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A VALIDITY AND RELIABILITY STUDY OF THE CREATIVITY-SUPPORTING HOME ENVIRONMENT SCALE

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Abstract

In this study, it is aimed to improve the "Creativity-Supporting Home Environment Scale" for the purpose of determining the level of creativity in the home environment of parents with children aged 3-6 years old. Research study groups were composed of 500 parents across various provinces of Turkey. The scale items written in the context of the literature were presented to field experts for their opinion in accordance with the scale's purpose, and the content validity index was calculated as proof of the scale's content validity (.89). A pretest application of the scale was conducted in accordance with the expert opinion, and the items were examined for their distinctiveness. A test application was conducted for the purpose of demonstrating the factor structure of the scale, and whether or not the data was appropriate for factor analysis by using KMO and Bartlett statistics. Factor analysis based upon principal component analysis was performed with the optimum application of parallel analysis, and according to both parallel analysis and scree plot, it was decided that the structure was four-dimensional. The percentage of the factors explaining the total variance was established as 49.9%. The item test correlation values of the items in each factor were found to be above .30 in accordance with the item analysis results. Two items that did not fulfill the criteria were removed from the scale by performing a confirmatory factor analysis to verify the structure. Factor loadings for 28 items in the scale were found to be higher than .30 and with error variances below .90. It was found that the McDonald's omega coefficients were between .71 and .88, and the Composite reliability coefficients were between .70 and .84 in the calculation of the reliability of the scale scores for each of the scale's four dimensions. For the whole scale, the stratified alpha reliability coefficient was calculated as .87. The obtained findings demonstrate that the "Creativity-Supporting Home Environment Scale" is a valid and reliable scale.

Keywords: Home environment, creativity, preschool children, scale development.

INTRODUCTION

Creativity is not only a thought formed in the mind of the individual, but also the success that emerges based on a synergy of different resources. In this respect, it is insufficient to only train the individual, resources should also be improved in order to develop creativity (Sak, 2014). In this context, creativity has been handled from a systemic perspective from the last century to the present and it has been defined as a continuous dynamic process as a result of both individual and environmental factors **(**Csikszentmihalyi, 2014; Gong, Zhang, & Tsang, 2020; Guo, Zhang, & Pang, 2021; Martínez, 2007; Nakano & Wechsler, 2012; Özer & Polat, 2019; Robinson, 2013; Sawyer, 2012; Simonton, 2008).

It is quite difficult to say what actually makes a child creative. According to Ellermeyer (1993), a creative child may arrive at many different, unusual, original, or detailed solutions. Taneri (2012) stated that creative thinking is a skill needed to adapt to the world of today and the future. According to Kaufman and Sternberg (2007), creative people solve problems in a convenient, advanced, and high-quality way. Problem-solving helps children feel in control, become aware of changes, and cope with difficulties. The process of becoming creative involves solving problems. Problem solvers are capable of recognizing problems and engaging their conscious and unconscious minds in order to realize an effective solution. Individuals with advanced problem-solving skills value the ideas of others as much as they value their own when it comes to solving problems (Herget, 2016).

It has been accepted by many researchers that in early childhood, the family, which is the closest context of children, has an important impact as it represents a starting point in their learning (Koslinski & Bartholo, 2020; Koslinski, Gomes, Rodrigues, Andrade, & Bartholo, 2022; Rodrigues & Muanis, 2020). The first and most crucial social group in the development of children's creativity is undoubtedly the family environment into which they are born. A child's first teachers are therefore its parents, whilst members of the wider family may also help a child's creativity to flourish. Research has shown that parents shape their children's creative abilities in various ways (Esquivel & Hodes, 2003; Greenspan, Solomon, & Gardner, 2004; Uçar, 2021). Parents effectively act as gatekeepers for their children. According to Berk (2001, p. 28), parents open or close many learning paths depending on the experiences that each offers to their children. This includes toys, books, watching television, having access to a computer, weekend trips, tutoring, spending time with grandparents and other extended family members, as well as the quality of childcare and school education. Children are deeply influenced by their parents, and in providing their children with additional opportunities, parents actively support their child's development and give a clear message that they care. Berk (2001, p. 246) explained this by saying that parental warmth combined with sound, consistent, rational, and appropriate expectations for mature behavior can be said to support child development. However, both Taneri (2012) and Zimmerman (2009) underlined that most parents are not fully aware of the meaning of creative thinking as a skill; therefore, the awareness of these skills needs to be increased among both parents and teachers. Parents have emphasized that it would be very beneficial for them to know how to apply this awareness in order to encourage their children's skills in both problem solving and creative thinking.

When it comes to exploring children's skills in creative thinking, it is considered both important and beneficial for parents to create a safe and supportive home environment. Gardner (1991) stated that exposing children to different materials within the family environment will help to improve their problem-solving skills, and therefore help children find their strengths, passions, and interests. According to Taneri (2012), parents should give more responsibility to children in order to facilitate the development of the children's self-confidence and risk-taking. In order to encourage learning in children and to help support their problem-solving skills acquisition, it should be ensured that the environment is appropriately comfortable so as to entice children to participate (Caroll & Tucker, 2007). However, parents are required to pose several questions when children are attempting to solve problems or think creatively. This helps to stimulate the children's thinking and for them to perceive organizational structures, as well as to mechanize the internal control necessary for success in life. Bresler, Thompson, Chapman, and Ayers (2002) stated that children who participate in activities along with their parents, students, and their peers can learn a significant number of cognitive and physical skills.

Creativity in the parent-child relationship covers behaviors that help parents to acquire an appropriate mindset and attitude, as well as the personal qualities and skills necessary for their child's creativity to flourish (Kwasniewska, Gralewski, Witkowska, Kostrzewska, & Lebuda, 2018, p. 14). In the parent-child relationship, there is a requirement to encourage the acquisition of new and diverse experiences, to support some incompatible attitudes and independence, to strengthen perseverance in the fulfillment of creative tasks, and to encourage and support imagination in order to develop creativity within the

parent-child relationship (Kwasniewska et al., 2018; Kwasniewska & Lebuda, 2017). All these factors have a reinforcing effect on the integrative development of children, with a particular focus on creativity development. Gaining new and varied experiences, and encouraging new ideas and interests enhances a child's sense of creativity and enriches their cultural capital (Gute, Gute, Nakamura, & Csikszentmihalyi, 2008; Soller, 2004). Studies in this field have increased gradually in line with the growing necessity to understand the actual nature of creativity (Craft, McConnon, & Matthews, 2012; Kucirkova & Sakr, 2015; Runco, 2003; Sumiyati, Indriasih, & Sumaji, 2020). These studies have also indicated that the golden age of creativity is early childhood (Alfonso-Benlliure, Meléndez, & García-Ballesteros, 2013; Alfuhaigi, 2015). On the other hand, although many studies have indicated how schooling affects creativity (Elibol, 2021; Pugsley & Acar, 2020; Runco, 2003; Torrance, 1968), it is also understood that the effect of the parents and the family environment on creativity has not yet been studied to a sufficient level (Pugsley & Acar, 2020). Emphasis has been made that such studies are required in order to provide opportunities to establish solutions to problems concerning creativity (Puccio, 1999), to conduct activities such as brainstorming, to follow clues and complete stories (Tulumello, 2009), and to create environments that enable children to learn the value of their own creativity (Gayret, 2021; Vygotsky, 2004). Doing so would support the creativity development of parents and also their children in research studies conducted both nationally and internationally. In the context of such research, a child should be able to express their ideas freely within the environment in which they live and should not feel that they may be admonished for having such ideas. When the literature is examined, there are very few studies that have examined the relationship between the home environment and children's creativity. Considering the research undertaken outside of Turkey, Pugsley and Acar (2020) examined the effect of parenting style and the home environment on children's creativity, Jankowska and Gralewski (2020) examined the effect of a creative home environment on parenting styles in the child-family relationship, whilst Oh and Choi (2006) developed the Creativity-Supporting Home Environment Scale for Preschool Children. When the studies conducted within Turkey were analyzed, it was found that Can Yaşar and Aral (2011) examined the effect of parental education level on 6-year-old children's creative thinking skills, whilst Erbay and Çağdaş (2007) examined whether the education levels of mothers and their behavior towards their children had any effect on their children's creative thinking levels, and Özyürek and Bedge (2016) examined the effect of teacher and parent attitudes on the problem-solving skills of preschool children.

In terms of the emergence and development of creativity, when children are supported by qualified stimuli and activities within the family environment into which they were born, this makes it easier for thinking skills to be acquired such as learning to establish relationships between different situations and events, asking appropriate questions, reasoning, discussing, deep thinking, discovering, and also evaluating and testing can play an important role in their future lives. However, parallel to this, it is also possible for children to reach their highest potential at the end of their school education when activities are presented or made available to them that support creativity in the home as well as at school (Elibol, 2021; Gino & Wiltermuth, 2014; Khaleque, 2013). In this context, it is thought that the development of a culture-specific measurement tool that aims to assess the creativity level of children aged 3-6 years old would contribute to the existing studies published in this field. The aim of the current study is, therefore, to assess the validity and reliability of the "Creativity-Supporting Home Environment Scale" (CSHES), which was created to determine the level of creativity within the home environment of children aged 3-6 years old. As can be seen from previous studies conducted within Turkey, no other measurement tool exists that can be used to determine the creativity level of children within the familial environment. In accordance with this purpose, the current study seeks to answer the following research questions:

1. Is the Creativity-Supporting Home Environment Scale a valid measurement tool?
2. Is the Creativity-Supporting Home Environment Scale a reliable measurement tool?

For this purpose, data gathered using the Creativity Supporting Home Environment Scale were limited to 500 parents of children aged between 3 and 6 years old, who reside in various provinces across

Turkey, and were collected through face-to-face and online means, taking into account the conditions in place due to the COVID-19 pandemic at the point when the study was undertaken.

METHOD

This research is a scale development study that aims to develop the "Creativity-Supporting Home Environment Scale" for parents with children aged 3-6 years old. Survey method was used in the development process of this scale. Survey studies applied to a whole population, or to a group of examples or samples taken from it, may consist of many elements in order to make a generalized judgment about the population (Karasar, 2002). In the current study, answers to questions regarding the home environment of children, and how the home environment is considered creative were sought, with each situation attempted to be defined as they are.

Study Group

The current research was conducted during the Fall and Spring semesters of the 2019-2020 Academic Year with three different study groups, each consisting of parents with children aged 3-6 years old. The convenient sampling method was used to form the study groups of the research. A pretest application was conducted with the first study group which consisted of 40 mothers (80%) and 10 (20%) fathers. A pilot study was applied to the second study group, which consisted of 220 (88%) mothers and 30 (12%) fathers in order to assess the dimensionality of the scale. Data were then collected from the third study group which consisted of 184 (92%) mothers and 16 (8%) fathers in order to confirm the factor structure of the scale.

According to Ferguson and Cox (1993), and Gorsuch (1983), at least 100 participants are required to be reached in order for factor analysis results to be deemed reliable, whilst Kline (1994) stated that a sample of 200 people would be sufficient for factor analysis results reliability. From the research of Cattell (1978), participants totaling 3-6 times the number of items in a scale should be included in the study group in studies looking to perform factor analysis. Based on these guidelines, it may be said that the study group in the current research reached a sufficient number of participants.

The Development Process: Creativity-Supporting Home Environment Scale

The stages set out by DeVellis (2016) were followed in the development of the "Creativity-Supporting Home Environment Scale," which aims to determine the level of creativity in the home environment in accordance with the opinions of parents with children aged 3-6 years old.

The content of home environments with children was determined in terms of creativity in the development process of the scale. As a result of the literature review, it was determined that the social and psychological environment as well as the physical environment can affect the creative thinking skills of children (Oh & Choi, 2006; Özerbaş, 2011). In this context, the physical, social, and psychological attributes of the environments were also taken into consideration whilst preparing the media content. Additionally, five dimensions were determined in the scale according to a review of the literature whilst preparing the scale: Respect, Rich Learning Environment, Play, Encouragement, and Communication.

After defining the attributes to be measured and having established the boundaries, the process of creating an item pool took place. A total of 55 items were included in the item pool: eight items for the Respect factor (e.g., "I listen to the questions my child asks," "I always respect my child's thoughts," etc.), 13 items for the Rich Learning Environment factor (e.g., "I often exhibit my child's products at home," "I always recommend new activities to my child," etc.), 11 items for the Play factor (e.g., "We decide together with my child when choosing what to play," "I don't always let my child win while playing," etc.), 11 items for the Encouragement factor (e.g., "When my child doesn't know what to do, I give them time to figure it out, talk about my child's dreams," etc.), and 12 items for the Communication factor (e.g., "I ask my child open-ended questions, tell my child how to behave in certain situations," etc.).

The draft item pool was submitted for expert opinion in order to determine the content validity of the pretest form, which consisted of all 55 items. Expert opinion was sought from 11 faculty members in total; from the subject area (n = 8), from Measurement and Evaluation in Education (n = 2), and from Turkish language (n = 1). The experts were each asked to express their opinion as to whether or not the items proposed for the scale were "appropriate," "partially appropriate," or "inappropriate," and to state any suggestions they may have where they expressed an opinion as partially appropriate or inappropriate. In accordance with the expert opinions received, the content validity ratios (CVR), developed by Lawshe (1975), and were calculated for each item. Whether the CVR values obtained were significant at the α = .05 level for each dimension was examined in accordance with the content validity criterion. Accordingly, two items with low content validity ratios (CVR = .27 and .45) were removed from the scale. The Content Validity Index (CVI) of the 53-item scale was calculated as .89. Lawshe CVRs calculated according to expert feedback are presented in Table 1.

Table 1. Lawshe content validity ratios for each items

Item Number	Lawshe CVR	Item Number	Lawshe CVR
1	.27*	29	.81
2	1	30	.81
3	1	31	1
4	.82	32	1
5	.64	33	1
6	1	34	.81
7	.81	35	.81
8	1	36	1
9	.81	37	1
10	1	38	1
11	.81	39	1
12	1	40	1
13	.45*	41	1
14	1	42	.81
15	1	43	1
16	1	44	1
17	1	45	.81
18	1	46	1
19	.81	47	.64
20	.81	48	1
21	.81	49	1
22	.81	50	1
23	.81	51	.64
24	1	52	1
25	1	53	.81
26	.64	54	1
27	.81	55	.81
28	.81		

*Items removed from the scale due to low CVR

Certain language changes were applied as suggested by the experts. The pretest (i.e., second version) scale consisted of five dimensions and 53 items in line with the expert opinions received. These dimensions were "Caring for Ideas" (7 items), "Rich Learning Environment" (12 items), "Play" (11 items), "Encouraging Independence" (11 items), and "Communication" (12 items). It was then decided to rank the scale as a 4-point, Likert-type instrument, scale items were ranked from "1" (*never*) to "4" (*always*). A directive containing the purpose of the scale, its practitioner, and their personal information was then added to the scale form.

Data Collection

The scale was applied to parents who wanted to participate in the study by filling out the Volunteer Participation Form on a voluntary basis. Each parent participating in the application was informed about the subject, purpose, and importance of the research. In preparation for the data collection phase, an application in paper-and-pencil form was applied to 25 parents with children between the ages of 3-

6 years old by the researchers in order to determine whether any problem existed in terms of the comprehensibility of the scales. No problems were identified in terms of clarity as a result of the application. Later, the pretest form of the scale was applied to the first study group in paper-and-pencil form and the necessary adjustments were conducted in accordance with the performance of the item examined. The test and actual applications of the scale could not be applied in paper-and-pencil form due to the pandemic, and were instead carried out electronically by creating an online form. No erroneous or missing data was detected in the applied scales. All participants answered the scale items completely. How to complete the scale in face-to-face applications was explained by the practitioner; whereas, for online applications, information instructions were presented on how to apply the scale.

Data Analysis

Analyses were conducted using the parallel analysis technique, confirmatory factor analysis (CFA), correlation coefficients, and reliability coefficient calculations in order to examine the statistical validity and reliability of the developed Creativity-Supporting Home Environment Scale. The item discrimination power of the scale items was examined through corrected item-total score correlation and upper-lower group analysis. The suitability of the scale data for factor analysis was examined by calculating KMO (Kaiser-Meyer-Olkin) and Bartlett statistics using IBM's SPSS Version 25.0 package program. According to Timmerman & Lorenzo-Seva (2011), factor analysis was conducted based on principal components analysis with the FACTOR 10.10.01 program with the optimum application of parallel analysis in order to examine the factor structure of the scale. Confirmatory factor analysis was performed with LISREL 8.8 in order to confirm the determined factor structure of the scale. The reliability of each dimension of the scale was analyzed by calculating the McDonald's omega coefficients, Composite reliability coefficients and for the whole test Stratified Cronbach's alpha was calculated using SPSS Version 25 and R software.

RESULTS

Validity Proofs

In order to answer the first research question of the study, item analyses were conducted, and parallel analysis and Confirmatory factor analysis were performed in order to obtain evidence of the measurements' construct validity. A total of 53 items were written under the titles of Caring about Children's Ideas, Creating a Rich Learning Environment, Play, Environments that Encourage Independence, and Communication for the "Creativity-Supporting Home Environment Scale" which was developed within the scope of the current research. The items were initially applied to a pretest group of 50 participants, the item discrimination was examined by calculating the corrected item-total score correlations over the obtained dataset, and the results are presented in Table 2.

Table 2. Corrected item-total score correlations of Creativity-Supporting Home Environment Scale

Corrected item-total score correlation		Corrected item-total score correlation	
m1	.638	m28	.545
m2	.621	m29	.340
m3	.588	m30	.348
m4	.631	m31	.609
m5	.672	m32	.522
m6	.543	m33	.354
m7	.589	m34	.624
m8	.495	m35	.355
m9	.594	m36	.573
m10	.314	m37	.625
m11	.462	m38	.451
m12	.431	m39	.348

Table 2 (Continued)**.** Corrected item-total score correlations of Creativity-Supporting Home Environment Scale

Corrected item-total score correlation		Corrected item-total score correlation	
m13	.467	m40	.559
m14	.470	m41	.652
m15	.483	m42	.581
m16	.581	m43	.585
m17	.541	m44	.466
m18	.547	m45	.517
m19	.380	m46	.601
m20	.497	m47	.606
m21	.102	m48	.541
m22	.041	m49	.408
m23	.166	m50	.421
m24	.284	m51	.525
m25	.139	m52	.569
m26	.469	m53	.463
m27	.392		

According to Table 2, it is understood that the corrected item total score correlation of all but five of the scale's items (Items 21-25) was greater than .30. As such, it can be said that the five items have low discrimination power and are therefore insufficient for measuring the relevant attribute in the scale as they have a factor loading value of less than .30 (Hair, Black, Babin, & Anderson, 2010**)**. Therefore, it was decided to remove these five items from the scale.

Within the scope of the research, factor analysis based on principal component analysis was performed with the optimum application of parallel analysis (Timmerman & Lorenzo-Seva, 2011) in order to examine the structure of the scale with data collected from 250 participants. During the factor analysis, items with a factor loading less than .30 and also overlapping items were excluded from the analysis. In this context, 18 items (Items: 10, 11, 13, 14, 16, 17, 19, 26, 30, 32, 33, 36, 37, 38, 39, 40, 43, 44) were excluded and the analysis was repeated after each exclusion. Finally, the calculated KMO (Kaiser-Meyer-Olkin) and Bartlett statistics values (KMO = .90; Bartlett's statistic = 2742.0, *SD* = 435, *p* = .000) were examined prior to the factor analysis. With a KMO value greater than .60 and the Bartlett test results showing a statistically significant difference, this indicated that the data and sample size was considered suitable for factor analysis (Tabachnick & Fidell, 2012). The eigenvalues and explained variance ratios are presented in Table 3.

Table 3. Eigenvalues & explained variance ratios of Creativity-Supporting Home Environment Scale factors

Item	Eigenvalue	Explained variance ratio	Cumulative Explained Variance ratio
1	9.838	.328	.328
2	1.977	.066	.394
3	1.622	.054	.448
4	1.524	.051	.499
5	1.129	.038	
6	1.052	.035	
7	1.006	.034	
8	.926	.031	
9	.878	.029	
10	.862	.029	
11	.777	.026	
12	.751	.025	
13	.694	.023	

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Table 3 (Continued)**.** Eigenvalues & explained variance ratios of Creativity-Supporting Home Environment Scale factors

Item	Eigenvalue	Explained variance ratio
14	.659	.022
15	.620	.021
16	.591	.020
17	.573	.019
18	.526	.018
19	.508	.017
20	.437	.015
21	.421	.014
22	.362	.012
23	.349	.012
24	.335	.011
25	.330	.011
26	.319	.011
27	.276	.009
28	.233	.008
29	.219	.007
30	.205	.007

The variance ratio explained by the first factor of the Creativity-Supporting Home Environment Scale was 32.8%, for the second factor it was 6.6%, the third factor was 5.4%, whilst the variance ratio explained by the fourth factor was 5.1%. Together, the four factors explained 49.9% of the variance in the Creativity-Supporting Home Environment Scale. As can be seen from Table 3, there were seven factors with eigenvalues above 1. On the other hand, the recommended number of dimensions is four in accordance with the parallel analysis performed based on a 500 (Timmerman & Lorenzo-Seva, 2011) random correlation matrix. In addition, in the scree-plot of Figure 1, it can be seen that a flattening begins following the fourth factor. Therefore, it was decided that a four-factor structure best fits the data.

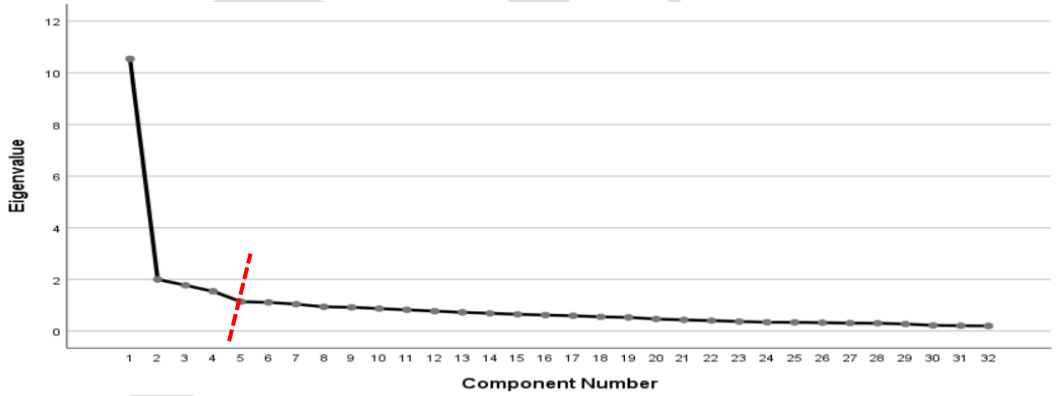

Figure 1. Creativity-Supporting Home Environment Scale scree-plot

Factor loadings of the Creativity-Supporting Home Environment Scale are presented in Table 4.

The loading of Factor 1 was seen to vary between .481 and .830, whereas for Factor 2 it varied between .487 and .756, for Factor 3 it was between .467 and .791, and for Factor 4 the loading varied between .43 and .786. It can therefore be said that the items serve their purpose within the dimension that they reside as the factor loading for each item was higher at .30. When the items were examined under their factors, the first factor was named "Caring for Ideas," the second factor "Rich Learning Environment," the third factor "Play and Encouraging Independence," and the fourth factor "Communication."

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Table 4. Factor structure of the Creativity-Supporting Home Environment Scale

Item	Factor 1	Factor 2	Factor 3	Factor 4
1	**.730**	-.038	.053	.008
2	**.481**	-.074	.157	.025
3	**.561**	-.007	.15	.074
4	**.663**	.128	-.003	-.105
5	**.775**	-.068	.046	.049
6	**.830**	-.092	-.109	.018
7	**.820**	-.006	-.146	.056
8	**.698**	.19	-.112	-.051
9	**.592**	0	.079	-.005
12	.204	**.487**	.116	.023
15	.126	**.664**	.051	.045
18	.111	**.756**	-.034	-.051
35	-.118	**.654**	.031	.100
20	.163	.215	**.467**	-.150
27	-.091	-.11	**.739**	.074
28	.044	.006	**.791**	-.08
29	-.127	.189	**.680**	-.006
34	-.049	.049	**.615**	.099
31	.201	-.106	.204	**.430**
41	-.079	.129	.151	**.543**
42	.021	.008	.061	**.611**
45	.102	.187	-.213	**.664**
46	.155	-.078	.064	**.656**
47	-.002	.12	.071	**.651**
48	-.095	-.129	.05	**.786**
49	-.075	.014	-.168	**.769**
50	-.149	.351	-.365	**.715**
51	.123	-.059	-.108	**.758**
52	.08	-.012	.049	**.643**
53	-.124	.291	-.058	**.588**

In order to examine the item discrimination power of the scale items, the scale scores were ordered from the highest to the lowest, with those in the top 27% as the upper group and those in the lowest 27% as the lower group. The significance of the difference between the upper and lower 27% groupings was examined with *t*-test, and the results are presented in Table 5.

Table 5. Item analysis of Creativity-Supporting Home Environment Scale

Factor	Item	Item-Total Score Correlation	Corrected Item-Total Score Correlation	Upper Group		Lower Group		
				Mean	Std.Dev.	Mean	Std.Dev.	t
Caring for Ideas	1	.745*	.660	3.60	.55	2.41	.81	9.992*
	2	.595*	.479	2.85	.83	2.18	.77	4.912*
	3	.727*	.627	3.19	.72	2.13	.81	8.075*
	4	.661*	.554	3.15	.72	2.31	.72	6.809*
	5	.794*	.728	3.46	.58	2.49	.68	8.927*
	6	.715*	.624	3.34	.70	2.38	.75	7.642*
	7	.739*	.661	3.69	.50	2.65	.89	8.421*
	8	.670*	.570	3.35	.66	2.54	.87	6.089*
	9	.663*	.550	3.43	.63	2.49	.97	6.711*
Rich Learning Environment	12	.714*	.471	3.53	.66	1.96	.53	15.361*
	15	.784*	.588	3.57	.58	1.91	.45	18.668*
	18	.749*	.514	3.68	.61	1.91	.59	17.130*
	35	.674*	.409	3.65	.54	2.09	.59	16.046*
Play and Encouraging Independence	20	.610*	.382	3.62	.57	2.25	.76	11.838*
	27	.668*	.461	3.71	.52	2.22	.77	13.186*
	28	.777*	.605	3.85	.36	2.01	.68	19.738*
	29	.672*	.470	3.59	.63	2.07	.53	15.224*
	34	.709*	.490	3.71	.60	2.00	.77	14.380*

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Table 5 (Continued)**.** Item analysis of Creativity-Supporting Home Environment Scale

Factor	Item	Item-Total Score Correlation	Corrected Item-Total Score Correlation	Upper Group Mean	Upper Group Std.Dev.	Lower Group Mean	Lower Group Std.Dev.	t
Communication	31	.625*	.536	3.54	.66	2.13	.69	12.233*
	41	.643*	.560	3.81	.43	2.41	.80	12.717*
	42	.667*	.590	3.72	.57	2.37	.71	12.258*
	45	.701*	.628	3.75	.47	2.29	.73	13.778*
	46	.743*	.683	3.84	.37	2.37	.64	16.312*
	47	.733*	.671	3.72	.51	2.32	.66	13.818*
	48	.681*	.607	3.79	.48	2.32	.70	14.327*
	49	.627*	.544	3.63	.69	2.41	.60	1.982*
	50	.575*	.471	3.44	.85	2.18	.57	1.156*
	51	.736*	.673	3.91	.29	2.43	.68	16.685*
	52	.705*	.635	3.87	.34	2.43	.72	14.932*
	53	.630*	.539	3.54	.72	2.16	.59	12.242*

*p<.05

As can be seen from Table 5, the corrected item-total score correlation values for the Caring for Ideas factor were found to be between .479 and .728, whilst for the Rich Learning Environment factor they were between .409 and .588, for the Play and Encouraging Independence factor they were between .382 and .605, and the corrected item-total score correlation values for the Communication factor were found to be between .536 and .683. When the item-total score correlations were examined, it was determined that they were between .595 and .794 for the Caring for Ideas factor, between .674 and .784 for the Rich Learning Environment factor, between .610 and .777 for the Play and Encouraging Independence factor, and between .625 and .743 for the Communication factor. As a result, it may be stated that the items each serve their purpose. As a result of the *t*-test between the upper and lower groups, a significant difference was found to exist for all of the prepared items ($p < .05$). In accordance with this, it may be said that the items in the Creativity-Supporting Home Environment Scale are successful in distinguishing individuals in the lower and upper groupings.

Confirmatory Factor Analysis Results of the Creativity-Supporting Home Environment Scale

A four-dimensional structure consisting of 30 items was obtained as a result of the parallel factor analysis for the Creativity-Supporting Home Environment Scale developed within the scope of the research. The first factor, "Caring for Ideas," consists of nine items (Items 1-9), the second factor, "Rich Learning Environment," consists of four items (Items 10-13), the third factor, "Play and Encouraging Independence," consists of five items (Items 14-18), whilst the fourth factor, "Communication," consists of 12 items (Items 19-30).

Confirmatory factor analysis was performed by collecting data from 200 parents again in order to confirm the structure determined by parallel analysis. While confirmatory factor analysis was performed, model-data fit was evaluated by examining model-fit indices, factor loadings, and also error variances. In the first confirmatory factor analysis, it was determined that there were two items (Item 50 and Item 53) with a factor loading below .30. Item 50, with the lowest factor loading (.14) and the highest error variance (.98) was removed from the scale and the analysis was then repeated. After Item 50's exclusion from the analysis, Item 53 was also excluded since the factor loading of the item was still below .30 (factor loading = .26; error variance = .90). After these two items were excluded, the subsequent confirmatory factor analysis revealed that the factor loadings for all items were shown to be higher than .30. The obtained factor loadings and significance values are presented in Table 6.

Table 6. Factor loadings and error variances obtained as a result of confirmatory factor analysis

Item	Caring for Ideas	Rich Learning Environment	Play and Encouraging Independence	Communication	Error Variance	*t*	*p*
1	.57				.68	-	-
2	.47				.78	4.95	< .05
3	.67				.54	7.84	< .05
4	.64				.59	6.59	< .05
5	.70				.51	8.21	< .05
6	.63				.60	9.49	< .05
7	.63				.61	7.55	< .05
8	.55				.70	7.14	< .05
9	.51				.74	6.30	< .05
10		.43			.82	-	
11		.46			.79	2.94	< .05
12		.55			.70	2.54	< .05
13		.62			.62	2.64	< .05
14			.46		.79	-	
15			.47		.78	5.83	< .05
16			.57		.68	6.33	< .05
17			.52		.73	5.79	< .05
18			.38		.85	4.07	< .05
19				.41	.83	-	
20				.50	.75	4.66	< .05
21				.49	.76	4.77	< .05
22				.52	.73	4.97	< .05
23				.58	.66	5.39	< .05
24				.45	.80	4.18	< .05
25				.51	.74	4.96	< .05
26				.32	.90	4.16	< .05
28				.58	.67	5.42	< .05
29				.41	.84	4.68	< .05

As can be seen from Table 6, the factor loadings for all items were found to be higher than .30, and the error variances .90 or below. In addition, all of the items were found to be statistically significant ($p < .05$). In accordance with these results, it may be interpreted that the items serve to measure the structure of their factor. The model-fit indices obtained as a result of the confirmatory factor analysis are presented in Table 7. In addition, the measurement model obtained as a result of the analysis is illustrated in Figure 2.

Table 7. Results of confirmatory factor analysis model-fit index of the Creativity-Supporting Home Environment Scale

	χ^2	χ^2/sd	*p*	CFI	GFI	NFI	RMSEA
Scale	668.54	1.94	.00	.89	.92	.81	.069
Recommended		≤ 3		≥ 90	≥ 90	≥ 90	≤ .080

According to the findings of the confirmatory factor analysis, it can be seen that the χ^2/SD value is lower than 3, hence it may be said that the model fits well with the data. The CFI value was found to be .89, which is very close to .90 as the acceptable level of fit. The GFI value was found to be .92, and since this value is greater than .90, it may be said that the model fits well with the data. The NFI value was found to be .80. Since this value was found to be lower than .90, it may be said that the model data fit was not achieved according to this index value. However, according to Forza and Filippini (1998), an NFI value greater than .80 may be considered to indicate a good fit. When evaluated in terms of the RMSEA index, this index value was found to be .069, and therefore it may be said that the model fits the data in accordance with this index. The path diagram and factor loadings of the model obtained are presented in Figure 2.

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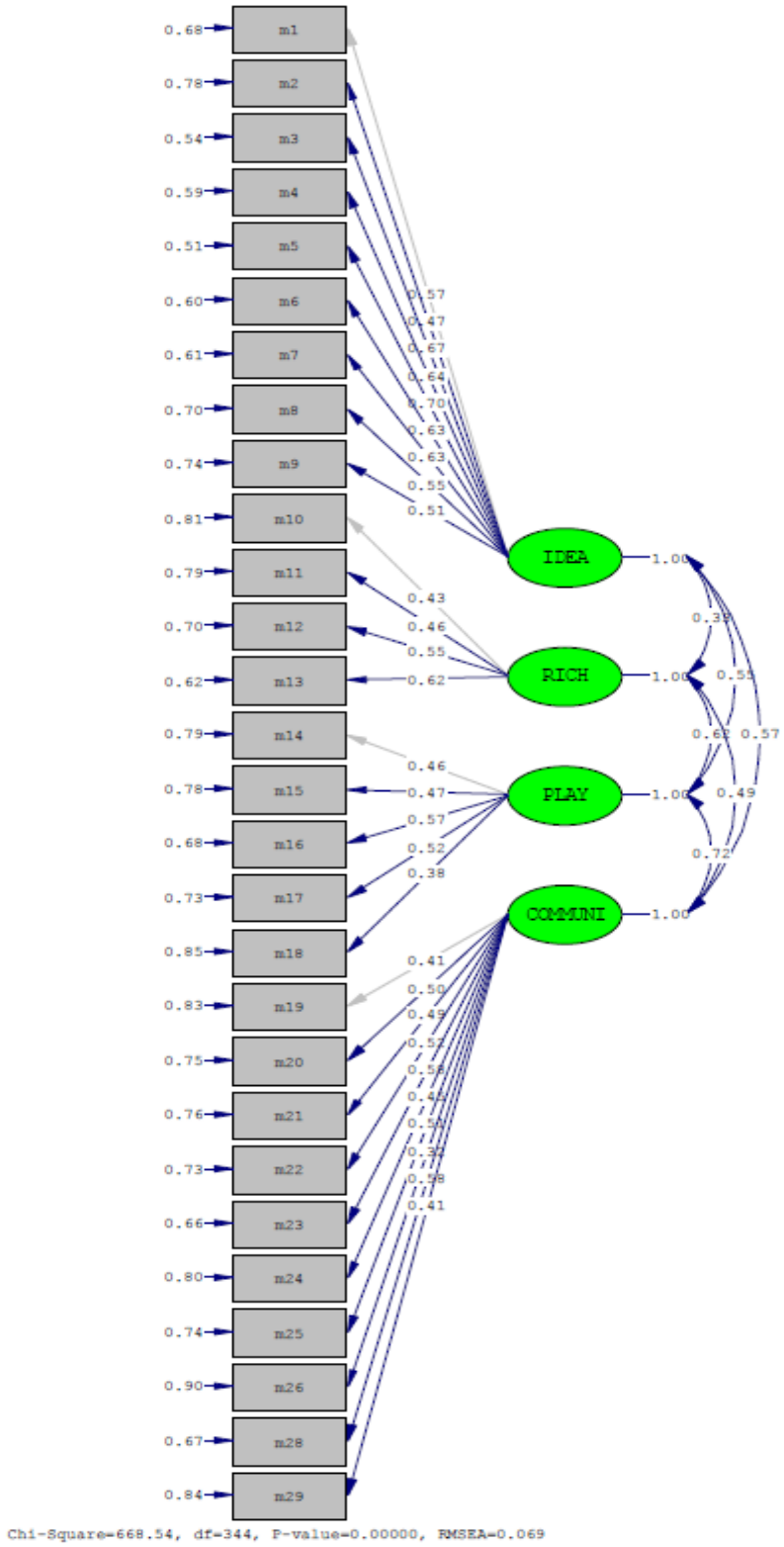

Figure 2. Creativity-Supporting Home Environment Scale measurement model

As can be seen from the path diagram illustrated in Figure 2, the determination coefficients (r^2) for the scale items were found to vary between .32 and .70. Accordingly, it may be said that the four-dimensional model fits with the data.

Reliability Proofs

In order to answer the second research question regarding the reliability of the measurements, the McDonald's omega (McDonald, 1999) and Composite reliability (Lord & Novick, 1968) coefficients for each factor, as well as the Stratified-alpha (α) reliability coefficient (Cronbach, Schonemann, & Brennan, 1965) were examined so as to assess the overall reliability of the scale. Since the examined scale is multidimensional, the reliability coefficient of the whole scale was also calculated using Stratified-alpha (Gignac, Reynolds, & Kovacs, 2019). The statistics obtained in line with the analyses are presented in Table 8.

Table 8. Creativity-Supporting Home Environment Scale McDonald's ω, Composite Reliability (CR) and Stratified Alpha Values

	McDonald's ω	CR	Stratified-α
Caring for Ideas	.88	.84	
Rich Learning Environment	.71	.70	.87
Play and Encouraging Independence	.73	.71	
Communication	.81	.75	

The McDonald's ω value for the "Caring for Ideas" factor was found to be .88, whilst for "Rich Learning Environment" it was .71, for "Play and Encouraging Independence" it was .73, and for the "Communication" factor it was found to be .81. The CR coefficient for "Caring for Ideas" was established as being .84, whereas for the "Rich Learning Environment" factor it was .70, for "Play and Encouraging Independence" it was .71, and for the "Communication" factor was found to be .75. In evaluating the calculated reliability coefficients, values below .50 were considered "low," whereas values between .50 and .80 were considered "medium," and values above .80 were accepted as "high" in terms of their reliability (Salvucci, Walter, Conley, Fink, & Saba, 1997). Therefore, when the calculated reliability coefficients are examined, it may be said that the scale scores obtained from the four factors can be considered reliable since the coefficients were each established as being greater than the value of .70. The Stratified-α coefficient calculated for the whole scale was found to be .87, and according to this value, it was decided that the scale could be said to be reliable.

DISCUSSION and CONCLUSION

In this study, the aim was to improve the "Creativity-Supporting Home Environment Scale" for the purpose of determining the level of creativity of the home environments in accordance with the opinions of parents with children aged 3-6 years old. The developed scale is a 4-point, Likert type instrument which consists of 28 items within four dimensions. Content validity of the scale was examined using the Lawshe (1975) technique. Factor analysis and item discrimination coefficients were presented as proof of validity, whilst internal consistency coefficients were calculated as proof of reliability.

The pretest form of the scale consisted of 53 items and was examined in terms of item performance based on data from the first study group. The item discrimination index was examined by calculating the corrected item-total correlation. Five items with a correlation value of less than .30 were removed from the scale as they were found to be insufficient to assess the relevant attribute. In this context, the testing form of the scale consisted of 48 items.

The testing form was applied to the second study group, and a parallel analysis was conducted in order to identify the factor structure of the scale. KMO and Bartlett's statistics were calculated and it was determined that the data was appropriate for factor analysis. In total, 18 items with a factor loading below .30 and with overlapping item attributes were removed from the scale. When the parallel analysis findings and the scree-plot of eigenvalues were examined, it was decided that the structure was composed of 30 items within four dimensions.

Within the scope of item analysis, the significance of the difference between the upper and lower 27% groups was tested with *t*-test in order to examine the item performance of all 30 items, and whether or

not items differed between the upper and lower groups. A significant difference was found between the lower and upper groups for all items. In accordance with the results of the analysis, it was concluded that the scale items were successful in distinguishing the individuals who make up the lower and upper groups.

Confirmatory factor analysis was performed according to the data of the third study group in order to confirm the revealed factor structure. While examining whether or not the model fits the data, model-data fit indices, factor loadings, and error variances were examined. During the CFA, two items with factor loadings below .30 and a high error variance were removed, and the model-fit indices were calculated for the 28-item scale in which all items had factor load values higher than .30 and error variances below .90. According to the indices, it was determined that the model fits with the data.

The reliability of the scale scores was examined by calculating the McDonald's omega, Composite reliability, and Stratified alpha coefficients. The McDonald's omega coefficients calculated for the four factors of the scale varied between .71 and .88, whilst the Composite reliability coefficients varied between .70 and .84. The stratified alpha coefficient for the whole scale was calculated as .87.

When the existing literature was examined, it could be seen that only one similar scale to the one examined in the current study was found, which was the "Creative Home Environment Scale for Preschool Children," developed by Oh and Choi (2006). In their research, Oh and Choi (2006) revealed a four-factor structure, and similar to the current study's Creativity-Supporting Home Environment Scale, the explained variance was found to exceed 40% for each of the four factors. In the social sciences, explained variance ratios should ideally be between 40% and 60% (Scherer, Luther, Wiebe, & Adams, 1988). Whilst Oh and Choi (2006) did not present confirmatory factor analysis as a proof of construct validity at the stage of examining factor structure, Cronbach's alpha coefficient was calculated for each dimension as proof of reliability for the four factors, and the coefficients ranged from .75 to .86. It should be added that the Cronbach alpha has assumptions that are considered difficult to satisfy, such as unidimensionality and equal factor loadings, and is also affected by the number of items. As such, McDonald's omega, Composite reliability, and Stratified-alpha coefficients were used as alternatives to Cronbach's alpha in the current study (Hayes & Coutts, 2020; Hult, Ringle, & Sarstedt, 2014; Osburn, 2000; Revelle & Zinbarg, 2009; Zinbarg, Revelle, Yovel, & Li, 2005). By using other coefficients instead of Cronbach's alpha, which is frequently used in scale development studies, the analyses results indicated that the "Creativity-Supporting Home Environment Scale" may be considered a valid and reliable scale.

In order to contribute to the healthy development of individual family members, a home environment consists of all kinds of moral and ethical values, as well as an emotional, social, and intellectual climate (Sharma, 2011). Stimuli presented to children that encourage reasoning, discussion, questioning, and the development of their thinking skills, such as establishing a cause and effect relationship between events, should also be provided as part of a healthy home environment (Elibol, 2021; Gino & Wiltermuth, 2014; Guo et al., 2021; Khaleque, 2013).

Research has indicated that a supportive and stimulating home environment provided by parents, as the first teachers, to their children during their early childhood years holds a unique importance in the development of their creative abilities (Esquivel & Hodes, 2003; Gong et al., 2020; Greenspan et al., 2004; Sak, 2014). However, considering that children learn mostly during the preschool period by modeling the adults around them, parents can help guide their children to become original, independent, and creative through their behavior in the home, such as by asking questions and producing different solutions to problems whilst undertaking activities with their children (Çetin & Ata, 2020; Dahmen-Wassenberg, Kammerle, Unterrainer, & Fink, 2016; Guo et al., 2021).

In this context, the parents' approach that encourages their child to gain new and different experiences, tolerates some level of incompatible attitudes, encourages and supports their independence, and values their determination and imagination is a milestone in the emergence and development of a child's creativity (Glaveanu, Karwowski, Jankowska, & de Saint-Laurent, 2017;

Gute et al., 2008; Kwaśniewska et al., 2018; Kwasniewska & Lebuda, 2017). When the research published in the field to date is examined, it can be seen that very few studies have examined the child's familial home environment and how it affects the creative skills of the child (Esquivel & Hodes, 2003; Janskowska & Gralewski, 2020; Pugsley & Acar, 2020). At this point, there is a requirement to improve the measurement tools available that include the attributes of the home environment according to creative attributes. Oh and Choi (2006) took the first step in this area by improving the Creativity-Supporting Home Environment Scale for Preschool Children. However, no evidence of any scale improvement in this field was published for Turkey. Therefore, the current study offers an improvement to this culture-specific, valid and reliable measurement tool that can be employed in order to assess the creativity level of the home environment for preschool children in Turkey, which presents a contribution to the field.

The current study was conducted using data obtained from the parents of preschool children. In cases where the scale is applied in different types of samples, it is recommended that proof of validity and reliability be reexamined. Future studies may consider how children reflect upon their creative skills both within the school and home environments. Additionally, the current study may be repeated using a larger sample group and from different cities in light of the data obtained in this research. Also, research that examines the creative home environment for preschool children could be planned to include various variables in line with the results of the current research.

Ethics and Conflict of Interest

Ethical permission has been granted by Gazi University Ethical Committee, approval number E-77082166-604.01.02-222661, approval date 23.11.2021 and the meeting 18. Research Code No: 2021-1031. The authors have no conflicts of interest to declare.

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