International J. Soc. Sci. & Education
2014 Vol.4 Issue 2, ISSN: 2223-4934 E and 2227-393X Print

A Study on Problem Solving Skills of Children Attending Nursery School

By

Vuslat Oğuz and Aysel Köksal Akyol
İnönü University, Health Care Profession High School,
Child Development Programme 44280 Malatya/Turkey

Abstract

In this research, it is aimed to determine whether problem solving skills of 60-72- month-old children attending a nursery school change as regards gender, birth order, the duration of nursery school attendance and the number of children in the family. The sample of 204 children consisting of 60-72 month-old children attending a nursery school are interviewed. Data is collected by means of the Personal Information Form and the Problem Solving Skills Scale (PSSS). The Mann-Whitney U test and the Kruskal Wallis test are used for the statistical analysis. According to the results, it is obtained that gender, birth order, the duration of nursery school attendance and the number of children in the family do not significantly affect the problem solving skills of children (p>.05).

Key words: *Problem solving skills, nursery school*

1. Introduction

During certain periods of his life, a child encounters small or large problems in various forms (Eskin, 2009). In order for the development of problem-solving skills in a child, he may need to face many similar and different problems. The child facing a problem starts producing alternative solutions on how to solve the problem, and thus his awareness on how to handle the problem increases. When the child faces the problem again, his ability to solve it will have increased (Oğuz & Köksal Akyol, 2012).

A problem is defined as an obstacle, difficulty, or hardship encountered by organisms during a certain process (Bingham, 1983; Duman, 2009; Huilt, 1992; Stevens, 1998). Problems are invaluable opportunities for children during their education and learning processes. As children find alternative solutions to existing and probable problems, their self-respect develops. To be able to solve problems effectively, actively, correctly and logically, the problem should first be perceived, felt and defined; then, hypotheses for solutions should be developed, solution alternatives should be considered and finally, the solution should be effected (Duman, 2009). Problem-solving is a process of overcoming the difficulties encountered while achieving a target. It is an ability that needs learning and acquiring (Aksu, 1998; Bingham, 1983). According to Stevens (1998), problem-solving is the name of the process used to remove the obstacles to be able to transfer from one situation to another, which is the preferred situation. Individual differences are influential on the problem-solving process (Arenofsky, 2001; Sardoğan, Karahan & Kaygusuz, 2006). At this point, personal traits of children also become important and children solve their problems according to their own personal characteristics.

Some research has studied the impacts of problem-solving education and interpersonal problem-solving programs on interpersonal problem-solving skills of pre-school children; the effects of problem-solving education on 5-year-old children's acquiring problem-solving skills, and the permanence of the effects of education provided for pre-school children on solving interpersonal problems (Dinçer Atilla, 1995; Dinçer & Güneysu, 1997, 2001; Özdil, 2008). There are also various studies on problem-solving skills of six-year-old children (Akkaya, 2006; Altun, Dönmez, İnan, Taner & Özdilek, 2001; Anlıak & Dinçer, 2005; Can Akbaş, 2005; Dereli, 2008; Kargı, 2009; Şahin, 2009; Şahin & Yıldırım, 2006; Tavlı, 2007;

Yıldırım, 2007). Research conducted in other countries were also examined and the following studies were determined: the behavior of pre-school children on finding new solutions through problem-solving (Klahr & Robinson, 1981), the effect of home interaction of a mother and child on problem-solving (Frankel & Bates, 1990; Freund, 1990), how a duty assigned to the child affects his problem-solving skills (Thornton, 1999), the development of metacognitive skills in a problem-solving situation in which pre-school children and children between six and eight years are involved (Annevirta & Vauras, 2006), socio-cultural problem solving skills in high intellectual preschoolers (Nellis & Gridley, 2000), gender influences on preschool children's social problem-solving strategies (Walker, Irving & Berthelsen, 2002), parent behaviors in free-play and problem-solving interactions in relation to problem behaviors in preschool boys (Davenport, Hegland & Melby, 2008), and influences of cooperating teachers on verbal math problem-solving skills of preschool children (Tarim, 2009). There are also studies conducted to evaluate the solutions children have produced in a problematic situation, to provide education on problem-solving, and to develop scales for preschoolers' problem-solving skills (Dinçer, Anlıak, Şahin & Karaman, 2009; Ocak Anlıak & Dinçer, 2009; Ömeroğlu, Büyüköztürk & Aydoğan, 2011; Ömeroğlu, Büyüköztürk, Aydoğan & Özyürek 2009a; Ömeroğlu, Büyüköztürk, Aydoğan & Özyürek 2009b).

An examination of the said studies, which were conducted to examine the problem-solving skills of preschoolers, indicated that research focusing on the personal traits of children is inadequate. Therefore, this study considered gender, birth order, the duration of nursery school attendance and the number of children in the family to determine whether there were any differences in the child's problem-solving skills by these variables.

2. Method

This piece of research, which was conducted among 60 – 72 month-old children, is a descriptive study that aimed to determine the influence of gender, birth order, the duration of nursery school attendance and the number of children in the family on problem-solving skills of a child.

Study Group

The study group of this research is composed of 204 preschoolers – 60 to 72 months old children, 101 of whom were girls and 103 were boys – from elementary schools in the province of Malatya.

Data Collecting Instruments

The instruments used in the research were the "Personal Information Form" prepared by the researchers with the aim of collecting information about families and children, and the "Problem Solving Skills Scale (PSSS)" developed by Oğuz (2012) to determine the problem-solving skills of children.

Personal Information Form: In the "Personal Information Form" prepared by the researchers with the aim of collecting information about families and children, there are questions about the child's gender, birth order, duration of preschool attendance and the number of children in the family.

Problem Solving Skills Scale (PSSS): The scale was developed by Oğuz (2012) to determine the problem-solving skills of preschoolers. PSSS includes eighteen problem situations and eighteen drawings relevant to these problem situations. PSSS is a five-point Likert type scale. Scores between "0-4" are assigned for solutions produced for each problem situation. If no solution has been suggested, the score is "0" points; one solution suggestion is scored as "1" point; two suggestions are scored as "2" points; three suggestions are scored as "3" points and more than three suggestions are scored as "4" points. To receive points, each solution should be different from one another. The score range of PSSS is 0 – 72. The higher the PSSS score, the higher the problem-solving skills of children.

PSSS Validity: Oğuz (2012) applied the content validity index (CVI) and exploratory factor analysis (EFA) to determine the validity of PSSS. First, a pilot study was conducted. In this study, the PSSS was

administered to 20 children selected by random sampling method from among the kindergarten classes of an elementary school. Children's perception of the items and drawings were assessed and the necessary changes in them were made. Then, to determine the content validity of PSSS, eighteen items were presented to eleven experts for their points of view, and all of the items were found appropriate. In evaluating the opinions of the experts, the content validity ratio (CVR) of each item was calculated. Then, the average of the content validity ratios (CVR) was taken and the content validity index (CVI) was determined. This value was calculated for two different situations: item compliance level and the level of compliance of drawings to items. As the number of experts was eleven, the content validity of the scale, whose content validity index (CVI) value was higher than 0.59, was established. As a result of calculating the content validity index (CVI) values, the CVI for the compliance level of items was found as 0.99; and the CVI for the level of compliance of drawings to items was 0.96. These values indicate that all the items in the scale are necessary and that the content validity of the scale as a whole has been established. To determine the construct validity of the scale statistically, the exploratory factor analysis (EFA) technique has been used. First, to decide whether the scale is suitable for factor analysis or not, the Kaiser-Meyer-Olkin (KMO) Test and the Bartlett Test were conducted. The Kaiser-Meyer-Olkin (KMO) Test result was found as 0.89 and the Bartlett test of sphericity was significant ($p<0.01$). An exploratory factor analysis was applied to the scale. In the first analysis, four factors whose eigenvalues were larger than 1 were determined. It was observed that a single factor, whose eigenvalue was higher than other factors and whose explored variance was also higher, was dominant. After the factor number of the scale was determined, the factor analysis was repeated. However, as only one factor was in question, no rotation process was applied. In the exploratory factor analysis, the limit value for the factor loading of the relevant items was taken as .30. The results of the analysis indicated that there were no items with a factor loading value lower than .30. Therefore, no item was removed. The exploratory factor analysis conducted on the Problem Solving Skills Scale (PSSS) concluded that the scale was a one-factor scale. This factor accounts for 30.68 % of the total variance of the scale. The data obtained as a result of the factor analysis indicate that the validity of the scale is high.

PSSS Reliability: To determine the reliability of the scale, Cronbach Alpha Reliability Coefficient was calculated. According to the statistics calculated, as it is a one-factor scale, reliability coefficient was calculated for the whole scale and found as .86. These results show that the reliability of the scale is high. Test-retest method was employed to determine whether the scale makes consistent measurements within time. Forty of the 204 children included in the research for this purpose were decided randomly. The PSSS was re-administered to these 40 children one month later. T-Test was applied for the Pearson Product-Moment Correlation coefficient and Correlated Samples. The correlation coefficient obtained as a result of statistical procedures was .60. This coefficient is meaningful and at an intermediate degree at a level of .05. According to the results of the t test for correlated samples, the scores obtained from the first and second administrations of PSSS did not differ in a statistical meaning [$t\ (39) = 1.63$, $p>0.05$]. The findings indicate that the internal consistency of the scale is reliable, and it measures consistently in time. The results of the reliability-validity studies conclude that the "Problem Solving Skills Scale" is an appropriate measuring instrument for children at the age of 60 to 72 months old.

Analysis of Data

Analyses were conducted by means of the SPSS 16.0 (Statistical Package for Social Sciences) software used on the PSSS scores that 204 children received and the data obtained from the Personal Information form. The data were analyzed according to descriptive statistics and normality test results. When the normality test results were evaluated, Shapiro-wilk Test was used. The results of the normality test indicated that the distributions were not normal. Therefore, non-parametric tests were applied. To examine the effects of two-variable factors on the mean scores of children from the Problem Solving Scale, Mann Whitney U-test was used, and to examine the effects of more-than-two-variable factors, Kruskal Wallis Test was used.

3. Findings and Discussion

The findings of this research, which aimed to determine the influence of gender, birth order, the duration of nursery school attendance and the number of children in the family on problem-solving skills of 60 – 72 month-old children, are presented below.

Table 1 shows that the scores children received from the Problem Solving Skills Scale did not differ by their gender (U=5078.00, p>.05). Based on this finding, it can be asserted that the problem-solving skills of children are independent of their gender and every child has a specific problem-solving skill regardless of his gender.

Some researchers studied and described the effects of other factors that influence problem-solving skills irrespective of gender. Eskin (2009) asserted that an individual's attention towards a problem would depend on whether his personal traits and the characteristics of the problem overlapped or not. According to Aydın (2009), being innovative, creative, brave and open to change, as well as being able to take risks are very important personal traits in solving problems. Gürşimşek, Çetingöz and Yoleri (2009) stated that the way an individual evaluates and perceives his own problem-solving skills is an important metacognitive component that affects how he approaches and copes with difficulties in his life. Gredlein and Bjorklund (2005) found in their research, in which boys and girls were assigned a problem to solve, that gender did not cause any differences in problem-solving skills of children. Terzi Işık (2000) studied the interpersonal problem-solving skill perception in children, and she found that gender did not influence it. There are other researchers who also concluded that gender does not have an impact on problem-solving skills. (Dereli, 2008; Ertuğrul Aydoğan, 2004; Korkmaz, 2002; Kurt, 2007; Şahin, 2009; Tavlı, 2007; Terzi, 2003; Thornton, 1999). These results support our findings. In light of our findings, research results and opinions of researchers, it can be asserted that in terms of factors related to the child, the problem-solving process is affected by personal traits and the child's self-perception rather than his gender.

It was observed that the scores received from the Problem Solving Skills Scale did not differ by the birth order of the child **(**X^2 (3)= .87, p>.05). In other words, birth order did not have an impact on children's problem-solving skills. Given the effect of other factors that influence the problem-solving skills of children, this is an expected result. Among these other factors are the following: the personal traits of the child (Eskin, 2009), self-confidence (Brown, 1988), fears and shy personality structure (Bingham, 1983; Eskin, 2009), being keen on taking risks or timid personality structure (Stevens, 1998), child's belief that he can solve problems (Miller, 2000), important personality traits such as being innovative, creative, brave and open to change, as well as being able to take risks (Aydın, 2009), whether an individual sees himself self-sufficient or not (Özsoy, 2008).

As can be seen in Table 3, no significant differences were found in the scores received from the Problem Solving Skills Scale as per the duration of attendance to kindergarten **(**X^2 (2)= 1.50, p>.05). The Table indicates that most of the children in the research attended kindergarten for one year or less. Very few of the children had been attending kindergarten for two years. The reason for reaching no significant difference in problem-solving skills by the duration of preschool attendance could be due to the fact that most of the children had been attending preschool for less than two years. Furthermore, children's problem-solving skills may not have been adequately supported during their preschool education.

It was determined that the number of children in the family did not have an impact on the scores received from the Problem Solving Skills Scale **(**X^2 (2)= .24, p>.05). Therefore, it can be concluded that the number of children in the family does not influence the problem-solving skills of children much. This result can be an indication that families behave their children in a similar manner whether they have one or more children. In her study, Terzi Işık (2000) determined that problem-solving skills perception of students did not differ by the number of children in the family.

Table 1. Mann Whitney U-Test results regarding the scores that children who participated in the research received from the Problem Solving Skills Scale by their gender

GENDER	n	Mean Rank	Sum of Ranks	U	p
Girls	101	103.72	10476.00	5078.00	.769
Boys	103	101.30	10434.00		

Table 2. Kruskal Wallis H Test results regarding the scores that children included in the research received from the Problem Solving Skills Scale by their birth order

BIRTH ORDER	N	Mean Rank	sd	X^2	p
First Child	82	100.57	3	.87	.831
Second Child	67	106.51			
The Third Child	40	103.64			
The Fourth and next	15	92.10			

Table 3. Kruskal Wallis H Test results regarding the scores that children included in the research received from the Problem Solving Skills Scale by the duration of nursery school attendance

The Duration of Nursery School Attendance	N	Mean Rank	sd	X^2	p
Less than one year	87	99.14	2	1.50	.472
One year	83	101.49			
Two years	34	113.56			

Table 4. Kruskal Wallis H Test results regarding the scores that children included in the research received from the Problem Solving Skills Scale by the number of children in the family

NUMBER OF IN THE FAMILY	N	Mean Rank	sd	X^2	p
One child	36	102.53	2	.24	.886
Two children	94	100.51			
Three children	74	105.01			

4. Conclusion and Recommendations

The results of the research revealed that children's gender, birth order, duration to kindergarten and the number of children in the family did not have an effect on their problem-solving skills ($p>.05$).

Given these findings, the following can be recommended. It is important that educationists prepare proper mediums for developing problem-solving skills of children starting from preschool periods. In addition to developing the problem-solving skills of children, educationists should also make an effort to develop their own problem-solving skills. In further research, experimental studies to develop the problem-solving skills of children can be conducted. Studies can be planned to determine the relationship between problem-solving skills and other variables such as creativity.

References

Akkaya, S. (2006). *Okul öncesi eğitim kurumlarında uygulanan fen ve doğa etkinliklerinin çocukların problem çözme becerilerine etkisi konusunda öğretmen görüşleri.* [The teachers' opinions on the effect of the science and nature activities implemented in the pre-school institutions on the children's ability to solve problems] (Unpublished master's thesis) Anadolu Üniversitesi, Eğitim Bilimleri Enstitüsü, Eskişehir.

Aksu, M. (1998). *Problem çözme becerilerinin geliştirilmesi* [Enhancing problem solving skills]. *Problem Çözme Yöntemleri El Kitabı* [Handbook on problem solving methods], ODTÜ, Ankara.

Altun, M., Dönmez, N., İnan, H., Taner, M. & Özdilek, Z. (2001). Altı yaş grubu çocukların problem çözme stratejileri ve bunlarla ilgili öğretmen ve müfettiş algıları [Problem solving strategies of six-age group children and school teacher's and inspector's perception of them]. *Uludağ Üniversitesi Eğitim Fakültesi Dergisi, 14*(1), 211-230.

Anlıak, Ş. & Dinçer, Ç. (2005). Farklı eğitim yaklaşımları uygulayan okul öncesi eğitim kurumlarına devam eden çocukların kişiler arası problem çözme becerilerinin değerlendirilmesi [The evaluation of the interpersonal problem solving skills of the children attending to the preschools applying different educational approaches]. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi, 38*(1), 149-166.

Annevirta, T. & Vauras, M. (2006). Developmental changes of metacognitive skill in elementary school children. *The Journal of Experimental Education, 74*(3), 197–225.

Arenofsky, J. (2001). Developing your problem solving skills. *Career World, 29*(4), 18-21.

Aydın, M. (2009). *Sorun çözme becerisi ile yaratıcılık arasındaki ilişkinin incelenmesi.* [Examining the relation between problem solving skill(s) and the creativity]. (Unpublished master's thesis). Ankara Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

Bingham, A. (1983). *Çocuklarda problem çözme yeteneklerinin geliştirilmesi.* [Improving children's facility in problem solving], (A. F. Oğuzkan, Transl.), 4. Baskı, Milli Eğitim Basımevi, İstanbul.

Brown, L. J. (1988). Helping children learn to solve problems. *Day Care and Early Education, 6*(22), 26-30.

Can Akbaş, S. (2005). *Okul öncesi eğitime devam eden altı yaş grubu çocukların sosyal problem çözme becerilerinin incelenmesi.* [The social problem solving skills of six years old children continuing to preschool education] (Unpublished master's thesis). Hacettepe Üniversitesi, Ankara.

Davenport, B. R., Hegland, S. & Melby, J. N. (2008). Parent behaviors in free-play and problem-solving interactions in relation to problem behaviors in preschool boys. *Early Child Development and Care, 178*(6), 589–607.

Dereli, E. (2008). *Çocuklar için sosyal beceri eğitim programının 6 yaş çocukların sosyal problem çözme becerilerine etkisi* [The effect of the programme of child social skills training on the skill of 6 - year - old children's social problem solving] (Unpublished doctoral dissertation). Selçuk Üniversitesi, Sosyal Bilimler Enstitüsü, Konya.

Dinçer Atilla, F. Ç. (1995). *Anaokuluna devam eden 5 yaş grubu çocuklarına kişiler arası problem çözme becerilerinin kazandırılmasında eğitimin etkisinin incelenmesi.* [The Examination of the effect of "problem solving" training on the arquisition of interpersonal problem solving skills by five year old children attending a kindergarten] (Unpublished doctoral dissertation). Hacettepe Üniversitesi, Sağlık Bilimleri Enstitüsü, Ankara.

Dinçer, Ç. & Güneysu, S. (1997). Examining the effects of problem solving training on the acquisition of interpersonal problem solving skills by 5-year-old children in Turkey. *International Journal of Early Years Education, 5*(1), 37-46.

Dinçer, Ç. & Güneysu, S. (2001). Examining the permanence of problem–solving training given for the acquisition of interpersonal problem solving skills. *International Journal of EarlyYears Education, 9*(3), 207-219.

Dinçer, Ç., Anlıak, Ş., Şahin, D. & Karaman, G. (2009). Kişiler arası bilişsel problem çözme programının okul öncesi eğitim kurumlarında yaygınlaştırılması projesi. [The project for dissemination of interpersonal cognitive problem solving program in preschools] *Uluslararası Katılımlı II. Çocuk Gelişimi ve Eğitimi Kongresi, Sağlık, Gelişim ve Eğitimde Çocuk Bildiri Özet Kitabı*,(p. 78). Ankara.

Duman, B. (2009). *Neden beyin temelli öğrenme* [Why brain based learning?]. 2. baskı, Pegem Akademi Yayıncılık, Ankara.

Ertuğrul Aydoğan, Y. (2004). *İlköğretim ikinci ve dördüncü sınıf öğrencilerine genel problem çözme becerilerinin kazandırılmasında eğitimin etkisinin incelenmesi* [Assessing the effect of education in acquiring general problem solving skills to second and fourth grades students in elementary schools]. (Unpublished doctoral dissertation). Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

Eskin, M. (2009). *Sorun çözme terapisi* [Problem solving therapy]. HYB BasımYayın, Ankara.

Frankel, K. A. & Bates, J. E. (1990). Mother-toddler problem solving: Antecedents in attachment, home behavior, and temperament. *Child Development, 61*, 810-819.

Freund, L. S. (1990). Maternal regulation of children's problem-solving behavior and its impact on children's performance. *Child Development, 61*(1), 113-126.

Gredlein, J. M. & Bjorklund, D. F. (2005). Sex differences in young children's use of tools in a problem-solving task. *Human Nature, 16*(2); 211-232.

Gürşimşek, I., Çetingöz, D. & Yoleri, S. (2009). Okul öncesi öğretmenliği öğrencilerinin bilişüstü farkındalık düzeyleri ile problem çözme becerilerinin incelenmesi [An analysis of prospective preschool teachers' metacognitive awareness levels and problem solving skills]. *I. Uluslar arası Türkiye Eğitim Araştırmaları Kongresi, 18 Mart Üniversitesi,* Çanakkale, Türkiye.

Huilt, W. G. (1992). Problem solving and decision making: Consideration of individual differences using the myers-briggs type indicator. *Journal of Psychological Type, 24*, 33-44.

Kargı, E. (2009). *Bilişsel yaklaşıma dayalı kişiler arası sorun çözme becerileri kazandırma (BSÇ) programının etkililiği: Okul öncesi dönem çocukları üzerinde bir araştırma* [The effectiveness of the interpersonal cognitive problem-solving program: An investigation children who attend preschool]. (Unpublished doctoral dissertation). Ankara Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

Korkmaz, H. (2002). *Fen eğitiminde proje tabanlı öğrenmenin yaratıcı düşünme, problem çözme ve akademik risk alma düzeylerine etkisi* [The Effects of project based learning on creative thinking ability, problem solving ability and level of academic risk taking in science education]. (Unpublished doctoral dissertation). Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü, Ankara.

Klahr, D. & Robinson, M. (1981). Formal assessment of problem solving and planning processes in preschool children. *Cognitive Psychology, 13*, 113-148.

Kurt, F. (2007). *Okul öncesi eğitim kurumlarına devam eden beş-altı yaş çocuklarının sosyal uyum ve becerilerine proje yaklaşımlı eğitim programlarının etkisinin incelenmesi* [An Examination of the effects of project based education programs on the social adaptation and social skills of five- and six-year old children attending pre-school]. (Unpublished master's thesis). Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

Miller. C. M. (2000). Student researched problem solving strategies. *Mathematics Teacher, 93* (2), 136-138.

Nellis, L. M. & Gridley, B. E. (2000). Sociocultural problem-solving skills in preschoolers of high intellectual ability. *Gifted Child Quarterly, 44*(1), 33-44.

Ocak Anlıak, Ş. & Dinçer, Ç. (2009). Çocukların kişiler arası bilişsel problem çözme becerileri zaman içerisinde nasıl bir değişim gösteriyor [How children's interpersonal cognitive problem solving skills change through the years]. *Eurasian Journal of Educational Research (EJER), 37,* 71-90. http://www.ejer.com.tr/ pdfler/tr/276739108.pdf. Erişim Tarihi: 05.01.2010.

Oğuz, V. (2012). *Proje yaklaşımının anasınıfına devam eden çocukların problem çözme becerilerine etkisinin incelenmesi* [A study on the effects of the project approach on the problem solving of children attending preschool]. (Unpublished doctoral dissertation). Ankara Üniversitesi, Fen Bilimleri Enstitüsü, Ankara.

Oğuz, V. & Köksal Akyol, A. (2012). Çocuklarda problem çözme becerisi [Problem solving skills in children]. N. Aral (Eds.), *Aile ve çocuk.* [Family and child]. (p. 217-237). Ankara Üniversitesi Sağlık Bilimleri Fakültesi, Yayın No.1, Ankara Üniversitesi Basımevi, Ankara.

Ömeroğlu, E., Büyüköztürk, Ş. & Aydoğan, Y. (2011). Okul öncesi ve ilköğretim 1-5. Sınıf düzeyindeki çocuklar için Problem Çözme Becerileri Ölçeğinin geliştirilmesi ve Türkiye norm çalışması [The development of problem solving skills scale for children who are in pre-school and elementary school [grades k - 5] and Turkish norm study]. *Proje No. 108K144, TÜBİTAK,* Ankara.

Ömeroğlu, E., Büyüköztürk, Ş., Aydoğan, Y. & Özyürek, A. (2009a). Okul öncesi ve ilköğretim 1-5. sınıf düzeyindeki çocuklar için Problem Çözme Ölçeğinin geliştirilmesi ve Türkiye norm çalışması [The development of problem solving scale for children who are in pre-school and elementary school [grades k - 5] and Turkish norm study]. *Uluslararası Katılımlı II. Çocuk Gelişimi ve Eğitimi Kongresi, Sağlık, Gelişim ve Eğitimde Çocuk Bildiri Kitabı*, p. 573-578. Gündüz Eğitim ve Yayıncılık, Ankara.

Ömeroğlu, E., Büyüköztürk, Ş., Aydoğan, Y. & Özyürek, A. (2009b). Determining the views of preschool and primary school teachers over the support of problem solving skills at children. *Procedia Social and Behavioral Sciences, 1*, 1969-1974.

Özdil, G. (2008). *Kişiler arası problem çözme becerileri eğitimi programının okul öncesi kurumlara devam eden çocukların kişiler arası problem çözme becerilerine etkisi* [The effect of interpersonal problem solving program on interpersonal problem solving ability education program's among the children who keep going their preschool education]. (Unpublished master's thesis). Adnan Menderes Üniversitesi, Sosyal Bilimler Enstitüsü, Aydın.

Özsoy, G. (2008). Üstbiliş [Metacognition]. *Türk Eğitim Bilimleri Dergisi, 6*(4), 713-740.

Sardoğan, M. E., Karahan, T. F. & Kaygusuz, C. (2006). Üniversite öğrencilerinin kullandıkları kararsızlık stratejilerinin problem çözme becerisi, cinsiyet, sınıf düzeyi ve fakülte türüne göre incelenmesi [An investigation of university students' indecisiveness strategies in level of the problem solving skill, gender, level of class, and kind of the faculty]. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 2*(1), 78-97.

Stevens, M. (1998). *Daha iyi nasıl… Sorun çözümleme* [How to be a better…problem solver]. (A. Çimen, Transl.). Timaş Yayınları, İstanbul.

Şahin, G. (2009). *Okul öncesi eğitim kurumlarına devam eden 5-6 yaş çocuklarının özerklik ve atılganlık düzeyleri ile sosyal problem çözme becerileri arasındaki ilişkinin incelenmesi* [Relation between social problem solving ability and autonomy and assertiveness level at 5-6 years old children who continue to pre-school education]. (Unpublished master's thesis). Selçuk Üniversitesi, Sosyal Bilimler Enstitüsü, Konya.

Şahin, F. & Yıldırım, M. (2006). Okul öncesinde örnek olaya dayalı problem çözme ile ilgili bir araştırma [A research on case-study based problem solving in preschool]. *I. Uluslararası Okul Öncesi Eğitim*

Kongresi içinde (p. 201-210). 30 Haziran-3 Temmuz 2004, Marmara Üniversitesi Atatürk Eğitim Fakültesi, İstanbul.

Tarim, K. (2009). The effects of cooperative learning on preschoolers' mathematics problem-solving ability. *Educ Stud Math, 73,* 325-340.

Tavlı, B. (2007). *6 yaş grubu anasınıfı öğrencilerinin problem çözme becerilerinin karşılaştırmalı olarak incelenmesi* [The survey of 6-age preschool students' problem solving skills as comparatively] (Unpublished master's thesis). Abant İzzet Baysal Üniversitesi, Sosyal Bilimler Enstitüsü, Bolu.

Terzi, Ş. (2003). Altıncı sınıf öğrencilerinin kişiler arası problem çözme beceri algıları [The interpersonal problem-solving skills perception of the 6th grade pupils]. *Türk Eğitim Bilimleri, 1*(2), 221-232.

Terzi Işık, Ş. (2000). *İlköğretim okulu altıncı sınıf öğrencilerinin kişilerarası problem çözme beceri algılarının bazı değişkenler açısından incelenmesi* [An analysis of the 6th grade students' perceptions of interpersonal problem solving skills in terms of some variables]. (Unpublished master's thesis). Gazi Üniversitesi, Sosyal Bilimler Enstitüsü, Ankara.

Thornton, S. (1999). Creating the conditions for cognitive change: The interaction between task structures and specific strategies. *Child Development, 70*(3), 588-603.

Walker, S., Irving, K. & Berthelsen, D. (2002). Gender influences on preschool children's social problem-solving strategies. *The Journal of Genetic Psychology, 163*(2), 197–209.

Yıldırım, A. (2007). *Okul öncesi eğitimde Türkçe etkinliklerinde uygulanan öykü tamamlama tekniğinin çocukların problem çözme becerisine etkisi konusunda öğretmen görüşleri* [The teachers' opinions regarding the effects of story completion technique applied in Turkish activities on children's problem solving skills in preschool education]. (Unpublished master's thesis). Anadolu Üniversitesi, Eğitim Bilimleri Enstitüsü, Eskişehir.