

Examination of Creativity Levels of Preschool Children

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Abstract

The study aims to examine whether the interaction of parents' education and income levels has a significant effect on the creativity scores of preschool children. The research was conducted in a district of Ankara, where parents are thought to vary in terms of income and education level. 123 children studying in independent kindergartens affiliated with the Ministry of National Education participated in the research. "Early Childhood Creativity Scale" was used as a data collection tool in the study. In the study, a 2x3 two-way analysis of variance was preferred because it was aimed to examine the possible effects or interaction effects of categorical independent variables on the continuous dependent variable. Test procedures were run after ANOVA assumptions were checked and it was observed that the assumptions were met. As a result of the research, it was determined that the interaction between parents' education levels and income levels had an effect on their children's creativity. When looking only through the main effects, independent of the interaction effect, it was determined that the level of parental education was influential on the creativity scores of the children, but the income level alone was not.

Keywords: Creativity, Preschool Children, Education Level, Income Level

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Introduction

The concept of creativity, which is included in the 21st century skills, has started to be used in every field today and has gradually become an important part of our lives. The concept of creativity, which manifests itself in all areas of life, has increased its importance even more today since the existence of constructive and creative individuals is needed to keep up with the developing and changing world (Özer & Yıldırım Polat, 2019). Creative individuals generally have features that can look at an event or situation from different perspectives, think outside of traditional ways, go beyond the given information and create original products (Yıldız Bıçakçı, 2012).

The specified features cover the most important competencies within 21st-century skills. Competencies of such important point to the concept of creativity. Creativity enables the production of new ideas and concepts. However, it is a mental and social process involving the creative mind's new associations between existing ideas or concepts. The conscious or unconscious process of insight fosters creativity. Good education, appropriate care, and providing opportunities for creative expression inspire, encourage and sharpen creative minds (Sharma, 2011). For this reason, the step related to creativity is also included in Bloom's revised taxonomy. Due to its importance and function, this step is at the top of the hierarchy of educational goals (Yeşilyurt, 2020). In recent years, interest in creativity has increased in the field of education. The development of creativity has increasingly been seen as an educational imperative. However, current educational strategies are limited to teaching rigid models that do not encourage creativity and knowledge acquisition through creative exploration. Children are considered smarter when they are able to acquire, remember and apply information that opposes a creative perspective (Castillo-Vergara et al., 2018). For this reason, it has become one of the main objectives of the education systems of many countries today. It is aimed to develop the creativity of individuals at all levels of education from preschool to university (Tuğluk & Özkan, 2019; Yeşilyurt, 2020).

In particular, the preschool period is a period in which all developmental areas of children gain momentum. This period is very important in terms of the development of creativity in children as well as forming the basis for formal education (Chien & Hui, 2010). In this period, while creativity shows an improvement of 90% in children aged 2-5, this rate may decrease to 20% from the age of 6-7. In other words, as age increases, the level of creativity also decreases. When children start school, they enter a new environment and recognize the rules and authority in the environment (Özer & Yıldırım Polat, 2019; Yeşilyurt, 2020). Children who have higher creativity skills in the pre-school period cannot maintain a large part of these creativity skills after they start primary school (Bogoyavlenskaya, 2013, as cited in Yeşilyurt, 2020). Environmental factors are the basis of this decrease. Among the environmental factors involved in creativity, variables such as parents' educational status and income level are very important. In the preschool period, these environmental

factors are largely dependent on parents' understanding and presentation of creativity education (Chien & Hui, 2010). Conscious parents can help their children to reveal their creativity-related powers by providing stimulants to improve their creative features, allowing freedom in their thoughts and activities, and creating environments based on respect and tolerance (Çeliköz, 2017). It is seen that this skill, which significantly affects the whole life of children, is affected by many factors.

Another environmental factor affecting creativity is the income level of the child's family (Sternberg & Lubart, 1992, as cited in Yang et al., 2020). Many studies have shown that there is a difference in creativity between children from low- and high-income families. It is claimed that children raised in families with high-income levels have higher creativity levels than children raised in families with low-income levels (Can Yaşar & Aral, 2011; Dai et al., 2012). Children raised in low-income families have fewer resources, such as books, electronics, and travel opportunities. It can be argued that the reduction of these resources may also lead to negative cognitive, financial, and emotional states. As a result, when faced with unmet needs and external threats or problems, low-income children may face difficulties in being creative (Kraus et al., 2012; Yang et al., 2020). Empirical research shows that high-income parents create a more positive learning environment to consciously develop children's creative abilities. In contrast, children from low-income parents will be more likely to face more pressure and difficulties due to the lack of good educational resources. More depression, anxiety, and other negative emotions are also factors that may be detrimental to the development of creativity (Dai et al., 2012; Zhang et al., 2018). When the literature is examined, it has been shown that there is a close connection between the income level of the parents and creativity, although there are exceptional cases.

Another factor affecting the development of creativity is the level of parental education. Parental education level is the source of creativity and family is the fertile ground for creativity. Since child discipline is the foundation and preliminary stage of school, there are differences in the development of creativity with age, but the development of creativity does not begin at the university stage. There is no doubt that the key to childhood experiences is largely associated with parents (Fang & Shen, 2021).

Çeliköz (2017)'s research on creativity and parental education level found that parental education level differentiated children's creativity levels. In the study of Tekin and Taşğın (2009), in which they examined the relationship between parental education level and their children's creativity, it was seen that the creativity level of children whose parents were undergraduate graduates was higher than those whose parents were primary school graduates. Heinla (2006) reported that creative thinking is higher in children when one or both parents have a high level of university education. Öztunç (1999), as a result of the research, stated that the creative thinking abilities of children whose parents are college graduates are higher than those of the children of high school, secondary school,

primary school, and illiterate parents. When the studies are evaluated, parents can be effective in satisfying their children's curiosity, presenting a rich stimulating environment, and displaying a democratic attitude in terms of education level. Therefore, the level of education can make a positive contribution to supporting and developing creativity.

As a result, creativity, which plays a key role in social and cultural change and is the focus of recent research, appears in every aspect of daily life. Creativity develops in the individual when positive environmental conditions are provided and emerges as a skill that can show itself in all areas of life. The development of this skill is possible with the opportunities that parents offer to their children. In line with the opportunities offered by the parents to their children, the creativity rates of children may differ. The fact that each child has different rates confirms that there are factors affecting the development of this skill (Özer & Yıldırım Polat, 2019; Zhang et al., 2018). When previous studies on the factors affecting creativity were examined, it was found that creativity was affected by parents' income and education level. In this study, it was examined whether the interaction of parents' education and income levels had a significant effect on the creativity scores of children in early childhood, and the aim of the study was formed in this direction.

Method

Participants

First of all, a region of Ankara, which is thought to vary in terms of income and education level of parents, was determined. In accordance with the purpose of the research, three schools from this region were selected for the study. Then, an independent kindergarten affiliated with the Ministry of National Education, which was confirmed to vary in terms of parents' income and education level, was included in the study by interviewing school administrators. It was decided to conduct the research with a total of 123 children (67 girls, 56 boys) who did not receive special education support and showed normal development in this school. Children live at home only with their parents. There are no other family elders. The mean age of the children was 63.18 months (SD=5.87). 13.8% of the parents are secondary school graduates, 38.2% are high school graduates and 48% are university graduates. In addition, it was determined that 61.8% of the parents were at the low-income level and 38.2% at the upper-income level, according to their own statements. The participants were informed that the data obtained would be used in scientific studies and that the names of the participants would be kept confidential, and consent was obtained from the parents.

Materials

“Early Childhood Creativity Scale” was used as a data collection tool in the research (Çeliköz, 2017). The original version of the scale and permission to use were obtained by reaching the author via e-mail. The part of the scale that measures children's creative thinking skills consists of 12

items. As an example of scale items; “Child finds many solutions to a problem”, “The child is imaginative and enjoys fantasy”, “Child is flexible and can adapt to expected changes in situations” such as. The options of the 7-point Likert-type scale are “(1) Almost never, (2) Very rarely, (3) Rarely, (4) Sometimes, (5) Often, (6) Very often, (7) Almost always. ” Çeliköz (2017) states that the scale consists of one dimension, this dimension explains 65% of the total variance and has a very high-reliability coefficient ($\alpha=.95$). After collecting data for this study, the reliability of the scale was retested and it was seen that the scale had sufficient reliability ($\alpha=.87$). In addition, demographic information about children and their parents was collected with the "General Information Form". While collecting information about the education level of the parents, the mother or father, who is interested in the education of the child and registered as the first parent to be contacted at school, was preferred.

Procedure

Parents were informed about the scope and purpose of the study. All of the parents consented to the data collection and their children to participate in the study. The form prepared by the researchers for the parent's education, income, and age information of the children was delivered to the parents. The forms were collected from the parents within the specified time. For the scale to be filled by the teachers, before applying the scale, the researchers gave explanatory information about the items in the scale to the teachers, and what each item represented was explained with examples. It was filled in by the teachers after a careful observation process for each child individually. When the teachers were unsure about specific situations of the child according to the questions on the scale, they did not score the child.

Data analysis

First of all, the forms collected from the teachers were transferred to the computer environment after they were checked and counted. It was checked again for missing or incorrect data entry. The independent variables of the study are the education status of parents in three categories (Secondary School-High School-University) and income status (Minimum Wage-Above Minimum Wage) in two categories. The dependent variable is the scores of the children in the creativity test. In this study, a 2x3 two-way analysis of variance (ANOVA) was preferred because it was aimed to examine the possible effects or interaction effects of categorical independent variables on the continuous dependent variable. First of all, ANOVA assumptions were checked, and after it was seen that the assumptions were met, ANOVA procedures were run. Levene's test was used for homogeneity in the variances of the variables, and the Shapiro-Wilk test for normality distributions for each cell in the 2x3 pattern was used. Corrected Bonferroni and Tukey tests were used from multiple comparison tests. All analyzes in the study were performed with SPSS 22 (IBM Corp, 2013). Partial η^2 was reported in the analyzes and the significance level was accepted as .05.

Results

Analyzes for ANOVA Assumptions

In this study, there is no relationship between the observations in each group of independent variables or between the groups themselves, so the observations are independent of each other. In order to determine the extreme values, Boxplots graphs of the residual values of the dependent variable were examined and it was seen that there were no outliers. Normality distributions for each cell formed in the ANOVA design were evaluated with the t-Shapiro-Wilk's test and it was seen that the data were normally distributed ($p > .05$). Levene's test was conducted for the homogeneity of variances, which is another assumption. There was homogeneity of variances, as assessed by Levene's test for equality of variances, $p = .537$.

After the ANOVA assumptions were met, descriptive statistics were calculated for each group formed in the dependent and independent variables design (Table 1).

Table 1. Descriptive statistics

Income	Education Level	N	M	SD	Skewness	Kurtosis
Minimum	Secondary School	12.00	4.00	0.97	0.01	0.12
Wage	High School	23.00	4.11	1.09	-0.51	-0.71
	University	40.00	4.60	0.89	-0.04	-0.30
Above	Secondary School	4.00	3.33	0.76	-1.42	2.30
Minimum	High School	24.00	4.86	0.98	-0.34	-1.00
Wage	University	19.00	4.34	0.80	1.03	0.90

Variance analyses and multiple comparison tests

In this step of the research, the results of the multivariate analysis were first examined in terms of the interaction effect. Educational status and income status, which are independent variables, were found to have a statistically significant interaction effect on creativity scores ($p = 0.010$). This shows that the effect of the educational status variable on the creativity scores depends on the income status, or similarly, the effect of the income status variable on the creativity scores depends on the education level. In short, there was a statistically significant interaction between income and education level for the "Creativity" score, $F(2, 116) = 4.742$, $p = .010$, partial $\eta^2 = .076$ (Table 2). Since there is a statistically significant interaction, after this stage, it is necessary to determine whether there are univariate interaction effects for each independent variable separately (Pituch & Stevens, 2016). Therefore, follow-up univariate two-way ANOVAs were run.

Table 2. Univariate interaction effects for education and income status

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	15.139 ^a	5	3.028	3.432	.006	.129
Intercept	1284.876	1	1284.876	1456.248	.000	.926
Income Level	.059	1	.059	.066	.797	.001
Education Level	7.050	2	3.525	3.995	.021	.064
Income * Educa	8.367	2	4.184	4.742	.010	.076
Error	102.349	116	.882			
Total	2499.210	122				
Corrected Total	117.488	121				

Since a significant interaction effect was observed between Income Level and Education Level for creativity scores, analyzes were carried out to determine simple main effects (Laerd Statistics, 2016; Pituch & Stevens, 2016).

First, simple main effects by income level were run. According to the results of the analysis, creativity scores differed according to the income levels of the parents in the high school group, $F(1, 116)=7.529, p=.007, \eta^2=.061$. Looking at the averages, among high school graduate parents, those with income above the minimum wage had higher scores than those with income at the minimum wage level, .752 (95% CI, 209-1,295). Second, simple main effects were studied by education level. There was a statistically significant difference in the mean creativity scores of parents with a Secondary, High, and University School education above the minimum wage, $F(2, 116) = 5.108, p < .01$, partial $\eta^2 = .081$.

When the Bonferroni-adjusted multiple comparison results were examined, there was a significant difference between the creativity scores of the children of secondary school and high school graduate parents with an income above the minimum wage ($p=.010$). According to creativity scores, the averages of High School graduate parents with income above minimum wage were higher than the averages of Secondary School graduate parents, 1,528 (95% CI, .295-2.760), $p = .010$. There was no significant difference between the other pairs of multiple comparisons.

Discussion

As the aim of the research was to determine whether the effect of parental education level on children's creativity is different for low and high-income groups. The results obtained for this purpose are that the interaction between parents' education levels and income levels has an effect on their children's creativity. When we look at only the main effects, independent of the interaction effect, we saw that the education level of the parents was effective on the creativity scores of the children, but the income level alone was not.

One of the main questions that we seek to answer in the research is whether the educational status of the parents has an effect on the creativity of the children. The results showed that parental

education levels had an effect on children's creativity scores, regardless of parents' income status. In their study, Dewing and Taft (1973) found that maternal education level was associated with both creativity test scores and the creative performances of children. Dursun and Ünüvar (2011) found in their study that parents with a high level of education are more conscious than parents with a low level of education. Can Yaşar and Aral (2011) found that parental education levels make a significant difference in children's creative thinking skills. Lu (2003) reported that fathers' education level is a positive predictor of children's creativity. Laosa (1978) found a positive relationship between mothers' level of education and creativity. Regarding the effect of a mother's education level on creativity, Brophy (1970) reported that mothers' teaching strategies with their children were related to the mother's education level. Again, studies have found that the higher education level of parents from parents affects the creative development of children (Lin, 2009). The findings given above show parallelism with our research results in terms of revealing the relationship between the education level of the parents and the creativity levels of their children. So the fundamental question we should ask is "Why is that so?" When we look at the literature, it can be shown that the most likely answer to this question is that parents with a high level of education spend more time with their children (Guryan et al., 2008). The fact that parents spend more time with their children, especially in the preschool period, may cause children to develop at the desired level in cognitive and affective terms. Educated parents generally have high incomes (Guryan et al., 2008), and the opportunities brought by this situation can be reflected as a facilitating factor in meeting the cognitive and affective needs of children.

Again, studies have shown that better-educated parents provide children with more support and cognitive stimulation than children from socially disadvantaged homes. They also stated that they engage in various intellectual activities with their children more frequently. Therefore, they indirectly support their children's creativity (Dai et al., 2012; Jankowska & Karwowski, 2019). From this point of view, the education level of the parents emerges as an important determinant in the education structure. The education a parent gives to their child plays a decisive role in the child's behavior and thinking. A parent whose cognitive process is higher due to education will be a better mentoring model for their child. At the same time, during the child's educational stages, a cognitive explanation and mindset will prevail over a non-cognitive teaching behavior. This child is likely to have difficulty developing creative roots. The development of a logical thought progression maximizes cognitive abilities. This development of cognitive structure is vital to creativity. Therefore, education level can be a powerful influence on the development of a creative mind (Griffith et al., 2018). Regarding this variable, it can be thought that a well-educated parent figure contributes positively to the child's learning process and thus affects their children's creativity.

Another question that is tried to be answered in the study is whether the income level of the parents has an effect on the creativity scores of the children. According to the results of the analysis, income level does not have a significant effect on creativity scores when all education levels of the parents are taken into account (Table 2). However, since a significant interaction effect was reached in this study, the results of the simple main effects analysis show that the income levels of the parents in the high school group make a difference in the creativity scores of the children. In fact, this is a very important point that shows that the evaluation of income level independently of the education level of the parents may be insufficient. However, when we look at the literature, it is seen that the income level is mostly evaluated alone in the studies on the relationship between income level and creativity. Castillo-Vergara et al. (2018) examined the creativity scores of 5th-grade students according to their socio-economic status, which is an important indicator of their income level, and found that all dimensions of creativity differed significantly according to SES. More generally, Tang et al. (2022) stated that school location is a significant predictor of Creative Ideation Behavior (CIB) in a Structural Equation Modeling study examining the effects of different variables on students' CIB scores. In other words, as the socioeconomic level of the region where the school is located increases, the CIB scores of the children also increase. Although the results of the related research are not directly related to this study, it is very important in terms of revealing the effects of socioeconomic level on creative thinking behaviors. As can be seen, income level is generally associated with creative skills. When this relationship is examined in more detail, the result does not change. Haley (1984) concluded in his study that socioeconomic status has a significant effect on verbal fluency, verbal originality, kinetic fluency, kinetic originality, and integrative fluency, which are sub-dimensions of creativity. However, in this study, as seen in Table 1, the relationship between income level and creativity did not show a significant difference regardless of education level. There could be several reasons for this. First of all, the sample group participating in this study is preschool children and this age group has not completed their intellectual development yet. Because the influence of individual experiences and experiences on the development of creative skills is quite high (Xu & Pang, 2020), it becomes difficult to talk about creativity development that is enriched by experiences at younger ages. Another reason is that in studies associated with SES, the components that make up SES do not consist only of income level. Occupation type, place of residence, prestige, ethnic origin, and even religious groups are included in SES determinations (APA, 2022).

According to the results of the analysis, perhaps the most important output of the research is the significant interaction effect of income status and education level on creativity scores. In fact, this result is very important in that it shows that income level alone is no longer a significant predictor of creativity, but when evaluated together with education level, it makes a significant difference in the creativity of the children of parents with higher education levels since the income levels of the parents may not have created enough life and experience environment to be reflected in the creativity scores

of the children in the preschool age group in this study. It is also conceivable that income level and a range of psychosocial factors potentially mediate creativity. However, this situation is different for the education level of the parents. Educated parents may approach their children more consciously, both verbally and behaviorally, starting from the birth of their children. Similarly, Can Yaşar and Aral (2011) stated the relationship between education level and creativity; They argue that the level of education is effective in developing mothering styles, and it helps parents to raise and develop themselves in all areas such as child care, development, and education.

The interaction effect, on the other hand, reveals that the gains of the parents from the education level are actually more meaningful with the income level. As the education level rises, the participation rate of parents in social life may increase and they can take part in a good job. Naturally, there is an increase in the income level and it can offer a rich stimulating environment to the child. At this point, the creativity of the child can be greatly supported (Çeliköz, 2017). Considering the contrary, it can be predicted that the creativity of children of high-income parents will not always be high. As a result, the combination of education level and high-income level are highly effective variables in children's creativity. It can also be said that the combination of these variables rather than their separate effects is more meaningful and can provide children with richer experiences.

Conclusion and Recommendations

The preschool period is a period in which the emotional and cognitive development of children is quite rapid. In this period, it is very important to create environments that are supported and that help him gain rich experiences. In this study, we have brought a different perspective to the findings in the field by revealing how the education levels and income levels of parents, whose effects on creativity are generally investigated separately in the literature, interact together. In other words, the interactions of independent variables that have an effect on creativity can also affect their level of influence. For this reason, the coexistence of different variables in such studies directly affects the interpretation of the outputs to be obtained from the study. As a result, at the point of development of creativity, it is necessary to focus on both variables instead of considering the effect of education level or income level alone. In this sense, it is very important to identify and strengthen the aspects of parents that need to be supported in terms of raising more creative children.

Limitations

This research has several limitations. First of all, the sample group in which the study was conducted is the preschool period and it is a stage in which the creativity skills of the children continue to develop. For this reason, the results of the study should be continued in the following age ranges and compared with the findings obtained. Another limitation is that parents' income levels cannot be obtained by more objective institutions or tools. Therefore, these data are limited to the self-reports of the parents.

Policy Implications

From the past to the present, the creativity skills of children have always brought about a serious change, especially in the 21st century, although it is always tried to be kept in the foreground. In this century, more importance has been given to creativity skills and the development of these skills of children has been taken as a basis. For this, it is important to offer creative environments to children. This is only possible thanks to the consideration of education policies in the light of 21st century skills. Because one of the important goals of education is to solve the difficulties encountered in a creative and original way. It is noteworthy that the creativity ability, which is thought to exist in children, decreases over time. Today, children do not encounter difficulties in accessing information with the convenience of the digital age. However, children face difficulties in making sense of information or using it effectively. This situation may appear as a situation that negatively affects the current and future academic and personal development of children. At this point, the important thing is that the institutions that determine the education policy should produce education policies on how to support creativity in education and learning processes in a more qualified way. As it is known, creativity can improve as long as it is supported. However, today's education and training materials also undergo changes in the process. For this reason, it is the adaptation of these materials to the process without reducing their effectiveness within the processes that support creativity. Because the 21st century necessitates the creation of new skills and new behaviors in children.

Ethical Approval

All procedures of this study involving human participants complied with the 1964 Helsinki Declaration, subsequent changes and the standards of Düzce University Scientific Research Publication and Ethics Committee (Report No E-78187535-050.06-223).

Conflict of Interest

The authors have declared that they have no competing or potential conflicts of interest. The authors confirm full responsibility for reporting the research and data and maintain that the material contained in the manuscript represents original work.

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Credit Author Statement

The contributions of the authors in the study are as follows: “Conceptualization, methodology, investigation, drafting and writing, Elcin Yazici Arici; Conceptualization, review and editing, H. Kagan Keskin; methodology, writing-review and editing,

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