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A validity and reliability study of a nomination scale for identifying gifted children in early childhood

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Abstract

The study aimed to develop a measure that enables gifted children to be picked out in early childhood hrough the nomination of teachers. In order to collect the data, a conceptual framework based on Gardner's theory of multiple intelligences was set to identify gifted children. Once the conceptual framework was created, a 64-item framework consisting of typical characteristics of gifted children was designed, and presented to experts' opinion. In line with expert opinion, the framework was finalized as a 50 item data collection tool. The participants of the study were composed of 365 teachers in different kindergartens and primary schools in the city centre of Kırşehir, Turkey. As a result of the data analysis, a nomination scale, the validity and reliability of which were tested was developed.

Keywords: Nomination, gifted child, multiple intelligences theory, early childhood, scale development

1. Introduction

Intellectual giftedness manifests itself with many differences compared to peer groups at a very early age, and these differences bring about some advantages and disadvantages. For gifted children to be happy, achieve self-realisation, unlock, realise, and develop their potential, it is necessary first to discover what their gift is (Bildiren, 2013). The first step in the education of children with special abilities is to identify and diagnose them appropriately. The diagnosis of gifted children is of great importance in providing them with appropriate educational opportunities. The sooner children's abilities are identified, the more likely it is to exclude factors that inhibit their capacity and provide an appropriate environment to develop their abilities (Levent, 2011).

Gifted and talented individuals are an important resource for society. Such individuals are rare in the population. In his report, Marland (1972) estimated the gifted and talented population in the United States to range from 2% to 3%. Webb, Meckstroth, and

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Tolan (2002) note that gifted and talented individuals have mental abilities in the upper 1.5 to 3 per cent of the population. Creative learning environments that allow all aspects and characteristics of gifted children to be identified stand out as the most reliable diagnostic method available in countries that take necessary actions in the education of gifted children. Creative learning environments allow children to explore their abilities and offer experiences that maximise all their potential (Akkanat, 2004).

To educate and integrate gifted individuals into society, they should first be identified appropriately and accurately (Ersoy & Avcı, 2004; Moore, 1992; Ömeroğlu, 1993; Stile, 1996). Due to the characteristics of gifted children, it is important to identify them at an early age and give an education appropriate to their developmental characteristics to boost their potential. To this end, various diagnostic techniques have been designed, training centres have been established, and laws have been enacted to regulate them throughout the world. In Turkey, since the Ottoman era, many schools designed specifically for the education of gifted people have been opened, associations have been established, diagnoses have been made in research centres, various tests have been developed, and legislations and regulations have been enacted. It is advantageous to notice a child's ability as early as possible. In this way, the deterioration and loss of the ability are prevented, and the ability is allowed to develop. Therefore, the diagnosis of gifted children in preschool and primary school periods is of utmost importance (Gökdere, 2013). Diagnosis is a process by which information about individuals is collected and decisions are made. The most important goal of diagnosis is to provide educational opportunities suitable for the development characteristics of gifted and talented students and respond to their needs (Ayas & Kirişçi, 2017). The first principal reason why gifted children should be diagnosed is that they should receive a proper education rather than a better education (Hansen, 1992). The second principal reason is that gifted children need a suitable challenging academic programme (Tomlinson & Layne-Kalbfleisch, 1998).

The concept of superior intelligence, frequently used in the early 20th century, is based on a cognitive intelligence score, and individuals with a cognitive intelligence score of 130 and higher are defined as gifted. Individuals who stand out in areas such as art, music, leadership, and gymnastics came to be considered to be different from individuals with high cognitive intelligence scores, thereby giving rise to the concept of intellectual giftedness and the need to diagnose gifted people in different ways (Clark, 2002). Regardless of the criteria or purpose in the diagnostic process, the following basic principles should be taken into consideration: serving the best interests of individuals, using scientific, objective, comprehensive and impartial diagnostic methods, diagnosis at an early age, offering equal opportunities to all individuals, maintaining continuity by systematically diagnosing at every grade and age level, using assessment and evaluation tools in the diagnostic process which are compatible with individual characteristics and the objectives and contents of education programmes, and ensuring that an

interdisciplinary team makes a decision at the end of the diagnosis (MEB [Ministry of National Education], 2010).

It is considered to be important to examine information about the individual characteristics of students considered to be gifted or talented (Sak, 2013). The examined information should be evaluated by a commission. Teachers are recommended that they not confuse gifted children with bright children when trying to distinguish children as gifted or normal (Ataman, 2000). Therefore, it is useful to know the characteristics that distinguish bright and gifted students (as cited in Uzun, 2004). As noted by Kulaksızoğlu (2005), Alfred Binet, unlike Galton, criticised the ideas about the identification and measurement of intelligence and asserted that intelligence consists of diverse mental components. Multiple types of intelligence are identified by Gardner (1983, 1993, 1999). These types of intelligence are also defined as areas of ability (Dağlıoğlu, 2015). Gardner (1983, 1993, 1999) created a conceptual model of the full range of abilities, potentials, and abilities that people possess and proposed modalities of intelligence. The descriptions in this model caused the use of the concept of gifted and the definitions of intellectual giftedness to become widespread (Saban, 2002; 2005). After Gardner's theory of multiple intelligence, the term "giftedness" has come to reflect a more comprehensive notion that also includes intelligence (Dağlıoğlu, 2014, 2015; Sak, 2018). Therefore, the term "gifted" has been used in recent years for children who are superior to their peers in intelligence and ability (Dağlıoğlu, 2015; Sak, 2014, 2018).

Supporting the interest, abilities, and skills of gifted children in early childhood positively affects the development of their abilities in the upcoming years (Davis, Rimm, & Siegle, 2011; MEB, 2013). If gifted children are not recognised in early childhood, it may be too late for them to find an appropriate environment to develop their skills positively (Sutherland, 2012; Winebrenner, 2001). Thus, the most basic need of gifted children is to be recognised and identified (Dağlıoğlu, 2012; Macintyre, 2008). Parents and pre-school teachers play a crucial role here. The first encounter of children in their educational life is with preschool teachers (MEB, 2018). Therefore, preschool teachers play a key role in recognising and identifying gifted children.

1.1. Theory of Multiple Intelligences

In his book "Frames of Mind: The Theory of Multiple Intelligences" published in 1983, Gardner defined seven areas of intelligence. Later, Gardner added an eighth intelligence: naturalistic intelligence. However, it should be noted that there may be other types of intelligence besides these types of intelligence. According to Gardner, to define a trait as a type of intelligence, it must fulfil some criteria such as having an important place in the culture, involving problem-solving, expression in a symbol system, and producing services or products (Canbay, 2006).

In the theory of multiple intelligences, all intelligences are considered equal. No type of intelligence is considered more important or superior to the other. For example, a basketball player learns the rules of the game using linguistic and social intelligence, engage in self-evaluation using intrapersonal intelligence, recognises the pitch and task using spatial intelligence, catches the ball, runs and shoots a basket using bodily intelligence; thus, all types of intelligence are used (Bümen, 2001).

Gardner introduced eight different types of intelligence:

Verbal-Linguistic Intelligence
Logical-Mathematical Intelligence
Visual-Spatial Intelligence
Music-Rhythmic Intelligence
Bodily-Kinesthetic Intelligence
Intrapersonal Intelligence
Interpersonal-Social Intelligence
Naturalistic Intelligence (Yılmaz, 2010).

1. Verbal-Linguistic Intelligence

People have basic language skills consisting of reading, listening, writing, and speaking. They use their ability to explain and understand through language intelligence. The most important mechanisms of verbal-linguistic intelligence include understanding, speaking, reading, communicating, and transforming experiences into preliminary information. Education should be based on meaningful experiences (Alaz, 2007). Verbal intelligence covers all actions that we do with language. They include the ability to chat with a friend or speak in front of an audience, the ability to write prose, poetry, reports and letters, and the ability to read newspapers, books, or labels on various products that we buy. Listening to the conversations of other people and perceiving and understanding the issues or messages in the conversation are also related to verbal intelligence (Başlı, 2006).

People with high verbal-linguistic intelligence have the following characteristics:

They are persuasive in their speech.
They show developed storytelling abilities.
They have a narrative power based on humour and enjoy saying tongue twisters and rhymes quickly.
They communicate well verbally.
They have the ability to learn foreign languages.
They have good vocabulary and memory.
They can create different products in the arts of reading, writing, listening, and speaking.
They can imitate people's voice, language style, reading, and writing.
They engage in superior verbal communication with others.

They easily understand, summarise, and remember what have they read.
They are good at motivating.
They listen to, interpret, and paraphrase sentences and remember what they have said (Yılmaz, 2010).

2. Logical-Mathematical Intelligence

Logical-mathematical intelligence can be defined as the ability to understand and make sense of the complex relationships between thoughts. This type of intelligence has to do with deduction, induction, abstract problem solving, reasoning, mathematical calculation, logical thinking, and associated concepts. Numbers have an important place in our lives. Mathematics is involved not only in the classroom environment at school but also in every area of our daily lives. Thus, people have to earn to use numbers and realise the fun in numbers (Alaz, 2007). Considering the place of logical-mathematical intelligence in education, teachers have a great duty to ensure that children are successful in both their daily lives and their classes. Teachers should use activities aimed at developing skills such as reasoning, analysis, synthesis, sorting, classification, understanding the logic of information, and identifying cause-and-effect relationships (Yılmaz, 2010).

3. Visual-Spatial Intelligence

Visual intelligence relates to everything that we see. It includes all ranges of colours, textures, shapes, patterns, designs and concrete or abstract images. Our brain thinks in images and pictures prior to words (Başlı, 2006). The ability to create images and design shapes in the mind through the sense of sight forms the basis of visual-spatial intelligence. Visual-spatial intelligence can be seen in children who think they are in a dream world, have superpowers, behave as if they were invisible, and pretend to travel to mysterious and secret places. Visual-spatial intelligence can also be defined as the ability of three-dimensional thinking (Bulut, 2003). People with high visual-spatial intelligence have the following characteristics:

They create and draw pictures in their mind.
They like drawing, painting, and sculpting.
They have extraordinary map reading skills.
They design objects in their mind.
They like to use their creativity and colours.
They have a good imagination (Başlı, 2006).

4. Music-Rhythmic Intelligence

Gardner asserted that linguistic and musical-rhythmic intelligence are correlated. There is a similarity between the use of notes and melodies in the production of music and the articulation of sounds with letters in language use. Intonation and stress are essential elements for the effective use of language. Music-rhythmic intelligence also

relates to intonation and stress. Thus, the relationship that Gardner established between verbal-linguistic intelligence and musical-rhythmic intelligence is clear (Yılmaz, 2010). Among the types of intelligence, musical-rhythmic intelligence is considered to be the first to develop because a fetus in the womb can hear sounds, rhythms, and vibrations. Because musical-rhythmic intelligence is not only composed of rhythms or music, it is also referred to as "auditory/vibrational intelligence". Natural sounds or sounds from human environments, instruments, machines, or choirs are all related to sounds and vibrations that fall within the type of musical-rhythmic intelligence (Başlı, 2006).

5. Bodily-Kinesthetic Intelligence

It is known as the most common type of intelligence that we usually use every day without paying attention. Bodily-kinesthetic intelligence is defined as the ability to demonstrate activities for a specific purpose through the perfect harmony of the body and mind (Yılmaz, 2010). It is the type of intelligence that we question least throughout our lives. However, this type of intelligence is involved in all bodily movements. Every day we unconsciously perform various bodily/kinesthetic movements. Bodily-kinesthetic intelligence relates to not only bodily accomplishments but also kinetic potentials that are innate but undiscovered (Başlı, 2006). Physical activities are limited only to physical education classes in the traditional understanding of education. This type of intelligence is considered by other teachers to be of interest to physical education teachers. To enable children to participate in classes and take responsibility, teachers should provide learning environments that increase learning motivation, make classroom environments interesting, and create products by which children can demonstrate their skills. Children with bodily-kinesthetic intelligence show active participation and achieve learning by doing, living, and experiencing (Yılmaz, 2010).

6. Intrapersonal Intelligence

Humans are known to be the only living beings in the universe that are self-aware and conscious of their actions and thoughts. Intrapersonal intelligence can be described as one's self-recognition and self-awareness. It can also be defined as the ability to learn from introspection and self-reflection. It involves self-awareness, self-discovery, and self-reflection as well as the ability to know one's feelings and thoughts. The functioning part of intrapersonal intelligence is the ability of self-transcendence (Başlı, 2006). Self-observation is one of the ways to improve this type of intelligence (Yılmaz, 2010). People with high intrapersonal intelligence have the following characteristics:

They know themselves well.
They are aware of their consciousness.
They understand the limits of their enthusiasm and manage their behaviour.
They know how to evaluate themselves and think and respond in time (Yılmaz, 2010).

Additionally, people with advanced intrapersonal intelligence like to meditate, understand their own feelings and thoughts and are good at concentrating and thinking beyond objects. (Başlı, 2006).

7. Interpersonal-Social Intelligence

High verbal and mathematical intelligence or high IQ do not mean that people succeed in life. Being tolerant of others in society, understanding people, solving problems, and empathising with others are also ways of succeeding in life, at which people with high interpersonal-social intelligence are good (Yılmaz, 2010). Among the types of intelligence, interpersonal-social intelligence is the most understandable type of intelligence because we communicate with other people in social settings and working environments throughout our lives. Human relations, recognising other people, collaboration, and learning things from people are part of social intelligence (Başlı, 2006). People with high interpersonal-social intelligence have the following characteristics:

They are keen on different lifestyles and cultural differences.
They use body language effectively.
They show leadership characteristics and are skilled in organising people.
They enjoy participating in committees, associations, and club work.
They are sensitive to others' feelings.
They have good empathy skills.
They like to be in a group and do an assignment with a group.
They have strong persuasion skills.
They like to be in different environments and adapt easily to different environments.
They like to listen and talk.
They are interested in social and political issues (Yılmaz, 2010).

8. Naturalistic Intelligence

Gardner noted that people who can make consequential distinctions in the natural world, use this ability in hunting, farming, or biological science, and know flora and fauna have naturalistic intelligence (Başlı, 2006). People with high naturalistic intelligence have the following characteristics:

They like to do research and explore new places.
They enjoy watching documentaries, taking trips, and reading nature-related publications.
They are curious about climate and seasonal events.
They love trips to historical museums and zoos.
They are quite sensitive to nature.
They are also sensitive to environmental protection and animal rights.
They have strong environmental awareness.
They are careful about the names of different species.
They are interested in the effects of human on nature or nature on human.

They organize their unique events.
They are interested in the life of almost every living thing in nature.
They are curious about animal and flower species (Yılmaz, 2010).

1.2. Diagnosing Intellectual Giftedness

Although giftedness and talentedness have different meanings, they are generally used interchangeably in the literature. The term 'talented' was most often used at the first National Talented Children Congress in Turkey in 2004. The World Council prefers to use the term "gifted and talented" (Kök, 2012). Scientific methods and measures are used to identify gifted children. Standardised intelligence tests include various group and individual intelligence tests: a) language-based intelligence tests such as the Wechsler Intelligence Scale for Children-Revised (WISC-R), Stanford-Binet Intelligence Scale, Primary Mental Abilities Test for Ages 5 to 7, and Primary Mental Abilities Test for Ages 7 to 11, b) non-verbal or non-language-based intelligence tests such as Raven's Progressive Matrices (RPM) and the Kohs Block Design Test, and c) standard knowledge and achievement tests such as Mathematics and Science Olympiads and placement tests (Çağlar, 2004). This is due to the fact that intelligence is seen as the most important determinant of giftedness. However, according to Gardner, intelligence is versatile, and each person has eight types of intelligence to some extent (Gardner, 1993 as cited in Selçuk, Kayılı, & Okut, 2004). Gardner, therefore, emphasises that the detection of intelligence by a single intelligence test is not accurate. From this point of view, the accuracy and validity of IQ test have become a matter of debate. Gardner's theory is called multiple intelligences on the grounds that there are types of intelligence and each person may have a different type of intelligence (Selçuk et al., 2004).

The earlier gifted children are identified, the more successful they are in their education life (Moore, 1992). It is easier to plan for the future of children who are diagnosed early and accurately (Schofield & Hotulainen, 2004; Stapf, 2003). The diagnosis of gifted and talented students is a process of evaluating their cognitive and other skills through formal and informal means (Ercan, 2013; Karadağ, 2015). The process and steps of the diagnosis of gifted and talented children in early childhood in Turkey are as follows: nomination pre-evaluation, group screening, individual assessment, and registration and placement (MEB, 2009; MEB, 2016). Gifted and talented children have many unique cognitive, sensory, social, and moral characteristics (Alma, 2015; Çetinkaya, 2013b).

The diagnosis of gifted children by criteria such as intellectual superiority may cause some of the intelligence types not to be identified. Existing scales and test are developed based on normal levels of mind and identify basic mental abilities. Therefore, more extensive tests and scales are needed to identify giftedness (Preliminary Fact-Finding Report of the First Talented Children Congress in Turkey, 2004). A search of the

literature showed that standard intelligence, ability and achievement tests, interviews with parents, and observation are used in evaluation and assessment processes to identify gifted and talented children (Baykoç Dönmez, 2014; Bildiren & Uzun, 2007). Because early research on giftedness focused on academic achievement, giftedness in art was ignored and children who show superiority in academic achievement were also considered to be superior in the field of art (Genç, 2016). This view began to change after a report presented by Marland to the United States Congress by Marland (1972) who described gifted as "showing high performance and achievement in one or several areas". Gardner (1993) highlighted that intelligence contains many different areas of ability that cannot be explained by a single factor and divided intelligence into eight different areas, including visual-spatial intelligence (as cited in Öznacar & Bildiren, 2012).

Many different methods and tools can be used to diagnose gifted and talented students. Objective techniques such as IQ, intelligence, creativity, achievement, and aptitude tests can be used. Subjective assessment methods can also be used, which take into parent and teacher suggestions and opinions (Ayas & Kirişçi, 2017). The process of identifying gifted and talented children in Turkey has three stages as follows (MEB, 2016):

Nomination by classroom teachers using observation forms,

Group screening for nominated children using tablet computers, and

Evaluating children who score above the average through individual intelligence tests according to their ability areas (general mental, painting, and music) after the results of group screening are obtained.

The evaluation of portfolios and performances may constitute the whole or part of the diagnostic processes of students deemed to be gifted or talented (Coleman, 1994, as cited in Ayas & Kirişçi, 2017). Teacher nomination is a technique commonly used in the identification of gifted children. The teacher observes the student in the classroom. The teacher follows the thinking skills and behaviour of the student (Davis & Rosso, 2006, as cited in Ayas & Kirişçi, 2017). There has recently been substantial research on the diagnosis of gifted children in early childhood in Turkey (Aldemdar, 2009; Alma,2015; Bildiren, 2017, 2018a; Bildiren & Bilgen 2019; Dağlıoğlu, Doğan, & Basit,2017; Darga, 2010; Kurt, 2008; Saranlı, 2017; Saranlı, Sühendan, & Deniz, 2017; Selçuk-Bozkurt, 2017). Sahin (2013) attempted to determine the behavioural status of gifted children by developing a scale. There is no nomination scale other than the Gifted Rating Scales-Preschool/Kindergarten Form (GRS-P) adapted to Turkish by Alma (2015), the Turkish-translated version of the Gifted Rating Scales (GRS) tested by Karadağ et al. (2015), and the Candidate Notification Scale for Gifted Children in Pre-School Period developed by Bildiren and Bilgen (2009). Based on Gardner's theory of multiple intelligences, this study aimed to develop a valid and reliable nomination scale for nominating gifted children in early childhood. It is believed that a nomination scale contributes to the nomination process in identifying gifted children in early childhood.

2. Method

In the study of the nomination scale development the following steps were followed (See Figure 1):

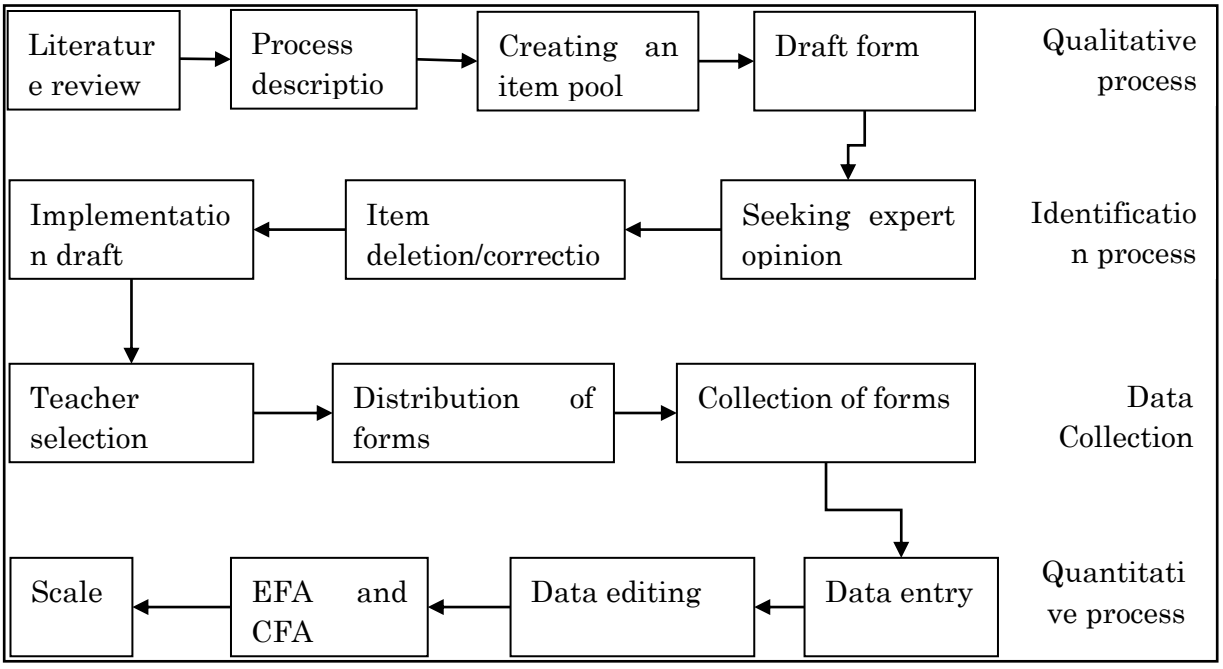

Figure 1. The process of the study

This is a scale development study. Figure 1 above presents an overview of the scale development process. The research was conducted between 2019 and 2020 using data collected from 365 teachers. The data were subjected to explanatory factor analysis (EFA). After the EFA, confirmatory factor analysis (CFA) was performed. The data collection forms were filled in by children's teachers because the target group consisted of preschool children. The implementation in the scale development process was introduced in detail.

2.1. Scale Development Process

In the study, initially, a literature review was conducted on the development of the student nomination scale (SNS). As a result of the literature review, an item pool was created based on Gardner's theory of multiple intelligences. The item pool consisted of 64 items. Because 5 items in the pool were repeated, the number of items was reduced to 59. Expert opinion was sought to check the construct validity of the draft version of the SNS. The draft SNS was sent to two Turkish teachers to check its language and meaning as well as three experts in giftedness and two experts in psychological counselling and guidance. In accordance with the feedback received, nine items were deleted and six were

revised because they failed to measure the desired characteristics or were considered to be incomprehensible. The draft SNS consisting of 50 items was formed in accordance with the feedback that the six items should be revised. The draft SNS is a 5-point Likert-type scale consisting of eight factors based on Gardner's theory of multiple intelligences. Table 1 below shows a sample item.

Table 1. Sample Question in the SNS

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Shows more reaction to rhythm and melody compared to peers.					

The sample item in the table above relates to the area of musical-rhythmic intelligence. A large number of the items in the SNS are based on the comparison of the performance of children to that of peers. This is because gifted children excel in one or more of the intelligence areas compared to their peers.

2.2. Data Collection Process

The sample group was selected using criterion sampling. According to the first criterion, preschool and primary school teachers who work in the Kırşehir province were recruited in the study. According to the second criterion, the data were collected through face-to-face interviews depending on the request of teachers. Prior to the interviews, the teachers were informed about the application. Then, the teachers who volunteered to interview were interviewed by appointment. The interviews lasted between 50 and 75 minutes. During the interview, the items were read to the teachers who were asked to rate the items on a scale from strongly agree to strongly disagree.

2.3. Data Analysis

The draft form consisting of 50 items was filled in by 380 teachers. The literature emphasises that item factor analysis should be performed to test the validity of a scale. To this end, the assumptions of explanatory factor analysis (EFA) proposed by Fabrigar and Wegener (2011) were tested.

The first assumption is that the measure is a metric "scale". Accordingly, item rating was designed to be at opposite ends and the items were rated on a 5-point Likert-type scale (e.g. agree vs disagree). Additionally, a sample of at least 200 or five times larger than the number of items is recommended. The form consisted of 50 items and 380

teachers filled in the form. To perform the analysis, there must be no outliers, extreme values, and missing value. The analysis of the missing data showed that there were missing data in seven items; these items were excluded from the analysis. Because of the existence of outliers, the data of eight respondents were excluded from the analysis and the data of 365 respondents were analysed.

After the assumptions were accepted, EFA was carried out using SPSS software. Maximum likelihood estimation (MLE) was chosen as the EFA method. The literature recommends choosing MLE instead of principal component analysis, which is presented as a standard analysis during scale development. Direct oblimin rotation was used with the default delta of 0. Direct oblimin is a rotation method used for scales in which the factors are considered to be correlated. Considering that the SNS is built on the theory of multiple intelligences and the areas of intelligence are correlated, direct oblimin was used. The Cronbach's alpha coefficient of the SNS was found to be .944, the Guttman Split-half coefficient was .878, the Spearman-Brown coefficient was .884. Guttman's Lambda 6 ranged from .885 to .945. Table 2 shows the variance values for the scale consisting of six factors.

Table 2. Total Variance Table for the SNS

Factor	Percentage of variance	Cumulative percentage	Total
1	35.611	35.611	11.336
2	8.782	44.393	5.608
3	5.096	49.489	5.879
4	4.122	53.611	6.544
5	3.024	56.636	6.276
6	2.806	59.441	2.156

As seen in Table 2, the six-factor scale explained 59.44% of the total variance. Given these values, the scale appears to explain the behaviour that it aims to measure with a likelihood of approximately 60%. The literature suggests that total variance should be 50% and over.

Table 3 below shows the subscales and item factor loadings.

Table 3. Factor Loadings of the SNS Items

	Items	Item factor loadings					
		1	2	3	4	5	6
1	Can come up with many new and original ideas.	.798					
2	Can use what he or she has learned in new and different areas.	.773					
3	Can distinguish connections, cause and effect relationships and similarities between events more quickly than peers.	.764					
4	Distinguishes important parts of subjects and events and notices problems.	.758					
5	Can establish logical relationships between the subject he or she has learned in one area and the subject in another area.	.751					
6	Use his or her knowledge in everyday life.	.722					
7	Draws interesting conclusions by interpreting information that he or she has gained at different times and in different places.	.709					
8	Asks questions to have in-depth knowledge.	.694					
9	Has vocabulary larger than peers.	.645		.395			
10	Tries to go beyond "what", "how", and why" questions in his or her inquiries.	.643					
11	Tries to produce the best solution to find the correct result.	.631			.330		
12	Understands the subjects described quickly.	.625		.323			
13	Easily remembers what he or she has heard, read, and seen.	.617		.339			
14	Perceives relationships between events, situations, and information at a level that peers may not notice.	.617		.331			
15	Infers the implied or suggested meaning of a sentence or phrase.	.610					
16	Can bring thoughts and objects together systematically	.604					
17	Uses music as a means to express his or her feelings and thoughts.		.729				
18	Makes collections of musicians, singers, and music pieces.		.722				
19	Shows interest in various musical instruments and tries to play them.		.707				
20	Shows great desire and effort to make new and original music pieces according to his or her level.	.310	.653				
21	Shows more reaction to rhythm and melody compared to peers.		.628				
22	Listens to music and enjoys attending music activities.		.546				
23	Willing to express his or feelings and thoughts through painting.			.703			
24	Enjoys painting and drawing pictures of a variety of subjects.			.685			
25	Takes particular interest in others' works of art (such as painting and sculpture exhibitions).			.646			
26	Shows interest in making objects with soft materials such as mud, soap, and plastic.			.559			.336
27	Successfully uses painting to express his or her experiences and feelings.			.549			
28	Spends a lot of time painting.			.527			.342
29	Takes individual and group responsibility.				.747		
30	Likes to help.				.700		.358
31	Listens to criticism against him or her.				.629		
32	Sensitive to others' problems.				.595		
33	Selected as the leader in activities.				.492		
34	He or she is one of those with the best physical fitness among peers.					.660	
35	Enjoys following sports competitions in newspapers, magazines, and other media.					.658	
36	Enjoys playing sports (e.g. volleyball, basketball, football, scouting, swimming, and tennis) in and out of school and constantly does some of these sports.					.653	

37	Enjoys participating in competitive games.	.602	
38	Can make facial expressions, mimics, postures, and all kinds of body movements.		.664
39	Shows interest in drama activities.		.632

As is seen in the table six-factor structure obtained as a result of the EFA. Confirmatory factor analysis (CFA) was to compute goodness-of-fit values, in other words, to verify the six-factor structure of the scale. Because the assumptions of CFA are the same as those of EFA, no assumption test was done. Table 4 shows the goodness of fit values obtained from the CFA.

Table 4. Goodness of Fit Values in the CFA

Measure	Values	Goodness of Fit
Chi-square (CMIN)	1657.464	
Degree of freedom (df)	687	
CMIN/df	2.413	Fit
CFI	.896	Acceptable
Goodness of Fit Index (GFI)	.878	Acceptable
Adjusted Goodness of Fit Index (AGFI)	.867	Acceptable
RMR	.047	Fit
RMSEA	.052	Fit
NFI	.878	Acceptable

As seen in the table above, the goodness of fit values is acceptable. The image below displays the distribution of the item factor loadings of the scale. Table 5 below shows the number of items in each subscale based on the analysis results.

Given the factor loadings, the covariance values of the scale ranged from .61 to .78. The standardised regression coefficients of the SNS ranged from .602 to .800. The literature recommends that the standardised regression coefficients should be higher than .500 and close to .700. Accordingly, the regression coefficients of the SNS items meet the desired criteria. The t values of the SNS items were within the recommended range ($8.454 <$ item t values < 12.401).

Table 5. Number of Items in Each Subscale

Subscale	Number of Items
General Intellectual Ability	16
Music	6
Painting	6
Bodily	4
Social	5
Intrapersonal	2

2.4. Reliability and Validity

The Cronbach's alpha coefficient, Guttman Split-half coefficient, Spearman-Brown coefficient, and Guttman's Lambda 6 coefficient of the scale were computed. EFA and CFA were performed. Direct oblimin rotation method was used because the factors of the scale were considered to be correlated (Tabachnick & Fidell, 2017). The literature includes many assumptions about the size of the sample. The sample of 365 respondents is considered to be adequate considering the number of items. For the content validity of the scale, a theoretical framework was defined. An item pool was created based on the theoretical framework. Expert opinions were sought for the draft form. The experts were selected to address grammar, spelling, semantic, and theoretical structure of the scale.

EFA and CFA were carried out for the construct validity of the scale. The Kaiser-Meyer Olkin (KMO) test and Bartlett's test were used for principal component analysis. KMO was found to be .925. According to Kaiser (1974), a KMO value higher than .090 indicates a perfect construct. The result of Bartlett's test was found to be significant ($p < .000$). This indicates the suitability of the scale for factorial decomposition (Field, 2013). The fact that the factor loadings were greater than 0.30 indicates the suitability of the factorial structure of the scale (Field, 2013; Gorsuch, 2014; Tabachnick & Fidell, 2017).

CFA was used for the suitability of the resulting structure and the values were given in the relevant section. The scale developed in line with the above-mentioned elements is considered to have a valid and reliable structure.

3. Discussion and Conclusion

The study aimed to develop a measure to help gifted children aged between 0 and 8 years in early childhood. The process of developing the scale was described in detail.

The literature includes scales based on teacher observation. One of them is the scale adapted to Turkish by Karadağ (2015) and the other is the scale developed by Bildiren and Bilgen (2019). The scale developed is based on Gardner's theory of multiple intelligences and consists of six subscales. The scale developed by Bildiren and Bilgen (2019) is for gifted students in early childhood based on Renzulli's theory of giftedness. The scale developed in this study covers the areas of intelligence defined by Gardner. The scale developed in this study covers the age range of 0 to 8, unlike the scale developed Bildiren and Bilgen (2019). Furthermore, the scale developed by Bildiren and Bilgen (2019) has three subscales aimed at identifying gifted students, while the scale developed in this study has six subscales aimed at identifying gifted students. It is thus thought that the scale developed in this study will contribute to the literature.

The subscales of the scale are composed of the types of intelligence in Gardner's theory of multiple intelligences. They are verbal-linguistic intelligence, logical-mathematical intelligence, social-interpersonal intelligence, visual-spatial intelligence, musical-rhythmic intelligence, bodily-kinesthetic intelligence, intrapersonal intelligence, and naturalistic intelligence. Gardner notes that individuals may have multiple types of intelligence. This means that one area of intelligence is dominant. While describing the concept of intelligence, Gardner actually emphasises the abilities that people possess. One of the most important criticisms of this theory is that people have more than one type of intelligence. Gardner used the concept of intelligence purposefully to refer to the concept of ability in order to draw attention to the theory and make it interesting. Intelligence is not primarily a single piece but refers to the ability to channel functions and activities in different ways in line with abilities (Alaz, 2007).

Supporting the interest, abilities, and skills of gifted children in early childhood positively affects the development of their abilities in the upcoming years (Davis, Rimm, & Siegle, 2011; MEB, 2013). If gifted children are not recognised in early childhood, it may be too late for them to find an appropriate environment to develop their skills

positively (Sutherland, 2012; Winebrenner, 2001). Thus, the most basic need of gifted children is to be recognised and identified (Dağlıoğlu, 2012; Macintyre, 2008). Parents and pre-school teachers play a vital role here. Children first encounter preschool teachers in their educational life (MEB, 2018). Therefore, preschool teachers play a key role in recognising and identifying gifted children. A study on the observations of teachers and parents in identifying giftedness showed that teacher ratings are more accurate than parent ratings and further discussed that the recent increase in teacher rating scales and the detailed investigation of teacher observations indicate the growing importance of teacher opinions (Jarosewich, Preiffer, & Morris,2002). The teacher rating scales developed to identify gifted students are as follows: the Gifted and Talented Evaluation Scales (GATES; Gilliam, Carpenter, & Christensen, 1996), Scales for Rating the Behavioral Characteristics of Superior Students (SRBCSS; Renzulli et al., 1976), Gifted Rating Scales (GRS; Pfeiffer & Jarosewich, 2003), Scales for Identifying Gifted Students (SIGS; Ryser & McConnell, 2004), HOPE Scale (Peters & Gentry, 2009), Gifted Evaluation Scales (GES; McCarney & Anderson, 1998) (Yang, 2009; Karadağ, 2016). They all show how much emphasis is placed on teacher observations. Şahin (2016) evaluated teachers' competence in nominating students and found that two out of five teachers who used the teacher rating scale reached accurate results. However, the issue that needs to be addressed here is the adequacy of teachers' knowledge about gifted children. Şahin and Çetinkaya (2015) concluded that teachers trained in the education of gifted students are more successful in nominating students. Bildiren and Bilgen (2019) developed a scale for nominating gifted children aged between 3 and 6 who attend preschool education institutions. This nomination scale consists of thirteen items and three subscales. The subscales are based on Renzulli's model of gifted behaviour: above average ability, creativity, and task commitment

This study focused on the identification of gifted children in early childhood between 0-8 years of age according to teacher observations. The nomination of children for giftedness was based on teacher observations. Teacher observations are limited to the existing knowledge of and experience in giftedness and the areas of intelligence in the theory of multiple intelligences. In recent years, studies have been carried out on many

methods of identifying gifted children. The most important common point of these methods is the use of versatile, extensive, and diverse data in the nomination of gifted children. The Munich Model of Giftedness, which is used for the multidimensional diagnosis of giftedness is based on social features and non-related features. This model consists of seven independent abilities for the identification of giftedness (Heller, 2001; Heller, Perleth, & Lim, 2005; Karadağ, 2016). Under this perspective, it has recently been emphasised that giftedness cannot be evaluated based on only a few areas of ability. This scale development study relied on the assumption that the areas of intelligence are not independent but correlated. To this end, the general intellectual ability subscale covered the following areas of intelligence proposed by Gardner: verbal-linguistic, logical-mathematical, social-interpersonal, visual-spatial, musical-rhythmic, bodily-kinesthetic, intrapersonal, and naturalistic. This path was followed based on the assumption that the areas of intelligence support each other. Given the findings of the study, it is thought that the scale can be used for nominating gifted students in early childhood. Further research may focus on the diagnosis of gifted children in older age groups.

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