



INVESTIGATION OF THE DEVELOPMENT OF CREATIVITY IN SECONDARY SCHOOL CHILDREN: A FOUR-YEAR LONGITUDINAL STUDY

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Received 29 January 2020; accepted 17 November 2020

Abstract. In this study, which is planned to observe the advancement of creativity in secondary school children in the sixth, seventh and eighth classes starting from the fifth class, the relational scanning model which is one of the describe approachs was used. This is as well lengthwise research. The population of the study contained of children attending the first grade of secondary schools in Yozgat (Turkey) city center in 2015–2016 academic year. The sample of the study contained of 154 children (78 girls, 76 boys) attending two fifth grade branches in three secondary schools selected from these secondary schools. In the sixth grade, the number of samples decreased to 147 (72 females, 75 males), 137 in the seventh grade (68 females, 69 males) and 132 (65 females, 67 males) in the eighth grade. The analyzes were performed on data collected from 132 children in the eighth grade. General Information Form and Torrance Tests of Creative Thinking (Figure Form A and Form B) were used as data collection tools. In the analysis of the data, descriptive statistics, frequency, analysis of variance for rehearced measurements and T-Test for unrelated measurements were performed. Hence of the study, it was seen that the creative thinking scores of the children in the fifth, sixth, seventh and eighth classes differed in all sub-dimension scores and total creativity scores. In the fluency sub-dimension, the scores obtained in the fifth grade and sixth, seventh and eighth classes differed in favor of the sixth, seventh and eighth classes, respectively. In the sixth grade, the difference between the scores received in the seventh and eighth classes advantage of the scores obtained in the seventh and eighth classes, respectively. Moreover, the difference between the scores obtained in the seventh class and the scores taken in the eighth class were found advantage of the scores obtained in the eighth grade. In the sub-dimension of originality, there was a difference between the scores obtained in the fifth grade and the scores obtained in the seventh and eighth classes, respectively, in favor of the scores obtained in the seventh and eighth grades. It was found that there was a differentiation between the scores obtained in the seventh grade, and the scores obtained in the eighth grade in the seventh and eighth classes, respectively. It is seen that there is a statistically significant difference between the scores obtained in the fifth, sixth and eighth grades in the abstraction of headings advantage of the scores obtained in the seventh grade. In the enrichment sub-dimension, it was found that the scores obtained in the fifth and sixth grades differed significantly from the scores obtained in the eighth grade in favor of the scores obtained in the fifth and sixth grades. In the sub-dimension of resistance to early closure, it was observed that there was a difference between the scores obtained in the fifth, sixth and eighth grades and the scores

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obtained in the seventh grade advantage of the scores obtained in the seventh grade. In the total creativity scores, there was a difference between the scores obtained in the fifth grade and the scores obtained in the sixth class advantage of the ratings obtained in the sixth grade. It was determined that the scores obtained in the fifth sixth and eighth grades differed significantly advantage of the scores obtained in the seventh class ($p < .05$). It was determined that the total creativity rating of the children participator in the survey in the sixth class and the early closure resistance subscale scores obtained in the eighth grade differed according to gender ($p < .05$).

Keywords: child, creative child, creativity, longitudinal research, secondary school.

Introduction

It is widely accepted that creativity is complex, has many aspects, and occurs in all areas of life (Lucas, 2016). It is very difficult to define creativity because creativity has process, product and psychological dimensions (Ataman, 1992). However, creativity has been handled by numerous scholar scientists and philosophers. Guilford saw creativity as the capability to produce new concepts and associated it with intelligence (1950, 1968). Some authors supported the same view. Others understood creativity as the capability to solve problems (Mumford & Gustafson, 1988). According to one of the point of view, in order for creativity to subsist, there must be a conceptual context, which should be implement and defined, and then the problem must be solved. The conceptual context should cover all areas of life such as thought, art and sciences, and be relevant to all. What is important here is the innovation and originality of the conceptual context. So whatever the field, it is important to go beyond the known solutions and models in creativity (Torrance, 1965; Taylor, 1972; San, 1979; Urban, 1991). Creativity is one of the most striking activities of man, using his mental abilities to create a new product. For this reason, many scientists and artists emphasize the importance of creativity and many educators work on how children can improve their creativity (Erdoğan, 2006). Because it is important to handle creativity from an early age without dulling. It is very valuable for scientists and educators to raise awareness on this issue.

Since creative actions are not learned, it is simpler to monitor creativity in children. Children unwittingly have the will to push themselves into the act of creation. Imagination, emotions and thoughts unite with sincere incentive and quick their intentions independently (Özden, 1993). Generally, pre-school children's approximation to creativity is much further free and straight forward. In this term, children are very creative and confident in their ways of expressing themselves in creative activities since their self-consciousness is not fully developed. In elementary school, the child is now familiar with some items. He besides learned that there is no exact answer to every problem. Although they dominate the development of self-consciousness, they are skeptical that they can achieve their aims in creative events (San, 1979). In some studies, it has been shown that there is a common reduce in creative abilities as the level of class increases (as cited in Torrance, 2018). Moran III et al. (1988) found that preschool children had a greater original response than older children. These results show that school children who devote a lot of time with formal school subjects are affected by constricted and non-original by these rigid procedure (Packer Isenberg & Renck Jalongo, 2000). In this way, they have the chance to be in more suitable environments to develop their creativity. For this reason, this period of development in the life cycle should be evaluated well for the child.

According to the observations of Torrance (2018), many children leave all their fantasies, and their imagination decline. However their curiosity continues to develop unless it is restricted by adults in the first and second grades (Çakmak & Baran, 2007; San, 1979; Torrance, 2018). Between the ages of eight and ten, the use of various creative skills is increasing, and the child can discover ways to use his or her talents creatively and enjoys identifying with heroes who overcome difficulties. During this period, they can undertake projects that require attention and effort. Children at the age of ten or twelve enjoy discoveries. At this age, children can now read or think for longer periods. During this period, musical talent and other artistic talents developed rapidly. The child's analytical behavior increases with mental maturation (Çağatay-Aral, 1990; Çakmak & Baran, 2007; Öncü, 1989; Torrance, 2018). The period in which the most intense creative skills are exhibited is stated to be thirteen to fourteen years of age. After this period, creativity can either continue to a certain level or decrease. There are individual differences in reaching the peak (Gülyüz, 2001). The desire to be adopted by the opposite sex during the age of thirteen to fifteen years, which is the period of adolescence, may negatively affect creativity (Ataman, 1992). As you can see, as the age gets older, there may be a decline in the creativity of the child. Some studies have shown that as the grade level increases, there is a general decrease in creative abilities especially in the sixth and seventh grades. In some studies, this decrease was observed in the eighth grade (14 years) (as cited in Torrance, 2018). Although the decrease in creative abilities as the age gets older or as the grade level rises can be explained depending on the developmental needs of the children, it also suggests that the issue of whether the curriculum applied in schools supports creativity should be reviewed. Can the curriculum take into account both the developmental characteristics of children and creative activities appropriate to this developmental period together?

There are also researchers who argue that there is a connection among a certain cultural texture and creativity (Öncü, 1989, 2000, 2003). If the cultural texture offered gives backup and empowerment to creative people, creative actions improve (Taylor, 1972; Cohen, 1988). Researchers likewise situation that the levels of intelligence, financial prizes and sufficient opportunities to occupation in warm, pliable and creative actions are factors that enhance a person's capability participate in different ideas (Thistlethwaite, 1959; Knapp, 1963; Torrance, 1965). However, some other researchers argue that financial awards and strengthening do harm creativity and that there is no important connection among intelligence and creativity (Mumford & Gustafson, 1988). In addition, research has been conducted to see whether there is a significant connection among creativity and education and school systems, teachers' approaches or factors example creativity and intelligence games and education. The outcomes are separated in two. Some studies determine this relationship to be meaningful, while others did not (Feldhusen & Treffinger, 1975; Thomas & Berk, 1981; Woodman & Schoenfeldt, 1990; Wang & Tzeng, 2007). In fact, the effects of these external factors mentioned above on creativity may vary from child to child, from environment to environment. The needs of the child at the moment may be effective in this. Educators and adults who care for children should be careful about this.

Despite the negative effects of education systems, the concept of creativity is accepted as an important educational output, especially in the field of education (Aslan, 2007; Goree,

1996). Educational institutions undertake the responsibility of raising individuals who think creatively, realizing the function of preserving their existing potentials (Aslan, 2007; Black, 2003; Yıldız et al., 2003). Creativity emerges only as a result of cognitive, affective and dynamic cultural activity. This can only be possible with creative training. For this reason, the educational environment should be in a structure that will allow students to recognize the problem, diagnose and develop the necessary balances and collaborate (Sönmez, 1993). Starting from preschool, they should prepare children for life by offering rich positive and constructive experiences, constantly supporting and encouraging them (Aral et al., 2007; Aslan, 2007; Berretta & Privette, 1990; Mangır & Aral, 1992; Yıldız et al., 2003). Because creativity has an significant place in the enhancement of society and humanity, and it is a talent that exists in every individual and can be found in every period of life. Moreover it is a process that covers a wide area ranging from daily life to scientific studies, a way of attitude and behavior, something new and different from existing. subtraction, the ability to see the immediate and distant environment, is an intense awareness and a consciousness plus (Aslan, 2000). The contribution of creativity and creative individuals in the rapid change in our globalizing world cannot be denied. At the same time, it is obvious that we will need creativity and creative individuals more than ever in solving the new problems brought about by globalization.

Creative thinking is a whole that is based on individual capacity, includes specific cognitive processes, problems and solutions, and a series of individual activities (Birgili, 2015). Creative thinking skills can generate useful ideas in solving problems (Al-Oweidi, 2013; Eratay, 2017). These skills help individuals to be productive by generating new and innovative ideas in modern society (Kenett et al., 2018; Nur et al., 2020). When the researches are considered, it is accepted that creative thinking is an innate talent, but it is also a learnable talent, and when appropriate programs are developed and appropriate environments are created, individuals with these talents can develop their creativity skills (Karakuş, 2001). Especially the first years of preschool and primary education are suitable for children who have a certain creative potential to develop and use these potentials (Bessis & Jaqui, 1973). Understand the creativity levels of children according to their developmental stages may facilitate the preparation of appropriate programs for them. Thus, environment arrangements can be made that can bring their creativity to the fore.

When the literature is examined, the relationship between the creativity and socio-economic level and gender of children aged nine and fourteen (Aral, 1992, 1996), the relationship between parental attitudes and creative thinking of preschool children (Dinçer, 1993), seven-eleven years children's creativity and personality structures (Öncü, 1989) were examined. In addition, it is seen in the literature that the benchmarking of creativity levels of children between the ages of twelve and fourteen by age and gender (Öncü, 2003), the effects of the creativity program on the social and cognitive development of four-five years old children (Yıldız, 2000), creative thinking levels of sixth class students (Ersoy & Başer, 2009), class level and creativity (Alacapınar, 2013) have been investigated. Longitudinal studies on the development of creativity abroad are limited (Russ et al., 1999; Claxton et al., 2005), as well as experimental studies with secondary school students (Falconer et al., 2018) and again, it has been determined that studies examining the effect of creative learning supported by

Instagram have been conducted to improve the learning outcomes of middle school students in graphic design (Salehudin et al., 2019).

It has been observed that there are researches about creativity in different age groups in our country, but there are no studies on which creativity is studied longitudinally. From this point of view, this study aims to investigate the creativity of children attending secondary school in a longitudinal manner. The goal of this study is to examine the creativity of secondary school children from years 5 to 8. For this purpose, the following questions were sought:

1. Do the secondary school children who participated in the research differ in their creativity sub-dimension scores and their total scores in the fifth, sixth, seventh and eighth classes?
2. Do the secondary school children who participated in the research differ in terms of gender in their creativity subscale scores and total scores in the fifth, sixth, seventh and classes?

When the relevant literature is investigated in our country, it is seen that there is no study have been done considering secondary school students' creativity in terms of a longitudinal manner. From this point, this study aims to track secondary school students' creativity starting from 5th grade to 8th grade. It is thought that the results of this study will contribute to develop appropriate activities and curriculum that will develop and support secondary students' creativity. Therefore, the current study is important for these aspects.

1. Method

1.1. Research model

The relational scanning model, one of the explanatory approaches, was used in this study, which was planned to monitor the enhancement of creativity in middle school children in the sixth, seventh and eighth grades starting from the fifth grade. Relational scanning model is scientist design that goal to resolute the existence and/or of change among two or above arguments. In the longitudinal research, the variance, whose development or change is desired to be resolute is observed constantly or at certain intervals on like component or departments, taken from a definite beginning or origin. It is a particularly suitable access when comprehensive observations are made to its deep and extend (Karasar, 2009, p. 80).

1.2. Universe and sample

The population of the study consisted of children attending the first grade of secondary schools in Yozgat city center in 2015–2016 academic year. The sample of the study comprised of 154 children (78 girls, 76 boys) attending two fifth grade branches in three secondary schools selected from these secondary schools. In simple random sampling method; the probability that each unit forming the universe is included in the sample is equal. In other words, each unit has an equal chance to be selected and the selection of one unit does not affect the selection of the other (Altunışık et al., 2005). Three junior high schools from the city center were chosen by lot method from the list of secondary schools and two fifth grade branches were chosen from each of these three junior high schools. In the sixth grade, the

number of samples decreased to 147 (72 females, 75 males), 137 in the seventh grade (68 females, 69 males) and 132 (65 females, 67 males) in the eighth grade. The analyzes were performed on data collected from 132 children in the eighth grade. Therefore, in this study, the datum acquired from the datum addition instruments convened to 132 children who participated in all four applications were analyzed. Information about the sample group of the research is given in Table 1.

Table 1. Distribution of sample by sex by years (source: created by author)

Application time	Gender	N
In the fifth grade	Girl	78
	Male	76
	Girl	154
In the sixth grade	Male	72
	Girl	75
	Male	147
In the seventh grade	Girl	68
	Male	69
	Girl	137
In the eighth grade	Male	65
	Girl	67
	Male	132

1.3. Data collection tools

General Information Form (GIF) created by the researcher and Torrance Tests of Creative Thinking (TTCT) Form A and B was used as the data collection tool.

1.3.1. Torrance Tests of Creative Thinking Figure Form A and B

The test break out by Torrance in 1966 comprise verbal and formal parts. A and B forms of verbal and formal tests are available. The subtests in TTCT verbal and formal tests are intended at telling a lot of ideas necessary for problem solving in a very distinguish area and in a way that is rader scarce and necessary creative domination. Creativity in shape testing; fluency, authenticity, abstracts of titles, enrichment and resistance to early closure are evaluated in the sub-dimensions. There are three sub-tests in the form of form A in the form of image creation, picture completion and parallel lines.

Picture creation: The geometric shape is completed to create a new shape and to create a story about this new shape or to give a name.

Picture completion: It is desirable to have ten decimals in a new shape and name.

Parallel lines: It is intended to test dissimilar responses that can be given to the identical type of stimulus. With thirty parallel lines, new shapes are required to be created and named.

In the form B form of the scale, there are three sub-tests: create pictures, complete pictures and circles.

Picture creation: The geometric shape is completed to create a new shape and to create a story about this new shape or to give a name.

Picture completion: It is desirable to have ten decimals in a new shape and name.

Circles: It is intended to test distinct answers that can be given to the equal type of stimulus. It is required to produce and name new shapes with 42 apartments.

To be able to develop many alternatives for a problem of fluency, to produce many ideas, concepts the ability to produce different, unique and unparalleled response versus a problem of authenticity (R. P. Rein & R. Rein, 2000; Bakır & Öztekin, 2014; Haviz & Maris, 2020), the ability to develop the story of the idea of enrichment (R. P. Rein & R. Rein, 2000; Bakır & Öztekin, 2014; Haviz & Maris, 2020), while creating intelligent ideas or introducing new special solutions, while creating new, unusual and uncommon ideas. It is used to mean developing, entering details and adding answers (Torrance & Goff, 1989; Erlendsson, 1999; R. P. Rein & R. Rein, 2000; Bakır & Öztekin, 2014; Haviz & Maris, 2020). The abstractness of the titles is related to the amalgamation of operations and arrangement. At the highest level, it is important to be able to examine the essence of the information in question and to know what is important. This kind of head enables the viewer to see the picture in a deeper and richer way. Resistance to early closure is not used to consider the possible information, but rather to tend to jump forward out to incomplete outcomes, meaning to delay close sufficient make the mental leap that reaches the initial notions conceivable, and to keep the mind open, according to Torrance (see Aslan, 2001).

In the evaluation of the test, two dimensions are taken into consideration such as norm based dimensions and criteria based criteria. Norm based measurements; fluency, originality, abstractness of titles, enrichment and opposition to early closure are five. Fluency score; image completion and parallel lines test, originality score; image creation, picture completion and parallel lines test, headlines' abstraction score; resistance to early closure test of image creation and image completion test, enrichment score, image creation, picture completion and parallel lines test; evaluation of the picture completion test. Criteria based on criteria are; in thirteen measurements. These are emotional expressions, storytelling, movement or activity, the clarification of the headlines, the unification of incomplete shapes, the synthesis of unfinished lines, unusual visualization, internal visualization, the extension of boundaries or passing, humor, imagination, imagination color and fantasy dimensions. For each of the three tests (picture creation, completion, parallel lines, or circles) points are expressed emotionally, story telling, movement or activity, explanations of titles, combining incomplete shapes, synthesis of unfinished lines, unusual visualization, inner visualization, extension or extension of boundaries, humor, imagination, imagination, and fantasy. Consequently of the evaluation of TTCT Scale Figure Form A (and B); except for scores related to the dimensions of fluency, originality, abstraction of titles, enrichment and resistance to early closure, a score of the Creative Forces List (CFL) is obtained by taking the criteria in the list of creative forces. The total creativity score is designed by adding the total of the points obtained from the five dimensions of the child to the criteria based on the criteria of the criteria of the CFL (Aslan, 2001). The verbal and formal parts of the TTCT Scale were adapted to Turkish by Aslan (2001). The correlation between English and Turkish test applications was highly significant for total formal creativity ($r = 0.59$). In the internal consistency analysis, $r = 0.38$ to $r = 0.89$.

The lowest score of the pre-school group was located found to be .50 for the Cronbach's alpha value and .71 for the highest internal consistency coefficient. In the extent of validity studies, internal validity and external validity studies were conducted. In the criterion validity title, the adjective list, Wechsler Adult Intelligence Scale and the Wonderlic Test (General Ability Test) were used and consequently as a result of the analyzes, the test was found to be reliable for all age groups and score types (Aslan, 2001). Within the scope of this research, the reliability study of TTCT Scale Figure Form A and Form B was repeated.

Table 2. Torrance Tests of Creating Thinking Scale Figure Form A and Form B reliability test results (source: created by author)

SUB-DIMENSIONS OF SCALE	(Form B) Alpha value of the application in the fifth grade	(Form A) Alpha value of the application in sixth grade	(Form B) Alpha value of the application in seventh grade	(Form A) Alpha value of the application in eighth grade
Fluency	.917	.917	.917	.917
Originality	.914	.914	.915	.914
Headings abstract	.921	.921	.922	.921
Enrichment	.917	.917	.917	.917
Resistance to early closure	.918	.918	.918	.919
Total creativity	.913	.913	.912	.913

TTCT Scale Figure Form A, Form B and its sub-dimensions reliability coefficients of all four applications are given in Table 2. Total scale reliability coefficients were (alpha) 0.913, (alpha) 0.913, (alpha) 0.912, (alpha) 0.913, in order of. In accordance with the calculated Alpha value, TTCT Scale Figure Form A and Form B can be said to be a credible datum gathering instrument.

1.4. Data collection and analysis

The required permit for the research was obtained from the Provincial Directorate of National Education of the Governorship of Yozgat. The data collection process was performed by applying the scale four times to the same sample group. The first stage of datum collection was carried out in May, in the second half of the 2015–2016 academic year in Yozgat city center in 3 secondary schools under the Ministry of National Education (Turkey) in a total of 6 fifth grade branches. In the research, the general purpose of the research, confidentiality issues were explained and information was provided by the researcher by informing interviews with school administrators and teachers before the application.

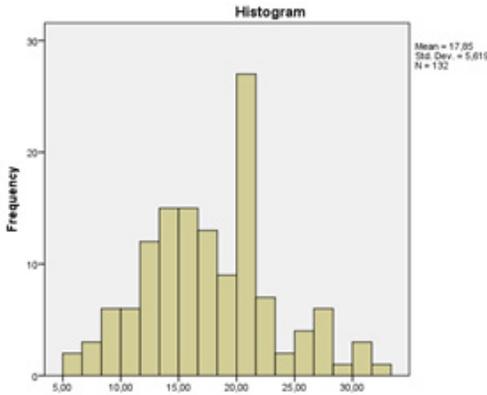
Volunteer practices were conducted in a spacious and calm classroom environment, away from noise and to prevent the exhibitors from being affected by each other. During the implementation, exhibitors were given ten minutes to complete the tests in each subtest (picture creation, picture completion, parallel lines). The test materials were then collected. The test lasted roughly fifty minutes with explications for each seans. At the request of the participants, the General Information Form was given to each participant after an interval of about ten minutes. After the answer process was ended, these forms were also collected and all applications were completed.

When the sample group reached the sixth, seventh and eighth grade (2015–2016, 2016–2017 and 2017–2018, 2018–2019), the creativity scale was applied in the second half of May in the same way. In the fifth and seventh grade, TTCT Scale Figure Form A and in the sixth and eighth grade TTCT Scale Figure Form B were used. Number of samples of 154 children (78 girls, 76 boys) in fifth grade; in the sixth grade, 147 (72 girls, 75 boys); 137 in the seventh grade (68 girls, 69 boys) and 132 (65 girls, 67 boys) in the eighth grade.

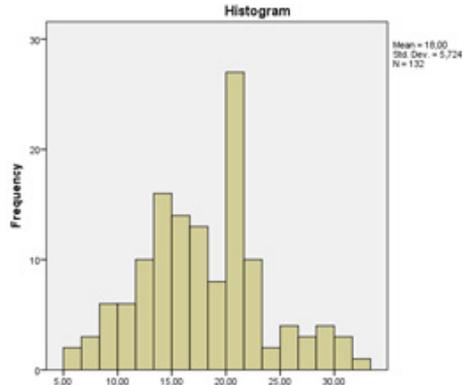
The analyzes were performed on datum collected from 132 children who were available in the eighth grade and participated in the three previous practices. Therefore, in this study, the data obtained from the data collection tools applied to 132 children were analyzed for each of the four applications. Firstly, normality tests were performed in the analysis of the data. Shapiro-Wilk Test results are given in Table 3 and Figure 1. In the analysis of the data, descriptive statistics, frequency, analysis of variance (ANOVA) for repeated measurements and T-Test for irrelevant measurements were performed (Büyüköztürk, 2007).

Table 3. Torrance Tests of Creative Thinking Scale Figure Form A and subdimension scores normality analysis (source: created by author)

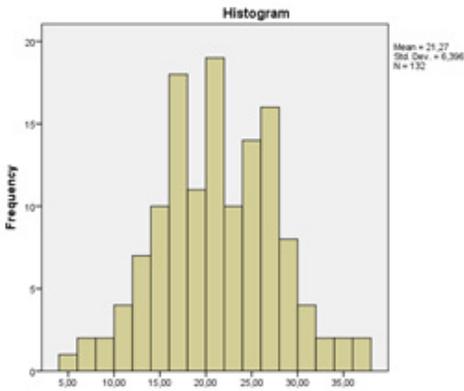
NORMALITY TESTS			Shapiro-Wilk Test		
			Statistic	df	p
Torrance Tests of Creative Thinking Scale Figure Form B	Application in fifth grade	Fluency	.965	132	.002
		Originality	.971	132	.006
		Headings abstract	.817	132	.000
		Enrichment	.968	132	.003
		Resistance to early closure	.972	132	.007
		Total creativity	.984	132	.133
Torrance Tests of Creative Thinking Scale Figure Form A	Application in the sixth grade	Fluency	.970	132	.005
		Originality	.970	132	.005
		Headings abstract	.817	132	.000
		Enrichment	.964	132	.001
		Resistance to early closure	.971	132	.006
		Total creativity	.982	132	.077
Torrance Tests of Creative Thinking Scale Figure Form B	Application in the seventh grade	Fluency	.978	132	.032
		Originality	.980	132	.048
		Headings abstract	.821	132	.000
		Enrichment	.981	132	.062
		Resistance to early closure	.981	132	.060
		Total creativity	.993	132	.771
Torrance Tests of Creative Thinking Scale Figure Form A	Application in the eighth grade	Fluency	.936	132	.000
		Originality	.980	132	.055
		Headings abstract	.711	132	.000
		Enrichment	.962	132	.001
		Resistance to early closure	.990	132	.460
		Total creativity	.994	132	.833



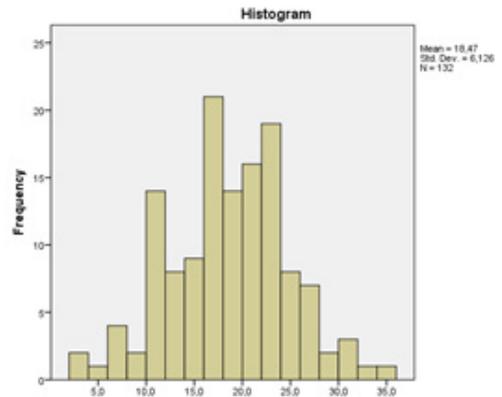
Application in fifth grade total creativity (B)



Application in the sixth grade total creativity (A)



Application in the seventh grade total creativity (B)



Application in the eighth grade total creativity (A)

Figure 1. Histogram for the total scores of Shapiro-Wilk normality test results obtained from the fifth, sixth, seventh and eighth grade application results of Torrance Creative Thought Scale Figure Form A and Form A (source: created by author)

2. Results

2.1. Findings on whether creativity sub-dimension scores and total scores of the secondary school children participating in the study differed in the fifth, sixth, seventh and eighth grade

Are the creativity subscale scores and total scores of the secondary school children participating in the research differentiated in the fifth, sixth, seventh and eighth grades? are presented in Table 4.

Table 4. Results of analysis of variance test according to the creativity scores of the participating children in the fifth, sixth, seventh and eighth grades (source: created by author)

Dimension	Application time	N	\bar{X}	Ss.	F	p	η^2	Meaningful difference
Fluency	In the fifth grade	132	19.8561	6.51965	69.445	0.000*	0.346	1-2, 1-3, 1-4, 2-3, 2-4, 3-4
	In the sixth grade	132	20.2652	6.85383				
	In the seventh grade	132	24.6061	8.02454				
	In the eighth grade	132	28.4318	8.90509				
Originality	In the fifth grade	132	17.1136	5.44598	21.950	0.000*	0.144	1-3, 1-4, 2-3, 2-4, 3-4
	In the sixth grade	132	17.2879	5.57192				
	In the seventh grade	132	19.3409	7.77531				
	In the eighth grade	132	21.4318	8.36313				
Headings abstract	In the fifth grade	132	2.11	2.04	26.085	0.000*	0.166	1-3, 2-3, 3-4
	In the sixth grade	132	2.11	2.04				
	In the seventh grade	132	4.42	4.634				
	In the eighth grade	132	1.78	2.62				
Enrichment	In the fifth grade	132	12.12	3.59	21.189	0.000*	0.039	1-4, 2-4
	In the sixth grade	132	12.24	3.67				
	In the seventh grade	132	11.58	3.12				
	In the eighth grade	132	11,29	2.85				
Resistance to early closure	In the fifth grade	132	9,48	3.51	21.189	0.000*	0.139	1-3, 2-3, 3-4
	In the sixth grade	132	9.55	3.61				
	In the seventh grade	132	11.90	4.18				
	In the eighth grade	132	9.53	4.00				
Total creativity	In the fifth grade	132	17.85	5.62	21.722	0.000*	0.142	1-2, 1-3, 2-3, 3-4
	In the sixth grade	132	18.00	5.72				
	In the seventh grade	132	21.27	6.40				
	In the eighth grade	132	18.45	6.13				

Note: *p < .05.

When Table 4 is examined, it is seen that the creative thinking scores of the children who participated in the research in the fifth, sixth, seventh and eighth grade differed in all sub-dimension scores and total creativity scores. In the fluency sub-dimension, the scores obtained in the fifth grade differed with the sixth, seventh and eighth grades in favor of the sixth, seventh and eighth grades, respectively. The scores obtained in the sixth grade differed with the seventh and eighth grades in favor of the seventh and eighth grades. The scores obtained in the seventh grade differed with eighth grade points in favor of eighth grade $F(3.393) = 69.445, p < .05$.

In the sub-dimension of originality, there was a difference between the scores obtained in the fifth grade and the scores obtained in the seventh and eighth grades in favor of the scores obtained in the seventh and eighth grades. In the sixth grade, the difference between the points obtained in the seventh grade and the eighth grade in the seventh grade, and in the seventh grade, there was a differentiation in favor of the scores obtained in the eighth grade $F(3.393) = 21.950, p < .05$. In Table 3, it is seen that there is a statistically significant difference between the scores obtained in the fifth, sixth and eighth grades in the abstraction of the headings and in the seventh grade in favor of the scores obtained in the seventh grade $F(3.393) = 26.085, p < .05$. $F(3.393) = 21.189$. It was found that the scores obtained in the fifth and sixth grades in the enrichment subscale differed significantly in favor of the scores obtained in the fifth and sixth grades from the scores taken in the eighth grade. In the sub-dimension of resistance to early closure, there is a difference between the scores obtained in the fifth, sixth and eighth grades and the scores obtained in the seventh grade in favor of the scores obtained in the seventh grade $F(3.393) = 16.734, p < .05$. When the total creativity scores are examined, it is seen that there is a difference between the scores taken in the fifth grade and the scores taken in the sixth grade in favor of the scores taken in the sixth grade. It was found that $F(3.393) = 18.664, p < .05$ differed significantly between the scores obtained in the fifth, sixth and eighth grades and the scores obtained in the seventh grade in favor of the scores obtained in the seventh grade. When the Eta Squared (η^2) value is considered, the effect of the class level on the fluency sub-dimension score is 35%; the effect on originality sub-dimension score is 14%; the abstraction of the titles on the sub-dimension score is 16%. The effect on the enrichment sub-dimension score is 03%. Moreover, it is seen that the effect on the sub-dimension score is 14% and the effect on the total creativity score is 14%.

2.2. Findings on whether creativity subscale scores and total scores of secondary school children participating in the research in the fifth, sixth, seventh and eighth grades differ according to gender

Are the creativity subscale scores and total scores of the secondary school children participating in the research in the fifth, sixth, seventh and eighth grade differentiated by gender? They are given between Table 5 and Table 8.

It was determined that the total creativity scores ($t(130) = 2.137, p < .05$) of the children participating in the research in the fifth grade differed according to sex and this difference was in favor of the girls' scores. When the Eta Squared (η^2) value is examined, it is seen that the effect of gender on total creativity score is 03%. It is seen that there were no significant difference in terms of gender in the fluency sub-dimension ($t(130) = 1.649, p > .05$), originality sub-dimension ($t(130) = 1.793, p > .05$); abstraction of titles sub-dimension

(t (126) = -1.188, p >.05); enrichment subdimension (t (130) = 1.170, p >.05) and early closure resistance subdimension (t (130) = 0.469, p >.05) scores. Although there is no significant difference, creativity fluency (K = 20.80, E = 18.94), originality (K = 17.97, E = 16.28), enrichment (K = 12.49, E = 11.76) and In the sub-dimensions of resistance to premature closure (K = 9.63, E = 9.34), the mean score of the girls was higher than the mean score of the boys. On the other hand, in the abstraction of the headings, the mean score of the mean score of the boys (N = 2.31, E = 1.89) girls were higher than the average score (see Table 6).

Table 5. Results of the T-Test of creativity points of the participating children in the fifth grade (source: created by author)

Dimension	Gender	n	\bar{X}	SS	Sd	T	p	η^2
Fluency	Girl	65	20.80	6.34	130	1.649	0.102	0.020
	Male	67	18.94	6.61				
Originality	Girl	65	17.97	6.04	130	1.793	0.075	0,024
	Male	67	16.28	4.69				
Headings abstract	Girl	65	1.89	1.64	130	-1.188	0.237	0.011
	Male	67	2.31	2.36				
Enrichment	Girl	65	12.49	3.72	130	1.170	0.244	0.010
	Male	67	11.76	3.46				
Resistance to early closure	Girl	65	9.63	3.55	130	0.469	0.640	0.002
	Male	67	9.34	3.50				
Total creativity	Girl	65	18.90	5.75	130	2.137	0.034	0.034
	Male	67	16.83	5.34				

Note: *p < .05.

Table 6. Results of T-Test of creativity score of sixth grade children according to gender (source: created by author)

Dimension	Gender	n	\bar{X}	SS	sd	T	p	η^2
Fluency	Girl	65	21.25	6.72	130	1.630	0.106	0.020
	Male	67	19.31	6.90				
Originality	Girl	65	18.08	6.14	130	1.612	0.109	0.020
	Male	67	16.52	4.88				
Headings abstract	Girl	65	1.89	1.64	130	-1.188	0.237	0.011
	Male	67	2.31	2.36				
Enrichment	Girl	65	12.62	3.81	130	1.153	0.251	0.010
	Male	67	11.88	3.51				
Resistance to early closure	Girl	65	9.74	3.68	130	0.580	0.563	0.003
	Male	67	9.37	3.55				
Total creativity	Girl	65	19.05	5.86	130	2.098	0.038	0.033
	Male	67	16.99	5.44				

Note: *p < .05.

It was determined that the total creativity scores ($t(130) = 2.098, p < .05$) of the children participating in the research in the sixth class differed according to sex and this difference was in favor of the girls' scores. When the Eta Squared (η^2) value is examined, it is seen that the effect of gender on total creativity score is 03%. It is seen that there were not significantly different according to gender in the fluency sub-dimension ($t(130) = 1.630, p > .05$); originality sub-dimension ($t(130) = 1.612, p > .05$); abstraction of titles sub-dimension ($t(130) = -1.188, p > .05$); enrichment subscale ($t(130) = 1.153, p > .05$) and early closure resistance subscale ($t(130) = 0.580, p > .05$) scores. Although there is no significant difference, creativity fluency ($K = 21.25, E = 19.31$), originality ($K = 18.08, E = 16.52$), enrichment ($K = 12.62, E = 11.88$) and In the sub-dimensions of resistance to early closure resistance ($K = 9.74, E = 9.37$), the mean scores of girls were higher than the mean scores of boys, whereas in the abstraction of the headings, the mean scores of boys ($N = 2.31, E = 1.89$) girls were higher than the average score.

It is seen that there was no important difference according to gender in the fluency subscale ($t(130) = 0.750, p > .05$); originality subscale ($t(130) = 0.577, p > .05$); abstraction of headings subscale ($t(130) = -0.961, p > .05$); enrichment sub-dimension ($t(130) = 1.009, p > .05$); early closure resistance sub-dimension ($t(130) = 1.610, p > .05$), and total creativity scores ($t(130) = 1.149, p < .05$). Although there is no significant difference; creativity fluency ($K = 25.14, E = 24.09$), originality ($K = 19.74, E = 18.96$), enrichment ($K = 11.86, E = 11.31$), In the sub-dimensions of resistance to early closure ($K = 12.49, E = 11.33$) and total creativity ($K = 21.91, E = 20.64$), the average score of girls was higher than the average score of boys, and the abstraction of headings was mean scores of boys ($F = 4.81, E = 4.03$) were found to be higher than the mean scores of girls (Table 7).

Table 7. Results of T-Test of creativity score of seventh grade children according to gender (source: created by author)

Dimension	Gender	n	\bar{X}	SS	sd	T	p	η^2
Fluency	Girl	65	25.14	8.23	130	0.750	0.455	0.004
	Male	67	24.09	7.85				
Originality	Girl	65	19.74	8.39	130	0.577	0.565	0.003
	Male	67	18.96	7.20				
Headings abstract	Girl	65	4.03	4.47	130	-0.961	0.338	0.007
	Male	67	4.81	4.79				
Enrichment	Girl	65	11.86	3.49	130	1.009	0.315	0.008
	Male	67	11.31	2.71				
Resistance to early closure	Girl	65	12.49	4.33	130	1.610	0.110	0.020
	Male	67	11.33	3.98				
Total creativity	Girl	65	21.91	7.16	130	1.149	0.253	0.010
	Male	67	20.64	5.53				

Table 8. Results of T-Test of creativity scores of children participating in the study in the eighth grade according to gender (source: created by author)

Dimension	Gender	n	\bar{X}	SS	sd	T	p	η^2
Fluency	Girl	65	28.55	9.07	130	0.154	0.877	0.000
	Male	67	28.31	8.80				
Originality	Girl	65	21.86	9.17	130	0.580	0.563	0.003
	Male	67	21.01	7.54				
Headings abstract	Girl	65	1.86	2.83	130	0.350	0,727	0.001
	Male	67	1.70	2.41				
Enrichment	Girl	65	11.46	3.15	130	0.689	0.492	0.004
	Male	67	11.12	2.53				
Resistance to early closure	Girl	65	10.43	4.37	130	2.605	0.010	0.050
	Male	67	8.66	3.41				
Total creativity	Girl	65	19.44	6.95	130	1.824	0.071	0.025
	Male	67	17.52	5.09				

Note: *p <.05.

It was determined that the early closure resistance subscale scores of the children who participated in the study were different according to gender ($t(130) = 2.605$, $p <.05$), and this difference was in favor of girls' scores. When the Eta Squared (η^2) value is examined, it is seen that the effect of sex on total creativity score is 05%. It is seen that there were not significantly different according to gender in the sub-dimension scores of fluency ($t(130) = 0.154$, $p >.05$), originality ($t(130) = 0.580$, $p >.05$), abstraction of headers ($t(130) = 0.350$, $p >.05$), enrichment subscale ($t(130) = 0.689$, $p >.05$) and total creativity ($t(130) = 1.824$, $p >.05$). Although there is no important difference, the fluency of creativity ($K = 28.55$, $E = 28.31$), originality ($K = 21.86$, $E = 21.01$), the abstraction of titles ($K = 1.86$, $E = 1.70$), enrichment ($F = 11.46$, $M = 11.12$) sub-dimension and total creativity ($F = 19.44$, $M = 17.52$) scores were found to be higher than the mean scores of girls.

Conclusions, discussions, and recommendations

The results and the discussion of the datum collected for this study, which is planned to the creativity of children starting from the fifth grade to the eighth grade, are presented below in order for the purposes of the research.

According to the results of the study, it was seen that the creative thinking scores of the children in the fifth, sixth, seventh and eighth grades differed in all sub-dimension scores and total creativity scores. In the fluency sub-dimension, the scores obtained in the fifth grade and sixth, seventh and eighth classes differed in favor of the sixth, seventh and eighth grades, respectively. The scores obtained in the sixth grade in the fluency sub-dimension differed with the scores obtained in the seventh and eighth grades in favor of the scores obtained in the seventh and eighth grades, respectively. The difference between the scores obtained in the seventh grade and the scores taken in the eighth grade were found in favor of the scores

obtained in the eighth grade in the in the fluency sub-dimension. In the sub-dimension of originality, there was a differentiation between the scores obtained in the fifth grade and seventh and eighth grades, respectively, in favor of the scores obtained in the seventh and eighth grades. It was found that there was a differentiation between the scores obtained in the seventh grade and the scores obtained in the eighth grade in the seventh and eighth grades respectively.

The increase in children's fluency and originality scores from the fifth to the eighth grade can be as an indicator of the positive effect of secondary education on children. When the results of other researches are examined, it is seen that there are similar results. Consequence of the study conducted by Alacapınar (2013), a significant difference was found between fluency, originality, flexibility, adornment and total score averages according to grade level. Fluency, flexibility, originality, ornamentation and total scores of the fifth grade students were found to be higher than the other grades. Fluency, elasticity, originality, adornment (enrichment) and total scores were found to increase from third grade to fifth grade (Alacapınar, 2013). Consequence of the study implemented by Ceylan (2008) to examine the creativity levels of 5–6 years old children in preschool education according to cognitive tempo, it was found that the age of the children caused a statistically important difference between the detailing (enrichment) points, and the fluency scores of 6 years old children compared to 5 years old children. It was found to be significantly higher. In the study conducted by Atay (2009), it was found that there was a important relationship between the age and enrichment scores of children, and the fluency scores of 6-year-old children were substantially higher than 5-year-old children. As the grade level increases, so does age, so this result can be interpreted as detailing increases as the grade level increases. In the enrichment sub-dimension, the scores obtained in the fifth and sixth grades differed significantly from the scores obtained in the eighth grade in favor of the scores obtained in the fifth and sixth grades. Contrary to these results, research findings showing that the enrichment score increased as the grade level increased were also found. The results of Claxton et al. (2005, p. 332) showed that the enrichment score gradually increased in the fourth, sixth and ninth grades. It is seen that there is a statistically important difference between the scores obtained in the fifth, sixth and eighth grades in the abstraction of headings in favor of the scores obtained in the seventh grade. In the sub-dimension of resistance to early closure, there is a difference between the scores obtained in the fifth, sixth and eighth grades and the scores obtained in the seventh grade in favor of the scores obtained in the seventh grade. In general, it is seen that the scores obtained in the seventh grade are higher than the scores obtained in the other grades in the abstraction subheadings and resistance to early closure subheadings. When the total creativity scores are examined, it is seen that there is a difference between the scores taken in the fifth grade and the scores taken in the sixth grade in favor of the scores taken in the sixth grade; It was determined that the scores obtained in the fifth, sixth and eighth classes differed significantly in favor of the scores in the seventh class. Overall, it was seen that total creativity scores increased from fifth to seventh class and decreased again in eighth grade. Research shows that the development of creativity in children draws a remarkable curve. It begins to manifest itself in the first years of life, especially when the child is in play, and gradually spreads to other areas. The peak period in which the most creative products are exhibited is

reported to be between the ages of 13–14. After this period, creativity either continues to a certain level or decreases (Smutny, 1993; Ataman, 1992).

It was determined that the total creativity scores of the children who attended in the research in the fifth and sixth grades and the early closure resistance subscale scores that they received in the eighth grade differed according to gender, and these differences were in favor of the scores of the girls. In the seventh grade, there was no difference in creativity scores of the children. In general, although there is no significant differentiation, it is seen that the average scores of girls are higher than the average scores of boys in all sub-dimensions and total subscale scores except for the abstraction subscale score in all grades. In the study conducted by Atay (2009), it was found that there was an important relationship between the gender and fluency and enrichment scores of the children, and the fluency scores and enrichment scores of the girls were higher than the scores of the boys (Atay, 2009).

In other one longitudinal study, it was found that creativity scores increased substantially from fourth grade to sixth grade and this rise was in favor of girls' elasticity and fluency scores (Lau & Cheung, 2010). Mullineaux and Dilalla (2009) stated that the enrichment scores of girls aged 10–15 are higher than the enrichment scores of boys and that their drawings are better and more innovative.

Research on the relationship between creative thinking scores and gender reveals different results according to the tests, sample and research designs they use. Discussions continue on the gender variable, which is largely dependent on cultural variables. What is interesting here; reveals that highly creative individuals can more easily accept opposite sex roles.

This research was planned to examine the creativity of children from years 5 to 8. Some suggestions can be made in line with the results of the datum aggregation within the scope of the research.

Starting from the pre-school period, the rich stimulating environments at all teaching levels positively affect the creativity of children. From this point of view, it can be paid attention to the enrichment of the environment in the upper classes as in kindergartens. For this purpose, children can benefit from the places where they can work on their own and provide accumulation and satisfaction in all aspects (library-library, workshop, laboratory, etc.) and live in these environments. Instead of directing the child, his/her activities can be supported and a positive model can be provided by helping the child to come up with his/her own thought, by giving little help to the child instead of providing examples. Some suggestions can be made for future research. In addition to the creativity of children, it is possible to investigate the creativity of parents and teachers, and to compare the creativity of parents and children, teachers and children. Experimental research using different methods and techniques to develop children's creativity can be planned. Datum aggregation instruments can be developed to assess the creativity of children for distinct age groups.

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VIDURINĖS MOKYKLOS MOKSLEIVIŲ KŪRYBIŠKUMO UGDYMO KETVERIŲ METŲ TRUKMĖS ILGALAIKIS TYRIMAS

Güneş SALI

Santrauka

Šiame tyrime, kuriame buvo suplanuota stebėti vidurinės mokyklos šeštos, septintos ir aštuntos klasių, pradedant nuo penktosios, moksleivių kūrybiškumo pažangą, buvo taikomas vienas iš aprašomųjų metodų – santykinio skenavimo modelis. Šis tyrimas taip pat yra ir išilginis. Tyrimas apima vaikus, 2015–2016 mokslo metais lankiusius Jozgato (Turkija) pirmas vidurinių mokyklų klases. Tyrimo dalyvių imtis – 154 vaikai (78 mergaitės, 76 berniukai), trijose vidurinėse mokyklose lankantys pasirinktus du penktų klasių skyrius. Šeštoje klasėje tiriamųjų skaičius sumažėjo iki 147 (72 moteriškosios lyties, 75 vyriškosios lyties tiriamieji), septintoje – iki 137 (68 moteriškosios lyties, 69 vyriškosios lyties tiriamieji), o aštuntoje klasėje – iki 132 (65 moteriškosios lyties, 67 vyriškosios lyties tiriamieji). Analizė buvo atlikta, remiantis 132 vaikų, besimokančių aštuntoje klasėje, duomenimis. Bendroji informacijos forma ir Torrance'o kūrybinio mąstymo testai (skaitinė forma A ir forma B) buvo naudojami kaip duomenų rinkimo priemonės. Analizuojant duomenis, pakartotiniams matavimams atlikti buvo taikoma aprašomoji statistika, dažnis, dispersijos analizė, o nesusijusiems matavimams atlikti – *t* testas. Taigi tyrimo metu buvo pastebėta, kad penktoje, šeštoje, septintoje ir aštuntoje klasėse besimokiusių vaikų kūrybinio mąstymo vertinimas balais buvo skirtingas visiems paaspekčiams vertinti skiriamų balų atžvilgiu ir visuminiam kūrybiškumui vertinti skiriamų balų požiūriu. Sklandumo paaspekčio atveju balų skaičius, kurį surinko penktų bei šeštų, septintų ir aštuntų klasių moksleiviai, atitinkamai skyrėsi nuo šeštų, septintų ir aštuntų klasių moksleivių gautų balų skaičiaus pastarųjų naudai. Šeštose klasėse skirtumas tarp septintoje ir aštuntoje klasėje besimokančių moksleivių gautų balų skaičiaus atitinkamai buvo pranašesnis už septintoje ir aštuntoje klasėje besimokančių moksleivių surinktų balų skaičių. Be to, skirtumas tarp septintų klasių moksleivių gautų balų skaičiaus ir aštuntų klasių moksleivių surinktų balų skaičiaus buvo pastebėtas aštuntose klasėse gautų balų skaičiaus pranašumas. Originalumo paaspekčio atžvilgiu vyravo skirtumas tarp balų skaičiaus, kurį surinko penktų klasių moksleiviai, ir balų skaičiaus, kurį surinko septintų ir aštuntų klasių moksleiviai atitinkamai septintų ir aštuntų klasių moksleivių naudai. Nustatyta, kad vyravo skirtumas tarp septintų klasių moksleivių gauto balų skaičiaus ir balų skaičiaus, surinkto aštuntose klasėse besimokančių moksleivių atitinkamai septintų ir aštuntų klasių moksleivių atžvilgiu. Matyti, kad vyrauja statistiškai reikšmingas skirtumas tarp balų skaičiaus, kurį

gavo penktų, šeštų ir aštuntų klasių moksleiviai, abstrahuodami antraštes – pagal surinktų balų skaičių jie yra pranašesni už septintų klasių moksleivius. Praturtinimo paaspekčio atžvilgiu nustatyta, kad balų skaičius, kurį gavo penktų ir šeštų klasių moksleiviai, reikšmingai skyrėsi nuo balų skaičiaus, kurį surinko aštuntų klasių moksleiviai penktų ir šeštų klasių moksleivių naudai gautų balų skaičiaus atžvilgiu. Paspriešinimo ankstyvojo uždarumo paaspekčio požiūriu buvo pastebėta, kad vyrauja skirtumas tarp balų skaičiaus, kurį surinko penktų, šeštų ir aštuntų klasių moksleiviai, bei balų skaičiaus, kurį gavo septintų klasių moksleiviai – šiuo atveju pagal turimą balų skaičių laimi septintų klasių moksleiviai. Bendrųjų kūrybiškumo vertinimo balų skaičiaus atžvilgiu vyrauja skirtumas tarp balų skaičiaus, kurį surinko penktų klasių moksleiviai, ir balų skaičiaus, kurį gavo šeštų klasių moksleiviai – vertinimo pranašumas pastebimas šeštų klasių moksleivių atžvilgiu. Nustatyta, kad balų skaičius, kurį surinko penktų, šeštų ir aštuntų klasių moksleiviai, reikšmingai skyrėsi ir lėmė pranašumą septintų klasių moksleivių surinktų balų skaičiaus atžvilgiu ($p < .05$). Nustatyta, kad apklausoje dalyvavusių vaikų, besimokiusių šeštoje klasėje, bendrasis kūrybiškumo vertinimas skyrėsi pagal lytį nuo aštuntose klasėse besimokiusių vaikų gautų balų skaičiaus pasipriešinimo ankstyvojo uždarumo paaspekčiu ($p < .05$).

Reikšminiai žodžiai: vaikas, kūrybiškas vaikas, kūrybiškumas, ilgalaikis tyrimas, vidurinė mokykla.