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Research Article

Development of the Parent Form of the Preschool Children's Communication Skills Scale and Comparison of the Communication Skills of Children with Normal Development and with Autism Spectrum Disorder

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Abstract

This study aims at developing an assessment scale for identifying preschool children's communication skills, at distinguishing children with communication deficiencies and at comparing the communication skills of children with normal development (ND) and those with autism spectrum disorder (ASD). Participants were 427 children of up to 6 years of age with ND (45% female, 55% male) and 76 children from ages 1–6 years with ASD (25% female, 75% male. Exploratory factor analysis and principal component analysis were applied to maintain construct validity. The total loads of factors were between 65.32% (0–1 module) and 75.75% (4–5 module). The Cronbach's alpha internal consistency coefficient value was high for all the modules (α_{min} = .93; α_{max} = .97). The items in all the modules are highly correlated to the total score of the module (r_{min} = .35; r_{max} = .91; p < .001), and the high/low groups of the items included in all the modules are distinctive (t_n = −9.95; t_{max} = −52.67; p < .001). Results of the independent samples t-test applied to compare children with ND and children with ASD revealed the difference in the means of all the modules is significant (t_{min} = 6.30; p < .001). In conclusion, all the modules in the parent form are sufficiently reliable and valid; thus, the form can be used to distinguish children with ND from those with ASD in terms of their communication skills.

Keywords

Communication • Preschool • Autism spectrum disorder • Parents' opinions • Scale development

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Communication is a process that starts from infancy, when babies communicate with their mothers or the babysitters to meet their needs. During the developmental process, babies begin to acquire basic communication skills by having mutual interactions with people around them. For instance, babies signal to their mother their distress or needs by crying, and mothers satisfy their needs by feeding them or changing their diapers. At the same time, mothers communicate with their babies by smiling at and speaking to them. Over time, babies also start to respond to the people around them. This mutual process during which babies engage in communication with other people not only helps them become aware of different types of responses but also enhances their communication skills. Therefore, from the time babies are born, they express their needs/wants and get to know and understand the world they live in by communicating with the people around them.

Before babies make their first utterances, they try to communicate with the people in their environment by using their voices, gestures and looks to meet their needs (Topbaş & Maviş, 2005). During the cooing period (6 weeks–3 months), they cry, depending on their needs, and chirp when they are happy. Following the babbling period in which babies consciously repeat the sounds they hear (3–6 months), the echolalic babbling period begins (6–9 months), during which the relationship between voice production and hearing becomes important. In other words, babies imitate the sounds they hear and repeat them. Repeating syllables, such as ba–ba, ma-ma, is a distinctive feature of this period (Alisinanoğlu, 2003). Babies' initial attempts at uttering sounds are kinetic, follow a certain order and depend on the baby's maturity. Babies first repeat sound units and then finally utter their first syllables (Alpöge, 1991). The development of the concept of object continuity leads to progress in their perceptions. By combining the cognitive designs they perceive, babies develop new designs and perceive the world by keeping these designs in their conscious mind (Poole, Miller, & Church, 2005). This perception process can be actualized through the baby's interest in and interaction with his/her immediate surroundings. In this process, as babies look in the direction from which they hear a sound, they also learn to distinguish their own names, pay attention to the people saying their names and take part in mutual games. In brief, they begin to be aware of the environment they live in and acquire communication skills. Another vital communication skill observed in this period is the acquisition of the joint attention skill.

The joint attention skill, which enables babies to look at the objects pointed to or looked at by an adult, and then to look at the adult again, is one of the most fundamental communication skills. This skill, which is acquired between 9 and 18 months, is an indication that babies are interested in their environment, share joint attention and have the willingness to continue communicating. According to several

studies, there is a relationship between the development of joint attention and language development (Markus, Mundy, Morles, Delgado, & Yale, 2000; Mundy & Crowson, 1997). Before children use language for communication purposes, they engage in mutual interaction with their parents (Seitz & Marcus, 1976). During this process, smiling and recognizing language features and different facial expressions play an important role (Pascalis, Loevenbruck, Quinn, Kandel, Tanaka, & Lee, 2014). As children's curiosity increases when they interact with their immediate surroundings, they become more interested in their environment. They start to point to objects with their index finger when they want to communicate or reach objects. When attracting adults' attention with their index finger, children actually invite them to communicate as a means of expressing their needs. Adults naming the objects or the situations that children point to supports their language development. The relevant literature also indicates there is a positive relationship between language development and such pointing behavior (Diessel, 2013; Liebal & Tomasello, 2009; Muñetón Ayala, & Lopez, 2011). The use of parents' gestures starting from infancy is closely related to the increase in awareness and the imitation skills of babies. Beginning from babyhood, children first observe the people around them, imitate movements and sounds and then perform motor imitations using the objects. Finally, they imitate the conversations they hear around them. By means of such imitation, they both communicate with people in their surroundings and learn language. Several research studies found that the use of gestures and mimics (Buffington, Krantz, McClannahan, & Poulson, 1998; Crais, Watson, & Baranek**,** 2009; Rowe, Ozcalişkan, & Goldin-Meadow, 2008; Watt, Wetherby, & Shumway, 2006) and motor imitation skills are related to language development (McDuffie, Yoder, & Stone, 2005). Based on the normal developmental stages, a baby who is approximately 12 months old has 5–10 vocabulary items, and his/her vocabulary is doubled in the next six months (Tanrıdağ, 1995). By age 2, their vocabulary set is rapidly improved, and children start to use necessary words such as 'What? Where? Who?' (Yavuzer, 2000). There are three important stages in the development of effective typical communication and more complex symbolic language skills: the use of gestures (i.e. hand waving) and/or sounds, the use of one word and more advanced language levels. In these stages, children start to use objects in accordance with their functions, play symbolic games and, finally, play sociodramatic cooperative games (Prizant, Wetherby, Rubin, & Laurent, 2003). Thanks to symbolic games, children at approximately age 2 realize that toys are representations of reality and get involved in real life. By using these symbols, they learn how to communicate with the real world and the people around them (Cohen, 2006; Moor, 2005). Language is comprised of a set of symbols commonly used by people who speak the same mother tongue. In short, language is a cluster of socialized symbols (Jersild, 1983). Through symbolic games, children not

only learn the rules of social life but also improve in terms of language learning and language use. Kelly and Dale (1989) indicated that children who cannot use words fail at symbolic games. Likewise, other researchers have claimed that symbolic games are related to children's language development (Aydın, 2008; Leila, 2006; McCune, 1995; Ogura, 1991; Veneziano, 1981). When children turn 3, they start to understand the causal relationship between wants and emotions. With the development of reasoning skills at age 3, they begin to question the reason for events and the cause-effect relationship of these events. Additionally, they perform the behaviors they observe in their surroundings by means of games based on scenarios. It is thought that at this age, children feel satisfied when they achieve their goals, while they feel dissatisfied when they cannot achieve them (Flavell, 1999); however, they establish a link between their own ideas and feelings and others' ideas and feelings when they turn 4 (Poole et al., 2005). Starting from age 4, they can predict and notice what other people think (Qates & Grayson, 2004), and play games, such as hide-and-seek, using their skills of guessing what is occurring in other people's minds. Also, they exhibit appropriate behaviors and use the expressions expected from them (e.g. politeness sentences). Throughout this whole process, the communication between families and their children is important for their learning and adaptation because children who communicate with other people to respond to social expectations also improve their language skills.

When children turn 3, they have a grasp of approximately 300 words and use language eagerly. When they reach age 4, they can speak completely comprehensibly, use questions starting with 'Why? When? How?' and listen to stories (Yavuzer, 2000). It is also known that children at the ages of 4 and 5 speak their language while following its fundamental grammar rules, and when they turn 5–6, their vocabulary set is comprised of nearly 2,000–2,500 words, which enables them to make sentences in accordance with the appropriate grammatical rules (Yapıcı, 2004). The development of this vocabulary span and the ability to speak in line with grammar rules lead children to express themselves better and communicate with people in their surrounding with greater ease. Four- to five-year-old children have the skills to engage in conversations (Demir, 2011) and liken objects to something, and this skill paves the way for them to have vivid and memorable communication with their environment (Berk, 2013). These developments that can be observed among children with normal development (ND) enhance their communication skills. Similarly, communication skills contribute to their development. In other words, learning opportunities increase as their communication skills are improved. However, in the case of communication deficiencies, it is difficult for the children to enhance these skills and for their family members to help them with their communication abilities.

In the case of autism spectrum disorder (ASD), which is described as a communication problem in which children fail and are unwilling to communicate, children do not make a noticeable effort to be a member of the community because they have deficiencies in terms of communicating with their surroundings. ASD is characterized by significant deficiencies in social-communication skills and by restricted, repetitive behaviors as well as limited interests (American Psychiatric Association, 2013). It can be observed that in the early stages of ASD, children with this disorder have deficiencies in making eye contact, smiling, initiating communication and responding (Dodd, 2005; Whitaker, Barratt, Joy, Potter, & Thomas, 1998; Wing, 2012). In addition, they show a lack of progress in joint attention skills (Bernier & Gerdts, 2010), gestures and pointing (Baron-Cohen, 2008; Ingersoll & Lalonde, 2010; Korkmaz, 2010). Moreover, they have difficulty in comprehending messages, mimics, the facial expressions of their interlocutors, body language, emotional expressions in conversations and the changes in voice tones that are easily understood by most people (Rapin, 1991). All these deficiencies, which are unique to autism, result in difficulties in communication and adaptation. The difficulties encountered by children with ASD in initiating communication and games are also the cause of problems in social communication. In other words, the communication difficulties of children with ASD include the initiation of communication and game skills, difficulties in responding to these problems (Baker, 2001) and deficiencies in playing imitation-based social games that are appropriate to their developmental level (Lockshin, Gillis, & Romanczyk, 2005). To summarize, children with ASD do not feel the need to share with others, learn more by communicating and develop their language skills.

As in many other aspects of child development, the preschool period is a crucial time in which a child acquires fundamental communication skills. Identifying preschool children's communication skills and detecting those whose communication skills are delayed and/or lacking can pave the way to for parents to take the necessary precautions. An examination of the literature suggests that a scale assessing exclusively preschool children's communication skills in Turkey has not yet been developed, while there are a number of instruments for assessing their general development (e.g. Ankara Development Screening Inventory [ADSI], Denver II Developmental Screening Test, Peabody Vocabulary Test). Moreover, it is noteworthy that scales which assess communication skills generally focus on adults (Ersanlı & Balcı, 1998; Korkut, 1996, 2005). Also, no assessment instruments exist that deal with the diagnosis of autism spectrum syndrome, which is in essence a communication problem (Irmak, Sütçü, Aydın, & Sorias, 2007; Kabil, 2005; Yıkgeç, 2005). Similarly, no scales concerning social communication have been developed in Turkey (Öner, Öner, Çöp, & Münir,

2012). Yet it is possible that when children's communication problems and deficiencies are not noticed early on, their language development, peer relationships and social life adaptation may become more difficult later. Therefore, it is very important to assess children's communication skills in the preschool period in which cognitive and school adaptation skills are developed rapidly. Additionally, identifying autistic children's deficiencies in communication skills can lead to the design of educational programs aimed at bridging the gap in these skills. The identification of the basic communication deficiencies of children and intervention in autism in the early stages can contribute to improving their communication abilities. Thus, autistic children's participation in and adaptation to school can be encouraged by using the data obtained through a scale aimed at identifying communication deficiencies. Considering the importance of parents' roles not only in realizing the communication deficiencies of their children, especially children between the ages of 0 and 6, but also in supporting their children's communication process in daily life, it is considered essential to evaluate children's communication skills from the perspective of their parents. Therefore, with this necessity in mind, the present study has the main objective of developing a scale to assess preschool children's communication skills and compare the communication skills of children with ND and those with ASD.

Purpose

More specifically, the first aim of the study is to design the parent form of a scale intended to assess preschool children's communication skills, and the second aim is to compare the communication skills of children with ND and those with ASD.

Method

In this research study, the 'Parent Form of the Preschool Children's Communication Skills Scale' is developed, and the communication skills of children with ND and those with ASD are compared. In developing the scale, comparisons made for the validity analysis also focus on the assessment of communication problems typical of children with ASD as distinctive features of children with this condition. The analyses were carried out to reveal that the scale can distinguish children with communication problems from those with normal development and to show that the scale is functional in terms of identifying the communication needs of children with ASD. The procedures followed in the present study are discussed below.

Participants

Participants in the study are parents with children enrolled at preschool institutions. There are 943 preschool educational institutions in İstanbul, and a total of 136,535

children attend these schools (MEB, 2015). Children with normal development were selected as participants on the basis of random cluster sampling from 27 preschool educational institutions affiliated with the National Ministry of Education in İstanbul province. A total of 427 parents who have children with ND took part in the study. A total of 76 parents who have children with ASD were selected on the basis of convenience sampling from 6 rehabilitation centres. Convenience sampling was preferred in this study because it is difficult to gain access to children officially diagnosed with ASD. According to Ross (2005), convenience sampling is a type of sampling method used among other methods, which is based on the researcher's purpose and the participants' availability.

Among the children with ND, 55% are male and the remaining 45% are female. Their age groups are as follows: 0–1 years (7.3%), 1–2 years (8.9%), 2–3 years (11.1%), 3–4 years (18.8%), 4–5 years (23.2%) and 5–6 years (30.9%). Among the children with ASD, 25% are female while the remaining 75% are male. Their age groups are as follows: 0–1 years (21.1%), 1–2 years (11.8%), 2–3 years (22.4%), 3–4 years (23.7%), 4–5 years (14.5%) and 5–6 years (6.6%). The age groups of mothers who have children with ND are as follows: 20–25 years (4.4%), 25–30 years (27%), 31–35 years (40.7%), 36–40 years (16.4%) and 41 years and over (10.5%). The age groups of mothers with children who have ASD are as follows: 20–25 years (6.6%), 25–30 years (36.8%), 31–35 years (31.6%), 36–40 years (14.5%) and 41 years and over (10.5%). The educational background of mothers who have children with ND are as follows: primary school (16.2%), secondary school (9.6%), high school (28.6%), undergraduate (38.9%) and postgraduate degree (6.8%). The educational background of mothers who have children with ASD are as follows: primary school (34.2%), secondary school (13.2%), high school (21.1%), undergraduate (27.6%) and postgraduate degree (3.9%). The age groups of fathers who have children with ND are as follows: 20–25 years (3.3%), 25–30 years (14.1%), 31–35 years (38.4%), 36–40 years (21.5%) and 41 years and over (22.7%). The age groups of fathers who have children with ASD are as follows: 20–25 years (7.9%), 25–30 years (14.5%), 31–35 years (35.5%), 36–40 years (17.1%) and 41 years and over (25.0%). The educational background of fathers who have children with ND are as follows: primary school (12.9%), secondary school (8.0%), high school (34.0%), undergraduate (38.2%), and other (7.0%). The educational background of fathers who have children with ASD are as follows: primary school (21.1%), secondary school (7.9%), high school (38.2%), undergraduate (30.3%) and postgraduate degree (2.6%). Also, it was found that 19.2% of the parents who have children with ND come from low-income backgrounds, while 71.7% come from middle-income backgrounds and 9.1% come from high-income backgrounds. For, parents who have children with ASD, 22.4% come from

low-income backgrounds, while 62.2% come from middle-income backgrounds and 14.5% come from high-income backgrounds.

Data Collection Instruments

Ankara Development Screening Inventory (ADSI). The ADSI aims at assessing 0- to 6-year-old infants' and children's current development and skills in line with data obtained from their mothers. In addition to mothers, this inventory can also be responded by fathers, babysitters and teachers who know the children very well. The inventory, which includes 154 items arranged in accordance with the children's ages, are responded to by the mothers on a scale of 'Yes, No, I do not know'. The questions are arranged in such a way as to represent different but connected aspects of social development (i.e. language competence, fine and gross motor skills, social competence–self-care). The internal consistency of the inventory and the subtests (e.g. language competence) were found by calculating the Cronbach's alpha coefficient for the 3-year-old group (i.e. 0–12, 13–44 and 45–72 months). The ADSI is suitable for 1- to 3-month-old children as well as for 12-month-old and 5-year-old children. It can also be conducted with children above age 6 if they have growth deficiency (Savaşır, Sezgin, & Erol 1994)

ADSI	Language Competence	Fine Motor	Gross Motor	Social Skills–Self-Care
0–12 months	.93	.93	.91	.92
13–44 months	.97,	.95	.80	.85
45–72 months	.88	.84	.19	.37

Development of the Preschool Children's Communication Skills Scale

The Preschool Children's Communication Skills Scale was designed by the present researcher to assess preschool children's communication skills. At the beginning of the scale development process, relevant national and international literature dealing with the communication skills of children ages 0–6 was reviewed. Then, in light of the literature review, items including communication skills were prepared for each age range between the ages of 0 and 6. Initially, the scale contained 86 items, and the opinions of 17 experts were obtained regarding these items. Among these experts, 8 specialized in special education, 6 were experts in preschool teaching and 3 were psychological counsellors who had experience in preschool education. After the necessary information pertaining to the scale development process was provided to these experts and the aims of the scale were explained, their opinions about the scale form were collected. Experts were requested to mark "needs to be deleted," "needs to be revised" and "needs to remain" for each item. In addition, they were asked to justify their suggestions for each item. After the experts' opinions and evaluations

were collected, the content validity ratios (CVRs) were calculated by dividing the number of experts marking "necessary" for each item into half the total number of experts indicating their opinions about the item. The CVRs were found by subtracting 1 from the ratio between the number of opinions indicating "necessary" for an item and the total number of experts indicating their opinions for the item. When the CVR values were negative or zero for some items, these items were deleted at the first stage. The items with positive CVR values were analyzed statistically to determine their significance. CVR is a criterion taken into account for identifying whether an item is statistically significant or not (Yurdugül, 2005). The CVR value was found to be approximately 0.49 when there were 15 experts, 0.42 when there were 20 experts and 0.45 when there were 17 experts (CVR = 3.58/67 = 0.795). Then, the number of items in the scale was reduced to 66 after the deletion of items with values under 0.45. The number of scale items for each age group is as follows: 9 items for 0–1 year (0–12 months), 12 items for 1–2 years (13–24 months), 13 items for age 2–3 years (25–36 months), 13 items for 3–4 years (37–48 months), 8 items for 4–5 years (49–60 months) and 11 items for 5–6 years (61–72 months). The scale aimed at assessing children's communication skills from the perspective of their mothers is a five-point Likert-type scale (i.e. "never," "rarely," "sometimes," "often" "always"). In addition, demographic variables about parents and children were included in the scale.

Data Collection and Analysis

A team comprising teachers and teacher candidates was organized for the distribution and administration of the scale. The team members were informed about the research scale and its administration. Pilot applications were carried out with 38 children with ND and 11 children diagnosed with ASD to reveal whether there were any problems in the process of conducting the scale. The items causing difficulties during the pilot studies were identified, and alternative data collection methods, such as phone calls, were applied in the actual data collection procedure. It was considered that in the actual administration, parents cannot respond to some questions pertaining to their sociodemographic backgrounds; therefore, the team members told parents the questions face-to-face or on the telephone during or after administration of the scale. At the end of the pilot application, it was determined that the parents understood all the questions in the scale. The scales were then distributed to the predetermined institutions, sent to parents by the team members and were received back after the parents had filled them out. Considering that it is difficult for 0- to 2-year-old children to verbally respond to the scale questions and that autistic children have a lack of communication and language skills, it was deemed appropriate for the parents to fill out the scale. Additionally, parents' opinions were obtained to assess children's communication skills because the first communication takes place between parents

and the baby in the family, and children spend most of their time with their parents. During the data collection procedures, a total of 1,020 forms were distributed to the families of children with ND, and 704 of these forms were considered valid as 316 forms were eliminated because they included unsound data. The process of eliminating these forms was based on various reasons, such as the incompleteness of the scales and inappropriate coding. Out of the 704 forms taken into account in the first stage, 277 scales were not considered as they contained erasures while 427 scales were analyzed as they were filled out appropriately. Two hundred ninety-two of these forms were responded to by both mothers and fathers, 118 were filled out by mothers and the remaining 17 were completed by fathers. In the data collection process, 250 scales were distributed to parents of children with ASD, and 76 of these forms were included in the study. During the data analysis, in order to determine whether the data obtained from the participants were suitable for factor analysis (i.e. Measure of Suitability and Sampling Adequacy), the Kaiser-Meyer-Olkin (KMO) test was applied. Moreover, the Bartlett's sphericity test was used for normality assumptions. Then, the exploratory factor analysis was carried out. Also, the principal component analysis was used in factor analysis, and the calculations were made by taking the eigenvalue as "1." Subsequently, the common factor loads of the items were calculated for each age group separately, and the loads they take from the factors they were in were calculated. Then, for each scale item, item total and item remaining correlations were calculated; Cronbach's alpha internal consistency values were found for each factor; and for scale discrimination, comparative analyses were carried out. The relationship between the total scores of items in all the modules and the total score of the module was revealed by calculating the Pearson product-moment correlation coefficient. Furthermore, to identify whether there is a significant relationship between the parents' form scores in all the modules and the scores in the subdimensions of the ADSI, Pearson correlation analysis was applied. Finally, an independent samples t-test was used to find out whether there is a significant relationship between the scores in the parents' form and the arithmetic means of children with ND and those with ASD.

Findings

Findings Related to the First Aim of the Study, Which Was to Design the Parent Form of the Scale Intended to Assess Preschool Children's Communication Skills

To apply factor analysis, there should be some statistical adequacies. Therefore, for sampling adequacy, KMO values, and for normality, Bartlett's sphericity values are the most frequently used values. Tavşancıl (2010) indicated that when the CVR value is at or above .90, the sampling size is considered ideal, and when the Bartlett

value is significant, the data is considered to have multivariate normal distribution. However, Sharma (1996) and Büyüköztürk (2008) pointed out that data is thought to be suitable for factor analysis when the KMO value is above .60 and the Bartlett sphericity test is significant. Therefore, the items in the modules prepared for each age group were separately analyzed. Forty-seven 0- to 12-month-old children (93%), 47 12- to 24-month-old children (9.3%), 64 25- to 36-month-old children (12.7%), 98 37- to 48-month-old children (19.5%), 110 49- to 60-month-old children (21.9%) and 137 61- to 72-month-old children (27.2%) took part in the study. The number of children in each group is in accordance with the suggestion that 'the sampling size should be five times bigger than the number of items' (Child, 2006). The findings reached as a result of these analyses are presented below:

Table 1
Factorability Values and Explained Total Variance Table

Module	KMO	Bart. X^2/p	Fac.	Initial Eigenvalues			Total Factor Loads		
				Tot.	Var.%	Cluster.%	Tot.	Var.%	Cluster.%
0–1	.931	2944.82*	1	5.88	65.32	**65.32**	5.88	65.32	65.32
			2	.82	9.11	74.42			
1–2	.946	5578.46*	1	8.88	73.99	**73.99**	8.88	73.99	73.99
			2	.71	5.95	79.94			
2–3	.954	4762.07*	1	8.94	68.75	**68.75**	8.94	68.75	68.75
			2	1.05	8.11	76.86	1.05	8.11	76.86
			3	.60	4.58	81.45			
3–4	.958	5000.65*	1	9.83	75.58	**75.58**	9.83	75.58	75.58
			2	.63	4.86	80.44			
4–5	.947	2046.19*	1	6.06	75.75	**75.75**	6.06	75.75	75.75
			2	.41	5.18	80.93			
5–6	.942	2049.57*	1	7.52	68.32	**68.32**	7.52	68.32	68.32
			2	.72	6.54	74.86			

* $p < .001$.

As shown in Table 1, in all the factor analyses, CVR values were found to be above .90 (KMO_{max} = .958; KMO_{min} = .931) and the Bartlett values are significant ($p < .001$). These values reveal that the data is suitable for factor analysis. As a result of these findings, factor analysis was applied. A principal component analysis was used, and the calculations were made by taking the eigenvalue as 1. Tavşancıl (2010) stated the easiest way to determine the eigenvalue is to take it as 1 in the context of Kaiser normalization. It was found that all the items in each age group have a sole factor structure except for the 2- to 3-year-old group. For this group, the eigenvalue of the items is above 1 and has a two-factor structure; however, it was observed that the difference between the first and the second factor loads is too high (60%). Çokluk, Şekercioğlu and Büyüköztürk (2010) maintained that, when the contribution of factors to the total factor reduces, the factor number can be taken as 1. Therefore,

it was decided that the items in this group had a sole factor structure. In conclusion, it was found that the items prepared for all age groups are considered within a sole factor structure. Seçer (2013) emphasized that it is sufficient for the variance justified in sole factor patterns to be 30% and above. The total loads explained by factors (explained total variance percentages) were found to be between 65.32% (0-1 module) and 75.75% (4-5 module).

Based on these results, the communalities of the items and the loads they take from the factors they are in were calculated separately for each group. The findings are shown in Table 2 below:

Table 2
Communalities of Items for Age Group and Unrotated Factor Loads

Item	Module 0-1		Module 1-2		Module 2-3		Module 3-4		Module 4-5		Module 5-6	
	Com.	Fac. Loads	Com.	Fac. Loads	Com.	Fac. Loads	Com.	Fac. Loads	Com.	Fac. Loads	Com.	Fac. Loads
Item 1	.604	.884	.600	.911	.581	.903	.803	.930	.747	.900	.672	.878
Item 2	.694	.873	.778	.908	.839	.898	.854	.924	.728	.892	.696	.869
Item 3	.761	.856	.769	.908	.786	.892	.659	.920	.724	.882	.679	.858
Item 4	.354	.835	.694	.907	.737	.885	.864	.905	.778	.878	.736	.834
Item 5	.733	.833	.662	.882	.865	.874	.787	.896	.771	.864	.639	.828
Item 6	.689	.830	.824	.877	.834	.870	.847	.887	.810	.853	.770	.824
Item 7	.564	.777	.824	.875	.851	.848	.643	.871	.796	.851	.755	.820
Item 8	.782	.751	.766	.833	.792	.840	.696	.860	.707	.841	.670	.819
Item 9	.697	.595	.822	.822	.776	.836	.759	.858	-	-	.598	.799
Item 10	-	-	.829	.814	.738	.832	.740	.834	-	-	.615	.785
Item 11	-	-	.636	.798	.752	.781	.736	.812	-	-	.686	.773
Item 12	-	-	.676	.774	.749	.737	.819	.802	-	-	-	-
Item 13	-	-	-	-	.693	.499	.618	.786	-	-	-	-

As can be seen in the table, the communalities of the items were calculated separately for all age groups, and the loads taken from the factors they are in were analyzed. This finding indicates that the items in each age group are related to one another, and these variables (items) can be considered as a whole emerging as a single variable assessing a single construct. From Büyüköztürk's (2008) perspective, it is important that an item does not take a load of less than 30% in the factor it is in. According to the results based on all the calculations, the lowest factor load was approximately 50%. Likewise, the communalities were found to be the lowest with a percentage of nearly 62%. Therefore, it can be concluded that the scales had a subdimension for all the age groups and that each item contributes highly to the common variance of the scales. In addition, the loads of factors of these items were found to be high. Next, item total and item remaining correlations were calculated for each scale

item. For the factors, Cronbach's alpha internal consistency values were taken into account, and for scale discrimination, comparative analyses were done. Tavşancıl (2010) indicated that as the reliability coefficient of a test gets closer to 1, the scale becomes more reliable. However, Büyüköztürk (2008) suggested that the calculated alpha value should be .70 or higher in order for one to be able to claim that test scores are reliable. Another criterion for determining whether the items and the total scores of a scale measure what it aims to measure is its discrimination feature. According to Tavşancıl (2010), this procedure is conducted considering the total scores of the scale by ordering the groups from the higher score to the low score, and then the score means of high and low groups in each item are compared. The next step is explained by Büyüköztürk (2008), who argued that an independent samples t-test can be used to reveal the difference between the arithmetic means of high and low 27 groups in each item. He also maintained that significant differences in favor of the high group ($p < .05$) can be regarded as an indication of the internal consistency of the scale.

In this study, the Pearson product-moment correlation coefficient analysis was applied to identify the relationship between the items in the module and the total score of the module. Özgüven (2007) pointed out that items with a value of $r > .30$ are suitable items.

Table 3
Internal Consistency, Discrimination and Item Analysis for All Modules

Module	Num. of Items	X	SsS	C.Alpha	$r_{total\ (min)}$	$r_{total\ (Max)}$	t_{min}	t_{max}
0–1 year old	9	35,98	9,54	,93	,607*	,607*	-15,98*	-30,89*
1–2 years old	12	46,65	16,96	,97	,773*	,913*	-15,91*	-52,67*
2–3 years old	13	50,15	17,27	,96	,386*	,632*	-15,71*	-45,36*
3–4 years old	13	51,41	16,93	,97	,592*	,740*	-14,14*	-31,95*
4–5 years old	8	31,57	9,79	,95	,812*	,889*	-13,11*	-21,32*
5–6 years old	11	41,70	12,99	,95	,350*	,660*	-9,95*	-21,30*

* $p < .001$.

As shown in Table 3, the Cronbach's alpha internal consistency coefficient is high for all the modules ($\alpha_{min} = .93$; $\alpha_{max} = .97$). This finding indicates that all the modules are highly reliable. However, it was found that the items in all the modules and the total score of the module are highly related ($r_{min} = .35$; $r_{max} = .91$; $p < .001$). This finding indicates that all the items in the modules contribute to the construct assessed in the module. Finally, the items in all the modules were found to be distinctive for low and high groups ($t_{min} = -9.95$; $t_{max} = -52.67$; $p < .001$). These findings also indicate that all the items in the modules can significantly discriminate low and high groups in terms of the construct they are assessing.

Table 4
Relationship between Scores of all Modules in Parent Form and Scores of ADSI Subdimension

Modules		Language competence	Fine motor	Gross motor	Social skills–self-care	General development
Module0-1	R	.489*	.444*	.405*	.488*	.493*
	N	495	494	494	495	495
Module1-2	R	.724*	.656*	.589*	.694*	.720*
	N	469	469	469	469	469
Module2-3	R	.718*	.644*	.577*	.661*	.708*
	N	419	419	419	419	419
Module3-4	R	.768*	.654*	.557*	.714*	.755*
	N	355	355	355	355	355
Module4-5	R	.662*	.563*	.427*	.552*	.627*
	N	304	304	304	304	304
Module5-6	R	.551*	.519*	.436*	.446*	.531*
	N	244	244	244	244	244

* $p < .001$.

As indicated in Table 4, as a result of applying the Pearson correlation analysis to identify whether there is a significant relationship between the parent form scores in all the modules and the scores in the subdimension of ADSI, significant and positive differences were found between all the scores ($r_{min} = .41$; $r_{max} = .77$; $p < .001$). These values reveal the effectiveness of the scores in the parent form in terms of similar scales validity.

Findings Related to the Second Aim of the Study, Which Was to Compare the Communication Skills of Children with ND and of Children with ASD

Table 5
Comparison of Parent Form Scores in all Modules for Children with ASD and with ND

Module	Groups	*N*	$\bar{x}$	*ss*	$Sh_{\bar{x}}$	*t* Test		
						t	*Sd*	*p*
Module 0-1	ND	423	37.22	8.66	.42	7.30	495	.000
	ASD	74	28.88	11.19	1.30			
Module 1-2	ND	399	49.18	15.32	.77	8.14	469	.000
	ASD	72	32.61	18.78	2.21			
Module 2-3	ND	361	52.68	15.86	.84	7.88	419	.000
	ASD	60	34.95	17.75	2.29			
Module 3-4	ND	315	53.99	15.04	.85	8.65	355	.000
	ASD	42	32.10	18.03	2.78			
Module 4-5	ND	274	32.73	8.83	.53	6.46	304	.000
	ASD	32	21.63	11.95	2.11			
Module 5-6	ND	221	43.33	11.72	.79	6.30	244	.000
	ASD	25	27.28	14.91	2.98			

As shown in Table 5, the results of the independent samples t-test that was applied to reveal whether there is a significant difference between the mean scores of children

with ND and those with ASD and the parent form scores, found significant differences in the arithmetic means of all the modules (t_{min} = 6.30; p < .001). These differences were found to be in favor of the children with ND. These findings show that all the modules of the parent form can be used to distinguish children with ND from those with ASD.

Discussion

It is an unavoidable fact that communication skills and their effective use are necessary in most of the phases of our life. For the acquisition of communication skills, the preschool period is the most important time in children's life as they are prone to learning and can acquire the most fundamental skills in that period. The communication skills and competencies they develop at this time enable children both to adapt to the environment they live in and exhibit the behaviors appropriate to their age. Thus, the development of an instrument aimed at assessing children's communication skills would be useful not only in helping parents identify their children's communication deficiencies or delay in the early stages but also in aiding educators in appropriately intervening to address a problem when necessary. Also, there is currently a lack of research literature pertaining to an assessment tool intended to measure preschool children's communication skills; therefore, the main objective of the present study is to develop the "Preschool Children's Communication Skills Scale."

The Preschool Children's Communication Skills Scale developed by the present researcher was designed to evaluate the communication skills of children in the preschool period. The scale comprised 86 items when it was first designed, and the number of items was decreased to 66 after the calculation of the content validity ratio. There are 9 items for the age range 0–1, 12 items for the age range 1–2, 13 items for the age range 2–3, 13 items for the age range 3–4, 8 items for the age range 4–5 and 11 items for the age range 5–6. In the scale developed as a result of the analysis of the data, it was found that scales for all age groups have a subdimension and that each item contributes highly to the communality of the scales. In addition, it was revealed that the loads of the factors to which each item belongs are high. Next, item-total and item-reminder correlations were calculated for each item. Furthermore, Cronbach's alpha internal consistency values were found for the factors, and comparative analyses were carried out for the scale discrimination. All of these analyses indicate that all the modules have a high level of reliability and that the items in all the modules are highly related to the total score of the module. This finding shows that all the items in the modules contribute to the construct measured in the modules. It was also revealed that the items in all the modules are distinctive for high and low groups, which means that all the items in the modules can discriminate significantly the high

and low groups in terms of the construct they measure. Additionally, positive and significant relationships were found between the parent form scores and the scores of ADSI subdimensions. This finding justifies the high level of relationship between the language-cognitive and social skills–self-care subdimensions of the ADSI, and it can also justify the relationship between communication and general development. Thus, it would be fair to state that the development of communication skills can be one of the indications that children are in the process of normal development. It is known that children with ND can expand their awareness about the environment with which they communicate and become prepared for new learning opportunities by communicating with their parents.

It was also found that there are positive and significant relationships between the parent form scores of all the modules and that the subdimension scores of the ADSI overlap with the relevant literature. Children without normal development might have difficulty in responding to their parents' attempts to communicate with them and in recognizing clues (Seitz & Marcus, 1976). However, a child who can respond to an adult's communication attempt in the 0–1 age period can also signal that he/she has basic communication skills. Being able to recognize different facial expressions in later stages (Pascalis et al., 2014) and the development of joint attention are indications of the eagerness of a baby to continue communicating with the environment (Markus et al., 2000; Mundy & Crowson, 1997). Beginning at birth, human beings use language to communicate with the outside world, to become informed about events happening around them so as to identify their place in society (Aktan Kerem, 2005). Language development is related to the development of the vocal organs, the child's social environment and his/her interaction with this environment (Oktay, 2002). There is an important relationship between the acquisition of communication skills at the age of 1–2 and language skills. According to Blanc, Adrien, Roux, and Barthêlemy (2005), children learn the following five fundamental skills in the first two years of their lives: language, delayed imitation, drawing, cognitive design and symbolic games. By means of language, children can make sense of their own and others' thoughts (Lloyd, 1995). Children with ND can express themselves and thus make contact with their environments. It would be true to state that as a result of these relationships, they are expected to be well-adjusted and approachable members of society and that their academic gains become more distinctive.

In the process of developing the Preschool Children's Communication Skills Scale, as a result of the comparative analyses between the form scores of parents with children who have ND and those with children who have ASD, the difference in the arithmetic means of all the modules was found to be significant. These differences were in favor of children with ND. These findings show that all the modules of the

parent form can be used to differentiate between groups with ND and with ASD. In addition, in considering the characteristics of children with ASD, the results of the study are in line with the relevant literature.

As for the differences among age groups, there is distinction between children with ND and those with ASD because in the first module (i.e. 0- to 1-year-old children), it was found that children with ASD have a lack of development in mutual joint attention and a lack of eye contact and pointing skills as well as undeveloped gestures and imitation skills (Baron-Cohen, 2008; Bernier & Gerdts, 2010; Dodd, 2005; Ingersoll & Lalonde, 2010; Iban ˜ez, Grantz, & Messinger, 2013; Korkmaz, 2010; Markus et al., 2000; Rapin, 1991; Wing, 2012). In the second module (i.e. 1- to 2-year-old children), it was found that, while children with ND can use gestures and mimics, recognize the features of language, improve their imitation skills and acquire expressive language skills, children with ASD have deficiencies in these aspects (McDuffie, Yoder, & Stone, 2005; Mederios & Winsler, 2014; Pascalis et al., 2014; Watt, Wetherby, & Shumway, 2006). The third module (i.e. 2- to 3-year-old children) is a period when children with ND can rapidly improve their language skills, ask questions to communicate with the people around them and get to know the world by playing games (Güven & Bal, 2000; Prizant et al., 2003; Yavuzer, 2000). However, autistic children have difficulty not only in acquiring language skills but also in using language (Bernier & Gerdts, 2010; Baron-Cohen, 2008; Korkmaz, 2010; Sicile-Kira, 2004; Piven, 1999; Wing, 2012). These children have serious deficiencies in terms of playing mutual games, in the functional use of toys and especially in engaging in symbolic and social games (Jordan, 2003; Lockshin, Gillis, & Romanczyk, 2005; Lucket, Bundy, & Roberts, 2007). However, in the fourth module (i.e. 3- to 4-year-old children), children can give information about themselves and they have improved reasoning skills and peer relationships. It is emphasized in the literature that children with ASD experience difficulty in expressing their thoughts and feelings while communicating and in getting involved in social relationships (Baker, 2001; Robledo & Ham-Kucharski, 2005). Additionally, they have deficiencies in executive functions (Happé, Briskman, & Frith, 2001), in interpreting other people's behavior, in exhibiting appropriate behaviors and in social cognition enabling effective social interaction (Grady & Keightley, 2002). It can be pointed out that because of these deficiencies, children with ND differ from children with ASD in the module that includes items dealing with establishing cause-and-effect relationships, ordering events and exhibiting the expected appropriate behavior. Significant differences were also found between children with ND and those with ASD in the fifth and sixth modules dealing with their expression of themselves very well and their use of communication skills suitable for the social context in line with others' expectations

and intentions. This finding can be justified by referring to the deficiencies of children with ASD in abstract thinking skills and their theory of mind (Baron-Cohen, 2008; Begeer et al., 2011; Gammeltoft & Nordenhof, 2007).

The mutual interaction and emotional solidarity between parents and children have an influence on communication competencies and self-control skills (Lindsey, Cremeens, Colwell, & Caldera, 2009). Also, when individuals have deficiencies in terms of expressive language, they are reported to exhibit aggressive behaviors and feel depression or extreme anxiety (Levine, 2003). It is also indicated that children with ASD who have difficulty in communication can experience emotional and behavioral problems (Maskey, Warnell, Parr, Le Couteur, & McConachie, 2013). It is useful for children with ND and those with ASD to have excellent communication with their parents so that the parents can understand their feelings and deal with their behavioral problems. Therefore, it is necessary for parents to be familiar with their children's communication skills and their communication needs.

It is assumed that through the Preschool Children's Communication Skills Scale, the communication skills and needs of children not only with ND but also with ASD can be identified. Hence, the relationship between the nonverbal communication skills of children with ASD and the symptoms of this disorder is stronger than the relationship between this disorder and verbal language skills (Kjellmer, Hedvall, Fernell, Gillberg, & Norrelgen, 2012). Children with ASD can have problems with language skills that range from mutism to deficiency in the functional use of language. However, the real problem is not the skill of speaking the language as expected by most parents but rather the inability to use nonverbal communication skills such as gestures and mimics (Wilkinson, 1998). In addition, parents with children who have ASD can encourage their children to communicate by showing awareness about their interests and helping them acquire communication skills (Siller & Sigman, 2002). It is suggested that instead of focusing on the speaking skills of children with ASD, it is useful for families to be aware of the real problem, which is basic communication skills, and to establish deeper relationships with their children for the sake of their development. Moreover, it has been suggested that children's relationship with their parents is more effective than their relationship with their teachers in terms of their adaptation to the preschool environment (Pianta, Nimetz, & Bennett, 1997). In particular when it comes to evaluating preschool children's deficiencies, parents play a key role in contributing to the development of their children by selecting appropriate remedial educational programs (Bloch & Weinstein, 2009; Estes et al., 2013). The parent form of the Preschool Children's Communication Skills Scale is considered beneficial for identifying children's fundamental communication skills and preparing suitable educational programs.

It is recommended that in further research studies, the Preschool Children's Communication Skills Scale be administered to a larger group of participants. It is also suggested that the scale should be conducted with different disability groups. One limitation of the study is there is a big difference between the high number of questionnaires that were distributed and returned by the participants and the low number of completed forms. Furthermore, it is advisable to ask parents to fill out the forms with the help of the teachers rather than sending the questionnaires to their homes. Another limitation of the study is that the ideas of mothers and fathers are evaluated as a whole. Therefore, further research studies should consider mothers' and fathers' opinions separately and compare them with each other.

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