (38) p> .01). According to the CFA results, there is a perfect fit in the structure (Hoyle, 1995).

In this study, a measurement tool was developed that includes tasks that participants can answer as many times as they want, draw figures, and express verbally. Since creative thinking is considered a cognitive skill, it is an accepted approach to use measurement tools with tasks instead of tools based on self-report (Chien & Hui, 2010; Torrance, 1977; Wallach & Kogan, 1965; Williams, 1980). Sub-dimensions of creative thinking skills like originality, fluency, elaboration, and divergent thinking emerged in the CTTC. In the literature, originality, fluency, and elaboration sub-dimensions are also seen in other measurement tools that evaluate creative thinking skills (Torrance, 1977; Wallach & Kogan, 1965; Williams, 1980). Divergent thinking, the other sub-dimension, refers to evaluating different alternatives (Guilford, 1967; Fautley & Savage, 2007). In this respect, it is thought to be similar to flexibility (Chien & Hui, 2010), including finding different ideas about a problem. In the evaluation of CTTC, the results are evaluated by giving each item a score from the criteria of originality, fluency, elaboration, and flexibility. When the overlapping structures of the concepts of flexibility and divergent thinking are taken into consideration together, it can be thought that divergent thinking, which is a more inclusive concept, has emerged as a sub-dimension. Therefore, in future studies, it may be recommended to develop measurement tools that include different creative thinking skills.

CTTC has been developed for individuals aged 11-14. It can be said to be important to develop a measurement tool for the individuals' age between 11-14 in line with the views that creative thinking skills can be developed (Rawlinson, 1995; Vexliard, 1966), and educational environments have an important role in developing creative thinking skills (Cowley, 2005; Katz, 2009). Thus, it will be possible to plan to evaluate and develop these skills individually or as a group in educational settings. Although there are different opinions about the results change due to age increase in creative thinking skills, the age of 11-14, which is the target group of CTTC, is considered a period when these skills begin to decline (Öncü, 2003). Therefore, it is important to pave the way for evaluating and supporting creative thinking skills through CTTC at these ages.

As a consequence, the findings obtained in this research showed that CTTC is a valid and reliable instrument comprising tasks that includes the sub-dimensions of originality, fluency, elaboration, and divergent thinking for evaluating the creative thinking skills of individuals between the ages of 11-14. It is seen that CTTC is the first measurement tool that has been developed specifically for Turkish culture and includes a task structure for 11-14 ages. It is stated that it is important to develop measurement tools specific to a culture (Anastasia, 1988; Cronbach, 1990). In future, studies can be carried out using CTTC in different samples individually and as a group. Also, studies can be planned for sub-dimensions that are thought to be developed by evaluating the results.

Limitations of Study

This study has some limitations. The criterion validity for the measurement tool was not examined. Another limitation of the study is that variables such as socio-economic status or place of residence were not evaluated. Also, Measurement Invariance by gender has not been examined. The measurement tool developed in the current study should be evaluated with these limitations.

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Appendix 1.

Creative Thinking Task for Children (CTTC)-Turkish Version

Çocuklar için Yaratıcı Düşünme Görevi (ÇYDG)

Okul: Sınıf: Tarih:

Sevgili öğrenciler,

Bu çalışma sizin yaşınızdaki bireylerin özelliklerini daha iyi anlamak için bilimsel amaçlı yapılmaktadır. İsim yazmanız gerekmemektedir. Sonuçlar yalnızca araştırma için kullanılacaktır. Katılmanız gönüllük esasına dayanmaktadır. Lütfen boş madde bırakmayın ve her madde için sizden ne istendiğini dikkatle okuyarak yapmaya çalışın.

Katıldığınız için teşekkür ederiz.

Kaçıncı sınıfa gidiyorsun?	
Kaç yaşındasın?	
Cinsiyet	Kız □ Erkek □
Siz dahil kaç kardeşsiniz?	
Kaçıncı çocuksunuz?	En büyük □ Ortanca □ En küçük □
Çaldığınız bir müzik aleti var mı?	
Resimle uğraşıyor musunuz?	
Bir sporla uğraşıyor musunuz?	

-A-

Herkesin yapacağından farklı bir hayvan oluşturun. Bunu yaparken aklınıza gelen bütün nesne ve varlıkları kullanabilirsiniz. Çizdiğiniz hayvanın özelliklerini mutlaka yazın.

Çizim:
Özellikleri:

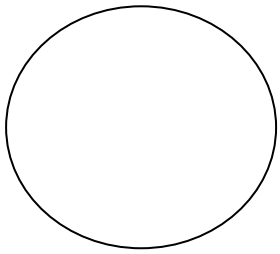
-B-

B1.	Aşağıdaki durumu okuyarak herkesin aklına gelebilecek olanlardan farklı çözümler bulmaya çalışın. Bir sınıftaki öğrenciler, teneffüs zili çaldığında sınıflarından duyulmadığı için teneffüslere hep geç çıkıyorlar. Bu sorunu çözmek için bir icat yapmaya karar veriyorlar? Ne yapsınlar?
B2	Aşağıdaki duruma uygun bir ürün ortaya çıkarmaya çalışarak özelliklerini yazın. Deniz yaşlı büyükannesinden uzakta yaşıyordu. Büyükannesine telefon edip o gün olanları anlatmayı çok seviyordu. Büyükannesi yalnız yaşadığı için Deniz'in aramasına çok seviniyordu. Ancak büyükannenin kulakları az işittiği için telefon çaldığında duyamıyordu. Deniz, büyükannesinin telefon çaldığında fark edip açabilmesi için bir telefon tasarlamaya karar verdi. Siz olsanız büyükanne için nasıl bir telefon tasarlardınız? Aşağıya özellikleri yazın. (açık olarak tüm özellikleri belirtin)

	Tasarladığınız telefonun özelliklerini buraya yazın:

-C-

C1. Aşağıdaki çembere bakın, bu çemberi kullanarak neler yapabilirsiniz, çizin. Çemberin içini ve dışını istediğiniz şekilde kullanabilirsiniz.



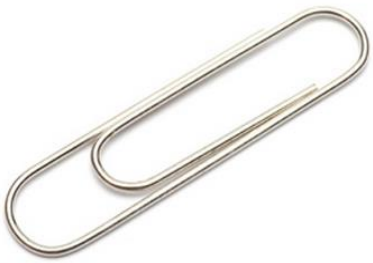
C2. Aşağıdaki üç nokta ile neler yapabilirsin? Noktalar bu şekildeyken yapabileceğin şeyleri düşün ve çiz. Noktaları tek tek ya da birlikte kullanarak birden fazla çizim yapabilirsin.

C3. Aşağıdaki şekille neler yapabilirsin? Çiz.

-D-

D1 ve D2 satırlarında, nesneleri nasıl ve ne amaçla kullanabileceğinize ilişkin seçenekler üretin. Mümkün olduğunca çok sayıda farklı kullanım yazın. Başkalarının aklına gelmeyecek kullanımlar düşünmeye çalışın. Burada önemli olan önerdiğiniz kullanımların sayısının fazla olmasıdır.

D1		Kavanozun farklı kullanımlarını listeleyin:

D2		Ataşın farklı kullanımlarını listeleyin:

Appendix 2.

Scoring Criteria for CTTC-Turkish Version

Çocuklar İçin Yaratici Düşünme Görevi (ÇYDG) Puanlama Kriterleri

MADDE NO	PUAN	PUAN KRİTERLERİ
A SORUSU: 1,2 ve 3. maddeler ÇYDG'nin "A" sorusu için verilen üç alt puandır. A sorusu orjinallik alt boyutunda puanlanmaktadır.		
1	0 puan	Belirsiz çizim ve karalamalar. Hayvan dışındaki canlı ve cansız varlıkları ana figür olarak çizme (eşya, bitki vb). Var olan bir hayvanın aynısı olan çizim ve özellikler.
	1 puan	Basit özellikler ekleme (kafası döner, konuşur, tehlikelidir, korkunçtur, sevimlidir, suyla beslenir vb.). Basit birleştirmeler yapma; zürafa fil karışımı, yarı inek yarı köpek.
	2 puan	Birden fazla canlının özellikleri birleştirme (hayvanlar, hayvana bitkinin ya da insanın özelliklerinin eklenmesi vb). Yeni bir isim koyma. Hayvanların özelliklerini birleştirme (uçan bir hayvanın kendisini korumak için dikenleri var, doğaüstü güçleri, sihri var).
	3 puan	Tamamen yeni bir canlı oluşturma. Kurgusal özellikler ekleme (tehlike anında su fışkırtma, lazer atan göz vb).
2	0 puan	Var olan herhangi bir hayvana ait çizimler (normal bir köpek vb.). Karalamalar, belirsiz şekiller.
	1 puan	Genel özellikleri belli olan bir hayvana basit özellikler ekleme (örneğin rengi, deseni, boyu farklı).
	2 puan	Farklı organ ya da uzuv ekleme (göz, boynuz, kanat vb.). Birden fazla hayvanın görüntüdeki detaylarını birleştirme.
	3 puan	Canlı ve cansız varlıkları birlikte kullanarak çizim (palet ayak vb). İnsan ve hayvan görüntüsünü birleştiren çizimler. Görüntüde tamamen yeni bir canlı oluşması.
3	0 puan	Var olan herhangi bir hayvana ait çizimler (normal bir köpek vb.). Karalamalar, belirsiz şekiller.
	1 puan	Belirli bir hayvana basit işlev ekleme (eğlendirir vb.). İnsana ait işlevler ekleme (konuşur, şarkı söyler, düşünür vb)
	2 puan	Hayvanlarda var olan işlevleri birleştirme; (at gibi hızlı koşan, deve kadar dayanıklı ancak küçük olduğu için her yerde yaşayabilen bir hayvan, köpek ama süt verir, yarasa ama bal yapar vb). Hayvanlarda var olmayan işlevler ekleme; ağzından sıvı fışkırtma, gözünden ışık çıkarma, ışınlanma, şarkı söyleme, odasını toplama, ödev yapar, ışınlanır, görünmez olabilir, renk değiştirir.
	3 puan	Sistem içeren yanıtlar ve yararlı somut işlevler ekleme; hipnotize eder, savaşı engeller, ölümsüzdür, istekleri gerçekleştirir, geri dönüşüm yapabilir, çim biçer, havayı temizler vb. 2 puan alan işlevleri sonuçlarıyla verme (görünmez olup insanları korur vb.).
B SORUSU: B'nin altında iki ayrı madde bulunmaktadır. B1; 4. Soru, B2 ise 5 ve 6. Soru olarak puanlanmaktadır. 5 ve 6. maddeler ÇYDG'nin "B2'" sorusu için verilen iki alt puandır. B sorusu ıraksak düşünme alt boyutunda puanlanmaktadır.		
4	0 puan	Teneffüse çıkmasınlar gibi çözüme yönelik olmayan yanıtlar.
	1 puan	Elle çalınan zil kullansınlar, Sessiz olsunlar, öğretmen zilin çaldığını söylesin, saate baksınlar

	2 puan	Saate bağlanan hoparlör, sınıfa ayrı zil takılması, okulla aynı anda çalan yakına yerleştirilen ayrı zil.
	3 puan	Sistem geliştiren yanıtlar; görüntülü zil, titreşimli zil, zil çalınca kapıya vuran cihaz, zil çalınca sinyal gelmesi, sınıfta ışık yanması vb.
5	0 puan	İşitme cihazı taksın, telefonu yanına alsın gibi tasarıma katkı sağlamayan yanıtlar. Gerçekçi olmayan yanıtlar (telefon çalınca gelip koluna dokunsun vb.).
	1 puan	Titreşimin artırılması, hoparlör işlevinin değiştirilmesi, farklı zil sesi kullanılması (siren sesi, dikkatini çekebilecek sesler vb.).
	2 puan	Işık işlevinin farklılaştırılması, telefon ekranındaki görüntünün dikkat çekecek hale getirilmesi.
	3 puan	Koku, hologram, eve yansıyan görüntü.
6	0 puan	Telefonla konuşmasın gibi çözüme katkı sağlamayan yanıtlar.
	1 puan	Telefon çalınca otomatik açılması. Telefonla konuşmak için belli saatler belirlenmesi.
	2 puan	Saat telefon yapılması, telefonu evin ziline bağlamak, koluna titreşim cihazı bağlamak, telefonda ışık yanıp sönmesi.
	3 puan	İşitme cihazını telefona bağlamak, parfüm çıkaran telefon, telefona bağlı bileklik (ışık saçan ya da titreşimli), titreşimli saat telefon, telefon çaldığında gözlüğünün titremesi, evde ışıklı tabelalar yanıp sönmesi.
C SORUSU: C'nin altında 7,8 ve 9.maddeler bulunmaktadır. C sorusu ayrıntılama alt boyutunda puanlanmaktadır.		
7	0 puan	Anlamsız çizgi ya da şekiller ekleme
	1 puan	Şeklin yalnızca kendisini kullandığı çizimler; Top, saat, pizza, güneş, gülen yüz, tekerlek, çiçek, pusula, dünya gibi. Süsleme, mandala vb.
	2 puan	Bir bütünün parçasını oluşturan yanıtlar (güneş sistemi, Gezegen çiçek buketi vb.). Şeklin dışına da eklemeler yaparak oluşturulan araba, hayvan, insan, kuyu, fotoğraf makinesi objektifi, kol saati eşya vb. Semboller ve amblemler; okul, araba, marka vb amblemleri, mevsim tablosu, tabela, hedef tahtası, olimpiyat halkası, kum saati, iyilik dağıtan çiçek.
	3 puan	Kurgusal, hikaye oluşturan yanıtlar; uçan balon uçuran çocuk. Var olmayan bir varlık oluşturma. Farklı işlev ekleyen yanıtlar. Soyut ve manevi kavramlar.
8	0	Anlamsız çizgi ya da şekiller ekleme, yalnızca üç noktayı birleştirme.
	1 puan	Noktaları birleştirerek yapılan şekiller; kalp, üçgen, açı, pizza, parti şapkası.
	2 puan	Noktaları merkeze alarak farklı varlıklar çizme (eve, arabaya dönüştürme, dondurma, hayvan, zarf, uçurtma, kaydırak vb.) Soyut kavramlar oluşturma; İlluminati, sevgi bahçesi vb.
	3 puan	Hikaye oluşturan yanıtlar (çocuğun hayatı, evlerin olduğu bir mahalle vb). Var olmayan bir varlık oluşturma. Farklı işlev ekleyen yanıtlar (insanlara yardım eden bir kalp vb.).
9	0 puan	Belirsiz çizim ve karalamalar.

	1 puan	Çizgiyi ana figür olarak kullanma; tırtıl, yılan, solucan, şeker, sosisli sandviç, kuyruklu yıldız, balon, uçurtma.
	2 puan	Çizgiyi bir nesnenin parçası olarak kullanma; perde, yol, kaydırak, defter, dalga, saç, yay-ok, dna sarmalı, bıçağın tutma yeri, ipe geçen iğne, saatin yelkovanı, dalgadaki gemi vb. Şekil ekleme; bir çift küpe vb. Sembol ve amblemler; Okul amblem vb.
	3 puan	Kurgusal ve hikaye oluşturan yanıtlar (yayla ok atan kişi, ödül alan kişinin sahneye gittiği yol, çocuğun oynadığı balon, kedinin iple oynaması, uçan halı, akan şelale vb.). Var olmayan bir varlık oluşturma. Farklı işlev ekleyen yanıtlar.
D SORUSU: D'nin altında 10 ve 11.maddeler bulunmaktadır. D sorusu akıcılık alt boyutunda puanlanmaktadır.		
10	0 puan	Yiyecek konur, gerçekçi olmayan yanıtlar (içinde giysilerimizi saklarız).
	1 puan	1-3 adet farklı kullanım.
	2 puan	4-5 adet farklı kullanım.
	3 puan	6 ve üzeri farklı kullanım.
11	0 puan	Defter ve kitabın kenarına takılır, gerçekçi olmayan yanıtlar (uçak yakıtı olarak vb).
	1 puan	1-2 adet farklı kullanım.
	2 puan	3-4 adet farklı kullanım.
	3 puan	5 ve üzeri farklı kullanım.

Appendix 3.

Creative Thinking Task for Children (CTTC)-English Version

Creative Thinking Task for Children (CTTC)

-A-

Create a different animal than anyone else would. While doing this, you can use all the objects and assets that come to your mind. Be sure to write down the characteristics of the animal you draw.

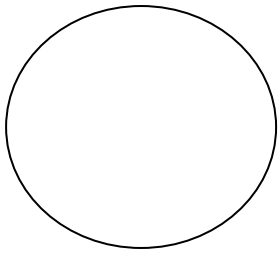
Drawing:
Properties:

-B-

B1.	Read the story below and try to come up with solutions that are different from what anyone can think of. Students in a class are always late for recess because they are not heard from their class when the bell rings. They decide to make an invention to solve this problem? What should they do?
B2	Trying to come up with a product suitable for the following event, write its characteristics. Deniz lived far from her elderly grandmother. She loved to call her grandmother and tell her what had happened that day. Since her grandmother lived alone, she was very happy when Deniz called. However, she couldn't hear when the phone rang because her grandmother's ears were low. Deniz decided to design a phone so that her grandmother could recognize when the phone was ringing and pick it up. What kind of phone would you design for grandma? Write the specifications below. (explicitly specify all features) Write the features of the phone you are designing here:

-C-

C1. Look at the circle below, draw what you can do using this circle. You can use the inside and outside of the circle as you wish.



C2. What can you do with the three dots below? Think and draw what you can do while the dots are like this. You can draw more than one by using the dots individually or together.

.

.

.

C3. What can you do with the figure below? Draw.

-D-

In rows D1 and D2, generate options for how and for what purpose you can use the objects. Write down as many different uses as possible. Try to think of uses that others may not think of. The important thing here is that the number of uses you suggest is high.

D1		List the different uses for the jar:
D2		List different uses of paper clip:

Appendix 4.

Scoring Criteria for CTTC-EnglishVersion

Item	Point	Scoring Criteria
QUESTION A: Items 1,2 and 3 are the three sub-points given for the "A" question of the CTTC. Question A is scored in the originality sub-dimension.		
1	0	Indeterminate drawings and doodles. Drawing animate and inanimate objects other than animals as main figures (items, plants, etc.). Drawing and features identical to an existing animal.
	1	Adding simple features (dizzy, talking, dangerous, scary, cute, water-fed, etc.). Making simple joins; Giraffe elephant mix, half cow half dog.
	2	Combining characteristics of more than one living thing (animals, adding plant or human characteristics to an animal, etc.). Don't give a new name. Combining the characteristics of animals (a flying animal has spines to protect itself, has supernatural powers, magic).
	3	Creating a completely new live. Adding fictional features (e.g. water squirt in danger, laser eye, etc.).
2	0	Drawings of any existing animal (a normal dog, etc.). Doodles, vague shapes.
	1	Adding simple features to an animal with certain general characteristics (for example, different color, pattern, size).
	2	Adding different organs or limbs (eyes, horns, wings, etc.). Merge details of multiple animals in the image.
	3	Drawing using living and non-living things together (pallet feet, etc.). Drawings combining the image of humans and animals. The formation of a completely new life in the image.
3	0	Drawings of any existing animal (a normal dog, etc.). Doodles, vague shapes.
	1	Adding a simple function to a particular animal (entertains, etc.). Adding human functions (speaks, sings, thinks, etc.).
	2	Combining functions existing in animals; (An animal that runs fast like a horse, is as hardy as a camel but can live anywhere because it is small, a dog gives milk but a bat makes honey, etc.). Adding functions that do not exist in animals; squirts out of his mouth, shoots out light from his eyes, teleports, sings, tidies his room, does homework, teleports, can become invisible, changes color.
	3	Adding systemic responses and useful concrete functions; hypnotizes, prevents war, is immortal, fulfills wishes, can recycle, mow grass, clean the air, etc. Giving functions that get 2 points with their results (invisible, protecting people, etc.).
QUESTION B: There are two separate items under B. B1; Question 4 is scored as question B2, and question 5 and 6. Items 5 and 6 are the two sub-points given for the "B2" question of the CTTC. Question B is scored in the divergent thinking sub-dimension.		
4	0	Non-solution-oriented answers, such as not going to recess.
	1	Let them use a manual bell, Let them be silent, Let the teacher say that the bell rings, Let them look at the clock.
	2	The loudspeaker connected to the clock, the installation of a separate bell in the classroom, the separate bell placed nearby that rings at the same time as the school.
	3	System-enhancing responses; video bell, vibrating bell, the device that knocks on the door when the bell rings, the signal comes when the bell rings, the light comes on in the classroom, etc.

5	0	Answers that do not contribute to the design, such as wear a hearing aid or take the phone with you.
	1	Unrealistic responses (come and touch your arm when the phone rings, etc.).
	2	Increasing the vibration, changing the speaker function, using different ringtones (siren sound, sounds that may attract attention, etc.).
	3	Differentiating the light function, making the image on the phone screen stand out.
6	0	Answers that do not contribute to the solution, such as not talking on the phone.
	1	Automatically turn on when the phone rings. Determining certain hours to talk on the phone.
	2	Making a watch phone, connecting the phone to the house bell, attaching a vibration device to the arm, flashing light on the phone.
	3	Connecting the hearing aid to the phone, the phone that emits perfume, the wristband (luminous or vibrating) connected to the phone, the vibrating watch phone, the vibration of the glasses when the phone rings, the flashing of the illuminated signs at home.
QUESTION C: Items 7, 8 and 9 are under C. Question C is scored in the detail sub-dimension.		
7	0	Add meaningless lines or shapes.
	1	Drawings where the shape only uses itself; Such as ball, clock, pizza, sun, smiley face, wheel, flower, compass, earth.
	2	Ornament, mandala, etc.
	3	Responses that form part of a whole (solar system, Planetary bouquet, etc.).
8	0	Don't add meaningless lines or shapes, just connect three dots.
	1	Shapes made by connecting dots; heart, triangle, angle, pizza, party hat.
	2	Drawing different assets by centering the points (conversion into house, car, ice cream, animal, envelope, kite, slide, etc.)
	3	Creating abstract concepts; Illuminati, garden of love etc.
9	0	Indeterminate drawings and doodles.
	1	Using the line as the main figure; caterpillar, snake, worm, candy, hot dog, comet, balloon, kite.
	2	Using the line as part of an object; curtain, road, slide, notebook, wave, hair, bow-arrow, dna helix, handle of the knife, needle passing through the rope, minute hand of the clock, ship in the wave etc. Adding shapes; a pair of earrings, etc.
	3	Fictional and story-forming responses (the person who shoots an arrow with a bow, the way the winner takes the stage, the balloon the child plays, the cat playing with rope, the flying carpet, the flowing waterfall, etc.). Creating an entity that does not exist. Answers adding different functionality.
QUESTION D: Items 10 and 11 are under D. Question D is scored in the fluency sub-dimension.		
10	0	Food is put, unrealistic answers (we hide our clothes in it).
	1	1-3 different uses.
	2	4-5 different uses.
	3	6 or more different uses.
11	0	Used in the margin of notebook and book, unrealistic answers (as aircraft fuel etc).
	1	1-2 different uses.
	2	3-4 different uses.
	3	5 or more different uses.