

## **An Examination of Creative Thinking Skills of Gifted and Talented Preschool Children in Terms of Various Variables**

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### **Abstract**

The purpose of this study is to examine creative thinking skills of gifted and talented preschool children according to socio-demographic characteristics like the age, gender, and parental education. The research was conducted by descriptive model. The study is based on 47 gifted and talented preschool students who attend the summer programs in Istanbul in the year 2010. The figural forms of the Torrance Test of Creative Thinking (TTCT) have been used to measure the creative thinking skills of students. TTCT was one of the most popular scales which can measure creativity; the fifth year validity study had been conducted by Runco, Miller, Acar, Cramond (2010). To determine socio-demographic characteristics, personal information form was used which was developed by the researcher. The data was analyzed in social science statistics program by using parametric and nonparametric test and descriptive statistics. Research findings have been evaluated in terms of sub-dimensions of TTCT and socio-demographic characteristics. There found to be a significant difference in terms of age, gender, father-mother's socio-economic situation. Average scores of students who were males, from private schools, and students whose parents were civil servants were higher than females, public school, and other occupations respectively. According to research findings, a previous research finding of TTCT which was examined in terms of different variables was investigated and suggestions were given.

### **Introduction**

In recent years creativity has been valued more in different fields including education, management, arts and sciences. The concept of creativity and intelligence are used together in different areas. In the past creativity was considered to be related to only for fine arts or music. Creativity is much more prevalent in our lives and fortunately the opinion is changing (Matthews and Foster, 2005). Nowadays, importance of creativity in science and technology

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is emphasized as much as creativity in fine arts. Intelligence and creativity which can be developed, was examined relational. Especially creativity has an important role for the theories which consider intelligence in a multi-dimensional structure.

In most of the 20<sup>th</sup> century, Giftedness was considered a single dimension structure. Intelligence Quotient (IQ) is the most commonly used criterion in order to measure this dimension. Using of this criterion stems from the idea that is “intelligence is unique and IQ is the tremendous way of measuring intelligence”. Nonetheless, during the same period, academic success was used for identifying gifted and talented children. This situation has changed later. Sternbergs’ successful Intelligence theory puts forward the idea that intellectual giftedness should be expressed by a more comprehensive definition that it is beyond an ability which can be measured by IQ scores and achievement tests. Especially, the criticism about environmental factors cognitive abilities which measured by intelligence tests, don’t include intelligence (Köksal, 2007).

Gifted and talented children who differ especially cognitively from their peers, has high creative thinking. High creative thinking plays a crucial role in this difference. For the emergence of outstanding talent, one of the target areas which were aimed to develop by many models and theories is creativity. As a matter of the fact, creativity is in the main dimensions of theories of gifted and talented (Renzulli ,1986).

Renzulli (1986) stated that gifted and talented individuals have three basic clusters which are interrelated. These clusters are above-average general and/or specific abilities, high levels of task commitment (motivation), and high levels of creativity. Above-average general and/or specific abilities: verbal and numerical reasoning, abstract thinking, spatial relations, memory, and word fluency. Specific ability; abilities in technical areas like music, theatre, mathematics, science, chemistry. Motivation is the capability to undertake superior tasks. Creativity is producing new ideas and applying these ideas to solving problems. Interactions among the three clusters were necessary for outstanding success. An individual should be %85 more successful than his peers in each cluster. Moreover, they can be accepted as gifted in case they show %98 success at least one of these clusters (Renzulli, 1998, 1986, 1978). Stenberg mentioned three different types of giftedness in The Triarchic theory of intelligence. These are analytical, practical and creative giftedness (Sternberg, 1999).

There is creativity in each study which was formed by human beings. Although creativity is as old as human history, especially in the last five centuries. It was accepted as phonemeon in the area of fine arts. Nevertheless, nowadays, there is a focus on creativity in science and technique as much as creativity in arts (Matthews and Foster, 2005). There are a

lot of definitions of creativity as the concept of gifted and talented. The broadest definition of creativity was done by Torrance. Torrance (1974) defined creativity as; a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies: testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results. According to Morris (2002) creativity is generating new and original ideas which are valuable socially. Again creativity is an ability that exists in every individual and shows itself in the every part of human life. It is a whole process includes a large area in our life and is an attitude and behavior style (San, 1979). Apart from Barlett, Wallach and Kogan's definitions, Ömeroğlu (2001) handles creativity as getting rid of the molds, generating many and original ideas without ignoring the essence, flexibility, originality, fluency and unusual thinking.

Creative thinking is designed according the interest indexes of students. These areas rely on Guilford' thinking different ideas. Indexes which are the basic component of Creative problem solving and problem based learning, include fluency, flexibility, elaboration and originality.

Fluency; ability of thinking and remembering

Flexibility; switching from expecting ideas to other different kinds of ideas

Elaboration; detailing the subject, developing idea, giving a concept special for life

Originality; making relations and synthesis independent new original ideas from known ideas (Baska & Stambaugh, 2001; Perkins, 1981; Torrance, 1966).

### **Intelligence and Creativity**

Intelligence and creativity were investigated by many researches throughout years. Literature suggests different results about the studies on intelligence and creativity. While people with a normal intelligence level may have a high creativity potential, people with high intelligence level may also have lower creativity potential than they are expected. It is generally thought that intelligent people have always creative ideas. The point that should be paid attention here is that these two relational concepts should not be evaluated by using the same meanings for these two. There are different ideas about the relation between intelligence and creativity. According to the results of many studies, there is not always a high correlation between high intelligence and creativity (Barron, 1961; Guilford, 1967). There must be a certain level of intelligence for creativity. The most concrete knowledge about the relationship

between intelligence and creativity are suggested by “Threshold Theory”. Threshold theory claims that a certain level of intelligence is necessary for creativity; but after this certain level, there is a moderate correlation between creativity and intelligence (Yıldırım, 2007; Runko and Albert, 1986).

As mentioned above highly intelligent people are not necessarily highly creative (Roe, 1952). Most of the studies show that highly creative children have 120-130 intelligence quotients (IQ). According to Çağlar (2004), creativity and IQ scores of students whose IQ scores are 130 or more are not strongly correlated. Guilford, claim that creative peoples’ thinking abilities that leads to multiple results, cannot be measured by standard IQ test are very strong. Other researches defends that thinking abilities that leads to multiple results is independent from IQ.

Sternberg and O’Hara (1999) suggested five different situations in which creativity and intelligence related. 1. Creativity is a subset of intelligence 2. Intelligence is a subset of creativity 3. Creativity and intelligence are overlapping sets. 4. Creativity and intelligence is essentially the same thing. 5. There aren’t any relation between creativity and intelligence, they are disjoint sets. The most powerful view is they are overlapping sets generally giftedness identified by intelligence cannot ignore creativity

It has been seen that most of the people who are highly creative cannot be successful in the school. Gifted underachievers and creative gifted students have some similar characteristics (Kim, 2008). In accordance with idea that the intelligent person should be successful, there is an idea people with creative ability should be academically successful. There are misconceptions about the situation we always come up with in the educational environment. The idea that if students have higher academic scores, they will be more creative is not true (Öztuna and Gürdal, 2004). There is not always a linear relation between intelligence and creativity. Some students, who are gifted and talented, are sometimes unsuccessful. One of the factors, school performance of students which have an impact on students’ academic success, was perceived as important for gifted and talented students as well as normal students. As mentioned in several studies (Cramond 1994; Davis 1997) behavioral characteristics of creative individuals counter with the behaviors that accepted in school environment. Torrance mentioned that the academic achievement of highly creative gifted and talented students in Georgia Military College High School. When creative teaching techniques had used in the students who are academically underachieved, had learned two times faster than their peers (Torrance, 1984).

Creativity and intelligence are not only innate characteristics limited genetically. These characteristics are not stable. People can develop the creativity and intelligence (Sternberg and Grigorenko, 2002). Many theory of giftedness suppose that they can develop giftedness by developing creativity. One of the most valid theoretical models used for the development of creativity is Amabile's theory of creativity view consists of abilities related to learning area, abilities related to learning area, abilities related to creativity and work motivation (Baska and Stambaugh, 2001; Amabile, 1983).

Guilford's The Structure of Intellect Model focused on the research about creativity and problem-solving research is focused on thinking (Guilford, 1967). Guilford argued that intelligence cannot be measured literally by traditional IQ test. However, The Structure of Intellect Model is designed in a three dimensional classification system. This system is designed to encompass and organize 120 possible abilities according to: 1. The types of mental operations employed in the act of thinking (evaluation, convergent production, divergent production, memory, cognition) 2. The types of content (figural, symbolic, semantic, behavioral). 3. The types of products that result from the act of thinking (Units, classes, relations, systems, transformations, implications).

This study intends to examine the creative thinking skills of gifted and talented preschool children according to socio-demographic characteristics like the age, gender, and parental education. It is important to note that the studies that examine the creative thinking skills of preschool children are very limited. Thus, this study fills an important void in gifted and talented education.

## **METHODOLOGY**

The research was conducted by scanning model. Scanning model is a research model which aims to describe a situation under its own condition that was exist in the past or still have been existed. An event, an individual or an object which is a subject of the research, was tried to identified in its own conditions and as it exist (Karasar, 1995).

The study is based on 47 gifted and talented preschool students who attend the programs at Istanbul in the year 2010. There were a total of 47 students enrolled in the institute at the time of the study and the researcher was able reach the whole population. 29 of these students were male and 18 were female. The students were between 4 and 7 years old. "Torrance Test of Creative Thinking" (TTCT) figural forms have been used to measure

creative skills of students. “Personal Information Form”, which was developed by the researcher, was used to determine socio-demographic characteristics.

### **Instruments**

**Torrance Test of Creative Thinking (TTCT):** Torrance Test of Creative Thinking is one of the most commonly used tests of creativity. The test consists of Figural forms A-B and Verbal forms A-B. The main objective of using this test is measuring the effectiveness of creative thinking. Although Torrance Test of Creative Thinking is used for identification of gifted and talented children, the original purpose of the tests was create the basis of individual educational planning (Torrance, 1966, 1974; Kim 2006). The test which was developed by Torrance in 1966 is seen as the most popular instrument tools that measure creativity. There are two forms of the verbal and two forms of the figural. That is, four different forms can be used to measure creative skills of students. Validity studies have been conducted in 1974, 1984, 1990, 1998 and 2010 (Runco, Miller, Acar, Cramond, 2010). Those studies reported predictive validity of the test after 7<sup>th</sup>, 12<sup>th</sup>, 22<sup>th</sup>, 40<sup>th</sup>, and 50<sup>th</sup> years.

Aslan (2001) adapted to Turkish version of TTCT figural and verbal versions. Aslan (2001) indicates the general framework of TTCT as an intelligence and creativity relation, creativity and school achievement, developing creativity with educational experience. TTCT uses two parts; a Verbal test and a Figural test. Verbal part has seven subtests; asking questions, guessing causes, guessing results, product improvement, unusual uses, unusual questions, and just suppose. The Figural test has three subsets - Picture Construction (from a marked cue), Picture Completion (again with cues), and Parallel Lines. In total the test was formed by ten subtests. TTCT which was published as its current form in 1984 has been administered to 10.271 people in verbal form, and to 37.814 people in figural form.

**Personal Information Form:** The form which has been developed by the researcher includes questions about gender, age, school type, mother’s age, father’s age, mother’s occupation, father’s occupation.

### **Data Analysis**

The data was analyzed in social science statistics program by using parametric and nonparametric test and descriptive statistics. Kruskal Wallis, Mann Whitney U was used in this study. The Kruskal Wallis test is used when you have one independent variable with more

than two dependent variables. This is the non-parametric type of ANOVA and a generalized form of the Mann-Whitney test method since it permits more than two groups. Also use t test because of assumes that within each group are normally distributed in the two groups.

## FINDINGS

Creativity scores of students who attend the programs were evaluated. These scores were investigated through different variables. Sub-dimensions of creativity scores of gifted and talented children are fluency ( $n=47$ ,  $\bar{X}=16.47$ ), flexibility ( $n=47$ ,  $\bar{X}=13.43$ ), elaboration ( $n=47$ ,  $\bar{X}=7.66$ ), resistance to premature closure ( $n=47$ ,  $\bar{X}=4.98$ ), originality ( $n=47$ ,  $\bar{X}=5.13$ ).

**Table1.**  
*Analysis of Creativity Score According to Gender*

	Gender	N	Mean Rank	Sum of Rank	U	p
Creativity	1.Male	29	1,13	8,98	4,29	>.05
	2.Female	18	1.02	9,34		

Table 1 shows a significant difference between creativity scores of gifted and talented  $U=4,29$   $p>.05$  students by gender . The scores of male students were higher than those of females. Most of the literature (Aslan,1994; Atay, 2009;Lee, 2005; Özben and Argun, 2005) reflects results that are contrary to our findings. These differences were explored in the discussion section of this study.

**Table 2.**  
*Analysis of Creativity Score According to School Type*

	Gender	N	Mean Rank	Sum of Rank	U	p
School Type	1.Private	30	1,19	9,55	2,54	.05
	2.Public	17	1.05	11,45		

Table 2 shows a significant difference between creativity scores of gifted and talented  $U=2,54$   $p<.05$  on school type. The scores of private schools were higher than public schools. Most of the literature (Çetingöz, 2002; Kuhn and Holling, 2009) reflects results that are similar to our findings. These similarities were explored in the discussion section of this study.

**Table 3.**  
*Analysis of Creativity Score According to Father's Occupation*

Score	Father's Occupation	N	$\bar{X}$	S	Sd	$X^2$	p	Significant Difference
Creativity	1. Military Personnel	4	1,14	6,87	8	4,15	,01	1-5, 2-5, 3-5, 3-8, 4-5, 5-6, 5-7, 5-8, 6-8.
	2.Academician	3	1,14	3,78				
	3.Banker	7	1,14	11,06				

4. Law business	4	1,14	9,66
5. Government Official	6	1,45	5,43
6. Health Personnel	9	1,16	7,24
7. Self-employment	4	1,09	10,81
8. Teachers	8	1,04	9,38
9. Others	2	1,04	9,89

There is a significant difference between creativity scores of student's father's occupation.  $X^2=4,15$   $p<.01$ . The scores of government official were higher than others. Most of the literature (Çetingöz, 2002) reflects results that are similar to our findings. These similarities were explored in the discussion section of this study. The analysis of Mann Whitney-U was executed in order to understand the difference between groups. The difference was between the 1-5, 2-5, 3-5, 3-8, 4-5, 5-6, 5-7, 5-8, 6-8 groups.

**Table 4.**

*Analysis of Creativity Score According to Mother's Occupation*

Score	Mother's Occupation	N	$\bar{X}$	S	Sd	$X^2$	p	Significant Difference
Creativity	1. Military Personnel	2	1,12	2,12	8	2,59	,05	3-5, 3-4, 3-9, 5-4, 5-8, 6-9
	2. Academician	2	1,04	17,67				
	3. Banker	4	1,19	12,78				
	4. Law business	10	1,1	7,93				
	5. Government Official	4	1,25	5,50				
	6. Health Personnel	11	1,15	8,65				
	7. Self-employment	3	1,05	9,53				
	8. Teachers	5	1,12	8,17				
	9. Others	6	1,03	12,27				

There is a significant difference between creativity scores of student's mother's occupation  $X^2 = 2,59$   $p<.05$ . The scores of government official were higher than others. Most of the literature (Çetingöz, 2002) reflects results that are similar to our findings. These similarities were explored in the discussion section of this study. The analysis of Mann Whitney-U was executed in order to understand the difference between groups. The difference was between the 3-5, 3-4, 3-9, 5-4, 5-8, 6-9 groups.

**Table 5.**

*Analysis of Creativity Score According to Father's Age*

Score	Father's age	N	$\bar{X}$	S	Sd	$X^2$	p	Significant difference
Creativity	1. 18-24	7	1,72	4,92	3	75,83	,01	1-2, 1-3, 1-4, 2-3, 2-4, 3-4
	2. 25-34	9	1,01	4,00				

3.35-44	22	1,12	4,84
4.45-54	9	1,23	5,94

There is a significant difference between creativity scores of student's father's age  $X^2=75,83$   $p<.01$  The scores of first group (18-24) were higher than others. The analysis of Mann Whitney-U was executed in order to understand the difference between groups. The difference was between the 1-2, 1-3,1-4, 2-3, 2-4, 3-4 groups.

**Table 6.**

*Analysis of Creativity Score According to Mother's Age*

Score	Mother age	N	$\bar{X}$	S	Sd	$X^2$	p	Significant difference
Creativity	1.18-24	7	1,14	5,42	3	40,72	,01	1-3,1-4, 2-3, 2-4, 3-4
	2.25-34	7	1,28	5,73				
	3.35-44	23	1,11	5,52				
	4.45-54	10	1,22	6,04				

There is a significant difference between creativity scores of student's mother's age  $X^2=40,72$   $p<.01$ . The scores of second group (25-34) were higher than others. The analysis of Mann Whitney-U was executed in order to understand the difference between groups. The difference was between the 1-3,1-4,2-3,2-4,3-4 groups.

## RESULTS and CONCLUSION

The study revealed significant differences between gender and creativity ( $p<.001$ ). The scores of male students were higher than those of females. This result differs from finding of Aslan (1994), Atay (2009), Naderi, Abdullah, Aizan, Sharir and Kumar (2009), and Özben and Argun (2005). The studies showed that there is no significant difference between creativity and gender ( $p>.05$ ). Another study showed that there is a difference in creative ability between boys and girls. Boys are more creative than girls in the preschool years (Lee, 2005). On the other hand some statistical data analysis shows that there is no difference in the overall creativity scores between boys and girls (Naderi, Abdullah, Aizan, Sharir and Kumar, 2009). In the research significant differences among the genders were not expected. But research results showed a significant difference so; it might be thought a shortage of number of students may have caused that result.

The study revealed significant differences between school type and creativity ( $p<.05$ ). The scores of private schools were higher than public schools. This result similar to finding of Çetingöz (2002), Kuhn and Holling (2009). Çetingöz (2002) examined creativity in terms of high school type and found a significant difference ( $p<.05$ ). Also, Kuhn and Holling (2009)

found that the creative potential of students was significantly affected by school-related factors. Creativity can be enhanced and a capability from birth. This potential is required to ensure that proper environment for the development. Çakmak (2005) in his research stated that in an enriched environment children feel much more free than and at the same time environment can arrange stimulants so children can put forward their creative forces. It might be thought that depending on the level of income, free from environmental factors and culture will provide a free learning environment can provide as a result of this.

The study revealed significant differences between mother's and father's occupation and creativity ( $p < .05$ ). The scores of government official were higher than others. Çetingöz (2002) classify parental occupations as housewife, officer, self-employment, worker, teacher, army officer, farmer and engineer in his study. In his study, creativity of the students shows significant difference according to mother's profession. Çakmak' study (2005) shows significant difference according to mother's and father's occupation ( $p < .05$ ). These results similar to finding of the study. In the research significant differences among the occupation' salaries were not expected. Economic level in terms of low and middle level income and creativity showed a significant difference. Şen's (1999) study which examined the creativity levels of students who has a middle and high level income is more significant than the creativity levels students who have lower level income. Economic situation has an impact on creative thinking. Excessive stimuli in the environment an effect on the development of creativity (Süzen, 1997).

The study revealed significant differences between mother's and father's age and creativity ( $p < .01$ ). The scores of age of between 18-34 were higher than others. Lee (2005), found that the creative potential of students was significantly affected by parents age. There is a significant difference between creativity scores of student's parents age ( $p < .05$ ). Young couples can provide an enriched environment for their children, by doing this it might be thought that creative capability of children is going to enhance. According the our finding we can *suggest* that;

Parental support is an important element in student development (Davaslıgil, 2004). To better support their children, parents should be able to identify their children's, strengths and weaknesses. This consciousness will aid parents in selecting better support and guidance services for students. Thus, parents should be educated and informed of techniques to better identify abilities of their children. Seminars, workshops, and trainings could improve the awareness of such parents of the importance of teaching strategies and techniques that might

enhance the creativity of students. Also parent should be good council and guidance contact with their school administration.

This research helps educator, parents or researcher to gain a different point of view about how important creativity is and why it should be investigated by various variables. Creativity is a significant dimension in the identification of gifted children since in the developing and rapidly changing world besides gaining the knowledge, producing many; original, useful and applicable ideas have an important role in daily life situation. Because of its importance study examine creativity in terms of different variables to identify the externals factors which have a related to creativity of our children. With the help of this research external factors like parental influence or school factors have an impact on children creativities. So, research show that parents education; parents point of view, behaviors attitude, school factor; education programs, teachers activities and so on, family income; the opportunities is given to the children effects children's creativity. In the light of these finding educators and parents should be more careful in their behaviors toward children.

**REFERENCES**

- Amabile, T. M. (1983). *The social psychology of creativity*. New York: Springer Verlag.
- Aslan, E. (2001). Torrance yaratıcı düşünce testi'nin Türkçe versiyonu. *Marmara Üniversitesi Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi*, 14, 19-40.
- Aslan, E. (1994). *Yaratıcı düşünce yeteneğine sahip ergenlerin danışmanlığa ihtiyaç duydukları problem alanları üzerine bir araştırma*. Yayımlanmamış yüksek lisans tezi, Marmara Üniversitesi, Sosyal Bilimler Enstitüsü, İstanbul.
- Atay, Z. (2009). *Okul öncesi eğitim kurumlarına devam eden 5-6 yaş öğrencilerinin yaratıcılık düzeylerinin yaş, cinsiyet ve ebeveyn eğitim durumlarına göre incelenmesi: Ereğli örneği*. Yayımlanmamış yüksek lisans tezi, Selçuk Üniversitesi, Sosyal Bilimler Enstitüsü, Konya.
- Barron, F. (1961). Creative vision and expression in writing and painting. In D. W. MacKinnon (Ed.), *The creative person* (pp. 237-251). Berkeley: Institute of Personality Assessment Research, University of California.
- Baska, J. V. , Stambaugh, T. (2006). *Comprehensive curriculum for gifted learners*. Boston. MA. Perason Education Inc. Third Edition.
- Cramond, B. (1994) Attention-deficit hyperactivity disorder and creativity – what is the connection?. *Journal of Creative Behavior*, 28 (3), 193-210.
- Çağlar, D. (2004). Yaratıcı çocuklar ve yaratıcılığın geliştirilmesi. *Türkiye Üstün Yetenekli Çocuklar Kongresi Seçilmiş Makaleler Kitabı*. İstanbul, Çocuk Vakfı Yayınları No:63.
- Çakmak, A. (2005). *Anasınıfına devam eden altı yaşındaki köy ve kent çocuklarının yaratıcılıklarının çeşitli değişkenlere göre incelenmesi (Kırıkkale Örneği)*. Yayımlanmamış doktora tezi, Ankara Üniversitesi, Fen Bilimler Enstitüsü, Ankara.
- Çetingöz, D. (2002). *Okulöncesi eğitimi öğretmenliği öğrencilerinin yaratıcı düşünme becerilerinin gelişiminin incelenmesi*. Dokuz Eylül Üniversitesi Eğitim Bilimleri Enstitüsü, İzmir.
- Davaslıgil, Ü. (2004). Üstün çocuklara sahip ailelerin eğitimi. *Türkiye Üstün Yetenekli Çocuklar Kongresi Seçilmiş Makaleler Kitabı*. İstanbul, Çocuk Vakfı Yayınları No:63.
- Davis, G.A. (1997). *Identifying creative students and measuring creativity*. In N. Colangelo & G.A. Davis (Eds), *Handbook of gifted education* (2nd ed.,pp269-287) Boston:Allyn& Bacon.
- Guilford, J.P. (1967). *The nature of human intelligence*. New York: McGraw-Hill.
- Karasar, N. (1995). *Bilimsel Araştırma Yöntemi: Kavramlar, İlkeler, Yöntemler* (7.Basım). Ankara: 3A Araştırma Eğitim Danışmanlık Ltd.
- Kim, K.H. (2006). Can we trust creativity tests? a review of the torrance tests of creative thinking (TTCT). *Creativity Research Journal*, 18 (1), 3–14.
- Kim, K.H. (2008) Underachievement and Creativity: Are Gifted Underachievers Highly Creative?. *Creativity Research Journal*. 20, (2), 234-242.

- Köksal, A. (2007). *Üstün zekâlı çocuklarda duygusal zekâyı geliştirmeye dönük program geliştirme çalışması*. Yayınlanmamış Doktora Tezi. İstanbul Üniversitesi Sosyal Bilimler Enstitüsü. İstanbul
- Kuhn, J. and Holling, H. (2009). Exploring the nature of divergent thinking: A multilevel analysis. *Thinking Skills and Creativity*, 4 (2), 116–123.
- Lee, K.(2005). The relationship between creativity thinking ability and creative personality of preschoolers. *International Education Journal*, 6(2), 194-199.
- Matthews, D.J. and Foster, J.F. (2005). *Being smart about gifted children: A Guidebook for Parents and Educators*. Great Potential Press.
- Morris, C. (2002). *Psikolojiyi anlamak*. Çev. HB Ayvaşık, M.Sayı. Ankara. Türk Psikologlar Derneği Yayınları. No:23.
- Naderi, H., Abdullah, R., Aizan, H., Sharir, J., Kumar, V. (2009). Creativity, age and gender as predictors of academic achievement among undergraduate students. *Journal of American Science*, 5(5), 101-112.
- Ömeroğlu, E. (2001). *Okulöncesi dönemde yaratıcılık eğitimi ve desteklenmesi*. Milli Eğitim Dergisi,151,49-53
- Özben, Ş. & Argun, Y. (2005). Buca eğitim fakültesi öğrencilerinin yaratıcılık boyutları puanlarının karşılaştırılması. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi*. 18, 16-23.
- Öztuna, A. & Gürdal, A. (2004). Çocukların yaratıcı fikir geliştirmelerinde beyin fırtınasının etkisi. *Türkiye Üstün Yetenekli Çocuklar Kongresi Bildiriler Kitabı*. İstanbul: Çocuk Vakfı Yayınları No:64.
- Perkins, D. N. (1981). *The mind's best work*. Cambridge, MA: Harvard University Press.
- Renzulli, J.S. (1998). *The three-ring conception of giftedness*. In S.M. Baum, S.M. Reis, & L.R. Maxfield (Eds.), *Nurturing the gifts and talents of primary Grade student* (pp.1-27). Mansfield Center, CT: Creative Learning Press.
- Renzulli, J.S. (1986). *The three-ring conception of giftedness: A developmental model for creative productivity*. In R.J. Sternberg & J.E. Davidson (Eds.), *Conceptions of giftedness*. Cambridge: Cambridge University Press.
- Renzulli, J.S. (1978). What makes giftedness? Reexamining a definition. *Phi Delta Kappan*, 60 (3). 180-184
- Roe, A. (1952). *The making of a scientist*. New York: Dodd Mead.

- Runko, M., Miller, G., Acar, S. Cramond, B. (2010). Torrance Tests of Creative Thinking as Predictors of Personal and Public Achievement: A Fifty-Year Follow-Up. *Creative Research Journal. Routledge*, 22 (4).
- Runco, M. A., and Albert, R. S. (1986). The threshold hypothesis regarding creativity and intelligence: An empirical test with gifted and nongifted children. *Creative Child and Adult Quarterly*, 11, 212-218.
- San, İ. (1979). Yaratıcılık iki düşünme biçimi ve çocuğun yaratıcılık eğitimi. *Eğitim Bilimleri Fakültesi Dergisi*.12, (1-4).77-190
- Sternberg, R. J. (1999). A triarchic approach to the understanding and assessment of intelligence in multicultural populations. *Journal of School Psychology*, 37 (2), 145-159
- Sternberg, R. J., and O'Hara, L. A. (1999). Creativity and intelligence. In R. J. Sternberg (Ed.), *The Handbook of Creativity* (pp. 251–272). New York: Cambridge University Press.
- Stenberg, R. ve Grigorenko, E. (2002). *Dynamic Testing: The nature and measurement of learning potential*. Cambridge University Press. ISBN: 05217128
- Süzen, D. (1987). *İlkokul 5. Sınıf öğrencilerinde yaratıcı düşünme yeteneği ile benlik kavramı arasındaki ilişki*. Yayımlanmamış Doktora Tezi. Hacettepe Üniversitesi. Ankara.
- Şen, H. (1999). *Yaratıcı düşünmenin hemşirelik yüksekokulu öğrencilerinde incelenmesi*. Yayımlanmamış Yüksek Lisans Tezi. Dokuz Eylül Üniversitesi. İzmir.
- Torrance, E. P. (1984). The role of creativity in identification of the gifted and talented. Treffinger, D.J (ed) *Creativity and Giftedness*. (pp: 79-86). California: Corwin Press.
- Torrance , E. P. (1974). *Torrance test of creative thinking. verbal tests forms a and b. (Figural A&B)*. Scholastic Service Inc. Bensenville.
- Torrance, E. P. (1967). The Minnesota studies of creative behavior: National and International Extensions. Buffalo: Journal of Creative Behavior, 1.
- Torrance, E. P. (1966). *Torrance test of creative thinking. Technical Manual*. Personnel Press Inc. Princeton.
- Yıldırım, İ. (2007). *Eğitim Psikolojisi*. Pegem A Yayıncılık.