İSTANBUL UNIVERSITY CERRAHPAŞA

*HAYEF: Journal of Education, 21*(2); 155-164

**DOI: 10.5152/hayef.2024.23059**

**Received:** June 1, 2023
**Revision Requested:** November 20, 2023
**Last Revision Received:** December 1, 2023
**Accepted:** December 9, 2023
**Publication Date:** May 23, 2024

# HAYEF: Journal of Education

RESEARCH ARTICLE

# Factors Affecting Creativity Potential: Creative Home Environment and Motivation to Learn Creative Thinking

**Arzu ATALAY[1], Fatih DERELİ[2]**

[1]Ministry of National Educaton, İstanbul, Türkiye
[2]Department of Early Childhood Education, Trakya University Faculty of Education, Edirne, Türkiye

**Abstract**

This study aims to examine the effects of creative home environments and motivation to learn creative thinking on the creativity potential of children in early childhood. In this context, the study was conducted using a correlational research design, which is one of the quantitative research methods. The study sample consists of 12 teachers working in kindergartens, 103 children in the classes of these teachers, and the parents of these children. The ages of the children participating in the study ranged between 61 and 79 months as of the date of data collection, with 49 girls and 54 boys. The sample was determined using the convenience sampling technique. The data were collected using three different tools: Evaluation of Potential Creativity (EPoC), Creative Home Environment Scale, and Motivation to Learn Creative Thinking Scale. As a result of the study, a significant relationship was found between children's motivation to learn creative thinking and their creativity potential. There was also a relationship between children's creative home environment and their motivation to learn creative thinking. In addition, it was revealed that the integrative-graphic thinking style scores of boys were significantly higher than those of girls.

***Keywords:*** Child, creative thinking, creativity, education, home environment, motivation

## Introduction

Creativity is defined as a skill in which the potential of the individual is revealed through education (Sternberg, 1999). Every child has the potential for creativity. However, the important thing is to reveal and develop the child's creativity skills and to put them in a position to be useful for themselves and society (Sternberg & Lubart, 1999). This skill, which is an innate ability of human beings, emerges at different levels in each person and under different conditions depending on a number of nonlinear interactions (Sternberg & Grigorenko, 2010; Sternberg & Lubart, 1999). Creativity, which is a skill that has no limits and can be developed, can only be developed if appropriate conditions are provided (Dilek, 2013). In order to develop a child's creative potential, an educational environment and teachers that support creativity are required. Researchers argue that this skill can be developed and learned through education (Clark, 2013; Gardner, 1993; Lubart et al., 2011; Sternberg & Grigorenko, 2001).

### Creativity

Creativity is a skill that prepares children for the age they live in, as well as a way to bring solutions to problems in their daily lives (Fox & Schirmacher, 2012). The potential for creativity is referred to as the ability to generate new ideas. Creative potential refers to the possibilities of an individual, taking into account their cognitive capacity, personality, motivation, and environment (Barbot et al., 2015). There are many different definitions and explanations of the term creativity (Craft, 2003; Rhodes, 1961). In the most general sense, creativity is defined as the ability to look at things from different perspectives, to relate to new situations by making use of old experiences, to develop unusual perspectives while solving a problem, to make predictions for the future, and as a result of all these, to create original and unique ideas or products (Amabile, 1996; Craft, 2003; Runco, 2014; Sternberg, 2006; Torrance, 1964, 1969). This is also a skill that we can use in daily life, enabling us to analyze and understand the situations we encounter (Leggett, 2015; Liska, 2013). Some characteristics of creative individuals are expressed as follows: easy adaptation to changing conditions, searching for different, original solutions when faced with a problem situation, having a developed sense of humor, and having strong intuition (Barbot et al., 2011; Blamires & Peterson, 2014; Fox & Schirrmacher, 2012; Lucas et al., 2013; Robinson, 2011; Torrance, 1966). Considering all these, it is inevitable that creativity skills should be supported at all levels of education and environments, starting from early childhood education.

### Early Childhood and Creativity

There are many factors that affect the appearance and development of creativity potential (Amabile, 2012; Zhou & Su, 2010). These factors have been addressed in studies as environment, heredity, society, teacher and parental attitudes, school, and curriculum (OECD, 2019). When we look at the factors affecting creativity in research, the environment in which the child lives and educational factors come to the fore. Therefore, it is important to support children's creativity potential in

This article is a shortened version of the first author's master's thesis supervised by the second author.

**Corresponding Author**: Fatih DERELİ, **E-mail:** fatihdereli@trakya.edu.tr

**Cite this article as:** Atalay, A., & Dereli, F. (2024). Factors affecting creativity potential: creative home environment and motivation to learn creative thinking. *HAYEF: Journal of Education*, 21(2), 155-164.

the early childhood period when the creative potential is at the highest level (Fox & Schirrmacher, 2012). Because the behavioral patterns acquired during this process continue throughout life (Copple & Bredekamp, 2009). Therefore, making the best use of this period is important for raising creative individuals. Providing children with creative environments, especially during this period, is very important for their development (Aslan et al., 1997)

Early childhood, when the foundations are laid for children to realize their potential and become productive members of society, is the period when they are most affected by environmental stimuli (Copple & Bredekamp, 2009; Pianta et al., 2012). Therefore, early childhood education should be turned into an opportunity to support and develop creative thinking in children. The development of creative thinking will enable children to generate the best solutions to the problems they face in less time. It will also make them more sensitive to their environment (Amabile, 1996; Craft, 2003; Runco, 2014; Torrance, 1964). Creative thinking is a way of thinking that makes inventions, is innovative, finds new solutions to old problems, and contributes to the emergence of original thoughts (Blamires & Peterson, 2014; Fox & Schirrmacher, 2012; Lind, 1998; Torrance, 1964, 1969). The creativity skill in children can be developed with a suitable physical environment to be offered from the first months of infancy, and a support program prepared by taking into account the developmental characteristics of the child and expert educators in the field (Cheung, 2012; Fasko, 2001; NACCCE, 1999, p. 11; Shaheen, 2010; Yates & Twigg, 2017). Creativity, which exists in the individual at birth and is a talent that can emerge at any moment of life, is a hidden ability within the individual that can be carried to an advanced level by supporting and creating various opportunities at an early age. A suitable physical environment is necessary for this hidden talent to develop and manifest itself. Creativity can be developed in an educational environment that is rich in stimuli, supports creativity, and encourages children to explore and enjoy (Duffy, 2006, p. 12; Nikkola et al., 2022; Yates & Twigg, 2017). Stimulus-rich educational environments can be characterized as environments that make children curious, open to new discoveries, allow them to access information through research, make choices by taking an active role, and positively develop their creativity with all this investigative spirit (OECD, 2019). Children can further develop their creative thinking skills when provided with parental and teacher support in appropriate environmental settings (Holmes et al., 2015; John et al., 2016).

The development process of creativity in children starts first in the family environment and then in preschool institutions, which is the first level of education (Nikkola et al., 2022). Researchers emphasize that this skill can be developed and learned through education (Amabile, 1995, 1996; Lucas & Spencer, 2017). A free learning environment, behaviors, feelings, trust, creative atmosphere, and supportive teachers play an important role in the development of this innate ability of the child (Sternberg, 2006). Torrance (1962) and many other researchers have stated that the preschool period is important for the development of creativity (Fox & Schirrmacher, 2012; Mohr & Welker, 2017). In early childhood, children's creativity is freer, and they create more original products in creative activities. Traces of creativity can be found in the stories, symbolic games, and drawings that the child creates on his/her own. Therefore, in the early childhood period, parents and teachers are needed around the child to observe, comment, and guide the child in the right way (Csikszentmihalyi, 1996; OECD, 2019).

The family environment, which is the first beginning of the child's life, is the environment that will help the child to think differently, be original, productive, and qualified, and take firm steps in his/her future life. The attitude of the parents toward the child, the rich learning materials in the environment, and the opportunity for children to express their thoughts easily are extremely important for creating a creative thinking environment that will help the child to think, produce, and imagine differently (Beghetto & Plucker, 2006; Davies et al., 2013). One of the factors that affect the development of creativity the most is the creative environments offered to the child (Hwang, 2015). In order to support creative thinking in creative environments, both the psychological needs of children should be met and they should be supported to acquire and demonstrate their creative thinking skills (OECD, 2019; Tanggaard, 2018). Here, the child begins to explore, adapt to, and create new things using the environment around him/her and his/her emotional abilities (Kaufman & Beghetto, 2009; Lew & Cho, 2013). With this harmony, creative thinking emerges and develops (Amabile, 1995, 1996; Lucas & Spencer, 2017).

**Factors that Affect Creativity Potential**

When studies are analyzed, it is seen that the emergence and development of creativity can be affected positively or negatively by some individual or environmental factors (Amabile, 2012; OECD, 2019; Nickerson, 2010; Wong & Niu, 2013; Zhou & Su, 2010). Individuals' differences in creativity depend on many factors such as heredity, cultural and physical environment, and level of education (OECD, 2019). All individuals can show creative behavior when given the necessary environment (Sternberg, 2006). The development of creativity and creative thinking skills, which are influenced by factors such as environment, heredity, society, teacher and parental attitudes, school, and curricula, is mainly influenced by the family and the environment in which the child lives (OECD, 2019). It is extremely important to develop the creativity of the individual through various external factors and to increase its impact positively. Creativity and creative thinking are important potentials that can be developed through education, rich learning environments, and the support provided by the family and school (Beghetto & Kaufman, 2010; Scardamalia & Bereiter, 2006).

Alder (2002) states that another factor for the emergence and support of creativity potential is motivation. He states that motivation has a very important place in creativity potential and that it is a very special personality trait found in long-term and creative individuals (Amabile & Pratt, 2016; Eisenberger & Shanock, 2003). According to Amaible (1998), another researcher on the subject, the three components of creativity are domain knowledge, creative thinking, and intrinsic motivation. Amaible states that the absence of one of these three components will limit creativity. In particular, he emphasizes the importance of motivation by pointing out that motivation is the factor that supports creative thinking and domain knowledge (Amabile, 1983, 1997). According to the findings of Radwan (2004), the reason for the positive relationship between creativity and motivation is that children with high motivation always have more desire to understand and learn. Adams (2007) argues that in order for children's motivation and knowledge to develop, educators should create environments that allow children to think freely beyond the written curriculum. Incorporating creativity into daily teaching practices will ensure that children are given opportunities to develop their full potential, not just the specific areas of development required by standardized education.

**The Importance of Study**

There are studies addressing creativity skills in early childhood. The effect of preschool education on children's creativity and creative problem-solving skills has been investigated, revealing significant differences in the scores of children receiving preschool education, differ significantly (Aslan et al., 1997; Gizir Ergen & Köksal Akyol, 2012) and that the development of creativity depends on the preschool education curriculum, environment, and the expertise of the educator (Alkuş & Olgan, 2014; Can Yaşar & Aral, 2010; Yuvacı & Dağlıoğlu, 2018). Additionally, creativity has been shown to be affected by many different variables such as age, socioeconomic level, environmental

conditions, and parental education level (Can Yaşar & Aral, 2011; Çakmak, 2005), and a relationship has been observed between the dimensions of creativity and cognitive tempo (Ceylan, 2008). The importance of the preschool period in terms of revealing and developing children's creativity is emphasized by all researchers and field experts today (Korkmaz, 2020).

There are studies investigating the factors affecting creativity potential in early childhood (Alsrour & Al-Ali, 2014; Barbot et al., 2016; Castillo-Vergara et al., 2018). However, there is a very limited number of studies examining the effects of the home environment where children spend most of their time and their motivation to learn creative thinking on their creativity potential (Amabile, 1985; Eisenberger & Shanock, 2003; Prabhu et al., 2008; Sharma, 2011). In order to reveal and support children's creativity potential, it is thought to be important to examine their home environments, which are thought to affect their creativity, and their motivation to learn creative thinking. Thus, by evaluating these factors that may affect creativity, appropriate opportunities and environments can be created for the emergence and development of creativity potential.

### The Current Study

The study aims to examine the effects of creative home environments and motivation to learn creative thinking on the creativity potential of children in early childhood. The research questions of the study designed for this purpose are as follows:

1. Is there a significant relationship between children's creativity potential scores and creative home environment scores?
2. Is there a significant relationship between children's creativity potential scores and their motivation to learn creative thinking scores?
3. Is there a significant relationship between children's creative home environment scores and their motivation to learn creative thinking scores?
4. Is there a significant relationship between children's creativity potential scores and their gender?

## Methods

This study was conducted in the correlational research design, which is one of the quantitative research methods. Correlational research examines the relationship between two or more variables without intervening in any way. This examination may give the researcher an idea that there may be a cause-and-effect relationship, but it certainly cannot be interpreted as cause–effect relationship between variables (Gall et al., 2007).

### Participants

The population of the study consists of teachers working in preschool education institutions affiliated with the Ministry of National Education in İstanbul, the children in their classrooms, and the parents of these children. The study group, which is the sample of the research, consists of 12 teachers working in kindergartens affiliated with the Ministry of National Education in İstanbul, 103 children in the classes of these teachers, and the parents of these children. The sample group of the research was determined using the convenience sampling technique. All of the children who participated in the study were enrolled in kindergartens. The ages of the children participating in the study ranged between 61 and 79 months as of the date of data collection, with 49 girls and 54 boys. Tabachnick and Fidell (2013) stated that the sample size should be 100 in correlational studies. In this context, the participant group of the study is considered sufficient. Ethics committee approval was obtained from Trakya University Social and Human Sciences Research Ethics Committee (Approval No: E-29563864-050 .04.04-62148, Date: 25.05.2021). Written informed consent were obtained from the participants of this study, 12 preschool teachers and the parents of 103 preschool children in their classrooms.

### Data Collection Tools

The data obtained within the scope of the research were collected using three different tools, which are the Evaluation of Potential Creativity (EPoC) to assess children's creativity potential, the Creative Home Environment Scale to assess children's creative home environment, and the Motivation to Learn Creative Thinking Scale to assess children's motivation to learn creative thinking.

### Evaluation of Potential Creativity

EPoC was developed in French by Lubart, Besançon, and Barbot in 2011. The EPoC, which is used in many countries, has been translated into five different languages: French, English, Turkish, German, and Arabic. Translated into Turkish by Ahmet Aksu, EPoC, which consists of two parallel forms, A and B, consists of eight items representing verbal and graphic domains. These eight items are based on divergent and convergent thinking styles. These eight items form four groups as follows: Divergent-Graphic Thinking (DG), Integrative-Graphic Thinking (IG), Divergent-Verbal Thinking (DV), and Integrative-Verbal Thinking (IV) (Lubart et al., 2011). The scores obtained separately from these four sub-dimensions were categorized into seven levels: very high, high, upper normal, average, lower normal, weak, and very weak (Lubart et al., 2011). The validity and reliability study within the scope of the Turkish adaptation of the EPoC was conducted by Dereli (2019), and according to the compatibility indices obtained, it was revealed that the model showed a good fit to the structure (GFI = .90, CFI = .93, TLI = .85, SRMR = .047). The four-factor structure of the creativity scale is confirmed. In the reliability study of the EPoC test, the reliability coefficient of the whole scale was found to be 0.70. As a result of these analyses, the scale was found to be valid and reliable (Dereli, 2019).

### Creative Home Environment Scale

The Creative Home Environment Scale was developed by Oh and Choi in Korea in 2006. The original language of the scale is Korean. The Creative Home Environment Scale consists of a total of 32 items on a 5-point Likert scale. The scale has four sub-dimensions: "respect for the child,", "enriched learning environment,", "stimulation of independence," and "family pressure." Atalay (2023) conducted an adaptation study by translating the scale into Turkish. As a result of the validity and reliability analyses conducted within the scope of the scale adaptation study, it is seen that the goodness-of-fit index values of the model have an acceptable structure (CMIN = 102,302, DF = 458, $p <$ .001, CMIN/DF = 2.23, RMSEA = .076, CFI = .620, GFI = .751). A $\chi^2$/SD ratio below 3 indicates a perfect fit, while a $\chi^2$/SD ratio below 5 indicates an acceptable fit (Kline, 2005). In this study, the $\chi^2$/SD value of 2.23 indicates that the model has a perfect fit. A reliability coefficient of .70 or higher is a sufficient criterion for reliability (Nunnally, 1978). Cronbach's $\alpha$ for the whole scale was found to be .79. The Cronbach's $\alpha$ values for the sub-dimensions of the scale were found to be .76, .78, .79, and .75. As a result of the analyses, it was revealed that the Creative Home Environment Scale is a valid and reliable instrument in Turkish.

### Motivation to Learn Creative Thinking Scale

The Motivation to Learn Creative Thinking Scale was developed by Al-Zu'bi, Omar-Fauzee, and Kaur in 2017 as a 5-point Likert-type scale. The scale, which was originally developed in English, was developed in Malaysia. It was created by Al-Zu'bi, Omar-Fauzee, and Kaur by combining and adapting two scales, namely the Intrinsic Motivation Inventory (Ryan, 1982) and the Learning Motivation Scale (Stephanou, 2014). The Motivation to Learn Creative Thinking Scale consists of five sub-dimensions: learning interest, learning efficacy, learning stress, learning effort, and learning pleasure, totaling 21 items. The learning interest subscale consists of seven items, learning competence

six items, learning stress three items, learning effort three items, and learning pleasure two items.

Atalay and Dereli (2023) conducted an adaptation study by translating the scale from English into Turkish. The validity and reliability analyses demonstrate that the goodness-of-fit index values of the model has an acceptable structure (CMIN = 446.97, DF = 177, $p < .001$, CMIN/DF = 2.52, RMSEA = .090, CFI = .944, GFI = .817). A $\chi^2$/SD ratio below 3 indicates a perfect fit, while a $\chi^2$/SD ratio below 5 indicates an acceptable fit (Kline, 2005). In this study, the $\chi^2$/SD value of 2.52 indicates that the model has a perfect fit. A reliability coefficient of .70 or higher is a sufficient criterion for reliability (Nunnally, 1978). Cronbach's $\alpha$ for the whole scale was found to be 0.94. The Cronbach's $\alpha$ values of the sub-dimensions of the scale were found to be .91, .84, .90, .95, and .95. The Motivation to Learn Creative Thinking Scale, which has 21 items and five sub-dimensions, and whose validity and reliability studies were conducted in was made suitable for use in determining preschool children's motivation to learn creative thinking.

**Procedure**

Necessary permissions were obtained from the Ministry of National Education to reach preschool children and their teachers and families. After obtaining the permissions within the scope of the research, the preschool education institution was contacted within the framework of easy accessibility. With the inclusion of teachers and parents in the study in line with the principle of voluntary participation, the Motivation to Learn Creative Thinking Scale was sent to the teachers as an electronic form via Microsoft Forms and they were asked to fill it out separately for each child in their class. Then, the Creative Home Environment Scale was sent to the parents as an electronic form via Microsoft Forms and they were asked to fill it out for their children. In the last part of the study, the EPoC was applied by the researchers to evaluate the creativity potential of children. These practices were conducted by the researchers one-on-one and face-to-face with the children. EPoC was administered in an empty classroom deemed appropriate by the school administration. In order for the children to express themselves comfortably in the EPoC test, the researchers were introduced to the children by the teachers in the children's classrooms and were allowed to participate in free-time activities. In this way, children were prevented from feeling insecure in the EPoC implementation.

**Data Analysis**

In the analysis of the data, the findings of the research were obtained by determining the appropriate analysis method for each sub-objective of the research. Before all these analyses, the normality of the distributions of the data obtained was examined. In this context, the skewness and kurtosis values of the data were examined. When the literature was examined, it was seen that distributions between −2 and +2 for kurtosis and skewness values were accepted to show a normal distribution (George & Mallery, 2010). When the normality of the distributions of the scales considered in the study was analyzed according to the total scores, it was seen that the Creative Home Environment Scale, the Motivation to Learn Creative Thinking Scale, and the EPoC showed a normal distribution according to the skewness and kurtosis values. Therefore, it is seen that the general distributions of the scales used in the research are normal. The results of the analysis are presented in Tables 1 and 2.

In Table 1, the data of the Creative Home Environment Scale and the Motivation to Learn Creative Thinking Scale were accepted to be normally distributed since their kurtosis and skewness values were between −2 and +2 (George & Mallery, 2010). In addition, since the kurtosis and skewness values of the sub-dimensions of the EPoC in Table 2 are between −2 and +2, it is accepted that the data are normally distributed (George & Mallery, 2010).

Table 1.
*Kurtosis and Skewness Values of the Scales*

| | *N* | Skewness | Kurtosis |
|---|---|---|---|
| Creative Home Environment Scale | 103 | .029 | .145 |
| Motivation to Learn Creative Thinking Scale | 103 | 1.08 | −1.11 |

Table 2.
*Kurtosis and Skewness Values for the EPoC*

| Sub-dimensions | *N* | Skewness | Kurtosis |
|---|---|---|---|
| Divergent-Graphic Thinking | 103 | .131 | .114 |
| Integrative-Graphic Thinking | 103 | 1.28 | 1.46 |
| Divergent-Verbal Thinking | 103 | .154 | .188 |
| Integrative-Verbal Thinking | 103 | 1.03 | 1.22 |

Based on the results in Tables 1 and 2, parametric tests were used since the scales and sub-dimensions of the scales to be used in the analyses showed normal distribution. The parametric tests used are paired sample *t*-test and independent sample *t*-test. The paired samples *t*-test was used in the analyses examining the differences between children's creativity potentials and home environment creativity, between children's creativity potentials and their motivation to learn creative thinking, and between children's motivation to learn creative thinking and their creative home environment. The independent samples *t*-test was employed to find out whether children's creativity potentials differed according to their gender.

## Results

In this section of the study, which examines the relationship between preschool children's creativity potential, creative home environments, and motivation to learn creative thinking, the findings obtained from the data are presented. The classification of creativity potential levels is as follows: 130 and more points are very high, 120–129 points are high, 110–119 points are upper normal, 90–119 points are average, 80–89 points are lower normal, 70–79 points are weak, and 69 and less points are very weak. When examining the sub-dimensions of the EPoC in Table 3, it is observed that the minimum score obtained from the Divergent-Graphic Thinking (DG) sub-dimension is 71, the maximum score is 137, and the average score is 106. When the average of the group is analyzed, Divergent-Graphic Thinking skill is at an average level. It is observed that the minimum score obtained from the Integrative-Graphic Thinking (IG) sub-dimension was 68, the maximum score was 131, and the average score obtained from the test was 83. Looking at the average score obtained from this sub-dimension of the test, it was found that the group's Integrative-Graphic Thinking was at a lower normal level. It is observed that the minimum score obtained from the Divergent-Verbal Thinking (DV) sub-dimension is 72, the maximum score is 129, and the average score is 90, which indicates that the

Table 3.
*Descriptive Statistics of Children's Scores from Scales*

| Scales | | *N* | Minimum | Maximum | Mean | SS |
|---|---|---|---|---|---|---|
| EPoC sub-dimensions | DG | 103 | 71.00 | 137.00 | 106.62 | 13.99 |
| | IG | 103 | 68.00 | 131.00 | 83.17 | 13.50 |
| | DV | 103 | 72.00 | 129.00 | 90.52 | 13.07 |
| | IV | 103 | 73.00 | 129.00 | 82.28 | 9.37 |
| Creative home environment scale | | 103 | 93.00 | 148.00 | 120.03 | 9.98 |
| Motivation to Learn Creative Thinking Scale | | 103 | 43.00 | 98.00 | 77.54 | 11.31 |
| Total | | | | 103 | | |

scores obtained from the Divergent-Verbal Thinking dimension are at an average level. The minimum score obtained from the Integrative-Verbal Thinking (IV) sub-dimension was 73, the maximum score was 129, and the average score obtained from the test was 82, which was found to be at the lower normal level.

The minimum score that can be obtained from the Motivation to Learn Creative Thinking test is 21, and the maximum score is 105. Since the lowest score obtained from the Motivation to Learn Creative Thinking Scale was 43, and the highest score was 98, with an average score was 78, it was a test in which high scores were obtained in general. The minimum score that can be obtained from the Creative Home Environment Scale is 32, and the maximum score is 160. When the scores obtained from this scale within the scope of the research were examined, it was seen that the minimum score was 93, the maximum score was 148, and the average score was 120. Considering the scores obtained, it can be said that the average of the group was close to the maximum score that could be obtained, and therefore high scores were obtained from the test.

In order to answer the first sub-problem of the study, "Is there a significant relationship between children's creativity potential scores and creative home environment scores?" a paired sample *t*-test was applied to children's creativity potential scores and creative home environment scores. The findings of the analysis are presented in Table 4.

Table 4 shows that there is a statistically significant relationship between children's creativity potential scores and creative home environment scores ($p < .05$). Children's creativity potential differs according to their creative home environment.

In order to answer the second sub-problem of the study, "Is there a relationship between children's creativity potential scores and motivation to learn creative thinking scores?," a paired sample *t*-test was conducted on children's creativity potential scores and motivation to learn creative thinking scores. The results of the analysis are presented in Table 5.

Table 4.
*Paired Sample t-test Results Between EPoC Scores and Creative Home Environment Scores*

| | *N* | $\bar{X}$ | *S* | df | *t* | *p* |
|---|---|---|---|---|---|---|
| DG-home environment creativity | 103 | –20.27 | 16.36 | 102 | –12.57 | .000* |
| IG-home environment creativity | 103 | –43.71 | 16.81 | 102 | –26.38 | .000* |
| DV-home environment creativity | 103 | –36.36 | 16.10 | 102 | –22.91 | .000* |
| IV-home environment creativity | 103 | –44.61 | 12.35 | 102 | –36.63 | .000* |

*Note*: *$p < .05$.

Table 5.
*Paired Sample t-Test Results Between EPoC Scores and Motivation to Learn Creative Thinking Scores*

| | *N* | $\bar{X}$ | *S* | df | *t* | *p* |
|---|---|---|---|---|---|---|
| DG-Motivation to Learn Creative Thinking | 103 | 18.54 | 17.69 | 102 | 10.63 | .000* |
| IG-Motivation to Learn Creative Thinking | 103 | −4.90 | 18.16 | 102 | −2.73 | .007* |
| DV-Motivation to Learn Creative Thinking | 103 | 2.44 | 18.04 | 102 | 1.37 | .172 |
| IV-Motivation to Learn Creative Thinking | 103 | −5.79 | 16.70 | 102 | −3.52 | .001* |

*Note*: *$p < .05$.

When Table 5 is examined, a significant difference is observed in children's motivation to learn creative thinking scores in terms of their divergent-graphic thinking, integrative-graphic thinking, and integrative-verbal thinking scores ($p < .05$). On the other hand, no significant difference was found in divergent-verbal thinking scores ($p > .05$).

In order to answer the third sub-problem of the study, "Is there a relationship between children's creative home environment scores and motivation to learn creative thinking scores?"a paired sample *t*-test was conducted on children's creative home environment scores and motivation to learn creative thinking scores. The findings of the analysis are presented in Table 6.

When Table 6 is analyzed, a significant relationship can be observed between children's creative home environment scores and their motivation to learn creative thinking scores ($p < .05$).

In order to answer the fourth sub-problem of the study, "Is there a relationship between children's creativity potential scores and their gender?," an independent samples *t*-test was conducted. The findings of the analysis are presented in Table 7. According to Table 7, no significant difference was found between genders in terms of graphic and verbal divergent thinking scores and integrative-verbal thinking scores ($p > .05$), while a significant difference was found in their integrative-graphic thinking scores by gender ($p < .05$).

A significant difference was found between the integrative-graphic thinking score and gender. A correlation analysis was performed to determine if there was a difference based on gender, the results of which are presented in Table 8. As a result of the correlation analysis, it was revealed that the integrative-graphic thinking style scores of boys were significantly higher than those of girls.

Table 6.
*Paired Sample t-Test Results Between Creative Home Environment Scores and Motivation to Learn Creative Thinking Scores*

| | *N* | $\bar{X}$ | *S* | df | *t* | *p* |
|---|---|---|---|---|---|---|
| Creative Home Environment-Motivation to Learn Creative Thinking | 103 | 42.49 | 14.45 | 102 | 29.83 | .000* |

*Note*: *$p < .05$.

Table 7.
*Independent Sample t-Test Results Between EPoC Scores and Gender*

| | *N* | df | *t* | *p* |
|---|---|---|---|---|
| DG-Gender | 103 | 101 | .410 | .694 |
| IG-Gender | 103 | 101 | −1.87 | .000* |
| DV-Gender | 103 | 101 | .088 | .992 |
| IV-Gender | 103 | 101 | −.85 | .216 |

*Note*: *$p < .05$.

Table 8.
*Correlation Test Results Regarding the Differences in EPoC Scores According to Being a Girl or a Boy*

| Variable | Group | *N* | *r* | *p* |
|---|---|---|---|---|
| DG | Girl | 49 | .259 | .389 |
| | Boy | 54 | .354 | .008 |
| IG | Girl | 49 | .229 | .118 |
| | Boy | 54 | .542** | .002 |
| DV | Girl | 49 | .056 | .035 |
| | Boy | 54 | .218 | .287 |
| IV | Girl | 49 | .251 | .035 |
| | Boy | 54 | .328 | .056 |

*Note*: ** $p < .01$.

## Discussion

According to the results of this study, which examined the relationship between preschool children's creativity in the home environment and their motivation to learn creative thinking and their creativity potential, there is a statistically significant relationship between children's creativity potential scores and creative home environment scores. When the relationship between children's motivation to learn creative thinking and their creativity potential was examined, a significant difference was found between graphical divergent thinking, graphical convergent thinking, and verbal convergent thinking, while no difference was found in verbal divergent thinking. There was a relationship between children's creative home environment and their motivation to learn creative thinking. While no significant difference was found between graphic and verbal divergent thinking and integrative-verbal thinking styles, a significant difference was found in integrative-graphic thinking style in terms of gender. In addition, it was revealed that the integrative-graphic thinking style scores of boys were significantly higher than those of girls.

The first result obtained from the study is that children's creativity potential scores are significantly correlated with their creative home environment scores and motivation to learn creative thinking scores. In other words, children's creativity potential differs according to their creative home environments and their motivation to learn creative thinking. A review of the literature (Gayret, 2021; Jankowska & Gralewski, 2020; Kim et al., 2015; Pugsley & Acar, 2020; Radwan, 2004; Sharma, 2011; Tehlan, 2015) reveals a positive relationship between the creative home environment and children's creative personality. Children raised in creative home environments have higher creativity potential. Looking at the studies conducted with different sample groups, Lew (2015) investigated the effect of adolescents' home environment on their creativity and found that the creativity of young people living in creative home environments was higher. It was seen that the studies examined in the literature support the results of the research.

In this study, the relationship between convergent (integrative) thinking and divergent thinking skills, which are sub-dimensions of the EPoC, and creativity in the home environment was examined. A significant relationship was found between children's creative home environment scores and their divergent-graphic thinking scores and divergent-verbal thinking scores. The related literature was reviewed for studies with divergent thinking and convergent thinking variables, and it was seen that there were no studies examining the relationship between creativity in the home environment and divergent thinking style, but there were a few studies, albeit limited, showing the effect of divergent thinking style on children living in different cultures. Cheung et al. (2016) wanted to make a cross-cultural comparison of divergent and convergent thinking styles of Chinese children living in Hong Kong and French children living in Paris. At the end of the study, it was found that Chinese children scored higher both in divergent and convergent thinking styles than French children. Torrance (1974) found that American children were better at divergent and convergent thinking than Arab children. It is seen in the literature review that there are no studies examining the relationship between divergent and convergent thinking styles and the home environment, but there are studies in which comparisons are made with children living in different cultures. Differences were observed between the divergent thinking style scores of children living in different cultures. Although very limited, the findings obtained from similar studies in the literature overlap with the findings of this study.

When the results of the research are examined, a significant relationship is seen between children's creative home environment scores and their integrative-graphic thinking scores and integrative-verbal thinking scores. Bashaw and White (1971) examined whether the socioeconomic level of families had an effect on convergent thinking and scientific creativity in preschool children. The study concluded that children raised in families with low socioeconomic status had lower convergent thinking skills and scientific creativity, which is consistent with the findings of the present study.

When the relationship between children's motivation to learn creative thinking and their creativity potentials is examined, a significant relationship was found between divergent-graphical thinking, integrative-graphical thinking, and integrative-verbal thinking, while no relationship was found in divergent-verbal thinking. In other words, it was found that children's motivation to learn creative thinking was related to divergent-graphical thinking, integrative-graphical thinking, and integrative-verbal thinking domains, but not the divergent-verbal thinking domain. Similarly, Al-Zu'bi et al. (2017) examined preschool children's motivation to learn creative thinking and creativity levels and found a significant positive relationship between them. Gayret (2021) examined the relationship between children's motivation levels and creativity, and found that there was a positive relationship between creativity and motivation. Since studies conducted in preschool are limited, studies conducted with different sample groups and different variables were also examined. Li et al. (2020) investigated how creativity and motivation are associated with achievement levels. The study group consisted of 606 university students studying at two universities in China. At the end of the research, it was found that creativity had an effect on achievement and motivation. These studies support the results of the research, but there are also studies with findings contrary to the results of the research. Lew and Cho (2013) examined the relationship between children's intrinsic/extrinsic motivation and creative thinking skills but did not find a significant relationship between them. The findings of the studies in the literature indicate different results; therefore, it is thought that the relationship between creativity and motivation does not show a single direction and that there is a need for further research on this subject.

The present study examined the relationship between convergent (integrative) thinking skill and divergent thinking skill, two sub-dimensions of the EPoC, and motivation to learn creative thinking. The results obtained from the study showed a significant relationship between children's motivation to learn creative thinking and their divergent-graphic thinking style scores, while no significant relationship was found in their divergent-verbal thinking style scores. Although there are no similar studies in the preschool field, there are studies conducted with different sample groups and different variables in the literature. Atacan (2020) examined the effect of using the design thinking activity on the motivation of students with divergent thinking styles in his study in which the study group consisted of 7th-grade students. It was found that children with low scores in the divergent thinking test had increased thinking skills and therefore increased motivation. It was observed that the problem-solving behaviors and motivation of children with high scores in the divergent thinking test increased. Based on these results, it can be interpreted that children experience a sense of success because they produce creative solutions to the problems they encounter with divergent thinking in their daily lives, and therefore their motivation to learn to think creatively increases. From another perspective, children with high motivation to learn creative thinking may also have high divergent thinking skills since they will be highly motivated and open to learning in the face of the problems they face.

There is a significant relationship between the motivation to learn creative thinking scores of the children in this study and their verbal and graphic integrative thinking scores. Since the studies on motivation are limited and no study was found for this finding, the studies on convergent (integrative) thinking were examined. These studies were not conducted with preschool age groups, but with different sample

groups and different variables. Çüçen and Ertürk (2008) examined whether the convergent–divergent thinking levels of university students who received logic and mathematics education and university students who did not receive enough logic and mathematics education were different. According to this study, a significant difference was found between the convergent–divergent thinking levels of girls and boys, and it was determined that the convergent–divergent thinking levels of girls were higher than those of boys. Another finding of the study was that the educational status of students' parents had no effect on their convergent–divergent thinking skills. In the same way, it was revealed that there was no significant difference between the convergent–divergent thinking skills of students from different income levels. Coşkun (2005) examined the effect of divergent and convergent thinking tasks on thought production performance. The research findings revealed that divergent thinking increases performance in brainstorming compared to convergent thinking. De Vink et al. (2022) examined how divergent and convergent thinking contribute to math performance and reported that children's mathematics performance was based on convergent thinking. In this respect, it is stated that divergent thinking has two roles: To complete convergent thinking in multi-solution operations and to compensate for convergent thinking in single-solution operations. When the studies were examined, no studies could be found examining the relationship between motivation to learn creative thinking and convergent thinking, but the relationship with different variables was examined. For this reason, it was seen that convergent thinking style is a variable that should be included more in research.

The present study found a significant relationship between children's creative home environment scores and their motivation to learn creative thinking scores. When the literature was examined, no studies related to motivation to learn creative thinking were found. Generally, studies have been conducted to examine the relationship between children's motivation levels and different variables (Berhenke, 2013; Gözübüyük & Özbey, 2019, 2020; Özbey, 2017, 2018; Köyceğiz & Özbey, 2019; Özbey & Aktemur Gürler, 2019). Since there are no studies examining the creative home environment in the literature, those conducted on the relationships between attachment patterns, parental education level, and parental relationship with children's motivation, which are thought to provide the closest results, were examined. Özbey (2017) found that children's motivation levels showed a significant difference in terms of variables such as the father's education level and occupation but did not show a significant difference according to the mother's education level. From this point of view, it can be said that parents' education level is not the only factor influencing the motivation levels of children. Gözübüyük and Özbey (2019) examined the relationship between children's motivation levels and attachment patterns and found that securely attached children had higher motivation levels compared to insecurely attached children. Gözübüyük and Özbey (2020) examined the relationship between father–child relationship and children's motivation levels. In the study, it was found that children with high levels of motivation had fewer problems in father–child relationships. However, when the number of problems in father–child relationships was high, children's motivation levels decreased.

The study examined whether there was a significant difference in children's creativity potential scores according to gender. While no significant difference was found between the genders of the children and their graphic and verbal divergent thinking and verbal integrative thinking style scores, a significant difference was found between their integrative-graphic thinking style scores and their genders. As a result of the correlation analysis, it was revealed that the integrative-graphic thinking style scores of boys were significantly higher than those of girls ($r = .542$). There are studies with similar and different results with the findings of this research. When the literature is examined, there are studies reporting that being a boy or a girl does not affect creativity potentials (Aslan et al., 1997; Baer & Kaufman, 2008; Çeliköz, 2017; Ceylan, 2008; Can Yaşar & Aral, 2010; Dilek, 2013; Dunn & Herwig, 1992; Gizir Ergen & Köksal Akyol, 2012; Gönen et al., 2011; Öncü, 2017; Saygın, 2004; Sayed & Mohamed, 2013; Sıdar, 2011). On the other hand, there are also studies in which children's creativity potential differs according to their gender. Lee (2005) examined the relationship between gender and creativity levels of 1000 children aged 4–5 years and concluded that creativity levels differed according to gender. Yıldırım's (2006) study included 180 preschool children and found that girls scored higher in fluency and enrichment subscales than boys. Basun (2017) examined whether the creativity levels of 48–66-month-old children differed by gender, and it was found that the creativity of boys was higher than girls in the fluency and flexibility sub-dimensions. Considering the studies in the literature and the findings of the research, it can be stated that the gender variable alone is not determinative in children's creativity potential.

## Conclusion and Recommendations

In the study, the relationship between home environment and motivation to learn creative thinking, which are among the factors affecting creativity, and creativity potential was examined. In future studies, research can be conducted with different variables that may affect children's creativity, such as the educational status, socioeconomic, and sociocultural level of the family. In this study, creativity in the home environment, which is thought to be related to children's creativity and exhibits the attitude of families, was examined. Similarly, the relationship between the school environment and teachers' attitudes and children's creativity can be examined in other studies. Additionally, research can be conducted to identify the situations that prevent children's creativity in the home environment and to eliminate these situations. Awareness can be raised about the factors affecting children's creativity by organizing in-service training for teachers in order to organize the school environment and by developing training programs for families for the home environment, and it can be monitored whether this awareness is effective or not. Furthermore, workshops can be organized where teachers can discuss activities that increase children's creative thinking motivation and gain positive experience.

**Ethics Committee Approval:** The research data were collected from preschool education institutions affiliated with the İstanbul Provincial Ministry of National Education in the fall and spring semesters of the 2021–2022 academic year. In order to obtain the data, ethics committee permission was obtained from Trakya University Social and Human Sciences Research Ethics Committee (Approval No: E-29563864-050.04.04-62148, Date: 25.05.2021).

**Informed Consent:** Written informed consent were obtained from the participants of this study, 12 preschool teachers and the parents of 103 preschool children in their classrooms.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – A.A., F.D.; Design – A.A., F.D.; Supervision – F.D.; Resource – A.A., F.D.; Materials – A.A., F.D.; Data Collection and/or Processing – A.A.; Analysis and/or Interpretation – A.A., F.D.; Literature Search – A.A., F.D.; Writing – A.A., F.D.; Critical Review – F.D.

**Declaration of Interests:** The authors have no conflict of interest to declare.

**Funding:** The authors declared that this study has received no financial support.

## References

Adams, A. B. (2007). The benefits of equalizing standards and creativity, *Giftedchildtoday*, *30*(1), 58–63. [CrossRef]

Alder, H. (2002). *Boost your creative intelligence*. Kogan Page Publishers.

Alkuş, S., & Olgan, R. (2014). Pre-service and in-service preschool teachers' views regarding creativity in early childhood education. *Early Child Development and Care*, *184*(12), 1902–1919. [CrossRef]

Alsrour, N. H., & Al-Ali, S. (2014). An investigation of the differences in creativity of preschool children according to gender, age and kindergarten type in Jordan. *Gifted and Talented International*, *29*(1–2), 33–38. [CrossRef]

Al-Zu'bi, M., Omar-Fauzee, M., & Kaur, A. (2017). The relationship between creative thinking and motivation to learn creative thinking among preschoolers ın Jordan. *European Journal of Education Studies*, *3*(3), 426–442. [CrossRef]

Amabile, T. (1996). *Creativity in context. Update to the social psychology of creativity*. Westview Press.

Amabile, T. (2012). *Componential theory of creativity, No. 12-096*. Harvard Business School. https://www.hbs.edu/ris/Publication%20Files/12-096.pdf

Amabile, T. M. (1983). The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, *45*(2), 357–376. [CrossRef]

Amabile, T. M. (1985). Motivation and creativity: Effects of motivational orientation on creative writers. *Journal of Personality and Social Psychology*, *48*(2), 393–399. [CrossRef]

Amabile, T. M. (1995). Attributions of creativity- what are the consequencies? *Creativity Research Journal*, *8*(4), 423–426. [CrossRef]

Amabile, T. M. (1997). Motivating creativity in organizations: On doing what you love and loving what you do. *California Management Review*, *40*(1), 39–58. [CrossRef]

Amabile, T. M. (1998). How to kill creativity. *Harvard Business Review*, *76*(5), 76–87. https://hbr.org/1998/09/how-to-kill-creativity

Amabile, T. M., & Pratt, M. G. (2016). The dynamic componential model of creativity and innovation in organizations: Making progress, making meaning. *Research in Organizational Behavior*, *36*, 157–183. [CrossRef]

Aslan, A., Aktan, E., & Kamaraj, I. (1997). The effect of kindergarten education on creativity and problem solving skills. *Marmara University Atatürk Faculty of Education Journal of Educational Sciences*, *9*, 37–48.

Atacan, B. (2020). *The effect of a design thinking activity for 7th grade science course on student's motivation, team study and course viewpoints* [Master's thesis]. Balıkesir University.

Atalay, A. (2023). *The effect of creative home environment and creative thinking motivations on children's creativity potantial* [Master's thesis]. Trakya University.

Atalay, A., & Dereli, F. (2023). Motivation to learn creative thinking scale: Turkish validity and reliability study *Mevzu*. *Journal of Social Sciences*, *10*, 359–383. [CrossRef]

Baer, J., & Kaufman, J. C. (2008). Gender differences in creativity. *Journal of Creative Behavior*, *42*(2), 75–105. [CrossRef]

Barbot, B., Besancon, M., & Lubart, T. (2011). Assessing creativity in the classroom. *Open Education Journal*, *4*(1), 58–66. [CrossRef]

Barbot, B., Besançon, M., & Lubart, T. (2015). Creative potential in educational settings: Its nature, measure, and nurture. *Education 3-13*, *43*(4), 371–381. [CrossRef]

Barbot, B., Lubart, T. I., & Besançon, M. (2016). "Peaks, Slumps, and Bumps": Individual differences in the development of creativity in children and adolescents. *New Directions for Child and Adolescent Development*, *2016*(151), 33–45. [CrossRef]

Bashaw, W. L., & White, W. F. (1971). Figural creativity and convergent thinking among culturally deprived kindergarten children. *American Educanional Research Association Convetion in NewYork City*. https://files.eric.ed.gov/fulltext/ED047346.pdf

Basun, B. (2017). *Studying on children between 48–66 monts their social problem solving abilities and creativity from the view of where they live (Urban, city)* [Master's thesis]. Cukurova Üniversitesi.

Beghetto, R., & Kaufman, J. (2010). *Nurturing creativity in the classroom*. Cambridge University Press.

Beghetto, R., & Plucker, J. (2006). "The relationship among schooling, learning, and creativity: "All roads lead to creativity" or "You can't get there from here"? In J. Kaufman & J. Baer (Eds.), *Creativity and reason in cognitive development*. Cambridge University Press.

Berhenke, A. L. (2013). *Motivation, self-regulation, and learning in preschool* [Doctoral dissertation]. University of Michigan.

Blamires, M., & Peterson, A. (2014). Can creativity be assessed? towards an evidence-informed framework for assessing and planning progress in creativity. *Cambridge Journal of Education*, *44*(2), 147–162. [CrossRef]

Çakmak, A. (2005). *The search of the creativitiy of six years old city and rural area children according to the various variations (Kırıkkale sample)* [Doctoral dissertation]. Ankara University.

Can Yaşar, M., & Aral, N. (2010). The study of the effect of socio-economic level and parents' educational status on creative thinking skills of six-year-old children. *Journal of Theoretical Educational Science*, *4*(1), 137–145.

Castillo-Vergara, M., Barrios Galleguillos, N., Jofré Cuello, L., Alvarez-Marin, A., & Acuña-Opazo, C. (2018). Does socioeconomic status influence student creativity? *Thinking Skills and Creativity*, *29*, 142–152. [CrossRef]

Çeliköz, N. (2017). Investigation of creativity levels of preschool children 5–6 years old. *Yıldız Journal of Educational Research*, *2*(1), 1–25. [CrossRef]

Ceylan, E. (2008). *According to cognitive tempo. The investigation of creativity levels of 5–6 age children who continue pre-school education* [Master's thesis]. Selçuk University.

Cheung, P. C., Lau, S., Lubart, T., Chu, D. H. W., & Storme, M. (2016). Creative potential of Chinese children in Hong Kong and French children in Paris: A cross-cultural comparison of divergent and convergent-integrative thinking. *Thinking Skills and Creativity*, *22*, 201–211. [CrossRef]

Cheung, R. H. P. (2012). Teaching for creativity: Examining the beliefs of early childhood teachers and their influence on teaching practices. *Australasian Journal of Early Childhood*, *37*(3), 43–52. [CrossRef]

Clark, B. (2013). *Growing up gifted: Developing the potential of children at school and at home* (8th ed). Pearson.

Copple, C., & Bredekamp, S. (Eds.) (2009). *Developmentally appropriate practice in early childhood programs* (3rd ed). National Association for the Education of Young Children.

Coşkun, H. (2005). The effect of divergent thinking and group composition on ıdea generation in brainwriting. *Turkish Journal of Psychology*, *20*(55), 39.

Craft, A. (2003). Creative thinking in the early years education. *Early Years*, *23*(2), 143–154. [CrossRef]

Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and ınvention*. Harper Collins Publishers.

Çüçen, A. K., & Ertürk, E. (2008). The role of logical and mathematical knowledge in abstract reasoning. *Uludag University Faculty of Arts and Sciences Journal of Philosophy*, *11*, 247–268.

Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P., & Howe, A. (2013). Creative learning environments in education—A systematic literature review. *Thinking Skills and Creativity*, *8*, 80–91. [CrossRef]

De Vink, I. C., Willemsen, R. H., Lazonder, A. W., & Kroesbergen, E. H. (2022). Creativity in mathematics performance: The role of divergent and convergent thinking. *British Journal of Educational Psychology*, *92*(2), e12459. [CrossRef]

Dereli, F. (2019). *Effectıveness of the traınıng program for nomınatıon of gıfted chıldren ın early chıldhood educatıon* [Doctoral dissertation]. Hacettepe University.

Dilek, A. N. (2013). *The ımpact of socio-cultural features on creative thinking* [Master's thesis]. Osmangazi University.

Duffy, B. (2006). *Supporting creativity and imagination in the early years* (2nd ed). Open University Press.

Dunn, L., & Herwig, J. E. (1992). Play behaviors and convergent and divergent thinking skills of young children attending full-day preschool. *Child Study Journal*, *22*(1), 23–38.

Eisenberger, R., & Shanock, L. (2003). Rewards, intrinsic motivation, and creativity: A case study of conceptual and methodological isolation. *Creativity Research Journal*, *15*(2–3), 121–130. [CrossRef]

Fasko, D. (2001). Education and creativity. *Creativity Research Journal*, *13*(3–4), 317–327. [CrossRef]

Fox, J. E., & Schirrmacher, R. (2012). *Creative development for young children*. Cengage Learning.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed). Allyn & Bacon.

Gardner, H. (1993). *Creating minds*. Basic Books.

Gayret, H. (2021). *Analyzing of the relationship between the motivation levels and creativity of children between 60–72 months attending preschool education institution* [Master's thesis]. Necmettin Erbakan University.

George, D., & Mallery, M. (2010). *SPSS for Windows step by step: A simple guide and reference, 17.0 update* (10th ed). Pearson.

Gizir Ergen, Z., & Köksal Akyol, A. (2012). An ınvestigation of creativity among children attending preschools. *Journal of Theoretical Educational Science*, *5*(2), 156–170.

Gönen, M., Çiçekler, C. Y., Akyüz, E., Arslan, A. Ç., & Baydemir, G. (2011). Examınatıon of the creatıvity level of 5 year old chıldren. *E-Journal of New World Sciences Academy*, *6*(1), 1185–1195.

Gözübüyük, A., & Özbey, S. (2019). Investigation of the relationship between attachment patterns and motivational levels of preschool children. *SDU International Journal of Educational Studies*, *6*(2), 101–113. [CrossRef]

Gözübüyük, A., & Özbey, S. (2020). Investigation of the relationship between motivational levels of preschool children and father-child relationships. *IBAD Journal of Social Sciences, (Special Issue)*, 23–37. [CrossRef]

Holmes, R. M., Romeo, L., Ciraola, S., & Grushko, M. (2015). The relationship between creativity, social play, and children's language abilities. *Early Child Development and Care*, *185*(7), 1180–1197. [CrossRef]

Hwang, S. (2015). Classrooms as creative learning communities: A lived curricular expression. https://core.ac.uk/download/pdf/33142843.pdf

Jankowska, D. M., & Gralewski, J. (2020). The familial context of children's creativity: Parenting styles and the climate for creativity in parent-child relationship. [CrossRef]

John, B. A., Cameron, L., & Bartel, L. (2016). Creative musical play: An innovative ap-proach to early childhood music education in an urban community school of music. *Action, Criticism, and theory for music education*, *15*(3), 21–36.

Kaufman, J. C., & Beghetto, R. A. (2009). Beyond big and little: The four C Model of creativity. *Review of General Psychology*, *13*(1), 1–12. [CrossRef]

Kim, H. J., Koo, S. S., & Lee, K. C. (2015). The mediating effect of their emotional intelligence on the relationship between creative home environment of fathers and creative personality of young children. *Journal of the Korea Academia-Industrial Cooperation Society*, *16*(3), 1844–1852. [CrossRef]

Kline, R. B. (2005). *Principle and practice of structural equation modelling* (2nd ed). The Guilford Press.

Korkmaz, S. (2020). *The effect of the Waldorf based education program on the creativity and cognitive skills of preschool children* [Master's thesis]. Aydın Adnan Menderes University.

Köyceğiz, M., & Özbey, S. (2019). An investigation of the motivation levels of children in preschool education institutions in terms of problem solving skills and some variables related to teachers. *Folklore/Literary*, *25*(97), 571–610. [CrossRef]

Lee, K. H. (2005). The relationship between creative thinking ability and creative personality of pre-schoolers. *International Education Journal*, *6*(2), 194–199. [CrossRef]

Leggett, N. M. (2015). *Intentional teaching practices of educators and the development of creative thought processes of young children within Australian early childhood centres* [Doctoral dissertation]. The University of Newcastle, Australia.

Lew, K. H. (2015). The effect of the home environment on adolescents' creativity. *Advanced Science and Technology Letters*, *92*, 81–85. [CrossRef]

Lew, K., & Cho, J. (2013). Creativity analysis for smart specialist of the ubiquitous era. *International Journal of Smart Home*, *7*(4), 183–194.

Li, P., Zhang, Z. S., Zhang, Y., Zhang, J., Nunez, M., & Shi, J. (2021). From implicit theories to creative achievements: The mediating role of creativity motivation in the relationship between stereotypes, growth mindset, and creative achievement. *Journal of Creative Behavior*, *55*(1), 199–214. [CrossRef]

Lind, K. (1998). Science in early childhood: Developing and acquiring fundamental concepts and skills. *Early Childhood Science, Mathematics and Technology Education*, 6–8, February.

Liska, I. H. (2013). *A pedagogic analysis: Middle years of schooling and the role of creative practice* [Master thesis]. Victoria University.

Lubart, T. I., Besançon, M., & Barbot, B. (2011). *Evaluation du Potentiel Créatif (EPoC). (Test psychologique et Manuel)*. Editions Hogrefe France. (English Version: Evaluation of creative potential: Test and Manual).

Lucas, B., Claxton, G., & Spencer, E. (2013). *Progression in student creativity in school: First steps towards new forms of formative assessments*. Database: OECD library. OECD working papers documents no. 86. Organization for Economic Co-operation and Development Publishing.

Lucas, B., & Spencer, E. (2017). *Teaching creative thinking: Developing learners who generate ıdeas and can think critically*. Crown House Publishing.

Mohr, K., & Welker, R. W. (2017). *The role of integrated curriculum in the 21st century school* [Doctoral dissertation]. University of Missouri-St. Louis.

National Advisory Committee on Creative and Cultural Education (NACCCE). (1999). *All our futures: Creativity, culture and education*. Department for Education and Employment.

Nickerson, R. (2010). How to discourage creative thinking in the classroom. In R. Beghetto & J. Kaufman (Eds.), *Nurturing creativity in the classroom*. Cambridge University Press. [CrossRef]

Nikkola, T., Reunamo, J., & Ruokonen, I. (2022). Children's creative thinking abilities and social orientations in Finnish early childhood education and care. *Early Child Development and Care*, *192*(6), 872–886. [CrossRef]

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed). McGraw-Hill.

Oh, M. H., & Choi, B. G. (2006). Development of a creative home environment scale for preschool children. *Journal of the Korean Home Economics Association*, *44*(1), 1–10.

Öncü, T. (2017). Comparison of creativity levels of children aged 12–14 by age and gender by means of Torrance Creative Thinking Tests-Shape Test. *Journal of the Faculty of Languages and History-Geography*, *43*(1), 221–237.

Organization for Economic Co-operation and Development. (2019). PISA 2021 Creative thinking framework [Third draft] OECD. https://www.oecd.org/pisa/publications/PISA-2021-creative-thinking-framework.pdf

Özbey, S. (2017). A study on the motıvatıon and self-regulation skılls of the pre-school chıldren. *Journal of Academic Social Science*, *6*(65), 26–47. [CrossRef]

Özbey, S. (2018). A study on the relatıon between the moral value behavıors and motıvatıon levels of the preschool chıldren. *Journal of International Educational Sciences*, *5*(16), 1–15. [CrossRef]

Özbey, S., & Aktemur Gürler, S. (2019). The ınvestıgatıon of relatıon among the problem behavıors, socıal skılls and motıvatıon level of students attendıng the pre-school ınstıtutıons. *International Journal of Turkish Literature Culture Education*, *8*(1), 587–602. [CrossRef]

Pallant, J. (2017). *SPSS survival manual: A step by step guide to data analysis using SPSS program* (6th ed). McGraw-Hill Education.

Pianta, R. C., Barnett, W. S., Justice, L. M., & Sheridan, S. M. (Eds.). (2012). *Handbook of early childhood education*. Guilford Press.

Prabhu, V., Sutton, C., & Sauser, W. (2008). Creativity and certain personality traits: Understanding the mediating effect of intrinsic motivation. *Creativity Research Journal*, *20*(1), 53–66. [CrossRef]

Pugsley, L., & Acar, S. (2020). Supporting creativity or conformity? Influence of home environment and parental factors on the value of children's creativity characteristics. *Journal of Creative Behavior*, *54*(3), 598–609. [CrossRef]

Radwan, W. S. (2004). *Cognitive motivation and classroom environment and their relationship to creative thinking for the fourth grade students* [Master's thesis]. Al-Azhar University.

Rhodes, M. (1961). An analysis of creativity. *Phi Delta Kappan*, *42*, 305–310. http://www.jstor.org/stable/20342603

Robinson, K. (2011). *Out of our minds, learning to be creative*. Capstone Publishing.

Runco, M. A. (2014). *Creativity theories and themes: Research, development and practice* (2nd ed). Academic Press.

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, *43*(3), 450–461. [CrossRef]

Sayed, E. M., & Mohamed, A. H. H. (2013). Gender differences in divergent thinking: Use of the test of creative thinking – Drawing production on an Egyptian sample. *Creativity Research Journal*, *25*(2), 222–227. [CrossRef]

Saygın, F. (2004). *The effects of some variables relating to mothers to creative thought in 5–6 years old children* [Master's thesis]. Selçuk University.

Scardamalia, M., & Bereiter, C. (2006). Knowledge building: Theory, pedagogy, and technology. In *Cambridge handbook of the learning sciences*. Cambridge University Press. https://ikit.org/fulltext/2006_KBTheory.pdf

Shaheen, R. (2010). Creativity and education. *Creative Education*, *1*(03), 166–169. [CrossRef]

Sharma, R. (2011). Effect of school and home environments on creativity of children. *MIER Journal of Educational Studies Trends and Practices*, *1*(2), 187–196. [CrossRef]

Sıdar, R. (2011). *The effect of creativity of problem solving skills on students attending in science and arts resource centre* [Master's thesis]. Nigde University.

Stephanou, G. (2014). Feelings towards child–teacher relationships, and emotions about the teacher in kindergarten: Effects on learning motivation, competence beliefs and performance in mathematics and literacy. *European Early Childhood Education Research Journal*, *22*(4), 457–477. [CrossRef]

Sternberg, R. J. (1999). *Intelligence, in encyclopedia of creativity* (M. A. Runco & S. R. Pritzker, Eds., pp. 81–87). Academic Press.

Sternberg, R. J. (2006). Retracted article: The nature of creativity. *Creativity Research Journal*, *18*(1), 87–98. [CrossRef]

Sternberg, R. J., & Grigorenko, E. L. (2001). Guilford's structure of intellect model and model of creativity: Contributions and limitations. *Creativity Research Journal*, *13*(3–4), 309–316. [CrossRef]

Sternberg, R. J., & Lubart, T. (1999). The concept of creativity: Prospects and paradigms. In R. J. Sternberg (Ed.), *Handbook of creativity*. Cambridge University Press.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed). Allyn.

Tanggaard, L. (2018). *Content-driven pedagogy: On passion, absorption and immersion as dynamic drivers of creativity*. Springer.

Tehlan, I. B. (2015). A comparative study of creativity of students in relation to their home environment. *International Journal of Advanced Research in Management and Social Sciences*, *4*, 189–197.

Torrance, E. P. (1962). *Guiding creative talent*. Prentice-Hall.

Torrance, E. P. (1964). Identifying the creatively gifted among economically and culturally disadvantaged children. *Gifted Child Quarterly*, *8*(4), 171–176. [CrossRef]

Torrance, E. P. (1966). *Torrance test of creative thinking (TTCT), 2006*. Scholastic Testing Service, Inc.

Torrance, E. P. (1969). *Creativity*. Dimensions Pub. Co.: In association with Fearon Publishers.

Torrance, E. P. (1974). *Torrance tests of creative thinking norms technical manual research edition verbal tests, forms A and B figural tests, forms A and B*. Personnel Press, Inc.

Wong, R., & Niu, W. (2013). Cultural difference in stereotype perceptions and performances in nonverbal deductive reasoning and creativity. *Journal of Creative Behavior*, *47*(1), 41–59. [CrossRef]

Yates, E., & Twigg, E. (2017). Developing creativity in early childhood studies students. *Thinking Skills and Creativity*, *23*, 42–57. [CrossRef]

Yıldırım, B. (2006). *Teacher's opinion about creativity and the search of kindergarten children and their teacher's creativity level* [Master's thesis]. Hacettepe University.

Yuvacı, Z., & Dağlıoğlu, H. E. (2018). Examining the relationship between the creativity levels of the classroom environment and the preschool children. *Journal of Early Childhood Studies*, *2*(2), 234–256. [CrossRef]

Zhou, J., & Su, Y. (2010). A missing piece of the puzzle: The organizational context in cultural patterns of creativity. *Management and Organization Review*, *6*(3), 391–413. [CrossRef]