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PROBLEM-SOLVING SKILLS EMPLOYED BY GIFTED CHILDREN AND THEIR PEERS IN PUBLIC PRIMARY SCHOOLS IN TURKEY

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In this study I explored whether or not the high intellectual potential of gifted children helps them cope more easily than other children do with problems, and also examined the children's own assessments of the problem-solving approaches that are thought to affect their social and emotional development. Results showed that children's problem-solving skills are not dependent solely on how academically gifted they are. Therefore, even if the ability to utilize intellectual capacity differs, the development of effective problem-solving skills and consequent productive-thinking skills will contribute to individuals making better decisions during their lifetime and to developing more positive interpersonal relationships. These are issues that merit special attention and further research.

Keywords: intellectual potential, gifted children, education, emotional development, social development, problem-solving skills.

Children who either manifest or have the potential to show superior performance skills in comparison with their peers in terms of general or special skills are described as gifted (Akarsu, 2001; Ataman, 1998; Callahan, Lundberg, & Hunsaker, 1993; Davaslıgil, 2004; Renzulli & Reis, 1986; Richert, 1990; Sak, 2011; Sayler, 1994). Due to these differences and superior skills, the issue of how to educate these children effectively has been discussed by many researchers from different perspectives (Hedricks, 2009; Hoogeveen, van Hell, & Verhoven, 2011; Malkoç, 2004; Yoon, 2009). There is a consensus among researchers with regard to creating conditions that would meet the special needs of educating gifted students while taking needed precautions and making appropriate

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modifications. In field studies (Coleman & Cross, 2001; Enç, 2011; Hyatt & Cross, 2009; Renzulli & Reis, 1986; Sak, 2010; Şenol, 2011), researchers have expressed concerns about both providing improvements to existing academic programs for developing the strengths of gifted children and the need for creating conditions, atmosphere, and opportunities to strengthen their weaknesses.

Gifted children, who form a privileged group, have different developmental features from their peers. This difference may result from these children showing more rapid development in some areas and also from the distribution and composition of the features they have (Akarsu, 2004). Many researchers (Buescher, 1991; Enç, 2011; Metin, 1999; Milgram, 1991; Winstanley, 2004) asserted similar views about the social and emotional problems of these gifted children, which may be caused by either perceiving differently or being perceived differently. Researchers (Ciğerci, 2006; Özoğlu, 2004; Yürük, 2003) have pointed out the negative effects that perceiving differently or being perceived differently have on social relationships within an individual's close environment and drew attention to the various emotional difficulties in the case of not meeting expected social needs. In studies in which researchers have investigated the social and emotional difficulties that gifted children may encounter within the dimension of family and peers and have focused on the troubles experienced by these individuals, two points of view are highlighted. First, the term *gifted* negatively affects the child's social relations within their close environment (Cross, Coleman, & Stewart, 1993; Heller, 2004; Reichenberg & Landau, 2009). Second, the child may feel inner pressure such as fear, anxiety, and/or depression when attempting to satisfy the high expectations of those in their close environment, may become deeply disappointed in the case that they cannot fulfill these expectations, and may manifest a variety of reactions (Berlin, 2009; Moore, 2006; Moulton, Moulton, Housewright, & Bailey, 1998; Webb, 2002).

Gifted children, like all children, grow by confronting problems and trying to find solutions for them. Ideally, in the process of overcoming the difficulties faced, an individual would use his or her own knowledge and skills and exert the effort needed for the solution rather than waiting for a decision or help from others (Bingham, 2004). Problem situations, which may arise at any time and involve mental effort for resolution, may require different reactions and behaviors according to the dimensions of the problem. An individual's self-perception in problem solving, style of focusing on the problem, skill for creating solutions, and decision making have an effect on the process of overcoming the problem, whereby an individual's problem-solving skills are significantly affected by personal experiences, characteristics, attitudes, and values. Even if aptitudes or attitudes required for the process of problem solving differ according to the individual and the problem, even so the process of finding solutions to problems will consist of a series of efforts including the noticing and solving of

the problem (Güçlü, 2003). During this process, in which the cognitive, affective, and behavioral capacities of intelligence should be managed effectively, problem-solving skills will help the individual to understand himself/herself and others and allow him/her to coexist in harmony with others (Heppner & Baker, 1997). It has also been found that there is a positive correlation between being gifted and effectively solving complex problems (Schiever & Maker, 2003). This may be a result of intelligence as the source of an individual's differences and may have a predictive effect on a variety of processes (Stankov & Roberts, 1997).

My aim in this study was to investigate gifted children's own perceptions about the problem-solving skills of gifted children by using various variables and by comparing the gifted children with their peers in the process of problem solving. I also examined the relationships among problem-solving skill levels, gender, and age. Lastly, in conjunction with related literature, I evaluated the social and emotional development of gifted children.

Method

Research Design

I used a descriptive research design for this study, based on a general screening model and using a quantitative research technique.

Sample and Procedure

I conducted the study in the spring term of 2011-2012 with 100 gifted students enrolled at the Sivas Science and Art Center, and 102 normal students in the same age group who were enrolled at Mevlana Primary School (see Table 1 for demographic statistics). The students were identified as gifted according to the intelligence tests applied by experts on the staff at the Science and Arts Center. Criteria for acceptance as a student at these centers are determined according to the regulations and guidelines for educational institutions in Turkey. In order to compare the problem-solving skills of gifted students with those of normal students, both groups of participants completed the Problem Solving Inventory for Children (see Measures).

Table 1. *Demographic Statistics of the Sample*

Independent variables		*n*	%
Intelligence	Normal	102	50.5
	High	100	49.5
Gender	Female	102	50.5
	Male	100	49.5
Grade	4	73	36.1
	5	72	35.6
	6	57	28.2

Measure

The Problem Solving Inventory for Children (PSIC; Serin, Bulut Serin, & Saygılı, 2010) was developed for the purpose of measuring problem-solving approaches and behaviors, and the self-perception of primary-level students as regards their level of problem-solving skills. It is a self-evaluated scale and consists of 24 items classified into three factors labeled as confidence, self-control, and avoidance. Responses are measured on 5-point Likert scales ranging from 1 (*totally disagree*) to 5 (*totally agree*). Scores can range from 24 to 120. In the calculation process, the points of the items which reflect the tendency towards greater self-control and avoidance and are located in the second (18, 19, 20, 21, 28, 49, 58) and the third (41, 43, 59, 62, 64) factors, are reverse coded. Higher total scores on the scale indicate how proficient in problem solving the individual considers him/herself to be. The Cronbach's alpha reliability coefficient is 0.80 for the scale as a whole and values for the factors of confidence, self-control, and avoidance are presented in Table 2.

Table 2. *Cronbach's Alpha Values of Scale Factors*

	n	Confidence in problem-solving skills	Self-control	Avoidance	Total
Cronbach's alpha	568	.85	.78	.66	.80
Test retest reliability	100	.84	.79	.70	.85

Data Analyses

SPSS version 15.00 was used to analyze the data obtained. Before determining main statistical analysis, the one-sample Kolmogorov- Smirnov test was used to identify whether or not the data were suitable for normal distribution (see Table 3). Because the sample complied with the normal distribution, an independent samples, paired *t* test was used to assess the binary variable and an analysis of variance (ANOVA) was used to identify whether or not there was a difference between the gifted and nongifted groups. A Scheffé test was applied in order to identify which variables were responsible for any difference found. Lastly, correlation analysis was applied in examining the relationships among the subscales. The level of significance was set at $p < .05$.

Table 3. *Sample Compliance with Normal Distribution*

Descriptors		Statistic	Std. Error
M		99.9500	1.2605
95% Confidence	Lower Bound	97.4490	
Interval for *M*	Upper Bound	102.4510	
5% Trimmed *M*		100.9333	
Mdn		102.0000	
Variance		158.876	

Table 3 comtinnued

Descriptors	Statistic	Std. Error
SD	12.6046	
Minimum	60.00	
Maximum	117.00	
Range	57.00	
Interquartile Range	15.7500	
Skewness	-1.121	.241
Kurtosis	1.244	.478

Note. The sample complies with the normal distribution ($p > .05$).

Results

As can be seen in Table 4, there was no significant difference found between gender and problem solving in relation to the scores for confidence, self-control, avoidance, total problem-solving skill ($p > .05$).

Table 4. *Comparison of Problem-Solving Scale Results According to Gender*

	Gender	*N*	*M*	*SS*	*t*	*p*
Confidence	Male	102	50.9118	7.4303	.363	.717
	Female	100	50.5400	7.1172		
Self-control	Male	102	27.4804	5.4767	.233	.816
	Female	100	27.3000	5.5149		
Avoidance	Male	102	22.1863	3.3143	1.21	.228
	Female	100	21.6500	2.9691		
Total PS	Male	102	100.5784	13.3501	.59	.555
	Female	100	99.4900	12.5798		

As can be seen in Table 5, there was no significant difference found between gifted and nongifted students and problem solving in relation to the scores for confidence, self-control, avoidance, and total problem-solving skill ($p > .05$).

Table 5. *Comparison of Problem-Solving Scale Results According to Whether or Not Participants are Gifted*

	Gifted or not	*N*	*M*	*SS*	*t*	*p*
Confidence	Gifted	102	51.1863	7.6814	.90	.36
	Nongifted	100	50.2600	6.8130		
Self-control	Gifted	102	27.2157	5.3891	.45	.67
	Nongifted	100	27.5700	5.5981		
Avoidance	Gifted	102	21.7255	3.3719	.89	.37
	Nongifted	100	22.1200	2.9138		
Total PS	Gifted	102	100.1275	13.3488	.09	.92
	Nongifted	100	99.9500	12.6046		

As can be seen in Table 6, there was no significant difference found in the confidence scores and academic grades of the students based on grade at school ($p > .05$). However, there was a significant relationship found between academic grades and self-control, avoidance, and total scores. As academic grades increased, there was a significant decrease in total scores for self-control ($p < .05$; $F = 3.79$; intragroup $SD = 2$; intergroup $SD = 199$) and avoidance ($p < .05$; $F =$ 4, 68; intragroup $SD = 2$; intergroup $SD = 199$) (see Table 7).

Table 6. *Comparison of Problem-Solving Scale Results According to Grade*

	Grade	*N*	*M*	*SD*	*F*	*p*
Confidence	4	73	51.1096	6.8710	2.794	.064
	5	72	51.8056	6.6282		
	6	57	48.8772	8.2269		
Self-control	4	73	28.5616	4.4315	3.792	.024
	5	72	27.3611	5.6427		
	6	57	25.9298	6.1900		
Avoidance	4	73	22.4795	2.7844	4.681	.010
	5	72	22.1806	2.7748		
	6	57	20.8772	3.7847		
Total PS	4	73	102.1507	11.3342	4.727	.010
	5	72	101.3472	12.2993		
	6	57	95.6842	14.7650		

Table 7. *Comparison of Intergroup and Intragroup Problem-Solving Scale Results*

		SS	*SD*	Quadratic Mean	*F*	*p*
Confidence	Intergroup	289.483	2	144.742	2.794	.064
	Intragroup	10308.541	199	51.802		
	Total	10598.025	201			
Self-control	Intergroup	221.801	2	110.900	3.792	.024
	Intragroup	5820.303	199	29.248		
	Total	6042.104	201			
Avoidance	Intergroup	89.720	2	44.860	4.681	.010
	Intragroup	1907.012	199	9.583		
	Total	1996.733	201			
Total	Intergroup	1529.705	2	764.853	4.727	.010
	Intragroup	32197.978	199	161.799		
	Total	33727.683	201			

As can be seen in Table 8, there was a significant difference found between 4th and 6th grades in self-control, avoidance, and total scores ($p < .05$), no significant difference was found between 5th and 6th grades ($p > .05$).

Table 8. Scheffé Test Results as Grade Levels

Subdimensions	Grade level		*M* differences	*p*
Self-control	4th grade	5th grade	1.200	.411
		6th grade	2.631	.024
	5th grade	4th grade	-1.200	.411
		6th grade	1.431	.330
Avoidance	4th grade	5th grade	.298	.845
		6th grade	1.602	.015
	5th grade	4th grade	-.298	.845
		6th grade	1.303	.062
Total PS	4th grade	5th grade	.803	.930
		6th grade	6.466	.017
	5th grade	4th grade	-.803	.930
		6th grade	5.663	.045

Discussion

From my results it can be seen that no significant differences were detected in gifted students' level of self-perception of problem-solving skills in comparison to their nongifted peers. There were also no significant differences found in gifted versus nongifted students' scores on the PSIC for confidence, self-control, avoidance, and total problem-solving skill. In recent years, researchers investigating gifted children by comparing them with their peers have tended to focus more on the gifted children's sense of self (Bencik, 2012; Hoogeveen et al., 2011; Preckel, Goetz, Pekrun, & Kleine, 2008; Shechtman & Silektor, 2012; Zhang & Postiglione, 2001), self-proficiency beliefs (Flett, Panico, & Hewitt, 2011; Malpass, O'Neil, & Hocevar, 2010), and aspects like creativity (Huang, 2012; Kanlı, 2008; Mohamed, Maker, & Lubart, 2012) and leadership (Acar, 2007).

However, my study was limited to comparing the problem-solving skills of a group of gifted students at one educational institution with a group of nongifted students at one other school. Results can, therefore, not be generalized to other populations of other aspects of the characteristics and social and emotional development of the gifted child. Studies are needed in which the relationship of other aspects of the characteristics of the gifted child to their social relations and emotional life are investigated. Prospective studies with regard to these subjects are important in terms of determining the possible negative impact involved in the process of social and emotional development, so that appropriate preventive precautions can be taken.

While some researchers assert that gifted children are superior to their peers in terms of social and emotional harmony, and that social and emotional problems are less prevalent within this group (Oğurlu, 2010; Vialle, Heaven, & Ciarrochi,

2007), others have noted that gifted children face difficulties such as isolation from their peers (Coleman & Cross, 2001; Gross, 2002; Schechter, Reis, & Colson, 1999) and, consequently, loneliness (Chan, 2002; Rimm, 2002), anxiety, and depression (Fonseca, 2011; Moore, 2006; Webb et al., 2004), in addition to the more serious problem of attempted suicide. Therefore, studies are needed in which the relationships of gifted children with family members, peers, and teachers are investigated, and in which the aim is to identify the social and emotional problems these children experience.

Conclusion

In this study I investigated the relationship between problem-solving skills and being gifted and found that children's problem-solving skills are not solely dependent on how gifted they are. Therefore, regardless of intellectual capacity, the development of effective problem-solving skills and consequent productive-thinking skills contribute to better decision making over a lifetime, as well as the development of more positive interpersonal relationships. I believe that these topics merit special attention in education research.

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