Examination of the Psychometric Properties of the Children's Loneliness Scale for Students with and without Special Needs in Inclusive Classrooms[*]

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Abstract

Early detection of loneliness in children, especially children with special needs who are at greater risk for loneliness, is crucial for planning appropriate interventions. A review of studies regarding the assessment of loneliness in children reveals the Children's Loneliness Scale (CLS) is commonly used in other cultures whereas information about the use of CLS in Turkish culture, especially on children with special needs, is very limited. This study investigates the psychometric properties of CLS on a group of 4th and 5th graders with and without special needs in inclusive classrooms. The study group consists of 554 typically developing students and 151 students with special needs, a total of 705 students whose ages range from 9 to 13. Exploratory factor analysis (EFA) was conducted to examine the construct validity of the CLS and revealed that the scale has a unidimensional structure. The validity of this unidimensional construct was confirmed using confirmatory factor analysis (CFA). Discriminant validity of the CLS was examined using the criterion group method and a significant difference was found between the loneliness scores of students with special needs and those without special needs. Internal consistency and test-retest reliability analyses were conducted in order to determine the reliability of the CLS. Results showed that the CLS has high internal reliability and provides stability in measurements. In general, the findings of this study indicated that the CLS is a valid and reliable instrument for assessing the loneliness levels of students with and without special needs attending 4th and 5th grade inclusive classrooms.

Keywords: Loneliness • Children with disabilities • Children with special needs • Loneliness Scale

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Loneliness is a rather common experience encountered in various periods of life by children as well as adolescents and adults. Loneliness is defined as an unpleasant experience that is felt when there is a qualitative or quantitative discrepancy between existing and desired social relationships (Perlman & Peplau, 1981). Rook (1984 as cited in Solomon, 2000) defines loneliness as a psychologically disturbing experience that arises when a person feels alienated, misunderstood, or rejected by others and/or lacks appropriate social partners to carry out activities that will provide desired social cohesion and opportunities for emotional intimacy. Although there are many definitions of loneliness, three common properties are shared in most definitions: first, it is commonly agreed that loneliness results from deficiencies in the person's social relationships; second, it is a subjective phenomenon and not synonymous with objective isolation; and third, it is an unpleasant and stressful experience (Peplau & Perlman, 1982).

There has been a growing interest in examining the social relationships of individuals in various life cycles and to identify the underlying mechanisms related to loneliness (Jong Gierveld & Tilburg, 2010). Although loneliness in adolescents and adults has been investigated for a longer period of time, loneliness in children is a phenomenon which has been studied for the last 20-25 years. According to Solomon (2000), one of the possible reasons for the growing interest in examining loneliness in children may be related to the gradual change in the previous beliefs resulting from psycho-dynamic and developmental perspectives that stated that loneliness is experienced only by adolescents when there is a need to form close relationships with others, and therefore children cannot experience loneliness. Solomon also reported that loneliness in children cannot be easily noticed; it is hidden under the masks of aggression, anxiety, and depression, or called as such, and even when it is recognized, it is perceived as temporary and no interventions are deemed necessary to help children overcome loneliness. Studies indicated that children experience feelings of loneliness and recognize these feelings as well (Cassidy & Asher, 1992; Hayden, Tarulli, & Hymel, 1988). In a study conducted by Hayden et al. (1988), children's metaphors about loneliness were examined by interviewing students in grades 3 through 8 and it was found that children used expressions about loneliness that were similar to those of adolescents. In another study, preschoolers were also found to express feelings of loneliness and dissatisfaction from peer relationships (Kumar & Vellymalay, 2010). It was reported that kindergartners and first graders perceived loneliness as having very few friends or as social incompetence (Cassidy & Asher, 1992), and for this age group, loneliness also meant sadness and a lack of playmates (Williams & Asher, 1992). On the other hand, in one of the studies that examined the relationship of age or grade level with loneliness, Galanaki and Kalantzi-Azizi (1999) stated that sixth graders were lonelier compared to fourth graders, and Parkhurst and Asher (1992) reported that adolescents experienced more loneliness compared to primary school students.

Margalit (1994, as cited in Solomon, 2000) indicated that different reaction patterns can be observed when children are experiencing loneliness. The first reaction pattern is observed in behaviors such as passively feeling sadness, crying, oversleeping, sitting idly, overeating (binging), or watching TV. While other reaction patterns in children may include looking for activities to form social connections, calling friends on the phone, and asking for support from teachers, family, or an adviser to find friends, they may also take the form of seeking solitary activities or hobbies. In addition to these, children can also react to loneliness by becoming angry and aggressive, arguing with peers, or displaying destructive behaviors.

Different theoretical perspectives were set forth to conceptualize and explain the concept of loneliness which is observed in different periods of life starting from childhood. The Cognitive Processes Approach, which is a relatively new perspective, asserts that loneliness is caused by an individual's perceived dissatisfaction regarding social relationships. In other words, loneliness is experienced when individuals perceive a discrepancy between desired social relationships and existing ones (Terrell-Deutsch, 1999). By adopting an individualistic perspective on loneliness, this approach focuses more on how individuals perceive their social life and relationships rather than how others perceive the individual. The Social Needs Approach, pioneered by Sullivan, Bowlby, and Weiss (as cited in Terrell-Deutsch, 1999), regards loneliness as a reaction to deficiencies in relationships. This approach suggests that the need for attention and closeness inherent in human nature continues throughout life, starting with infancy, and loneliness will occur whenever these needs are not met. Weiss (1973, as cited in Terrell-Deutsch, 1999) distinguished between two types of loneliness, emotional and

social. Emotional loneliness is experienced in the absence or loss of close emotional connections which generate acceptance, attention, trust, or feelings of being understood. Social loneliness is caused by a lack of social relationships (a social network) through which an individual shares common interests and activities. Cassidy and Berlin (1999) report that Bowlby's Attachment Theory contributes to our comprehension of the foundations of loneliness. Attachment Theory claims that the quality of parental attachment formed during early years affects a child's ability to form close and satisfying relationships with others in the future. Mental models formed by children about the primary caregiver as sensitive or insensitive to children's needs for attention and comfort determine the quality of attachment and also affect the mental models formed by children about themselves and others. Cassidy and Berlin, who reviewed studies on preschool and school-age children, reported that a child's quality of attachment is related to their peer relationships and loneliness. These studies showed that children who developed secure attachment in infancy had higher social competence regarding their peers, displayed less problem behaviors, and were more accepted by their peers. On the other hand, children who could not develop secure attachments had low self-worth, low self-competence, and experienced more loneliness. In the last few decades, views about the connections between loneliness and family systems have had prominence in psychological literature. The early social and emotional development of a child takes place in the family environment (Solomon, 2000). Parental relationships, family environment, interpersonal relationships, and difficulties experienced by the family affect children's social behaviors and attitudes. According to Social Learning Theory, children observe and imitate the behaviors of important figures around them. Since family plays a crucial role for children in learning social behaviors, it can be said that it is also highly effective in forming peer relations (Solomon, 2000). As an important indicator of social competence in children (Cassidy & Asher, 1992), positive relationships with peers are closely related to peer acceptance (Baydık & Bakkaloğlu, 2009). Children who are rejected by their peers experience more loneliness and dissatisfaction from social relationships compared to children who are accepted by their peers (Asher & Wheeler, 1985; Cassidy & Asher, 1992; Crick & Ladd, 1993). Many children who are socially rejected do not have a lot of friends due to a lack of social skills, and

they also display problem behaviors that prevent them from forming relationships (Bullock, 1993). Exclusion from peer activities at school and having no friends may result in loneliness whereas having at least one friend in the classroom ensures the provision of emotional support (Asher, Parkhurst, Hymel, & Williams, 1990). In their study on 3rd through 5th graders, Parker and Asher (1993) found that children with close friends in the classroom generally experience less loneliness compared to children with no close friends in the classroom.

Development of social competence and the ability to form and continue positive interpersonal relationships play an important role for children in receiving positive feedback and constructing a positive self-image (Sucuoğlu & Çifci, 2001). Studies have shown that a child's self-perception is related to loneliness and children who, rather than blame it on external factors, feel responsible for failure in social relations experience more loneliness (Crick and Ladd, 1993). Children who feel responsible for the difficulties experienced in social relations believe that they are socially incompetent and may quit their efforts at establishing positive social relationships with peers. This may result in an increase in social withdrawal and feelings of loneliness (Renshaw & Brown, 1993). On the other hand, lonely children may also perceive themselves negatively. Hymel, Rubin, Rowden, and LeMare (1990) reported that loneliness in children is related to low self-efficacy and negative self-perception.

Studies that aimed to investigate the peer relationships of children with disabilities as well as typically developing children mostly present findings that children with disabilities are generally at a greater risk for loneliness compared to typically developing children (Luftig, 1988; Williams & Asher, 1992). While 10-16% of typically developing children experience loneliness (Asher, Hymel, & Renshaw, 1984), this rate can increase up to 25% in children with intellectual disabilities due to the lack of peer acceptance (Luftig, 1988). Children with special needs attending inclusive classrooms are expected to have their social competence enhanced and to gain peer acceptance by engaging in positive social interactions with their peers (Dyson, 2005). Studies report that children with special needs have inadequate social skills, more problem behaviors, and difficulty in forming appropriate social relationships when compared to their typically developing peers (Sabornie & Beard, 1990, Sucuoğlu & Özokçu, 2005). Overall, it is observed that these children are less often accepted, more

often rejected by their peers (Baydık & Bakkaloğlu, 2009; Guralnick, Conner, Hammond, Gottman, & Kinnish, 1996; Koster, Pijl, Nakken, & Van Houten, 2010; Odom et al., 2006; Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010), and have increased levels of loneliness (Bakkaloğlu, 2010; Heiman & Margalit, 1998; Jobe & White, 2007; Pavri & Monda-Amaya, 2000; Williams & Asher, 1992) than typically developing children.

It is indicated that loneliness experienced in school environments have short and long term negative consequences on the social-emotional adjustment of children and may lead to academic failure, early drop-outs, anxiety, and depression accompanied by thoughts of suicide, delinquent behaviors, psycho-somatic diseases and development of negative self-perceptions (Bullock, 1993; McWhirter, 1990; Parker & Asher, 1987). Therefore, it is crucial to identify symptoms of loneliness earlier and provide appropriate interventions in order to prevent chronic and serious cases of loneliness (Margalit, 2010).

Several techniques such as observation, interviews, and rating scales are commonly used to assess loneliness in children (Pavri, 2001). With the observation technique, children are observed in the playground, during breaks, and in the classroom. Following this process, the observer evaluates whether the child is lonely or not by taking the child's behaviors such as shyness or playing alone into consideration. On the other hand, peer relations, social status in the group, and loneliness are assessed using sociometric methods such as informal interviews with peers, peer ratings, and peer nominations. In addition to these, information collected from rating scales and interviews held with people who interact with the children in or out of school such as teachers, parents, and others are used to assess loneliness. Children without close friends are regarded as lonely in several studies that have been conducted on the assessment of children's loneliness (Cassidy & Asher, 1992; Parker & Asher, 1993; Pavri & Monda-Amaya, 2000) whereas other studies have reported that loneliness is related to peer acceptance (Asher et al., 1984; Asher & Wheeler, 1985; Cassidy & Asher, 1992; Parkhurst & Asher, 1992; Yu, Zhang, & Yan, 2005). The quality of peer relations and peer acceptance contributes differently to the predictions of children's loneliness (Burgess, Ladd, Kochenderfer, Lambert, & Birch, 1999). It is stated that loneliness is a subjective experience even though it is related to, but not synonymous with, objective concepts such as social isolation and social rejection (Coplan, Closson, & Arbeau, 2007).

Although a lack of peer acceptance is closely related to loneliness in general, it is observed that children who have low acceptance may have some close friends and are satisfied with these relationships (Parker & Asher, 1993), whereas popular children in a peer group may sometimes experience high levels of loneliness (Asher et al., 1984). Asher et al. (1984) asserted that a child's own awareness of peer acceptance may mediate the relationship between peer acceptance that is sociometrically measured and loneliness since some children with poor awareness of being accepted at a low level in the group may not express dissatisfaction with social relations. On the other hand, although it is observed that some children enjoy playing alone and do not feel lonely while doing so, others may feel loneliness even when they are among peers (Coplan, Prakash, O'Neil, & Armer, 2004).

Asher et al. (1984) stated that the difficulties experienced by children in peer relations are usually determined by external sources such as sociometric measurements obtained from peers or rating scales completed by teachers. It would, however, be more suitable to gather information from the children themselves to assess loneliness. Several self-report measures were developed to assess loneliness in children. The Children's Loneliness and Dissatisfaction Scale (CLDS; Asher et al., 1984; Asher & Wheeler, 1985), the Louvain Loneliness Scale for Children and Adolescents (LLSCA; Marcoen, Goossens, & Caes, 1987, as cited in Goossens & Beyers, 2002), the Relational Provisions Loneliness Questionnaire (RPLQ; Hayden-Thomson, 1989, as cited in Goossens & Beyers, 2002), and the Children's Multidimensional Loneliness Scale (CMLS; DeBiase, 1992, as cited in Goossens & Beyers, 2002) are some of the major scales developed for primary school-aged children. Goossens and Beyers (2002) indicated that the basis of developing a series of scales to assess loneliness in children is related to researchers' desire to determine what types of loneliness are experienced by children in various social contexts such as family or peer relations and to examine which variables are related to loneliness. The CLDS focuses on peer-related loneliness whereas the LLSCA, RPLQ, and CMLS include subscales to determine loneliness experienced in peer or parental (family) relations, and the LLSCA also contains the *aversion to being alone* and *affinity for being alone* subscales. Results of confirmatory factor analysis that were concurrently carried out by Goossens and Beyers on three separate sample groups to compare the above mentioned scales supported that loneliness

related to parents and peers are two different constructs. In the same study, the *loneliness related to peers* subscale of the LLSCA and CLDS were both found to have higher internal consistency when compared to the other scales. These authors reported that researchers and clinicians may use the appropriate scale by taking the psychometric properties of the scales and the dimension of child loneliness that interests them into consideration.

The Children's Loneliness and Social Dissatisfaction Scale (CLDS), developed by Asher et al. (1984) to evaluate 3rd through 6th graders' feelings of loneliness and dissatisfaction from social relationships, is one of the most widely used scales in this field. The scale includes items about children's feelings of loneliness (e.g., "*I feel alone*"), their perceptions of social competence or incompetence (e.g., "*I get along well with other children*") and their subjective estimation of their status in peer groups (e.g., "*I have many friends*"). Although some items are expressed in a manner that can be interpreted in relation to peer and family contexts, the majority of the items focus on peer relations. Based on the cognitive processes approach, the scale contains items that represent children's cognitive appraisals and perceptions related to social relations, whereas based on the social needs approach, it also includes items that represent both social loneliness (e.g., "*I am well-liked by my friends*") and emotional loneliness (e.g. "*There is no one I can talk to*"). The scale does not differentiate among the types of loneliness or the social contents in which loneliness is experienced, and a single score that indicates whether the child is lonely or not is obtained on a continuous dimension (Terrell-Deutsch, 1999). Although the scale consists of items focusing on different aspects of loneliness, factor analysis results provided by Asher et al. (1984) indicated that the scale has a primary factor in which the items are loaded with high values. Previous studies showed that the CLS has a consistent factor structure in different samples, high internal consistency, and has good level of test-retest reliability, and therefore has highly sufficient psychometric properties (as cited in Terrell-Deutsch, 1999). Asher and Wheeler (1985) made modifications to the expressions of some items in CLS (e.g., "*I feel alone at school*" instead of "*I feel alone*") in order to use the scale for evaluating loneliness at school. Parkhurst and Asher (1992) examined the psychometric properties of the scale on students in secondary schools, and Cassidy and Asher (1992) reviewed the scale with 5 through 7 year old children and stated that these children could express loneliness and dissatisfaction from peer relations.

The CLS is used in various studies to assess loneliness in children with disabilities in addition to typically developing children (Bakkaloğlu, 2010; Heiman, 2002; Heiman & Margalit, 1998; Wiener & Tardif, 2004; Williams & Asher, 1992). However, related literature predominantly includes studies that examine the psychometric properties of the scale for typically developing children at different ages, grade levels, gender, and ethnic origin. The CLS, revised by Asher and Wheeler (1985), was adapted for Turkish culture by Kaya (2005) and the reliability and validity of the scale was examined on typically developing children attending 3rd through 8th grades. Therefore, it can be said that information about the use of the CLS in assessment of loneliness in children with special needs is very limited for Turkish culture. Hence, the current study set out to investigate the psychometric properties of the CLS on a group of 4th and 5th graders composed of students with and without special needs attending inclusive classrooms. This study examined the factor structure of the scale by using exploratory and confirmatory factor analysis and later compared the loneliness levels of children with and without special needs in order to determine the discriminant validity of the scale. Internal consistency and test-retest reliability analyses were conducted in order to determine the reliability of the CLS.

Method

Participants

The study group was composed of a total of 705 students attending fourth and fifth grade in inclusive classrooms in the provinces of Bolu and Denizli. Of these participants, 554 (78.6%) of them were typically developing students, whereas 151 students in the sample were officially diagnosed as having special needs by a formal institution and had been placed in inclusive education by the Guidance and Research Centers. Of these students, 106 of them were diagnosed with a mild intellectual disability, 24 with a physical disability, 9 with a mild hearing impairment, 7 with a learning disability, 3 with attention deficit hyperactivity disorder and 2 with a language and speech disorder. In the study group, 360 (51.1%) of the students were females and 345 (48.9%) were males. The ages of students ranged from 9 through 13 ($X = 10.8$, $SD = 0.77$). The distribution of students based on grade level is as follows: 348 (49.4%) were fourth graders and 357 (50.6%) were fifth graders.

Prior to commencement of the study, permission to conduct the study and a list of schools that have inclusive classrooms were obtained from the Directorates of National Education of both provinces. School principals and class teachers of participating schools were contacted in order to explain the purpose of the present study and their support was requested to have their students participate in the study.

Participants were recruited from ten randomly selected primary schools (for a total of 16 inclusive classrooms, half of them from 4th grade and the other half from 5th grade). Although there is no available socioeconomic index for each province, participating schools were selected from regions thought to represent a different socioeconomic status. An adequate number of typically developing students was recruited from the participating schools, whereas the number of students with special needs was not found sufficient to conduct the study and therefore more students with special needs were recruited from other schools that had inclusive classrooms as well.

Instruments

Children's Loneliness Scale: The Children's Loneliness Scale is a self-report questionnaire developed by Asher et al. (1984) to assess 3rd through 6th graders' feelings of loneliness and later reviewed by Asher and Wheeler (1985). It was used in the study as a data collection tool. Asher and Wheeler modified the expressions of some items from the original scale to reflect school-based loneliness (e.g., "*I feel alone at school*" instead of "*I feel alone*").

The Turkish adaptation study was conducted on typically developing students in grades 3 through 8 by including 7th and 8th graders (Kaya, 2005). The current study utilized the Turkish version of the CLS as translated by Kaya with permission from the author.

The original scale is composed of 24 items. 16 of them focus on children's subjective assessment of feelings of loneliness (e.g., "*I feel alone at school*"), their perceptions of social competence (e.g., "*I'm good at working with other children in my class*"), and their status among peers (e.g., "*I am well-liked by my classmates*"). There are 8 filler items in the scale (2, 5, 7, 11, 13, 15, 19, and 23) where students' hobbies and preferred activities (e.g., "*I like music*") were asked in order for the students to feel better while completing the scale. These items were not taken into consideration during scoring. Children

responded to the items on a 5-point Likert-scale ranging from "1: Always true", "2: True most of the time", "3: Sometimes true", "4: Hardly ever true" to "5: Not true at all." Some of the items in the scale (1, 4, 8, 10, 16, 22) were scored in the order (1 to 5) provided above while other items (3, 6, 9, 12, 14, 17, 18, 20, 21, 24) were reverse scored (5 to 1). The total score can range from 16 to 80, with higher scores indicating greater loneliness (Kaya, 2005).

Personal Information Form: Information regarding the gender, age, and grade level of participating students was collected via the Personal Information Form prepared by researchers.

Procedure

Data was collected from students with and without special needs attending 4th and 5th grade inclusive classrooms. Formal permission was obtained for data collection prior to the study. Before the administration of the CLS, students were informed that the aim of the questionnaire is to get to know the students and their relationship with their peers. Participants were also instructed on how to complete the scale and their questions were answered. The CLS was administered to students in about 15-20 minutes during a class session. As classroom teachers informed the researchers that students with special needs had average literacy skills, they were therefore given the scale in the classroom environment to complete themselves. However, students who had difficulty were given verbal help on completing the scale. Students with special needs who were recruited from schools besides the participating 16 classrooms filled in the scale individually or in small groups in a separate room that was appointed by the school principles. Procedures for CLS administration mentioned above were followed with these students as well.

Statistical Analysis

After data collection, incomplete or erroneously filled forms were excluded from analyses. Reliability and validity analyses of the CLS were conducted on data obtained form 705 students with and without special needs. Of these students, data from 48 students was used in the test-retest analysis and the remaining 657 students' data was included in the following analyses. In order to examine the factor structure of the CLS, SSPS was used to undertake exploratory factor analysis (EFA) by using the principal components analysis method, followed

by confirmatory factor analysis (CFA) performed with the LISREL 8.54 program. Loneliness levels of students with and without special needs were compared with the criterion group method to examine the discriminant validity of CLS. Whether group score distributions met the assumptions of parametric tests was investigated for this comparison. The results obtained from Levene's test regarding the homogeneity of variances showed that variances for the CLS scores of students with and without special needs were not equal ($F_{1,655}$ = 36.57, p = .000). On the other hand, the fact that the skewness and kurtosis values of the data obtained from typically developing students was higher than 1 and the results obtained from the Kolmogorov-Smirnov test were found to be significant pointed to a distribution that was not normal (Büyüköztürk, 2007). Since the data did not meet the basic assumptions of the t-test for independent samples, the CLS scores of students with and without special needs were compared by using a non-parametric test, the Mann Whitney-U test. Cronbach's alpha internal consistency coefficient and the Pearson correlation coefficient for item-total correlations were calculated to examine the reliability of the CLS. The test-retest reliability coefficient of the CLS was calculated using the measurements obtained from 48 typically developing students attending the fourth and fifth grades in two-week intervals to examine the stability of the CLS scores. Since students with special needs who participated in this study attended many different schools and a second administration of the CLS would have required too many visits to these schools, due to time constraints, it was not possible to administer

the CLS for a second time to students with special needs. Therefore, the test-retest reliability was not examined on students with special needs.

Results

Findings regarding the validity of the CLS

Results of Exploratory Factor Analysis (EFA): Exploratory factor analysis was performed to examine the factor structure of the CLS. Prior to factor analysis, the Kaiser-Meyer-Olkin (KMO) measure and Barlett's test of sphericity were utilized to examine the appropriateness for factor analysis of data obtained from 657 students for the 16 primary items excluding the filler items from the CLS. KMO values over .60 and the significance of the Barlett's test result indicate appropriateness of data for factor analysis (Büyüköztürk, 2007). In the current study, results such as a .91 KMO value and the significance of Barlett's test result (X^2 = 3004.985; sd = 120, p < .01) indicated appropriateness for factor analysis. The Principal Components Analysis (PCA) showed that 16 items in the scale were loaded into three factors whose eigenvalues were greater than 1. These three factors explained 50.58% of the total variance. The first factor composed of twelve items had an eigenvalue of 5.45 and explained 34.06% of the total variance, the second factor composed of two items had an eigenvalue of 1.54 and explained 9.61% of the variance, and the third factor again composed of two items had an eigenvalue of 1.10 and explained 6.92% of the variance. Cronbach's alpha coefficient that indicates the internal consistency of the scale was found to be .97 for

Table 1

Exploratory Factor Analysis and Item-Total Correlation Results of the CLS

Item No	Items	Factor I	Factor II	Factor III	Item-Total Correlation
18	There is nobody at school I can go to when I need help.	.70			.62
21	I am lonely at school.	.69			.61
14	I do not have anyone to play with at school.	.69			.61
12	I believe nobody at school likes me.	.68			.59
9	I feel alone at school.	.67			.59
24	I do not have any friends in the classroom.	.65			.57
20	I do not get along with the children at school.	.61			.53
17	I feel left out of things at school	.61			.53
3	There is nobody in class that I can talk to.	.54			.47
8	I have plenty of friends in the classroom.	.54			.47
16	I get along well with my classmates.	.53			.46
4	I'm good at working with other children in my class.	.49			.43
1	It is easy for me to make new friends at school		.60		.33
10	I can find a friend when I need one.		.47		.38
6	It is hard for me to make new friends at school.			.57	.44
22	I am well liked by my friends.			.51	.39

the whole scale and was calculated at .86 for the first factor, .48 for the second factor, and .22 for the third factor. The results of EFA and item-total correlations are presented in Table 1.

Principal Components Analysis (PCA) results showed that factor loadings of all items in the first factor were between .37 and .70. *Item 1* and *item 10* in the second factor were also loaded into the first factor with their respective .37 and .44 loadings while *item 6* and *item 22* in the third factor were loaded into the first factor with their respective .50 and .47 loadings. Examination of the two items both in the second and in the third factors displayed that one of the items in each factor focused on children's perceptions of their own social competence, and the other focused on subjective estimates regarding status among their peers. Item-total correlations for the second and third factors were found to be .32 and .13 respectively and Cronbach's α coefficient for the second and third factors were calculated as .48 and .22 respectively indicating a low internal consistency for these factors. Therefore, in light of these findings, conceptualization of second and third factors as significant and separate dimensions was considered to be inappropriate. A highly accelerated drop following the first factor was observed while low drops after the second and third factors were observed in the scree plot. This finding indicates a primary factor in the scale, in other words, a single dimensional construct (Büyüköztürk, 2007). The first criterion for a scale to have a single dimension is related to the variance explained by the first factor which is at least 30% of the total variance, and the second criterion

is related to the size of the eigenvalue of the first factor which is 3 to 3.5 times larger than the second factor (Doğan, 2002, as cited in Kaya, 2005). In this study, variance explained by the first factor in the CLS was found to be 34.06% of the total variance and the eigenvalue of this factor (5.44) is three times larger than the eigenvalue of the second factor (1.53) in the PCA. Since both criteria are sufficiently met, the scale can be accepted as a single dimensional construct. On the other hand, item-total correlations were found to be between .33 and .62 (*See* Table 2). Since these correlation coefficients, also regarded as item discrimination level, were found to be over .30, which is the generally accepted level (Tavşancıl & Keser, 2002), none of the items were excluded from the scale.

Results of Confirmatory Factor Analysis (CFA): EFA of the current study showed that the CLS has a single factor structure which is consistent with most of the findings from previous studies that indicated a single factor structure (Asher et al., 1984; Asher & Wheeler, 1985; Cassisy & Asher, 1992; Kaya, 2005) Confirmatory factor analysis (CFA) was also conducted on the 16 primary items to examine whether the single dimensional construct was confirmed. CFA aims to examine the extent of validation of a previously identified or designed construct by the collected data (Çokluk, Şekercioğlu, & Büyüköztürk, 2010). At the end of the first analysis, the chi-square value, an indicator of goodness-of-fit, was found to be 623.67, $sd = 104$, chi-square / $sd = 5.99$, the root mean square error of approximation (RMSEA): 0.087, the normed fit index (NFI): 0.92, the non-normed fit index (NNFI):

Table 2
Results of Confirmatory Factor Analysis

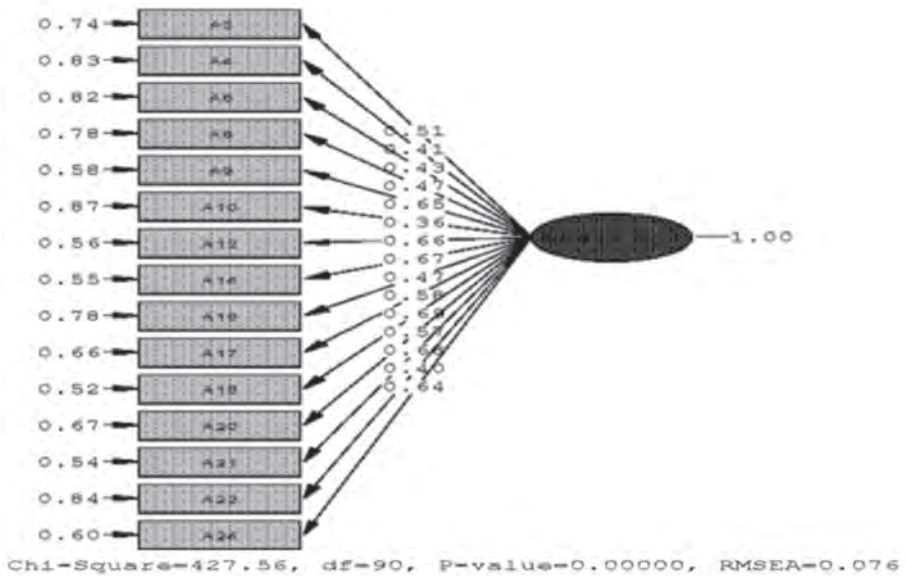| Constructs	Cronbach's Alpha	Variables	Standardized Values λ	*t*-Value
		A3	0.51	13.11
		A4	0.41	10.39
		A6	0.43	10.76
		A8	0.47	11.95
		A9	0.65	17.66
		A10	0.36	9.04
		A12	0.66	18.21
Children's Loneliness Scale	.87	A14	0.67	18.46
		A16	0.47	11.98
		A17	0.58	15.53
		A18	0.69	19.21
		A20	0.57	15.13
		A21	0.68	18.86
		A22	0.40	10.09
		A24	0.64	17.26

$p < .01.$

Figure 1: Path diagram for the Confirmatory Factor Analysis of the CLS.

0.93, the comparative fit index (CFI): 0.94, the incremental fit index (IFI): 0.94, the standardized root mean square residual (SRMR): 0.064, and the goodness-of-fit index (GFI): 0.89. These findings showed that fit indices of the one-factor model were relatively poor. Based on these findings, *Item 1* ("*it is easy for me to make new friends at school*") with a lower standardized coefficient of .30 and a t value of 7.38 compared to other items was excluded from the model. Goodness-of-fit indices recalculated for the model were as follows: chi-square value: 427.56, sd: 90, chi-square value / sd = 4.75, *RMSEA:* 0.076, *NFI:* 0.94, *NNFI:* 0.95, CFI: 0.95, IFI: 0.95, *SRMR:* 0.055 and *GFI:* 0.92. These findings showed that the one-factor model had acceptable limits of goodness-of-fit indices (Çokluk et al., 2010; Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999). Therefore, it is observed that the single dimensional structure obtained via the PCA was confirmed by the findings of the CFA. Table 2 presents the CFA results and Figure 1 displays the path diagram results.

Construct validity analyses of the 15 variables in the CLS included homogeneity and convergent validity analysis representing the measurement of the construct by each observed variable. CFA results showed that variables observed under the single factor structure were significant ($t > 1.96$) and standardized coefficients ranged between .36 and .69 which supports convergent validity. Correlations among variables ranged between .12 and .40 were found to be significant ($p < .01$).

Discriminant Validity of the CLS: Discriminant validity of the CLS was investigated using the criterion group method. Most of the previous studies reported that students with special needs in inclusive classrooms experience more loneliness compared to their typically developing peers (Bakkaloğlu, 2010; Heiman & Margalit, 1998; Jobe & White, 2007; Pavri & Monda-Amaya, 2000; Valas, 1999; Williams & Asher, 1992). Based on this common finding, the current study examined whether the CLS distinguishes between students with and without special needs attending 4th and 5th grade in terms of the levels of loneliness. The Mann-Whitney U test results showed a significant difference between the loneliness scores of typically developing students ($n = 506$) and students with special needs ($n = 151$) ($U = 1.99$, $p = .000$), and the mean rank of students with special needs (450.03) was higher than that of typically developing students (292.88). This finding indicates that students with special needs experience more loneliness than their typically developing peers and also provides support for the discriminant validity of the CLS.

Findings Regarding the Reliability of the CLS

Internal consistency and test-retest reliability analysis were performed to examine the reliability of the CLS. The internal consistency coefficient (Cronbach's α) was calculated as .87 for 657 students with ($n = 151$) and without ($n = 506$) special needs,

as .84 for typically developing students, and as .86 for students with special needs on the basis of the 15 items determined by the CFA in the scale. As another indicator of internal consistency, it was found that item-total correlations for the 15 items ranged between .36 and .63. Test-retest reliability analysis was conducted to examine stability in the CLS scores. For this purpose, a group of 48 typically developing students attending 4th and 5th grade (21 females and 27 males) was administered the scale in two-week intervals and the Pearson correlation coefficient was found to be .83.

Discussion

This study examined the psychometric properties of the Children's Loneliness Scale (CLS) on students with and without special needs attending the fourth and fifth grade. The CLS, a self-report measure, was developed by Asher et al. (1984) to assess children's loneliness and social dissatisfaction, and it was later revised by Asher and Wheeler (1985) to evaluate school-based loneliness. In the present study, a series of analyses were conducted on the scale in order to evaluate the validity and reliability of the CLS.

Validity of the CLS was examined via construct validity and discriminant validity. Exploratory factor analysis (EFA) was performed on data obtained from students with and without special needs in order to determine the construct validity of the scale. EFA results showed that all 16 items in the CLS that assessed children's loneliness and social dissatisfaction were loaded into the first factor with values ranging between .37 and .70, therefore the scale could be regarded as having a single dimensional construct. In addition to the study conducted on the original scale by Asher et al. (1984), a majority of studies that examined the factor structure of the CLS (Asher & Wheeler, 1985; Cassidy & Asher, 1992; Kaya, 2005) showed that the EFA results of the scale pointed to a single factor structure. Validity and reliability analyses of the Turkish version of the scale were undertaken by Kaya (2005) separately for 3rd and 4th grades, and 5th through 8th grades. Factor analysis results of the scale for the 3rd and 4th grades showed that 5 items from the scale were not suitable for this age group and the analysis that was repeated for the remaining 11 items showed that the scale pointed to a single factor structure. Results of the EFA on 15 items (after excluding *Item 1* from the scale) for 5th through 8th grades also presented a single factor structure as was the case with the original scale. Results of the current study also support the

findings related to a single dimensional construct of the CLS as found by Kaya for 5th through 8th grades.

Validity of the single factor structure of the CLS reported as a result of the EFA was also examined using confirmatory factor analysis (CFA). At first, the CFA was conducted on 16 items, however, fit indices were not found to be satisfactory and therefore *Item 1* was excluded from the analysis. When CFA was repeated after the exclusion of *Item 1*, fit indices for one-factor model were found to be at accepted levels. In this case, one of the model goodness-of-fit criteria; X^2/sd value = 4.75 was obtained. Based on chi-square statistics, since model goodness-of-fit up to 5 is reported to be acceptable (Hooper et al., 2008), it can be stated that the one-factor model in this study fit the data well. Considering that the SRMR value should be smaller than .05 as an indicator of goodness of fit (Hooper et al., 2008), the SRMR value obtained in this study (.055) provided support for the suitability of the model. It is suggested that GFI, CFI, NFI and NNFI values should be close to 1 and the RMSEA value should be smaller than .08 in order for the model to fit to the data (Çokluk et al., 2010; Hooper et al., 2008). In the present study, goodness-of-fit indices were found to be GFI (.92), CFI (0.95), NFI (0.94), NNFI (.95) and RMSEA (.076). It can be said that these fit indices point out that the one-factor model of CLS fit the data well. On the other hand, in their study on a student group whose ages range from 11 to 13 from different ethnic backgrounds, Bagner, Storch, and Roberti (2004) found that the scale had a two-factor construct (*Loneliness and Social Satisfaction*) via CFA. Authors stated that this finding may be explained by the fact that the study group was dominantly composed of students with different ethnic backgrounds and suggested that the factor structure of the scale should be examined further on children of different ethnic origins. The results of the current study, consistent with most of the previous studies (Asher & Wheeler, 1985; Cassidy & Asher, 1992; Kaya, 2005), supports that the CLS has a single dimensional construct.

In the present study, exploratory and confirmatory factor analyses were performed on the database collected from the same group instead of separate groups since there were a limited number of students with special needs attending the 4th and 5th grades in participating schools with inclusive classrooms. Therefore, this can be regarded as a limitation of the study. It would be feasible to examine whether the single dimensional construct of the CLS would be confirmed for separate samples that include students

with special needs. The criterion group method was used to determine the discriminant validity of the CLS and whether the scale distinguishes between students with and without special needs attending 4th and 5th grade in terms of their level of loneliness. Analysis results showed that the loneliness scores of students with special needs were significantly higher than those of typically developing students. This finding, which is consistent with the findings of previous studies (Bakkaloğlu, 2010; Heiman & Margalit, 1998; Jobe & White, 2007; Pavri & Monda-Amaya, 2000; Valas, 1999; Williams & Asher, 1992), also supports the discriminant validity of the CLS. Some studies that examined the discriminant validity of the CLS (Asher et al., 1990; Kaya, 2005) by investigating the relationship between sociometric peer ratings and scores obtained from the scale found that children's loneliness scores differed significantly based on their sociometric status, and that the loneliness scores of rejected children were higher than those of popular children. A lack of sociometric data gathered from peers may be regarded as a limitation in the current study. Use of multiple sources of information such as sociometric measures obtained from peers, teacher assessments, and observational techniques in addition to the CLS, may contribute to eliminate the limitations of the self-report method in future studies (Goossens & Beyers, 2002). On the other hand, relationships between children's loneliness levels determined through the CLS and variables such as depression, self-concept, social skills, and problem behaviors may also be examined in order to obtain more information about the validity of the scale.

Cronbach's alpha coefficient as an indicator of internal consistency of the CLS was found to be .87 for the whole group composed of students with and without special needs, as .84 for typically developing students, and as .86 for students with special needs. These values, which point to a high internal consistency in both groups, are similar to the alpha coefficients between .78 and .90 reported in other studies (Asher et al., 1984; Asher & Wheeler, 1985; Cassidy & Asher, 1992; Demir & Tarhan, 2001; Galanaki, Polychronopoulou, & Babalis, 2008; Goossens & Beyers, 2002; Kaya, 2005; Kumar & Vellymalay, 2010). The test-retest

reliability coefficient of .83 obtained from typically developing students was higher than .70, which is a value generally reported to be acceptable (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, & Demirel, 2008), and it can be regarded as an indicator of stability for the CLS scores. However, examination of the test-retest reliability of the CLS only on a group of typically developing students may be regarded as another limitation of this study. Test-retest reliability was not examined on students with special needs since a second administration of the CLS would have required too many visits to the schools of these students. Due to time constraints, the re-test of the CLS could not be performed on students with special needs. Future studies may include data from students with special needs in inclusive classrooms to examine whether the scale provides consistent measures.

Dissatisfaction from peer relations at school is considered to be one of the important factors that may lead to loneliness (Yu et al., 2005). Children who cannot form positive social relationships with peers are at greater risk for loneliness (Asher et al., 1990). Studies show that students with special needs in inclusive classrooms have more difficulties in relationships with their peers and have higher levels of social dissatisfaction than their peers (Frostad & Pijl, 2007; Koster et al., 2010). Therefore, it is important to identify the loneliness levels of students with special needs and implement intervention programs to eliminate loneliness in the students who are at a greater risk for loneliness (Asher & Wheeler, 1985; Heiman & Margalit, 1998) in order to prevent the short and long-term negative effects of loneliness on children's psycho-social adjustment. The findings regarding the validity and reliability of the CLS in the current study show that the scale is an instrument that can be used to assess levels of loneliness in 4th and 5th grade students with or without special needs. The CLS can be used in studies that examine direct and mediating factors contributing to loneliness in children. Especially in educational settings, the effectiveness of social skills training programs on eliminating loneliness in children who have high levels of loneliness can be evaluated by the CLS.

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