

Development of the Early Childhood Cognitive Perspective Taking Test (EBAT): A Validity and Reliability Study*

Research Article

Murat TUNCER¹, Durmus ASLAN²

¹Firat University, Faculty of Education, Department of Basic Education, Elazığ, Türkiye  0000-0002-9112-3131

¹Çukurova University, Faculty of Education, Department of Basic Education, Adana, Türkiye  0000-0001-5204-7749

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ABSTRACT

The purpose of this research is to develop a test that measures the cognitive perspective-taking skills of children in early childhood and can be applied directly to children. Cognitive perspective-taking is a type of social skill that refers the ability of an individual to correctly predict what is going through the mind of another person by distinguishing from his/her own thoughts. It is aimed to better understand the cognitive development field by determining the cognitive perspective-taking skill levels of children and thus to contribute to early childhood education. The Early Childhood Cognitive Perspective Taking Test (EBAT) developed in this direction consists of 15 items and 60 pictures. The research group consists of 146 children aged 5-6 years, enrolled in the preschool classes of independent kindergartens and primary schools in the city center of Elazığ in the 2020-2021 academic year. Data collected through one-on-one clinical interviews with children were analyzed in SPSS and TAP programs, and the KR-20 reliability coefficient was found to be .902. Explanatory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), item-total correlation, and item analysis were performed, as well as taking expert opinions throughout the research process for test validity. As a result of the research, it has been understood that the Early Childhood Cognitive Perspective Taking Test (EBAT) is a valid and reliable test for children aged 5-6 years.

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Introduction

Since human beings are social beings by nature, they need to interact with other people. Understanding the other person correctly in all kinds of communication established during these interactions is extremely

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¹ Corresponding author's address: Firat Üniversitesi

Telephone: +905331449909

e-mail: murattuncer62@gmail.com

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important for the healthy conduct of human relations. However, in order to understand the other person correctly, the individual must be able to recognize the other person's point of view by getting rid of the dominance of his/her own feelings and thoughts. The ability of an individual to understand the world around by adopting the perspectives of others in order to make sense of their thoughts, feelings, and perceptions and thus direct their behaviors is called perspective-taking skill (Cigala, Mori, & Fangareggi, 2015). Studies on the development of perspective-taking skills are rooted in Piaget and Inhelder's (1956) research titled "The Child's Concept of Space". This research, which was conducted to understand children's transition from egocentrism to socio-centrism, later became known worldwide as the "Three Mountains Task". In this experiment, Piaget and Inhelder conducted clinical interviews with 100 children between the ages of 4 and 11 in order to test the visual (perceptual) dimension of perspective taking and examined the level of development of the skill according to age. In the experiment, three distinguishable mountain models of different sizes, a doll and various objects were placed on a table and chairs were placed around it. The children were then taken in turn and asked how they saw the mountains from the doll's position each time the doll's position was changed. In response, the child was shown 10 photographs depicting mountains and objects from different angles and asked to choose the correct one. As a result of the study, Piaget and Inhelder argued that before the age of 7-8, that is, in the preschool period, children are embedded in the influence of egocentrism, so they cannot take a visual perspective (Cole, Samuel, & Eacott, 2022; Cole & Millett, 2019). Although this view was accepted in scientific circles in the early years, it lost its validity in the following years as new research results proved otherwise. New research has revealed that children were not successful due to the difficult structure of Piaget's experiment and that perspective-taking skills can be developed in early childhood if the necessary social environment is provided. However, although many studies have been carried out since Piaget, especially in the international arena, it cannot be said that it has been fully systematized and all its dimensions have been adequately explained.

As is commonly accepted in the studies of the literature, perspective taking skill has three dimensions: visual (perceptual), emotional and cognitive. Cognitive Perspective Taking Skill, which is the subject of this scale development research, constitutes an extremely important one of these dimensions (Cigala, Mori, & Fangareggi, 2015). Cognitive perspective taking refers to a person's ability to represent others' mental states, including emotional states, only cognitively without being emotionally involved (Hein & Singer, 2008). For this reason, this skill, which can also be examined under the concept of cognitive empathy in some studies, can be defined as an intellectual response that enables us to understand and learn the thoughts and feelings of others. According to some researchers, cognitive perspective taking skill is also considered as the basis of emotional perspective taking skills (Eunha & Inho, 2016; Kim & Chung, 2016). For this reason, this skill, which can also be examined under the umbrella of cognitive empathy in some studies, can be defined as an intellectual reaction that allows us to understand and learn the thoughts and feelings of others. Accordingly, children who exhibit cognitive perspective taking skills can take into account how a stimulus is perceived and known by others, imagine how events are experienced by others, and incorporate this into their own individual experiences (Hinnant & O'Brien, 2007). The development of cognitive perspective taking is related to the development of vocabulary, including mental state words (think and know, etc.), syntax and communication skills. Experiences gained through interactions with others and the age factor play an important role in the development of this skill (Hein & Singer, 2008; Kim & Chung, 2016). Researches on cognitive perspective-taking skill are largely conducted on child samples. When conducting research examining skill development, child participants are shown a social interaction, usually depicted by drawing, painting, video or audio recording, and asked to develop a narrative to explain the interactions they observe. Accurate retelling of the social interaction by the child is considered evidence that the child is able to take a cognitive perspective (Trzcinski, 2021). The ability to take a cognitive perspective is an important research

topic when it is considered in terms of facilitating people to understand each other's thoughts correctly in social interactions and thus serving to carry out human relations on a more accurate basis.

However, when we look at the domestic literature, unfortunately it is realized that there are almost no studies (except; Gözün Kahraman, 2012) on this subject in Türkiye. In addition to cognitive perspective-taking skill, even the number of studies on perspective-taking skills in general is quite insufficient (Karoğlu, 2022; Körükçü ve Güngör, 2021; Cantekin, 2020; Coşkun, 2019; Derman ve diğ., 2019; Halavurt, 2019; Yalçın, 2019; Aras, 2018; Emen, 2018; Genal, 2018; Şahin, 2018; Aslan 2017). When we look at the studies conducted abroad, it is seen that various studies have been conducted on perspective taking skills (Cole, Samuel, & Eacott, 2022; Katrein, 2021; Trzcinski, 2021; Mouw ve diğ., 2020; Welsh ve diğ., 2019; Maza, 2019; Martin ve diğ., 2019; Hodges ve diğ., 2018; Sang & Nelson, 2017; Birch ve diğ., 2017), However, it cannot be said that the number of studies investigating the cognitive perspective taking dimension alone is still insufficient (Healey & Grossman, 2018; Woodbridge, 2017; Eunha & Inho, 2016; Dosch ve diğ., 2010; Hein & Singer, 2008). On the other hand, another situation that draws attention in the domestic literature is the low number of social skills tests that can be directly applied to children in Türkiye. When we look at the existing measurement tools, it is seen that tests that can be directly applied to children are mostly developed and used in fields such as psychology and medicine. Studies using direct observation as a data collection technique, data on children in the social sciences can generally be found in interviews with parents and teachers. In the light of this information, it is thought that developing a test which includes pictures will attract the child's attention and contribute to the field in terms of facilitating the collection of data on early childhood in order to access data about the child first-hand and more efficiently. In conclusion, the aim of this study was to develop a valid and reliable test that directly measures the cognitive perspective taking skills of 5-6 year old children in early childhood. The test developed for this purpose was named "Early Childhood Cognitive Perspective Taking Test (EBAT)".

Methodology

This research is a test development study. Tests used as measurement tools refer to the measurement of the maximum/limit competence that an individual whose data are collected can exhibit in the face of a specific task or problem compared to other participants (Erkuş, 2010).

Research Group

The research group consisted of 146 children in the 5-6 age group who were studying in independent kindergartens and preschools of state-affiliated primary schools in Elazığ city center. Demographic information about the research group was collected through the "Personal Information Form" developed by the researchers. This information which was collected under five variables, namely "Gender, Age, Mother's occupation, Father's occupation, and Duration of preschool education", is presented below in tables (Tables 1-5);

Table 1. EBAT Research Group Gender Variables

Gender	<i>f</i>	%
Female	80	54.8
Male	66	45.2

Table 1 indicates that, the number of girls in the study group for the test development application is higher than the number of boys.

Table 2. EBAT Research Group Age Variables

Age	<i>f</i>	%
Age 5	74	50.7
Age 6	72	49.3

Table 2 indicates that, the numbers of 5 and 6 year old children in the research group are almost equal.

Table 3. EBAT Research Group Mother's Occupation Variable

Occupational Group	<i>f</i>	%
Housewife	59	40.4
Teacher	24	16.4
Healthcare worker	22	15.1
Other civil servant	10	6.8
Engineer	9	6.2
Private sector	7	4.8
University graduate (<i>not working</i>)	3	2.0
Adjudger	2	1.4
Other	10	6.8
Total:	146	100

Table 3 indicates that, the majority of the mothers of the children in the research group are housewives, followed by teachers and healthcare workers.

Table 4. EBAT Research Group Father's Occupation Variable

Profession	<i>f</i>	%
Private sector	29	19.9
Engineer	17	11.6
Teacher	16	11.0
Police Officer	15	10.3
Other Civil Servants	13	9.0
Healthcare Worker	10	6.9
Self-employed	8	5.5
Finance	8	5.5
Courthouse employee	5	3.4
Technician	4	2.8
Laborer	4	2.8
Academician	3	2.0
- (no father)	3	2.0
Prosecutor	2	1.4
Other	9	6.2
Total:	146	100

Table 4 indicates that the highest percentage of fathers of children in the research group are private sector employees and engineers, followed by teachers, police officers and other public servants.

Table 5. EBAT Research Group Preschool Education Duration Variable

Duration	<i>f</i>	%
0 year	63	43.2
1 year	52	35.6
2 years	23	15.8
3 years	6	4.1

4 years	2	1.4
Total:	146	100

Table 5 indicates that the majority of the children in the research group had not received any preschool education prior to the kindergarten in which they were enrolled. It is also notable that a considerable number had received approximately one year of preschool education beforehand.

Data Collection Tool

The "Early Childhood Cognitive Perspective Taking Test (EBAT)" developed by the researchers was used for data collection.

Early Childhood Cognitive Perspective Taking Test (EBAT): The test consists of 15 items and a total of 60 (15x4) pictures, 4 pictures for each item. The pictures of the items are structured as a narrative pattern describing events that children are likely to encounter in their natural daily lives. EBAT is a test that can be applied by conducting one-to-one clinical interviews with children aged 5-6 years in early childhood. While administering the test, the researcher first shows the pictures related to the item to each child and allows the child to examine the pictures, make comments or ask questions. Then, researcher explains the plot to the child by pointing with finger from the first picture to the fourth picture for each item. After making sure that the event described in the picture is understood correctly, the researcher covers the picture showing the key point of the event with hand. The researcher then asks the child, "If we invite a friend from outside and show him/her only these three pictures, what do you think he/she will think?". At that time, in order to make the child feel more comfortable and to make the interview more fun, the child can be given the opportunity to choose the friend we assume that the child has invited in. The aim here is for the child to be able to independently predict from his/her own point of view how a friend who has not seen all the pictures might respond if he/she is called in and listens to the event with an incomplete picture. In other words, the child's ability to correctly predict the cause-effect relationship that a friend can establish with incomplete information means the demonstration of the relevant skill. Therefore, the researcher's expectation was that the interviewed child would give any response different from the event that took place in the covered picture. To accurately infer the thoughts of others, a child must overcome their own egocentrism. To measure cognitive perspective taking skill in a healthy way, measures were taken at this point to prevent correct answers that might have been given by chance. Accordingly, the pictures for all items in the test were designed in such a way that when the part showing the key point of the event was covered, the hidden information could not be easily guessed. In other words, each picture that is covered by hand includes a drawing of an unusual moment (e.g. a turtle coming out from under a book that has fallen on the floor). In the interviews, the child is given 1 (one) point for each correct answer and 0 (zero) point for each incorrect answer. As a result, the maximum score that can be obtained from the test is 15 (fifteen).

Development of the Data Collection Tool

A number of scientific steps were followed by the researchers in the development of the EBAT. First, a detailed literature review was conducted on the development of cognitive perspective-taking skill in early childhood and the development of an assessment tool for measuring this skill of children. In these reviews, in addition to cognitive perspective-taking skill, perspective-taking skills in general were also examined and it was investigated whether there are measurement tools for children on these issues. In the reviews, it was noted that the existing studies are generally concentrated in the fields of psychology, neuro-imaging, diagnostics, and medicine under the title of perspective taking, except in the field of early childhood development. In addition, although various studies have been conducted abroad, it can be said that studies in our country have started to increase in recent years, but scale development studies that are specific to the field and can be

directly applied to the child are almost non-existent except for a few studies. Accordingly, it was observed that the "Empathy Scale for Children (ESC). developed by Köksal Akyol and Aslan (2014) and the "Perspective Taking Test for Children (ÇBT)" developed by Aslan and Köksal Akyol (2016) were frequently used in the studies on this subject. Apart from these scales, there are also a few adapted scales in the literature that have been used in relation to perspective taking skills. The first of these scales is the "Theory of Mind Scale" developed by Wellman and Liu (2004) and adapted into Turkish by Gözün Kahraman (2012). In addition, the "Perspective Taking Test" developed by Kurdek and Rodgon (1975) was adapted into Turkish by Şener (1996) and a validity and reliability study was conducted by Akın (2002). Finally, the "Empathy Quotient Scale for Children (ÇEBÖ)" developed by Auyeung et al. (2009) and adapted into Turkish by Altun, Değerli, Çıkrıkçı, and Kınık (2018) can be given as an example of domestic studies related to the subject of our research. As can be seen, the number of original scale development studies measuring cognitive perspective taking skills in early childhood is not sufficient in our domestic literature. Considering the fact that data are usually collected through parents and teachers in studies conducted on preschool children, the development of measurement tools that obtain data directly from the child is becoming more and more important.

As a result, considering the need for better recognition of cognitive perspective taking skill, which is a type of social skill, in our country and the need for measurement tools for this skill, it was aimed to contribute to the field by developing EBAT. After a comprehensive literature review, test items were determined, pictures were drawn for the items, data were collected (trial applications), and data were analyzed (validity and reliability analyses). In addition, expert opinions were utilized in all steps of the test development process.

Determination of Test Items

In order to determine the test items, it was first decided to create an item pool. While creating the item pool, criteria such as the items' suitability for the early childhood period, including supported behaviors, being able to fully measure the skill under investigation, being suitable for widespread use, and being internationally adaptable were taken as basis. In addition to these, care was taken to ensure that the items addressed events that children are likely to encounter in environments where they spend a lot of time in their daily lives. Accordingly, first the physical environments where 5-6 years old children usually spend time during the day were identified. In order to make the test adaptable to different cultures, it was decided that these environments would be common areas for all children. Considering the equal distribution of indoor and outdoor spaces, environments such as home environment (living room, dining room, children's room, balcony and garden), neighborhood, kindergarten, kindergarten garden, nature, natural life park, bicycle path for children were determined. Another criterion taken into consideration when creating the item pool was gender distribution. In order to prevent gender-based internalizations that may reduce the validity of the test, both because gender equality is important and because the tested skill is 'perspective taking', the number of male and female characters depicted in the items was kept equal. All these criteria were taken into consideration and an item pool of 50 items was initially created. Afterwards, expert opinions of 5 faculty members from the field of preschool education and 3 faculty members from the field of measurement and evaluation were obtained to ensure item validity. In addition, the expert opinions of 9 preschool teachers working in public and private kindergartens were also sought to support test validity. After the item and factor analyses were conducted, the number of items was reduced to 15. Thus, in its final form, 15 items were identified in the EBAT to be directly applied to children in the 5-6 age group in the early childhood period. Finally, since there are 4 pictures for each item in the test, there are 60 (15x4) pictures in the EBAT. The process of drawing the pictures is explained in detail below.

Drawing Pictures Related to Test Items

An illustrator was hired to draw the pictures for the items in the EBAT. In addition to the professional experience of the illustrator, personal characteristics such as having two children, a boy and a girl, were also

effective in terms of recognizing the nature of the child. The purpose and the way the test was administered were explained to the illustrator in detail during the first interview. In addition, the development of the 5-6 years old children constituting the research group and the issues to be considered about children's pictures were mentioned and the importance of the pictures being suitable for the early childhood period was emphasized. Then, the instructions of the items were read together by the researchers and the illustrator and ideas were discussed on how the pictures should be prepared. At the end of the interview, a sample of the test was given to the illustrator and she was asked to review it again. During this time, the illustrator was allowed to make various preparations. In the following interviews, the questions the illustrator was curious about were clarified and it was ensured that the purpose of the research and the structure of the test were well understood. In the first stage of the drawings, the illustrator created sketches in accordance with the instructions by visualizing the pictures suitable for the items. Throughout the drawing process, the pedagogical appropriateness of the drawings was checked by the researchers. In addition, attention was paid to issues such as originality, gender distribution, unity between the drawings, drawing the characters in different items in different ways, and the ability of the drawings to attract children's attention. Accordingly, the main characters were portrayed as girls in some pictures and boys in others, ensuring equal gender distribution. Thus, it was tried to prevent the gender-oriented illusions of the children interviewed in the test trial applications that could negatively affect the validity of the test. On the other hand, in order to prevent children from making any associations between the pictures of different items, the physical characteristics (height, facial structure, hair structure, clothing, etc.) of the characters depicted in each item were designed and drawn in a distinctive way. In addition, the pictures were painted with various colors in pastel (light) tones. Thus, it was aimed to focus the child's attention on the drawing during the administration of the test and to prevent the child from getting bored. Finally, utmost care was taken to ensure that the pictures visualized the event described in the test items in a way that could measure the exact event described in the test items, rather than artistic concerns. For this purpose, each picture was first sketched, evaluated by the researchers and the illustrator together, shown to a girl and a boy in the 5-6 age group, checked for comprehensibility, and necessary corrections were made. After these procedures, the drawings were presented to the expert opinions of 5 faculty members from the field of preschool education and 3 faculty members from the field of visual arts education, as well as 9 preschool teachers. As a result of making the necessary corrections in line with the expert opinions, 60 drawings for the 15 items in the test were completed and the EBAT was ready for trial applications.

Data Collection (Trial Applications)

In order to collect data, the researchers conducted face-to-face clinical interviews with 146 children in the 5-6 age group in the early childhood period. These interviews were conducted in public and private independent kindergartens and primary schools with kindergartens within the framework of volunteerism by obtaining the necessary Ministry of National Education permissions and Ethics Committee Approval. At the beginning of the research the purpose, content and scope of the study were explained to the parents in detail, and official permission and ethics committee approval documents were presented through school administrators. In the meantime, parents were asked for permission to audio record the interview forms for later verification. Audio recordings were taken during the interviews with the children for whom parental permission was obtained.

In order to conduct the interviews at the ideal time when children were most productive, their teachers were consulted and it was decided to start the interviews at 11:00 am before noon. In order to make the children feel comfortable, each child was introduced to each other before the interview and a short conversation was held. Again, for this purpose, the test trials were conducted one-on-one with the child in another kindergarten close to the child's own classroom and in a quiet kindergarten, using kindergarten table chairs. An interview recording form prepared separately for each child was filled in during the practices. At the beginning of the

interview, the EBAT test booklet was shown to each child and the following statement was made: "There are very beautiful and colorful pictures in this book. Now I am going to show you those pictures and tell you their stories, but in some places I will need your guesses about the event described in the picture. Come on, let's get started!" During the interventions, before each item, the child was given the opportunity to examine the picture related to the question, and if there was anything he/she wanted to say about what he/she saw in the picture or the event described in the picture, it was discussed. In addition, during the interviews, it was observed that some children needed to play and move around. In such cases, short breaks were given so that the child would not get bored with the interview and could fulfill his/her need for movement. If a child did not want to participate or continue the interview, the interview was terminated and the interview record was excluded. These interviews, which were conducted within the framework of test trial applications, lasted an average of 35-40 minutes for 5-year-old children and 25-30 minutes for 6-year-old children.

Data Analysis

In order to ensure the validity and reliability of the test, expert opinions were first taken and necessary arrangements were made accordingly. During the process of receiving expert opinions, no item was excluded from the test. After this process, EBAT trial applications were carried out on 146 children. For data analysis, the data obtained from these interviews were categorized according to age groups (5 and 6 years old), and the accuracy of the data was confirmed by matching the interview recording forms and audio recordings. Then, the collected data were transferred to the SPSS (Statistical Package for the Social Sciences) program to create a data set. For the validity of the test, factor analysis procedures were carried out using SPSS software. Factor analysis (FA) can be defined as a multivariate statistic that aims to find and discover a small number of conceptually meaningful new variables (factors, dimensions) by bringing together many interrelated variables (Büyüköztürk, 2002). For this reason, the test development process was completed with 15 items determined as a result of the factor analysis performed on the 50-item item pool. After these procedures in SPSS, TAP (Test Analysis Program) was used for item difficulty and item discrimination analyses, which constitute another validity evidence of the test. The data were analyzed separately for each age group in TAP. Kuder Richardson-20 (KR-20) reliability coefficient was used for the reliability analyses showing the degree of 'freedom from errors' of the test since the data structure was 1-0.

Findings

In the analysis of the data, first the reliability of the 74 data in the 5-year age group was examined and it was seen that the KR-20 score was .89. It was determined that the item discrimination indices of TAP, 2nd, 5th, 5th, 6th, 6th, 7th, 7th, 8th, 10th, 10th, 17th, 42nd, 45th, 46th, 49th, 50th items were low. These items were noted to be re-processed after the situations in the other age group. Then, the same process was applied for the remaining 72 data as a result of deleting 1 extreme value from 73 data in the 6-year age group. The KR-20 reliability score was found to be .83. In this age group, the discrimination indices of items 1, 2, 5, 6, 7, 8, 10, 11, 17, 18, 23, 24, 26, 29, 32, 37, 39, 41, 42, 43, 44, 46, 49, 50 were low. Following these results, the common items that TAP predicts to be removed between 5 and 6 years old (low discrimination) were identified and excluded from the analysis, and the reliability for 5-6 years old was re-examined. When the 2nd, 5th, 6th, 7th, 8th, 10th, 17th, 42nd, 46th, 49th, 50th, 42nd, 46th, 49th, 50th items were excluded from the analysis, it was seen that the KR-20 reliability score for ages 5-6 increased to .90. This shows that the test being developed has a very high reliability for 5 and 6 years old children.

Descriptive Statistics Related to Data

In the trial applications conducted for the development of EBAT, a total of 146 students in the 5-6 age group were administered the test and the data were coded as 1-0. Before proceeding with the item analysis,

descriptive statistics for the 5-6 age group data are presented below in two different tables: age groups together (Table 6.) and age groups separately (Table 7.);

Table 6. Descriptive Statistics Related to 5-6 Ages Data

Number of Students	146
Maximum Score	50
Lowest Score Received	19
Highest Score Received	50
Median	41
Mean	39.11
Standard Deviation	7.16
Variance	51.36
Skewness	-.75
Kurtosis	-.34

When the descriptive statistics for the 5-6 ages data are examined in Table 6, it is seen that the mean value of the data is 39.11 out of 50. This value shows that the achievement level of the children participating in the research is high. On the other hand, the fact that the value obtained by dividing the kurtosis and skewness coefficients, which are important values for normality, by the standard error is between -3 and +3 values shows that the data are close to normal distribution.

Table 7. Separate Descriptive Statistics for 5-6 Age Data

Feature	Age 5	Age 6
Number of Students	74	72
Maximum Score	50	50
Lowest Score Received	19	24
Highest Score Received	48	50
Median	38	43
Mean	36.70	41.59
Standard Deviation	7.79	5.44
Variance	60.72	26.60
Skewness	-.37	-.95
Kurtosis	-1.02	.64

When the descriptive statistics for the 5-6 age group data are analyzed separately, it is seen that the mean values of both data are 36.70 and 41.59 out of 50, respectively. These values show that the achievement levels of the 6-year-old children participating in the research are higher than those of the 5-year-old children. On the other hand, the kurtosis and skewness coefficients, which are important values for normality, are between -3 and +3 values, indicating that the data are close to normal distribution.

Item analysis is a statistical procedure used when developing a measurement analysis. Item analysis refers to the examination of whether each item in the measurement tool is suitable for the psychological structure determined at the beginning. In this examination process, it is examined whether the items distinguish between the ones that show the feature to be measured and the ones that do not, whether they are in the right dimension and their place in the relevant dimension (Erkuş, 2007). Before the item analysis results are presented, the general results are summarized in Table 8;

Table 8. General Results of Item Analysis

Number of Items Analyzed	50
Average Item Difficulty	.78
Average Item Discrimination	.34

Item Discrimination (Double Series)	.36
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When Table 8 is examined, it is seen that the average item difficulty is .78. As the item difficulty value approaches 1, the items become easier, and as it approaches 0, the items become more difficult. Considering the average item difficulty, it can be said that the items are easy according to the children's levels. On the other hand, when we look at the item discrimination values, which is the level of discrimination between students who know and those who do not know, it is seen that the item discrimination value is .34. An item discrimination value between .30 and .39 can be interpreted as an acceptable value (Tekin, 1977). In other words, it shows that the test (EBAT) has a high discriminating power between students who know and who do not know.

For item-based examinations, the discrimination and difficulty values of all items were calculated and presented in Table 9;

Table 9. Results of Item Analysis

Items (1-25)	Substance Difficulty	Substance Discrimination	Items (26-50)	Substance Difficulty	Substance Discrimination
Item 01	.99	.24*	Item 26	.84	.25*
Item 02	.55	.05*	Item 27	.46	.32
Item 03	.54	.48	Item 28	.68	.73
Item 04	.53	.32	Item 29	.98	.22*
Item 05	.99	.07*	Item 30	.64	.63
Item 06	.95	.13*	Item 31	.68	.75
Item 07	1.00	*****	Item 32	.98	.30*
Item 08	.98	.15*	Item 33	.74	.45
Item 09	.55	.56	Item 34	.68	.74
Item 10	.97	.07*	Item 35	.40	.21*
Item 11	.98	.16*	Item 36	.75	.71
Item 12	.66	.68	Item 37	.98	.30*
Item 13	.36	.21*	Item 38	.73	.72
Item 14	.71	.48	Item 39	.92	.26*
Item 15	.62	.66	Item 40	.68	.70
Item 16	.76	.35	Item 41	.99	.18*
Item 17	.99	-.05*	Item 42	.45	.11*
Item 18	.89	.29*	Item 43	.74	.32
Item 19	.60	.69	Item 44	.99	.20*
Item 20	.95	.27*	Item 45	.90	.13*
Item 21	.79	.33	Item 46	.99	.05*
Item 22	.72	.71	Item 47	.71	.75
Item 23	.99	.23*	Item 48	.81	.50
Item 24	.93	.21*	Item 49	.79	.04*
Item 25	.65	.69	Item 50	.95	.12*

n=50

When Table 9 is examined, first of all, according to the item analysis results, 27 items were excluded from the analysis because the items with item discrimination levels of .30 and below had low discrimination. These items are; items 1, 2, 5, 6, 7, 8, 10, 11, 13, 17, 18, 20, 23, 24, 26, 29, 32, 35, 37, 39, 41, 42, 44, 45, 46, 49, and 50. After the items were excluded from the analysis, the item analysis was repeated and presented in Table 7;

Table 10. Item Analysis with Revised Data

Items	Substance Difficulty	Substance Discrimination	Items	Substance Difficulty	Substance Discrimination
Item 03	.54	.60	Item 28	.68	.87
Item 04	.53	.45	Item 30	.64	.75
Item 09	.55	.77	Item 31	.68	.87
Item 12	.66	.82	Item 33	.74	.44
Item 14	.71	.57	Item 34	.68	.85
Item 15	.62	.85	Item 36	.75	.74
Item 16	.76	.36	Item 38	.73	.85
Item 19	.60	.90	Item 40	.68	.85
Item 21	.79	.28	Item 43	.74	.37
Item 22	.72	.85	Item 47	.71	.85
Item 25	.65	.90	Item 48	.81	.44
Item 27	.46	.31			

Number of items excluded from the analysis= 27

Number of items analyzed= 23

Average item difficulty= .67

Average item discrimination= .68

Item discrimination (double series)= .60

KR-20 (Alpha)= .92

When Table 10 is examined, it is seen that both the average discrimination and KR-20 reliability coefficient increased. As a result of the item analysis, the item discrimination levels of all items increased. After this stage, EFA was conducted for construct validity evidence.

Exploratory Factor Analysis (EFA) Results

For the validity of the test, Exploratory Factor Analysis (EFA), which is frequently used in test development, was used. EFA can be defined as a multivariate statistic that aims to discover a small number of conceptually meaningful new variables (factors, dimensions) by bringing together a large number of interrelated variables (Büyüköztürk, 2002). Kaiser-Meyer-Olkin (KMO) test was conducted to test the suitability of the sample size for factorization. As a result of the analysis, it was determined that the KMO value of the sample of 146 participants was .94. In line with this finding, it was concluded that the sample size was 'perfect' for factor analysis (Tavşancıl, 2006; Çokluk, Şekercioğlu, & Büyüköztürk, 2012). On the other hand, Bartlett's Test of Sphericity result is also significant [χ^2 :1570.53.p<.01]. It was concluded that the data set was 'suitable for factor analysis'.

In order to reveal the factor pattern of the scale, Principal Component Analysis was chosen as the factorization method and Varimax, one of the orthogonal rotation methods, was chosen as the rotation method. In the factor analysis conducted to reveal the factor pattern of the scale, the acceptance level for factor loading values was determined as .32. As a basic rule, the loading value of each variable should be .32 and above (Tabachnick & Fidell, 2001). The items with factor loadings below .32 and overlapping items were removed and the analysis was repeated. The criterion that can be taken for overlapping items to enter more than one factor is that there should be at least .10 difference between the factor loadings (Tavşancıl, 2006). When the scree plot graph is examined, the eigenvalue is greater than 1 and the break is from the 1st point shows that the structure is suitable for a single factor structure. Therefore, the analysis was limited to one factor and repeated. As a result of the second factor analysis, the total variance explained was found to be 58.15%. As a result of these procedures, 8 items were excluded. As a result, the EBAT scale was determined as 15 items with a single factor and presented in Table 11;

Table 11. EFA Results of the Cognitive Perspective Taking Test in Early Childhood

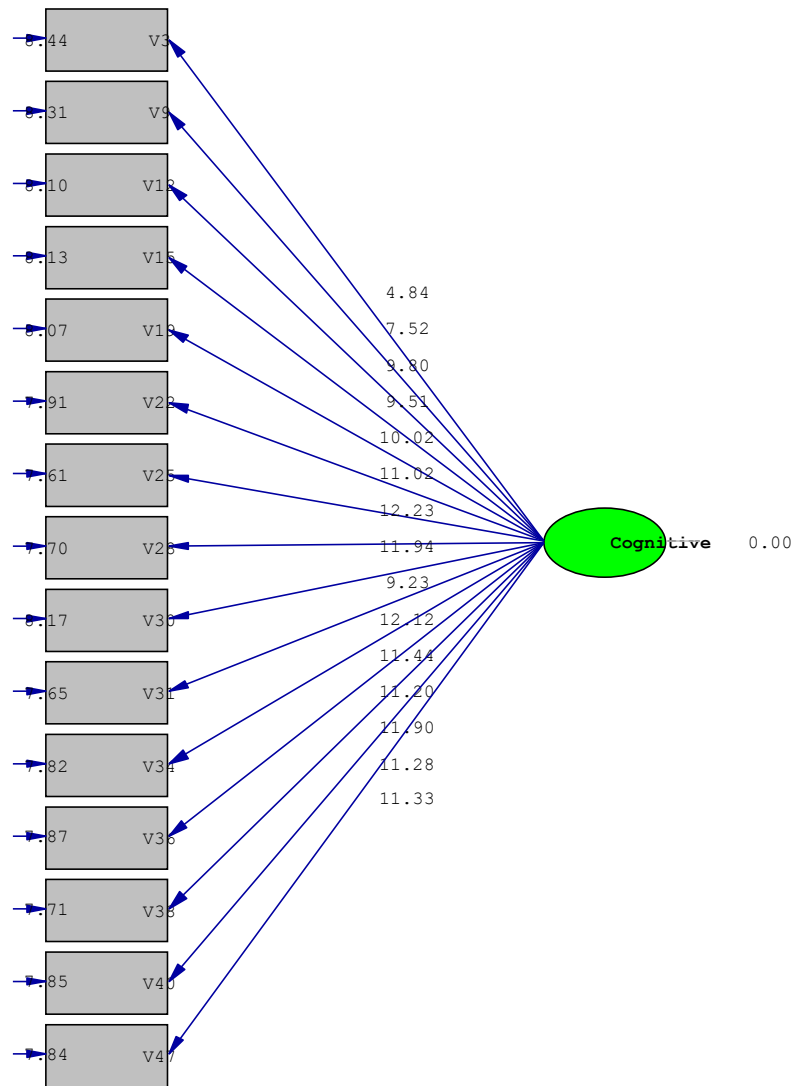
Factor: Early Childhood Cognitive Perspective Taking Test (EBAT)	Rotated Factor Loadings	Item-Total Correlation
Item 3	.44	.19
Item 9	.63	.39
Item 12	.75	.56
Item 15	.73	.53
Item 19	.76	.57
Item 22	.80	.64
Item 25	.84	.71
Item 28	.83	.68
Item 30	.71	.51
Item 31	.84	.70
Item 34	.81	.65
Item 36	.80	.63
Item 38	.82	.68
Item 40	.80	.64
Item 47	.80	.65

Eigenvalue= 8.72 and Explained Variance= 58.15%

χ^2 :1570.53.p<0.01 and KMO: .94

Confirmatory Factor Analysis (CFA) Results

Confirmatory Factor Analysis (CFA) was conducted using LISREL software in order to verify the structure obtained from EFA for the test development process. CFA is an analysis that tests whether a previously defined and delimited structure is confirmed as a model (Brown, 2006). CFA was applied to determine how well the one-factor structure determined by EFA fit. As a result of CFA, the fit indices were χ^2 =261.27 [sd=90, p< .001], [χ^2 /sd]=2.90, RMSEA= .11, GFI= .81 and AGFI= .74. The coefficients of item-factor relationships calculated by CFA are shown in Figure 1.



Chi-Square=261.27, df=90, P-value=0.00000, RMSEA=0.115

Figure 1. CFA results for EBAT

When the CFA results are analyzed, $\chi^2/df=2.90$ means that the tested structure shows 'perfect' fit (Kline, 2005). Another fit index, RMSEA= .11, indicates a 'good' fit (Hu & Bentler, 1999; Thompson, 2004). In the literature, it is stated that GFI and AGFI values close to 1 are indicators of 'excellent' fit (Hooper, Coughlan, & Mullen, 2008; Kelloway, 1998; Schumacker & Lomax, 1996; Sümer, 2000). In this research, GFI= .81 and AGFI= .70 and these values were accepted as 'adequate'.

Conclusion, Discussion and Recommendations

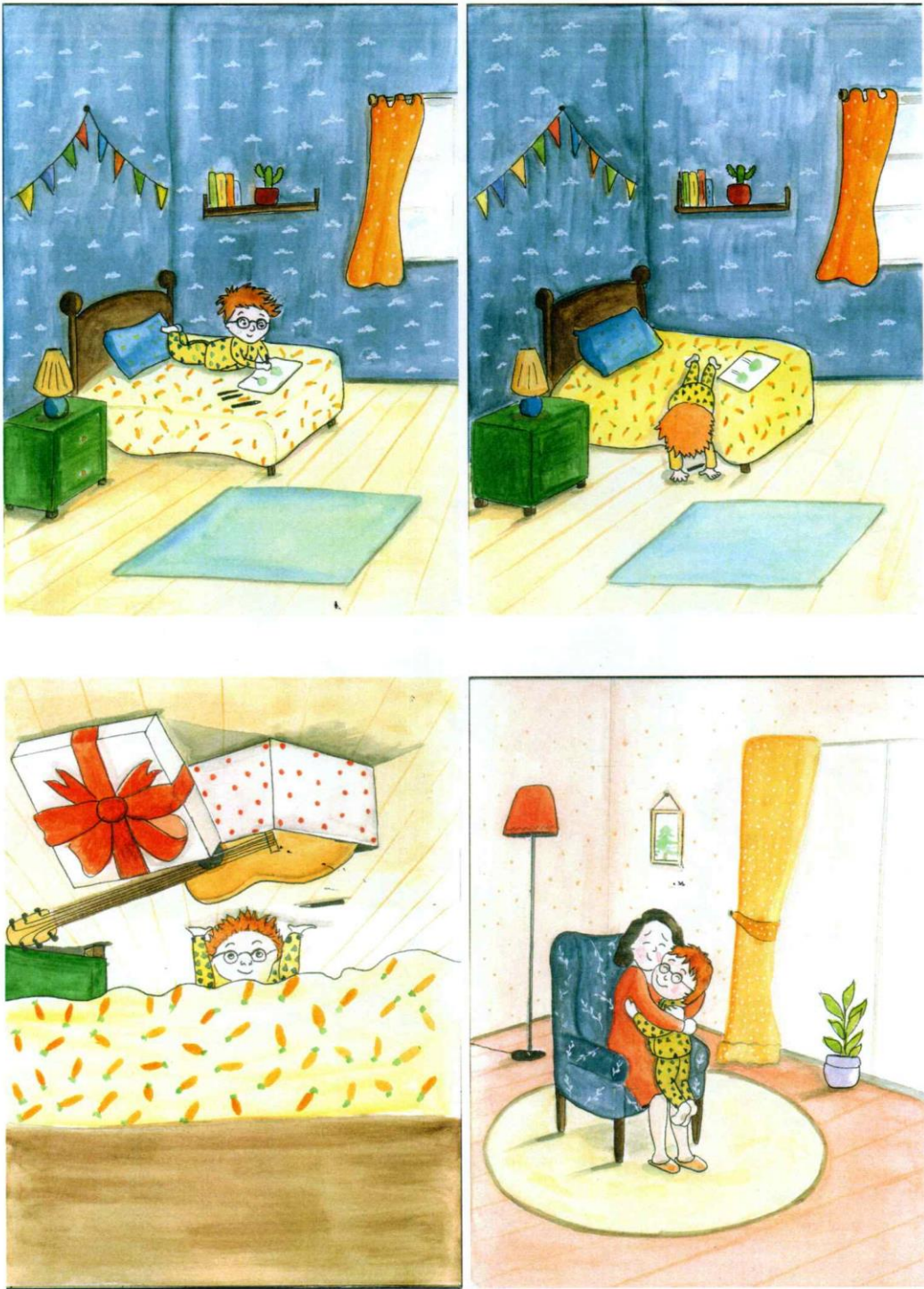
The aim of this research is to develop a valid and reliable test that can be directly applied to children and that measures the cognitive perspective-taking skills of children in the 5-6 age group in early childhood. For this purpose, an item pool of 50 items was first prepared. While preparing the item pool, considering that the test will be applied directly to the child, the items were considered to be suitable for early childhood, to include supported behaviors, to measure cognitive perspective taking skills accurately, and to be suitable for widespread and international use. In line with these criteria, the items were created for the common physical spaces where 5-6 years old children usually spend time in their daily lives and the events they are likely to experience. In addition, the gender distribution of the main characters mentioned in the items was kept equal. As a matter of fact, in a study conducted by Oruç, Tecim, and Özyürek (2011) on the personality development

of preschool children, children were made to watch cartoons and it was observed that children adopted cartoon heroes of their own gender more. Therefore, such a measure was taken in order to prevent such gender-related internalizations from affecting the validity of the research and thus the principle of gender equality was respected. After the 50 items in the item pool were determined in line with the expert opinions, the process of drawing the pictures related to these items was started. For this purpose, an expert illustrator was hired and the necessary information was given about the purpose and scope of the study, the structure of the test and the suitability of the drawings for early childhood. After ensuring the expressiveness of the items and pedagogical controls of the drawings, the drawings were presented to the expert opinions of faculty members working in the field of preschool education (5) and visual arts (3) and preschool teachers (9). After the necessary corrections were made in line with the expert opinions, the trial applications of the EBAT were started.

A total of 146 students in the 5-6 age group studying in independent kindergartens and preschools of primary schools were administered the test. Thus, validity and reliability evidence for the test was obtained. For reliability, since the responses to the items were 1-0, the KR-20 reliability coefficient was used and its value was found to be .92. This result means that the reliability of the developed measurement tool is quite high (Büyükoztürk, 2023; Ensari & Bayrak, 2023). On the other hand, within the scope of item and test statistics, item discrimination and difficulty values were calculated and inappropriate items were removed from the test. After the items were removed, the average discrimination of the test was calculated as .68 and the average difficulty was calculated as .67. These values lead to the conclusion that the items in the test were created in accordance with their purpose and that it is a scale with high validity for children in the 5-6 age group in the early childhood period. Exploratory Factor Analysis (EFA) was conducted in the context of the evidence for the validity of the test and it was determined that the factor structure was appropriate. On the other hand, Confirmatory Factor Analysis (CFA) was applied to confirm the structure obtained from EFA and it was concluded that the structure obtained was confirmed. As a result of the analysis of the data obtained from the trial applications, it was determined that EBAT is a test with high validity and reliability.

This test can be used as a data collection tool in new studies on cognitive perspective taking or perspective taking skills in early childhood. In addition, EBAT can be utilized in the development of different measurement tools that can be applied directly to the child to measure the level of social skills in early years. In addition, by determining the perspective-taking skills of preschool children, the social skills training given in the classroom and home environment can be evaluated. Therefore, since the child's social skills development level can be known during the transition from kindergarten to the first grade of primary school, it becomes possible to make the necessary interventions. As a result, with this test, it is aimed to respond to the need for a measurement tool that can be applied directly to the child, especially in our national literature, and to contribute to the field of early childhood development.

APPENDICE: EBAT Sample Item



APPENDICE: EBAT Sample Item (continued)

ITEM 14.

Directive 14;

- The researcher shows the child the pictures and allows him/her to examine them. If there is anything the child wants to ask or tell about the pictures, the researcher talks with the child about it. After that, the researcher tells the child about the event drawn in the pictures. According to this;
 - ✚ **In the first picture;** the child is lying on the bed and drawing a picture.
 - ✚ **In the second picture;** one of the child's crayons falls on the floor and the child bends under the bed to pick it up.
 - ✚ **In the third picture;** when the child looks under the bed, he sees the guitar his mother bought him as a gift and realizes that he hid it there. (The third picture will be covered by hand later.)
 - ✚ **In the fourth picture;** the child joyfully goes to his mother and hugs her.
- After ensuring that the interviewed child grasps the flow of events in these four pictures, the most striking part of the event, the third picture (i.e. the child bending under the bed to get the crayon and seeing the gift guitar) is covered by hand.
- Now the child is asked the following question by the researcher: "Do you think that if we called a friend from outside here and showed him/her only these three pictures, he/she would tell us why this child, who was drawing on his/her bed at the beginning, went to his/her mother and hugged her?"
- In the meantime, the interviewed child is allowed to choose the friend who is supposed to come in (e.g. which friend do you think we should invite, who would you want to come in?)
- The child is asked to guess the event with three pictures;
 - ✚ ***"0 (zero) points"*** is given if he/she says that the child in the picture saw the guitar that his/her mother had bought for him/her when he/she bent under the bed and that is why he/she went to his/her mother and hugged her.
 - ✚ ***If he/she makes any other guess, "1(one) point" is given.***

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