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Investigation of the relationship between the theory of mind and creative thinking skills of children in rural area

Investigação da relação entre a teoria da mente e as habilidades de pensamento criativo de crianças na área rural

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Abstract

The aim of this study, accordingly, is to determine the relation between creativity and theory of mind skills of children aged 5-11 (Ns:117) who continue Primary Education in rural areas and to reveal the relation between the sub-dimensions of these abilities. At the end of the study, it was found that there was a significant and positive relation between the total creativity score and the sub-dimensions of theory of mind. It was found that there was a significant and positive relation between all sub-dimensions of creativity and theory of mind. The total creativity score and the scores of the sub-dimensions of creativity (fluency, originality, and elaboration) were significant but weak predictors of theory of mind tasks.

Keywords: Divergent thinking; Rural enviroment; School age children; Theory of mind.

Resumo

O objetivo deste estudo é determinar a relação entre criatividade e a teoria das habilidades mentais em crianças de 5 a 11 anos (Ns: 117) que continuam cursando o ensino fundamental em áreas rurais e revelar a relação entre as subdimensões dessas habilidades. No final do estudo, verificou-se que havia uma relação significativa e positiva entre o escore total

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de criatividade e as subdimensões da teoria da mente dessas crianças. Verificou-se também que havia uma relação significativa e positiva entre todas as subdimensões da criatividade e da teoria da mente. O escore total de criatividade e os escores das subdimensões da criatividade (fluência, originalidade e enriquecimento) foram preditores significativos, porém fracos, das tarefas da teoria da mente.

Palavras-chave: *Pensamento divergente; Ambientes rurais; Crianças em idade escolar; Teoria da mente.*

Thinking can be expressed, in its simplest terms, as a sequence of events in our minds. People think, believe, desire and like. Some researchers state that such feelings of others cannot be directly observed. Some others state, by going a step further, that our feelings can be used to predict others' behaviors as well as our own behaviors (Premack & Woodruff, 1978). People can clearly model and respond to mental states of other people in addition to predicting behaviors using hints such as facial expressions, voice, and posture (Stone, Baron-Cohen, & Knight, 1998). The ability to make inferences about the mental states of others is defined as the Theory of Mind (ToM) (Premack & Woodruff, 1978).

Theory of Mind begins to show itself around the 18th month (Baldwin, 1991). Children begin to notice the difference between reality and pretense at the 18-24th months (Brüne & Brüne-Cohrs, 2006; Leslie, 1987). They develop the capacity to understand false beliefs between the ages of three and four (Wellman & Liu, 2004). The age four is important for children because they cannot understand until this age that other people may perceive the world as different from their own. A child about four years old begins to improve his ability to understand that other people cannot know what he knows and can have a false belief. The child can then understand first-order false beliefs (Baron-Cohen, Leslie, & Frith, 1985; Flavell, 2000; Stone et al., 1998).

Between the ages of six and seven, children begin to understand mental states of other people and begin to develop their ability to understand second-order false beliefs, which are the "beliefs about beliefs" (Perner & Wimmer, 1985). Advanced ToM skills are developed between the ages of 9 and 11. The faux pas ability develops when someone says something but she or he should have not said it and she or he does not know or realize that it should not be said. The person's ability to understand and describe develops (Stone et al., 1998).

Thinking involves the critical and creative dimensions of the mind. People can thus question and raise new ideas (Fisher, 2005). Creativity that gives the ability to suggest new ideas is also a state that develops during the early childhood and requires higher-order thinking skills. As in the ToM, meta representation is seen as an important factor in creativity (Suddendorf & Fletcher-Flinn, 1997). It is stated that creativity is an endowment and that children possess this ability at different levels. Creativity is seen as one's ability to see things differently, especially in new and unconventional ways, or to change his perspective (Aslan & Puccio, 2006). In creativity, as in the ToM, changing the point of view is the case. In the research, statistically significant relationships have been found between some dimensions of creative thinking skills and perspective taking skills (Yıldız & Karaman, 2017). The years when a child moves away from the egocentric thinking also begin to become rather critical milestones for the formation of creative thinking. Dağlıoğlu (2011) states that creativity will emerge when a person creates a solution to the problems he is facing in his life, or when he creates new connections in the depths of his perception. This emphasizes the importance of early childhood, a critical period for development. Presenting creative experiences to children at early ages can greatly affect their future development (Dağlıoğlu, 2011). Preschool period is also a critical period for the development theory of mind skills (Biçer & Sarı, 2017). According to Palut (2006), regardless of the kinds or levels of skills or talents children have, it will be easier to create appropriate environments if the ways of thinking preferred by children during the exhibition of their skills are found out as well as which of these talents they more comfortably use. According to the results of some research conducted in classroom environments; pretend play is thought to contribute to the development of mind theory (Keskin, 2005). Furthermore, pretend play,

which shows many elements of creativity, is thought to be highly connected to adult creativity (Russ & Lee, 2019).

When the relevant literature is examined, it is seen that the subjects of both creativity and ToM have been frequently studied in different disciplines. There are few studies, if any, that investigate the relation between these two concepts. Two studies by Suddendorf and Fletcher-Flinn (1997), show that even when the variables are excluded, the relation between ToM and creativity continues to exist strongly, and that creative thinking in children occurs when children understand false beliefs. In these studies, pre-school children between the ages of 3 and 6 were studied. The task of understanding first-degree false beliefs was used as the task of ToM. The fluency and originality dimensions of creativity were assessed using Wallach and Kogan's creativity test as the task of creativity.

The relation between ToM and having an imaginary friend, which is closely related to creativity, is one of the topics investigated in the literature. Dasi, Pons, and Bender (2016) found that when age and gender are ignored, children have better ToM and emotional understanding than those without imaginary friends. This finding is a striking conclusion that may be drawn to the relation between creativity and ToM. Sigirtmac (2016) conducted a study to investigate whether chess education has any impact on children's creativity and theory of mind skills. According to the results of this research the scores of the children who had chess education were higher than the scores of the other children in both creative thinking and mind test theory and the difference between the scores of these children was statistically significant.

Craig and Baron-Cohen (1999) studied children with autism and Asperger syndrome to identify the lack of creativity in autism. They found that creativity was impaired in children with autism and Asperger syndrome and this was the result of lack of imagination. They pointed out that children with autism and Asperger syndrome were be able to produce new changes for an object (such as originality) based on their fluency performance, but these changes were devoid of imagination and tended to be factual.

Dietrich (2004) established a theoretical framework that neuroanatomically systemizes the interaction between creative thinking and cognition. In his work, a new framework for the field of creativity was created by compiling the latest developments in the neurocognitive field, but the findings have not been used in studies in the field of creativity yet. The researcher proposed four types of creative understanding, each of which mediating a different nerve circuit. It was stated that these four types of neural pathways ended in the prefrontal cortex. Dietrich (2004) stated that ToM skills depended on the prefrontal cortex and that these skills were never used as an element in creativity tests and studies. According to Dietrich (2004), the ability to empathize or look through someone else's eyes is clearly less critical for scientific work, but critical for artistic work. Using ToM skills in creativity tests allows the concept of "what it means to be creative" to be expanded, especially in artistic and complex social situations.

Brüne and Brüne-Cohrs (2006) conducted a review study on ToM. The researchers have shown that different studies are needed to understand ToM in healthy and sick individuals due to their daily life needs. Up to this time, many studies have been conducted with middle-class, Western students. However, it is stated that new studies are needed to reveal the similarities and differences in the development of ToM of children with different backgrounds and cultures. It is also stated that studies on effects of different environments and cognitive factors on the development of ToM constitute a gap in the literature (Astington & Edward, 2010).

In this study, the relation between mental development and creativity of Turkish children aged 5-11 years was examined. The examination of the relation between these two skills gives a unique perspective to the study. In the study, it is thought that the data obtained from examining the three tasks of ToM and associating them with different sub-dimensions of creativity such as fluency and originality will contribute to the literature. It is thought that the fact that children participating in the study had a low socioeconomic level was important in terms of observing the effect of social environment in the development of ToM and

creativity. Another unique characteristic of the study was that the test of ToM that was used was administered in the form of an animation.

Understanding the developments of the concepts of ToM and creativity can give new ideas to us by shedding light on the invisible sides of children's minds. Knowing how and the concept of creativity – which is becoming increasingly important in today's educational perspective – is linked and to what it is linked can give us ideas about how we can improve it. A positive relation between ToM and creativity can shed light on new studies in order to find common activities and ways to develop both ToM and creative thinking. It is known that concepts of ToM and creativity are influential in social functions and school achievement. The discovery of the relation between these two concepts can help to discover new ways to improve children's school achievement and social functioning, or – with the awareness that these two concepts are influential on each other – it can help to facilitate the children's education process.

Method

In this study, the relational survey method was used. This method is used to determine relations between variables and to predict possible outcomes. In this method, the level of relation between two or more variables is tried to be measured using statistical tests (Karasar, 1995: 81-82). The relation between the tasks of ToM and creativity sub-dimensions were examined.

Participants

The research population consisted of the students who were attending Primary Education (preschool, 1st, 2nd, 3rd, and 4th classes) in rural Ordu province in Turkey. The purposive sampling method was used for the selection of sample. The sample of the study consisted of 117 children (preschool, 18; 1st class, 21; 2nd class, 20; 3rd class, 26; 4th class, 32) studying at two different schools, presumed to have the same characteristics in rural Ordu province.

The research was approved by Karadeniz Technical University Research Ethics Committee (Protocol nº 1743573 on 4.3.2013). In addition, the approval of the Ordu Province National Education Directorate Ethics Committee was obtained. Children and parents who were study group of research were informed and permission of the parents was obtained. The participation of children is based on volunteerism. The data of the research were collected between May-June 2014.

Instruments and Procedures

In the study, the Torrance Tests of Creative Thinking and ToM Tests were used. The Torrance Tests of Creative Thinking consists of two forms, figural and verbal. In this study, a form based on the figures was used in the sense that the illiterate pre-school students would respond more easily and comfortably through illustrations. There are three sub-tests in the figural form, Form A. These are creating pictures, completing pictures and lines or circles. All tests include the fluency, flexibility, originality and elaboration sub-dimensions. İn this study, "Torrence Creative Thinking Test" figural A form was distributed to each child. Children were given 10 minutes each for Picture Completion and Lines subtests. Every detail in the children's drawings was evaluated using the "Creative Scoring Paper" developed by Torrence.

The tasks of ToM consist of increasingly challenging social reasoning tests. There are applications in the literature that contain different scenarios and pictures. In this study, the first order false belief task was

tried to be tested using the "Sally-Anne paradigm" (Baron-Cohen et al., 1985). The child who answers the questions in this scenario can understand that others may have false beliefs (Stone et al., 1998). The child must be able to look back in the past to give the right answer, or to think based on the false belief of the character in the script, not what he sees and knows about reality (Suddendorf & Fletcher-Flinn, 1997). In order for the child to be able to find this answer, the child must have the ability of meta representation of the mental state of the hero in the story (Maxi or Sally): "I know that Maxi/Sally does not really know where the object is" (Brüne & Brüne-Cohrs 2006).

The "Martha and Oliver cookie paradigm" was used for second-order false beliefs (Stone et al., 1998). This paradigm tests the ability to understand what another person thinks. In order for the child to be able to answer this, the child has to represent not only the mental states of the characters, but also the false belief of one character about the belief of the other character (Stone et al., 1998).

Faux pas tasks involve more complex structures such as metaphor and irony and are the highest-level task of ToM. The faux pas task was tested using the "Jeanette-Anne gift paradigm." Here the child should be able to understand why the speaker was not supposed to say what he has said and why the audience would feel humiliated or hurt (Stone et al., 1998). With first-degree beliefs, the child can understand what other people think about real events. Thus, understanding the physical interaction between people and objects can be facilitated. The social interaction among people is largely realized when people take into account that other people think about their thoughts (second-order beliefs) and what other people think about them (advanced beliefs) (Perner & Wimmer, 1985).

The theoretical scenarios used to measure children's ToM were animated by taking the age level of the children into consideration and then implemented as video demonstrations in one-to-one interviews with the children. Scenarios are the most used tasks the of theory of mind in national and international studies. The originality of study usage of this Scenarios in the animation form. Names in the scenarios were replaced with Turkish equivalents for the children to better understand them. While the children watched the animations, the researcher told the story to the children. At the end of the animation developed for each task, children were asked questions. As stated in the literature, the ToM tasks started by applying the simplest task, the first order false belief task. Then the second-order false belief task and finally the most complex task, the faux-pas task, were applied. Children's answers to the questions were classified as true or false. Children who answered correctly three questions in each task were classified as "pass the test" and those who could not were classified as "fail the test" On the other hand, there were also children who had difficulties in understanding the animation. The researcher repeated the same theoretical scenario with toys.

Data Analysis

IBM® e SPSS® 18.00 Statistical package program was used in the analysis of the data. The point biserial correlation analysis was used to determine whether there was a relation between the Torrance Tests of Creative Thinking and the ToM test and whether there was a relation between the relevant correlation values. The *t*-test was used to determine whether the regression coefficients were significant. A simple linear regression analysis was carried out to predict the ToM test scores from the fluency, originality and elaboration dimension scores, and the creativity index total scores.

Results

Table 1 shows the success rates of the ToM skills according to age. A Chi-square analysis was conducted to see if the children's ToM achievements differed according to their age.

Table 1
Success rates in Theory of Mind skills by age

Age	ToM First-Order Test		ToM Second-Order Test		ToM Faux Pas Test	
	Fail (%)	Pass (%)	Fail (%)	Pass (%)	Fail (%)	Pass (%)
5 and under	50.0	50.0	90.0	10.0	100.0	0.0
6	30.0	70.0	90.0	10.0	100.0	0.0
7	15.8	84.2	63.2	36.8	94.7	5.3
8	0.0	100.0	15.0	85.0	60.0	40.0
9	0.0	100.0	12.0	88.0	52.0	48.0
10 and over	0.0	100.0	9.1	90.9	57.6	42.4
Test	$\chi^2 = 25.034$	$p = 0.000$	$\chi^2 = 53.378$	$p = 0.000$	$\chi^2 = 21.378$	$p = 0.001$

Note: $p < 0.05$. ToM: Theory of Mind.

As a result of the analyses, it was seen that the children's success in the ToM tasks increased with age. At age five and under, the success rate in the first-order false belief was 50.0%. While 30.0% of 6-year-old children were unsuccessful in the first-order false belief task, only one child was successful in the second-order false belief task. At the level of age 7, 63.2% of the children failed the second-order false belief task, while 94.7% failed the faux pas test. At the level of age 8, 60% failed the faux pas test. While 52.0% of the children at the level of age 9 failed the faux pas test, 57.6% of the children over 10 years of age were unsuccessful in the same test.

The point-biserial correlation analysis was used to determine whether there was a relation between the ToM test and the dimensions related to creativity: the fluency, originality, abstractness of titles, elaboration, resistance to premature closure, total bonus, and creative strengths list sub-dimension scores and the creativity index total score (Table 2).

As seen in Table 2, the creativity index total score, and fluency, originality and elaboration dimensions were significantly related to first-order, second order, and faux-pas tasks of ToM. Moreover, all of the correlations between the total bonus sub-dimension score and the faux-pas test of the ToM, between creative strengths list dimension score and second order and faux-pas tasks of the ToM were found to be positive and significant.

Table 2
Correlation values related to the relation between creativity index and Theory of Mind Test

Creativity Sub-Dimension	Theory of Mind Tasks					
	First-Order Task		Second-Order Task		Faux Pas	
	r	*p*	*r*	*p*	*r*	*p*
Creativity Index total score	0.209	0.024	0.307	0.001	0.363	0.000
Fluency sub-dimension	0.257	0.005	0.296	0.001	0.248	0.007
Originality sub-dimension	0.189	0.041	0.303	0.001	0.469	0.000
Elaboration sub-dimension	0.198	0.032	0.233	0.011	0.222	0.016

Note: $p < 0.05$. *p*: level of significance.

A simple linear regression analysis was conducted to investigate the power of predicting the scores of ToM from the fluency, originality and elaboration dimension scores and the creativity index total scores (Table 3).

As seen in Table 3, the creativity index total scores had a significant but weak relation with the children's ToM first-order test scores ($R = 0.209$, $R^2 = 0.044$, $p < 0.05$). A significant but weak relation was found between the children's ToM first-order test scores and each of the scores of fluency, originality

and elaboration dimensions ($R = 0.257$, $R^2 = 0.066$, $p < 0.05$; $R = 0.189$, $R^2 = 0.036$, $p < 0.05$; $R = 0.198$, $R^2 = 0.039$, $p < 0.05$, respectively).

Table 3
The results of the simple linear regression analysis conducted to predict the scores of the Theory of Mind Test from the fluency, originality and elaboration dimension scores and the creativity index total scores

Theory of Mind Tasks	Variable	β	Standard error	β	*t*	*p*
Theory of Mind First-Order Test	Constant	0.756	0.070		10.732	0.000
	Creativity Index Total	0.002	0.001	0.209	2.292	0.024
	$R = 0.209$	$R^2 = 0.044$				
	$F_{(1, 115)} = 5.254$ $p = 0.024$					
	Constant	0.699	0.077		9.057	0.000
	Fluency Dimension	0.012	0.004	0.257	2.855	0.005
	$R = 0.257$	$R^2 = 0.066$				
	$F_{(1, 115)} = 8.151$ $p = 0.005$					
	Constant	0.776	0.068		11.381	0.000
	Originality Dimension	0.012	0.006	0.189	2.065	0.041
	$R = 0.189$	$R^2 = 0.036$				
	$F_{(1, 115)} = 4.264$ $p = 0.041$					
	Constant	0.720	0.090		8.040	0.000
	Elaboration Dimension	0.018	0.008	0.198	2.168	0.032
	$R = 0.198$	$R^2 = 0.039$				
	$F_{(1, 115)} = 4.702$ $p = 0.032$					
Theory of Mind Second-Order Test	Constant	0.312	0.111		2.814	0.006
	Creativity Index Total	0.005	0.002	0.307	3.459	0.001
	$R = 0.307$	$R^2 = 0.094$				
	$F_{(1, 115)} = 11.967$ $p = 0.001$					
	Constant	0.282	0.123		2.289	0.024
	Fluency Dimension	0.022	0.007	0.296	3.320	0.001
	$R = 0.303$	$R^2 = 0.092$				
	$F_{(1, 115)} = 11.024$ $p = 0.001$					
	Constant	0.332	0.107		3.100	0.002
	Originality Dimension	0.031	0.009	0.303	3.406	0.001
	$R = 0.233$	$R^2 = 0.054$				
	$F_{(1, 115)} = 11.598$ $p = 0.001$					
	Constant	0.314	0.144		2.185	0.031
	Elaboration Dimension	0.034	0.013	0.233	2.574	0.011
	$R = 0.198$	$R^2 = 0.039$				
	$F_{(1, 115)} = 6.628$ $p = 0.011$					
Theory of Mind Faux pas Test	Constant	-0.108	0.105		-1.029	0.305
	Creativity Index Total	0.006	0.002	0.363	4.178	0.000
	$R = 0.363$	$R^2 = 0.132$				
	$F_{(1, 115)} = 17.456$ $p = 0.000$					
	Constant	-0.014	0.121		-0.117	0.907
	Fluency Dimension	0.018	0.007	0.248	2.746	0.007
	$R = 0.248$	$R^2 = 0.062$				
	$F_{(1, 115)} = 7.540$ $p = 0.007$					
	Constant	-0.206	0.096		-2.136	0.035
	Originality Dimension	0.047	0.008	0.469	5.700	0.000
	$R = 0.469$	$R^2 = 0.220$				
	$F_{(1, 115)} = 32.493$ $p = 0.000$					
	Constant	-0.027	0.140		-0.195	0.846
	Elaboration Dimension	0.031	0.013	0.222	2.445	0.016
	$R = 0.222$	$R^2 = 0.049$				
	$F_{(1, 115)} = 5.977$ $p = 0.016$					

Note: *R*: 0.209, R^2: 0.044, $p < 0.05$, *t*: *t*-value (for *t* test).

There was also a significant but weak relation between the ToM second order test scores and the creativity index total scores ($R = 0.307$, $R^2 = 0.094$, $p < 0.05$). ToM second-order test scores and each of the scores of fluency, authenticity, and elaboration dimensions had a significant but weak relation ($R = 0.303$, $R^2 = 0.092$, $p < 0.05$; $R = 0.233$, $R^2 = 0.054$, $p < 0.05$; $R = 0.198$, $R^2 = 0.039$, $p < 0.05$, respectively).

It was also found that there was a significant but weak relation between faux pas, which was another task of ToM test, and the creativity index total scores ($R = 0.363$, $R^2 = 0.132$, $p < 0.05$). Considering the sub-dimensions, it was seen that there was a significant but weak relation between ToM faux pas scores and each of the scores of fluency, authenticity and elaboration dimensions ($R = 0.248$, $R^2 = 0.062$, $p < 0.05$; $R = 0.469$, $R^2 = 0.220$, $p < 0.05$; $R = 0.222$, $R^2 = 0.049$, $p < 0.05$, respectively).

Linear multiple regression analysis was conducted to examine the effects of ToM skills on creative thinking skills according to the ages of children (Table 4).

When the effect of theory of mind subtests on the total creativity scores (TCTT) according to the ages of the children was tested; significant differences were found in terms of faux-pas subtest.

Table 4
The effect of Theory of Mind skills on creative thinking skills according to children's age

Source	Type III Sum of Squares	*df*	Mean square	*F*	*p*	Partial eta squared
Corrected Model	31922,476[a]	10	3192,248	6,804	0,000	0,391
Intercept	31512,879	1	31512,879	67,168	0,000	0,388
Age	18654,123	7	2664,875	5,680	0,000	0,273
ToM First Order Test	119,247	1	119,247	,254	0,615	0,002
ToM Second Order Test	134,730	1	134,730	,287	0,593	0,003
Faux-Pas Test	3777,069	1	3777,069	8,051	0,005	0,071
Error	49731,747	106	469,167			
Total	572605,000	117				
Corrected Total	81654,222	116				

Note: [a]: *R* Squared = 0,391 (Adjusted *R* Squared = 0,333). $p < 0.05$.

Discussion and Conclusion

This study was carried out to investigate the relation between ToM and creativity of children who were aged 5-11, lived in rural areas, and had a moderate or lower socioeconomic status. Findings showed that the level of ToM skills of Turkish rural children with moderate or lower socioeconomic status was worse than the level indicated in the literature (Table 1). Studies show that culture also plays an important role in the development of a ToM. For example, in a study comparing children in Hong Kong and America, it is reported that children in Hong Kong have a 2-year-delayed ToM (Wang, Devine, Wong, & Hughes 2016). Some studies carried out in Turkey also support this (Taymaz Sarı, 2013). In a study conducted in the United States of children from disadvantaged backgrounds, it seems that ToM develops at a much slower rate (Charness, List, Rustichini, Samek, & Van De Ven, 2019). According to research about Theory of mind concludes that children from lower socioeconomic status families lag behind children from higher socioeconomic status families (Devine & Hughes, 2018). In the literature, 75% of the 4-8 year-old children were reported to be successful in the tasks of first-order false belief (Keçeli Kaysılı & Acarlar, 2011; Wellman, Cross, & Watson, 2001). In this study, this rate was found to be 50% at age 5 and 70% at age 6. Therefore, in this study, the development was poorer than the development reported in the literature.

Again, in the literature, it is stated that the second-order false beliefs are acquired around the age 6-7 (Stone et al., 1998). In this study, the children at age 6 were found to fail at a rate of 90.0%. While it

is claimed that children aged 9-11 would acquire faux pas as one of ToM tasks (Stone et al., 1998), in this study, on average 54.0% of the children aged 9-11 were successful in the faux pas test (this rate was 52.0% at age 9 and 57.6% at age 10 and over).

Research has shown that children's mental states develop earlier if reasoning is provided when correcting their misbehaviors (Ruffman, Perner, & Parkin, 1999) during their conversations with their mothers about their thoughts, desires, and emotions (Ruffman, Slade, & Crowe, 2002). While ToM skills develop further in children whose mothers talk with them about causes and effects of behaviors and events, punishment behaviors without explanation have a negative impact on the development of children's ToM by causing insufficient stimulation (Meins et al., 2002). Most mothers of the students who participated in this study had a low education level.

Children's development is also affected by factors such as pretend play (Youngblade & Dunn, 1995), discussion of the story read, and discussion of past experiences with others (Rosnay & Hughes, 2006). Research has shown that exposure to cartoons and literary works can also uncover children's ToM (Mar, Tackett, & Moore, 2010).

The findings of the study revealed that there is a significant and positive relation between creativity and ToM skills. This finding supports the result of studies carried out by Suddendorf and Fletcher-Flinn (1997, 1999). The relation between children's ToM and their creativity continues to exist even when the age variable is excluded (Suddendorf & Fletcher-Flinn, 1997, 1999). Children with advanced ToM can express themselves socially well, which also supports the development of their creativity. As children's ToM skills develop, their positive social behaviors increase (Aydın & Karakelle, 2016; Güven, Ayvaz, & Göktaş, 2019; Imuta, Henry, Slaughter, Selcuk, & Ruffman, 2016; Slaughter, Imuta, Peterson, & Henry, 2015; Yağmurlu, Sanson, & Köymen, 2005). ToM is significantly associated with social competences (Korucu, Selçuk, & Harma, 2017) and social skills (Watson, Nixon, Wilson, & Capage 1999). Moreover, studies have shown that the cognitive component of empathy is associated with both ToM and taking an emotional perspective (Bensalah, Caillies, & Anduze 2016).

Craig and Baron-Cohen (1999) pointed out that in autistic children, the lack of both a ToM and lack of imagination may be related to the relation between these two concepts, and this relation should be investigated. The fact that the two skills were related in this study, which was carried out on healthy children, may contribute to the literature as a significant finding. A significant and positive relation was found between the sub-dimensions of ToM and creativity tests. However, the creativity index total scores and the scores of sub-dimensions of creativity (fluency, authenticity, elaboration) were found to weakly predict the ToM. It was determined that only the originality dimension predicted the faux pas moderately. In the literature, Müller, Liebermann-Finestone, Carpendale, Hammond, and Bibok (2012) found that executive function at age 2 predicted ToM at age 3, and executive function at age 3 predicted ToM at age 4. Considering that creativity is an ability that represents part of executive functions, if not the whole (Ayçiçeği, Dinn, & Harris, 2003), in this study, the fact that the fluency, originality and elaboration dimensions representing the subdimensions of creativity predicted the ToM at a low level is a significant finding.

Moreover, Suddendorf and Fletcher-Flinn (1997) found that there is a positive relation between the number of original responses in the creativity task and the performances of the first-order false belief task. Although a different creativity test was used in this study, the originality dimension was significantly and positively related to all sub-dimensions of ToM, supporting the literature.

The children's mean creativity scores and ToM achievements differed from those of the same age group specified in the literature. It is thought that this situation may have originated from the fact that children living in rural areas grow up with lack of stimuli. Astington and Edward (2010) pointed out that environmental factors such as disciplinary strategies and conversations with family influence the development of ToM. They

have demonstrated that reading, language, cognitive control, reading, and pretend play are also influential on child development. These factors are also important for the development of children's creativity. Research provides important clues as to why children of disadvantaged groups with low education or income may be far behind in terms of many developmental outcomes. A relationship was found between the explanatory behaviors of the mother and the executive function ability of the child. As the socio-economic level increases, the explanatory behaviors of the mother's increase, the executive function skills of the children progress and all these elements accelerate the language development of the child (Ekerim & Selçuk, 2018; Selçuk et al., 2018). Research findings suggest that family factors such as parental mental-state talk and social economic status show significant associations with more "advanced" theory-of-mind measures in middle childhood (Devine & Hughes, 2016; Ensor, Devine, Marks, & Hughes, 2014).

It was found that there was a significant and positive relation between the total creativity score and the sub-dimensions of ToM. It was found that there was a significant and positive relation between creativity and all sub-dimensions of ToM. The total creativity scores and the scores of creativity sub-dimensions (fluency, originality, and elaboration) were significant predictors of the ToM tasks at a low level. However, the dimension of originality,which is most emphasized in creativity, was a moderately significant predictor of the faux pas test, the most complex task of ToM.

Because there is a significant and positive relation between creativity and ToM, educators can support children's creativity by carrying out activities that improve the empathic abilities of children especially during early childhood. Carrying out activities that involve questions about the ways to predict others' thoughts through creative examples at a young age can contribute to improving children's ToM, creativity, as well as social skills. Children's learning processes can be enriched. Some research shows that there are close relations between the development of children's teaching strategies and ToM (Ziv, Solomon, Strauss, & Frye, 2016). In this way, they can learn to explore and reflect their own cognitive capacities. Children's social cognitive skills can be strengthened if the Ministry of National Education increases creativity- and empathy-enhancing activities in the preschool curriculum and puts activities and lessons that enhance creativity and empathy in the basic education curriculum. Research shows that children's ToM skills can be developed with an effective ToM program (Hofmann et al., 2016). ToM-based education and intervention programs have been shown to prevent future friendlessness (Fink, Begeer, Peterson, Slaughter, & Rosnay, 2015).

Parents should tell their children about causes of others' emotions and thoughts, and how their actions can have consequences for others. Thus, children's empathic skills can be improved. Positive and effective communication within family with children can also lead to the further development of children's empathetic abilities. Research emphasizes accommodating more games in pre-school education to raise an empathic generation. It is stated that ToM in early childhood predicts game strategies (Wang et al., 2016).

The study can be carried out with larger groups and children from different sociocultural backgrounds. Thus, its results can be more precise and significant at a higher level.

Contributors

L. CERRAH ÖZSEVGEÇ contributed to the research design, analysis and interpretation, writing the manuscript, critical review of the content and approval of the final version to be published. T. KONTAŞ AZAKLI contributed to the data collection, design, analysis, writing the manuscript, contributed to the writing of the final version to be published.

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