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Demographic factors associated with young children's motor creativity

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Abstract

This study investigated factors that are associated with the creative motor skills of young children. We recruited through random sampling 233 typically developing children attending preschool or kindergarten in Afyonkarahisar, Turkey. We administered a "General Information Form" to gather the children's demographic characteristics and the "Thinking Creatively in Action and Movement Test" to evaluate the children's creative motor skills level. We analyzed the children and familys' demographic characteristics with frequency and percentage values, and we analyzed the TCAM with multiple linear regression analysis to determine whether independent variables predicted creativity on the TCAM. Our results showed that, among the sub-dimensions of the TCAM, the mother's age and profession best predicted the sub-dimension of fluency and the mother's profession best predicted the sub-dimension of novelty. Regarding, the sub-dimension of children's creative motor-imagination, neither the children's gender or age, the parents' age, education or occupation were significant predictors.

Keywords: Creativity; creative thinking; motor creativity

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1. Introduction

Creativity has been defined as original ideas, insights and solutions (Runco, 2007), and creativity is seen as one of the most important adaptive requirements for future generations, especially in today's rapidly developing, unpredictable and competitive world (Craft, 2002; Shaheen, 2010). In order for the individual to adapt to the rapidly changing world from birth and to respond to increasing life demands, it is necessary to think creatively, to find creative solutions to problems and to be trained in creative skills. Creativity is a key to learning in the contemporary education system. It is only possible for children to have fun in the learning process and to develop positive attitudes towards learning in environments where they can express their feelings and thoughts easily. The first and basic way children can express their feelings about themselves and other individuals and use them in nonverbal communication is through movement, and movement is directly related to motor creativity. Greer-Paglia (2006) described creative motor as body movements that allow children to express their feelings and thoughts using stories such as storytelling, dancing, spontaneous development without competition while Hristovski et al (2011) defined it as novel ways of engaging in harmonious movement or moving appropriately in new situations.

Motor creativity, which has an important place in the life of the child who has been in motion since the prenatal period, combines both movements and creativity (Pica, 2000). Motor creativity also guides us in explaining the movement concepts that help children understand their own and others' movements. Hinitz (1980) stated that movement plays an integrative role in the preschool education program, and that movement is a way of knowing, a way of invention, a way of self-evaluation, a way of self-expression; movement it creates emotions, and emotions create movement (Pica, 2000). For this reason, preschool children freely express their feelings and thoughts, desires and needs according to their own style, and do not require any sample or imitation. Humphrey (1987) stated that children are creative with high imagination and curious during the preschool period. Also, in this period, children's gross motor skills are more developed than their fine motor skills (Wang, 2003). Rebecca (2011) suggested that children's creativity and creative thinking skills should be fostered during early childhood. Justo (2008) emphasized that creativity exists in human nature and that children can learn more about themselves and their environment when presenting activities and opportunities that support their creativity. Torrance (1981) noted that it is important to give children opportunities to express their ideas and emotions in different ways. With these opportunities, children respond to movement in a natural and creative way and enjoy creating their own movement structures. Children's social and emotional development affects their attitudes towards themselves and their friends. For example, while children learn to work in collaboration, they also learn to support and encourage each other, to value their individual efforts, to value positive thinking and to foster mutual respect. In this atmosphere, children both engage in pleasurable endeavours and develop their skills to be creative and productive (Wang, 2003).

When children are supported in terms of creative motor movement, they develop social-emotional and problem-solving skills (Wang, 2003; Lorenzo-Lasa et al., 2007), and they are encouraged to participate in collaboration and teamwork (Cheung, 2010; Muhamad, Razali & Raja Adnan, 2017); this support contributes to their ability to make their own decisions and to be brave enough to take risks (Wang, 2003; Dow, 2010). To the extent that modern educators focus only on children's academic achievement, they may decrease emphasis on supporting creativity. It is important for educators to be aware of the fact that children's holistic development can be adversely affected when the educators concentrate to heavily on early academic skills (Muhamad, Razali & Raja Adnan, 2017). Of importance to holistic development, children's movement activities contribute to

physical, social and cognitive development (Copeland et al, 2012). Craft (2000) and Tegano et al. (1991) pointed out the teacher's role in helping children achieve the optimum balance between structure and freedom of expression, and they stated that creative teachers and creative education are key aids to developing creativity in children. Pogana and Costas (2008) investigated whether children's motor creativity can be developed or is due to hereditary factors, and they concluded that motor creativity can be developed and that educators have a big role in fostering it.

In the preschool period, children's imagination is very wide, and movement is the most appropriate way to convey their feelings and thoughts (Torrance, 1981). In this period, when creativity is integrated with movement, creative movement contributes to children's future creative potential. Torrance (1965) stated that the development of creativity is too important for children to be left to chance, and it is a process that should be supported from birth. The first studies on creativity date back to the 1960s, and the studies on this subject have generally examined the cognitive, verbal and formal dimensions of creativity (Torrance, 1966; Felker & Treffinger, 1971; Aslan, Aktan & Kamaraj, 1997; Ferrando, Prieto, Ferrandiz & Sanchez, 2005; Can Yaşar & Aral, 2010; Scibinetti, Tocci & Pesce, 2011; Steele, Fulton & Lisa, 2016; Trevlas, Matsouka & Zachopoulou, 2003; Fleith, Renzulli & Westberg, 2002; Lau & Sau Li Chu, 2004; Kılıç, 2011; Matud, Rodríguez & Grande, 2007; Ceylan, 2008; Nijstad et al., 2010; Dietrich & Kanso, 2010; Kounios & Beeman, 2014; Baysal, Kaya & Üçüncü, 2013). Although there have been studies on the development of creativity, in the relevant literature, there is no specific work or view on the motor part of creativity or motor creativity. Little is known about the development of children's ability to respond differently, specifically or flexibly to motor challenges in activities such as games and sports (Runco & Charles, 1997). Having information about the creative motor development stage of children plays an important role in the evaluation and support of creative motor skills. In this context, in this study, we aimed to investigate the correlation of some demographic factors that may be associated with the development of motor creativity in preschool children.

2. Method

In order to examine the demographic factors that may be associated with creative motor skills, we used a survey model. Survey models describe a situation that existed in the past or present (Büyüköztürk et.al, 2012; Karasar, 2007).

2.1. Participants

We carried out this research during the 2018-2019 academic year in Afyonkarahisar, Turkey with typically developing children who attended public kindergartens or nursery classes affiliated with the Directorate of National Education. Our study group consisted of 233 randomly selected children whose parents gave informed written consent for their participation. Most children were male (45.1% female, 54.9% male), and aged between 60-66 months (52.4%) with 47.6% older than 67 months. The children's mothers' ages ranged from < 29 years (6.9%) to > 50 years (5.6%), with most between 30-39 years (62.7%) or 40-49 years (19.3%). The children's mother's education levels ranged from elementary (22.3%) to bachelor (45.9%) with most of high school education level (54.1%). The children's mother's occupational status was not working (45.9%), civil servants (44.2%), and self-employed (9.9%). The children's father's ages were between 30-39 years old (62.7%), 40-49 years old (22.3%), and 50 years and older (13%). Father's education levels were elementary school (12%), high school ((26.6%), or bachelor graduates (61.4%); and fathers' work status were unemployed (1.3%), civil servants (54.9%), and self-employed (43.7%). See Table 1 for a description of mothers' and fathers' demographic characteristics.

2.2. Data collection tools

In order to collect data, "General Information Form" which includes items related to the demographic characteristics of the participants and Thinking Creatively in Action and Movement Test (TCAM) developed by Torrance (1981) and adapted Karaca and Aral (2017) to evaluate the creative motor skills level of children were used.

2.2.1. General information form: In the form developed by the researcher there were items about gender, age, parental age, parental education and parents' working status. General information forms were filled out by the researcher for each child based on the school records.

*2.2.2. Thinking Creatively in Action and Movement Test (TCAM): I*t is a tool that allows the assessment of the creative motor of children aged three to eight years. This test is used to define the preschool children's creative thinking ability to express with kinaesthetic model.

The individual test consists of four activities and each activity lasts 15 minutes. The test consists of three sub-dimensions: fluency (number of different activities performed), originality (new, unique and unusual motor reactions) and imagination (imagination, empathy, unusual roles). The activities included in the test are described as follows:

Activity 1 (How many ways?): Children discover new and different ways to solve ongoing problems or have fun in their daily lives, and some even try forbidden ways. The first activity of Creative Thinking in Action was designed primarily for children to find alternative ways of acting. Both verbal and mobile responses and the combinations of the two are accepted. This activity measures both fluency and originality.

Activity 2 (Can you act like this?): This activity is designed to exemplify children's abilities such as imagination, empathy, imagination and unusual roles. This activity measures the sub-dimension of imagination.

Activity 3 (What are the other ways?): Creative people want to go back to old jobs and objects to see new ways. For example, the child tries different ways to throw a paper cup into the waste basket. This activity measures the dimensions of fluency and originality.

Activity 4 (What can this be?): In this activity, children are given paper cups and what they can do with this cup is observed. With this activity, fluency and originality dimensions of creativity are measured.

The evaluation of the test is obtained by calculating the totality of fluency, originality, imagination scores and the standard scores corresponding to the total scores. The second activity is scored at the time of application, while the other three activities are evaluated immediately after the test. In the statistical evaluation, the total score obtained from all criteria provides information about the level of creative motor (Torrance 1981).

When the results related to the validity and reliability of TCAM were examined, Torrance (1981) studied test-retest reliability with a total of 20 children aged between three and five years with an interval of two weeks. As a result of the study, test-retest reliability was .84, .71 for activity 1, .79 for activity 2, .67 for activity 3, and .58 for activity 4. In addition, it was emphasized that a single activity was not sufficient to assess the creativity of children (Torrance, 1981).

In the adaptation study of Karaca and Aral (2017), the validity and reliability analysis of TCAM were conducted with normally developing 170 pre-schoolers. According to the item total correlation and Cronbach's alpha analysis of TCAM (n = 170), the reliability coefficient was found to be .74 and

the majority of item total correlations were sufficient for the whole test. The difference between the average scores of the upper 27% and lower 27% (t = -25.1, p <.01), which was formed according to the scores of TCAM, was found to differentiate the creative motor levels. The test-retest reliability coefficients (n = 40) of TCAM were positive, high and significant, and accordingly, it can be suggested that TCAM showed a stable structure over time.

2.3. Procedure

In order to investigate the factors affecting the creative motor of preschool children, firstly, the study group was determined. Necessary permissions were obtained from Afyonkarahisar Directorate of National Education. Two weeks before the administration of the measurement tool, the researcher went to kindergartens and nursery classes four times in order to familiarize with the children, and implemented the planned activities (play, art, movement and drama). Two weeks later, the researcher applied the measurement tool to the children individually in a quiet environment in the school for a period of 15-20 minutes.

2.4. Data Analysis

In the analysis of the data obtained, the demographic characteristics of children and their parents were evaluated with frequency and percentage values, and descriptive statistics of the mean scores obtained from fluency, originality and imagination sub-dimensions of the creative motor dimensions are presented in Table 1.

Table 1 *Mean scores of creative motor: Fluency, Originality and Imagination sub-dimensions of children included in the sample*

Creative motor Sub-dimensions	***n***	$\overline{X}$	***Sd***
Fluency	233	76.4	11.4
Originality	233	87.8	14.3
Imagination	233	88.8	18.6

In Table 1, mean and standard deviation scores regarding children's creative motor: fluency, originality, imagination sub-dimensions are given. In the analysis of the data obtained from TCAM, Multiple Linear Regression Analysis was used to determine whether the dependent variables predicted the dependent variable. Multiple Linear Regression analysis is a type of analysis that can be used in cases where there are one dependent and multiple independent variables (Alpar, 2012).

3. Results

The results of the research conducted to examine the factors that affect the creative motor skills of preschool children (gender and age of children, parental age, parental education and profession) are presented below.

Table 2 *Results of Multiple Regression Analysis on the Effect of Demographic Characteristics of Children on Fluency Sub-dimension of Creative motor*

Fluency	R	R^2	F	s/d	B	β	t	p
Constant	.262	.069	2.067	8/224	79.763	-	9.892	.000*
Age					-1.421	-.062	-.893	
Gender					-1.210	-.053	-.809	
Mother's age					-3.887	-.223*	-2.294	
Father's age					1.616	.105	1.079	
Mother's educational level					.963	.069	.789	
Father's educational level					.528	.032	.368	
Mother's profession					-2.324	-.160*	-2.314	
Father's profession					1.011	.076	1.032	

* p<.05

According to Table 2, it was found that fluency sub-dimension was predicted by only .07 of the change in the variables (age, gender, parental age, parental education and parental profession). Multiple regression results showed that there was a significant relationship between demographic variables and fluency sub-dimension (R = .262, R^2 = .07, p <.05). Although this number was not very high, it was seen that maternal age and maternal profession were significant negative predictors in the mean scores of the children's fluency sub-dimension of creative motor. In line with this result, it was found that as the age range of mothers increased, the mean fluency score of children decreased. When the result was evaluated in terms of maternal profession, it was seen that the mean fluency score of the children of the mothers who did not work was higher than the mean score of the children of the working mothers. On the other hand, the predictivity of other variables on the fluency sub-dimension were not significant.

Table 3. *Results of Multiple Regression Analysis on the Effect of Demographic Characteristics of Children on Originality Sub-dimension of Creative motor*

Originality	R	R^2	F	s/d	B	β	t	p
Constant	.265	.070	2.107	8/224	95.806	-	9.456	.000*
Age					-1.195	-.042	-5.97	
Gender					-1.897	-.066	-1.010	
Mother's age					-3.818	-.174	-1.793	
Father's age					.766	.040	.407	
Mother's educational level					1.710	.097	1.115	
Father's educational level					-.004	.000	-.002	

Mother's profession	-3.577	-.196*	-2.834	
Father's profession	.750	.045	.609	

* p<.05

According to Table 3, it was found that originality sub-dimension was predicted by only .07 of the change in the variables (age, gender, parental age, parental education and parental profession). Multiple regression results showed that there was a significant relationship between demographic variables and originality sub-dimension of creative motor (R = .265, R^2 = .07, p <.05). Although this number was not very high, it was seen that the mother profession was a significant negative predictor in the mean scores of children's scores of originality sub-dimension of creative motor. When the result was evaluated in terms of maternal profession, it was seen that the originality means of the children of the mothers who do not work were higher than the mean scores of the children of the working mothers. On the other hand, it was found that the predictivity of other variables on the originality sub-dimension were not significant.

Table 4 *Results of Multiple Regression Analysis on the Effect of Demographic Characteristics of Children on Imagination Sub-dimension of Creative motor*

Imagination	R	R^2	F	s/d	B	β	t	p
Constant	.347	.120	3.821	8/224	38.576	-	3.018	.003*
Age					4.391	.118	1.741	
Gender					4.322	.116	1.823	
Mother's age					3.646	.128	1.357	
Father's age					3.478	.139	1.464	
Mother's educational level					-.707	-.031	-.365	
Father's educational level					3.647	.137	1.602	
Mother's profession					.730	.031	.459	
Father's profession					2.111	.097	1.359	

* p<.05

Table 4 shows that the imagination sub-dimension was predicted by only .12 of the change in the variables (age, gender, parental age, parental education and parental profession). Multiple regression results showed that there was a significant relationship between the imagination sub-dimension of creative motor and the variables (R = .347, R^2 = .12, p <.05); however, these variables were not significant predictors of the imagination sub-dimension of creative motor.

4. Conclusion, Discussion and Recommendations

Parallel to the rapidly developing and changing world, with the increase in the speed of social development, contemporary educational systems aim to raise children who are able to cope with the problems that are becoming more complex day by day and adapt to the ever-changing environment (Glasser 1999). They also try to reveal the creativity ability of the individual and enhance children's skills while transmitting knowledge (Ömeroğlu &Turla 2001). Creativity, which is an innate characteristic with no limits, is a feature that can be improved if appropriate conditions are provided (Eratay 1993). Creativity occurs in individuals at different ages and in different fields. It is important to support creativity, which is a natural talent, from the first years of life. Although all development

areas play an effective role in the development of creativity, it is emphasized that the contribution of motor skills may be more in creative motor (Wang, 2003). From this point of view, it was aimed to investigate the factors affecting the creative motor of preschool children.

For this purpose, it was found that maternal age and maternal profession variables were significant negative predictors on the Fluency sub-dimension of TCAM (Table 2). Torrance (1981) stated that fluency, originality and imagination sub-dimensions were effective in motor creative thinking. Fluency is defined as the ability of children to produce a large number of ideas, solutions or alternatives by thinking and acting freely, quickly and independently. Fluency score is obtained by calculating separate answers given by children regardless of their quality (Torrance, 1981; December 1990; Bonk & Smith, 1998; Tuna 2000; Çakmak & Baran 2005; Şenkaya, 2005; Çeliker & Balım, 2012). In this study it was found that as the age of mothers increased, children's fluency scores decreased. From this point of view, it can be said that mothers, as they get older, have different perspectives against the incidents and phenomena their children face and can use more ways to produce solutions. In short, this situation may lead to the conclusion that as older mothers find solutions for the obstacles before their children do, in this sense, they do not support the development of their children's creative motor and fluency sub-dimension. Research shows that there is little evidence relating the level of children's creativity to the age of the parents. In this context, for example, Mangır & Aral (1991) examined the creativity of children according to their parents' ages and as a result, they found that the children of middle-aged parents had higher creativity.

When the results were evaluated in terms of maternal profession, it was found that there were significant negative predictors on the fluency and originality sub-dimensions of creative motor (Table 2-3). Originality is defined as a process that requires features of mental energy and different results. The resulting thought is new and rare, other than the known and simple ones. In other words, responses should be unusual (Torrance, 1981; Aral, 1990; Bonk & Smith, 1998; Tuna 2000; Çakmak &Baran 2005; Şenkaya, 2005; Çeliker & Balım, 2012). In this study, it was found that the children of the mothers who did not work got higher scores in the fluency and originality sub-dimensions than the children of the working mothers. From this point of view, it can be said that housewife (non-working) mothers spend more time with their children than mothers working in different professions or the non-working mothers create environments and are more effective in supporting their children's creativity. According to the relevant literature, there are studies examining the relationship between mother's profession and the creativity of children, there were results which are not parallel to the findings of this study. For instance, Mangır and Aral (1991) found that the creativity of children of working parents was higher than that of non-working parents whereas Zeytun (2010) claimed there was no significant difference between parents' professions and children's creativity; however, according to the mean differences, children of the mothers who were civil servants scored higher than the children of non-working mothers and children of the fathers who were workers scored higher than those whose fathers were civil servants.

As a result of the study, it was found that the predictivity of variables on imagination sub-dimension was not significant (Table 4). Creativity, which forms the basis of all aspects of human life and development, is a way of thinking and has a very close relationship with imagination (Çağatay-Aral 1990). It is stated that imagination, which forms the basis of creative thinking, develops especially in preschool period, children are very creative and have high imagination in this period, but it decreases with age. Torrance (1981) emphasized that opportunities should be given to creative, original and imaginative children to express their ideas and emotions in various ways. With these opportunities, children respond to the movement in a natural and creative way and enjoy creating

their own movement structures (Torrance, 1981). From this point of view, appropriate environment and education play an important role in the development of creativity that exists in all individuals from birth. At this point, parents and teachers have great responsibilities. According to the findings; it is very important to provide opportunities for children to think and to express their thoughts in the home and school environment, to create environments in which they can easily express themselves while they develop creative thinking. Therefore, in order to foster creativity at home and at school, children can be offered opportunities to think differently, find solutions, and produce original products. In addition, informing and directing events regarding such activities can be planned for parents.

This study has potential limitations. This research is limited to 233 children living in Afyonkarahisar. Only kindergartens and nursery schools are included in the process. Within the framework measured by the TCAM, the motor creativity of children could be evaluated.

Declaration of Conflicting Interests

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