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The Examination of Relationship Between Behavioral Regulation with Phonological Awareness, Matching Images and Pre-Writing Skills in Preschool Children

Elif YALÇINTAŞ SEZGİN* **Leyla ULUS****
İbrahim ŞAHİN***

Abstract. Behavior regulation skills are associated with early academic skills in pre-school children in the studies. In addition to this, limited number of studies has been shown relations between behavioral regulation skills and early literacy skills; phonological awareness, matching images and pre-writing skills. The study aims at assessing the relation between phonological awareness, matching images and pre-writing skills which are early literacy skills and behavior regulation skills in preschool children with regard to age, gender, period of attending school, number of siblings.144 pre-school children, 68 of whom are girls and 76 boys, participated from Bursa central districts in the research. Results show that behavior regulation skills are associated with phonological awareness and pre-writing skills. When age increases, phonological awareness scores and matching images scores increase; according to number of siblings, there is a statistically significant difference pre-writing skills scores; period of attending school does not affect phonological awareness scores, matching images scores and pre-writing skills; there is a statistically significant difference between pre-writing scores by gender; the difference shows that girls' pre-writing scores are higher than the boys' pre-writing scores.

Keywords: Early literacy skills, phonological awareness, matching images, pre-writing skills, behavior regulation.

* Orcid ID: https://orcid.org/0000-0001-8523-8111, Lect. Dr., Bursa Uludağ University İnegöl Vocational School-Child Development, elifyalcintas@uludag.edu.tr
** Orcid ID: https://orcid.org/0000-0002-5483-0224, Assist. Prof. Dr., İstanbul University-Cerrahpaşa, Primary Education, Preschool Education Department, leylaulus@istanbul.edu.tr
*** Orcid ID: https://orcid.org/0000-0001-9031-3040, Graduate Student, Bursa Uludağ University, Graduate School of Health Sciences, Medical-Biostatistics Department, iesahin@outlook.com

1. INTRODUCTION

There are differences in the definition of self-regulation. Self-regulation is defining as individual's posession of control of emotion together with cognition over his/her behaviors (Vohs and Baumeister, 2004). In another definition, the self-regulation is explained primarily by the emotional regulation. Self-regulation is defined as delaying or restoring pleasure on emotional states and reactions (Kochanska, Aksan, Prisco and Adams, 2008; McClelland et al., 2013). Based on the previous studies, the behavior in this study defines attention as an aspect of the self-regulation of behavioral regulation, which includes working memory and inhibitory control. Self-regulation is a comprehensive structure that defines the capacity of people to regulate their emotions, cognitions, and behaviors. Behavior regulation within the self-regulation refers to the behavioral emergence of the interoperability, attention, working memory and the integration of the controller control (Wanless, McClelland, Tominey, & Acock, 2011). In other words, behavior regulation involves cognitive processes under a broader self-regulatory structure. Cognitive behavior is a set of cognitive skills that are composed of attention, working memory, and inhibitory control, known as executive functions (McClelland and Cameron, 2012; McClelland and Cameron, 2012; Ursache, Blair and Raver, 2012). For small children's behavior regulation skills, attention, working memory, and inhibitory control must be integrated (Ponitz, McClelland, Jewkes, and Connor, 2008). Behavior regulation is often assessed by measures that require integration of inhibitory control, attention and working memory (McClelland and Cameron, 2012). The period in which behavior regulation skills need to be considered is the pre-school period (Siegler and Alibali, 2005). It begins to develop in the first few years of the life that is in the pre-school period and continues for a lifetime (McClelland, Cameron, Connor and Farris, 2007; Best and Miller, 2010). However, attention skills and working memory continuously develop during early childhood and adolescence stage (Jarrold and Bayliss, 2007).

Pre-school children need to have behavioral skills in order to be successful in social-emotional and academic fields. Researchers emphasized the importance of behavior regulation for short and long-term academic success and positive behaviors (Blair and Raver, 2015; McClelland et al., 2013; Rimm-Kaufman, et al., 2009). Self-regulation enables children to focus on the task, to keep their attention, to transform their knowledge into experiences, and also support the continuity of positive social interactions with their teachers and peers (Pianta, Barnett, Burchinal and Thornburg, 2009). Children with self-regulation have the ability to conduct high levels of behavior and academic achievement (Becker, McClelland, Loprinzi, & Trost, 2014). The behavior regulation skills of small children are very important for a better school performance and acceptance to school (Bodrova and Leong, 2007). Children with strong behavioral regulation skills can better implement social rules (Vohs and Baumeister, 2004). As children with advanced behavioral skills are more socially compatible, they are also found to be better in early academic skills and academic performance.

Behavioral regulation skills in pre-school age are associated with first-grade behaviors and academic performance. Academic performance was found to be significantly associated with intelligence (Von Suchodoletz, Trommsdorff, Heikamp, Wieber and Gollwitzer, 2009). Behavioral regulation was found to be important for a lifetime. For example, having constant attention skills in early childhood is associated with the possibility of completing high school education (McClelland, Acock, Piccini, Rhea and Stallings, 2013). Research supports the view that strong behavioral regulation is associated with higher levels of academic achievement in primary school (NICHD, 2003; Bronson, Tivnan, & Seppanen, 1995). The attention skills of pre-school children predict the success of reading and mathematics when they start school (NICHD, 2003). However, weaknesses in behavior-regulation skills can lead to social and academic compliance problems at school (McClelland, Morrison and Holmes, 2000). Children with strong behavioral regulation skills can plan, organize and, use their attention in a social and classroom environment together with the attention, working memory and inhibitory control to control their behavior (Wanless, McClelland, Cock, Chen et al. 2011). In the study conducted abroad, it was found that the behavior regulation skills of preschool children have an impact on early pre-school childhood learning skills (early literacy, mathematics, and language) and on interpersonal social skills (McClelland, Acock and Morrison, 2006; von Suchodoletz, Trommsdorff, Heikamp and Wieber, 2009). Inhibitory control starts to develop from the age of three (Dowsett and Livesey, 2000). This skill is seen as a positive predictor of early literacy and mathematics skills (Blair and Razza, 2007). The working memory helps children to remember and practice information when they encounter new stimuli and when dealing with a new stimulus (Gatercole and Pickering, 2000). It is important that attention, working memory, and preventive control develop as a whole before school. However, skills must also be used together (McClelland, Cameron, Wanless and Murray, 2007). It was found that working memory was associated with language, literacy and mathematics skills (Bull and Scerif, 2001; Gatercole, Alloway, Willis and Adams, 2005).

Research conducted on behavior regulation abroad emphasizes the importance of behavioral regulation for early academic achievement (Blair and Razza, 2007; Gathercole, Pickering, Knight, and Stegmann, 2004). In a study conducted showed that, behavioral regulation in pre-school period significantly predicted the development of literacy, vocabulary and mathematical skills. In another study, it was found that children's behavioral regulation skills in pre-school through sixth-grade learning were influenced by reading and mathematical skills in pre-school and second-grade learning years (McClelland et al., 2006). In another study, children with strong behavioral regulation were found to have significantly higher early mathematics and vocabulary skills (Wanless, McClelland, Cock, Chen et al., 2011). Finally, it was found that children with poor behavioral regulation skills in pre-school period found with low academic skills (Bronson, Tivnan and Seppanen, 1995). Behavioral regulation can be critical for literacy development during this period when early literacy skills of children are acquired in preschool (Puranik, Boss and Wanless, 2018). Because, the early childhood

period has a critical importance in development of early literacy skills. Early literacy skills have a significant impact on the overall academic success of the child in primary school (Yalcintas-Sezgin and Ulus, 2017), as well as significantly affecting the child's performance in primary school literacy (Yalcintas-Sezgin and Ulus, 2017).

Phonetic awareness is related to self-regulation in the pre-school period (Allan and Lonigan, 2011). The strong relationship between phonologic awareness and behavior regulation represents the ability of small children to read (Lonigan, Anthony, Phillips, Purpura, 2009). In the literature, there are different results in relation to behavioral regulation in relation to phonetical awareness. It is seen that especially the language characteristics of the child and the ability to regulate behavior affect the level of phonetic awareness. For example, the behavior regulation skills of Spanish and English-speaking children have been associated with phonological awareness and writing skills, but these relationships have changed together with age (Lonigan, Lerner, Goodrich, Farrington, and Allan, 2016). In Spanish-speaking children, the relationship between behavior regulation, vocabulary, phonological awareness, and writing skills remained statistically significant, but the statistical significance was found to be eliminated in English-speaking children. It was found that the relationship between phonological awareness and regulation of behavior in Spanish speaking children was higher (Lonigan et al., 2016).

Although the findings of research on behavior regulation skills and early academic achievement of preschool children have been obtained abroad, there has been no study on the relationship between behavioral regulation and early reading writing skills and phonological awareness, visual matching and pre-writing skills in Turkey. However, the present study focuses on the direction of behavior regulation of self-regulation, which represents an important aspect of self-regulation in pre-school children. In order to evaluate the behavioral regulation skills used in the study, the Head-Toes-Knees-Shoulders (HTKS) Functional measurement tool, the children's overall literacy achievements, vocabulary and vocabulary reading were reported with the results of studies abroad (McClelland et al., 2010; Wanless et al., 2011, 2016; Lonigan et al., 2017). However, the researches on the relationship between early literacy skills of the Head-Toes-Knees-Shoulders (HTKS) Functional assessment tool and their relationship with pre-writing skills, phonological awareness, visual matching and writing skills have not been found in our country. Therefore, the aim of this study is to evaluate the role of behavioral regulation skills in phonological awareness, visual matching, and writing skills in terms of age, gender, number of siblings and duration of attendance at school.

2. METHOD

2.1 Universe-Sample

The study group of this research is consist of 144 children attending independent preschool education institution affiliated with the National Ministry of Education located in Inegol town of Bursa city, which is assumed to represent the low and middle socio-

economic level chosen by random sampling method in the 2017-2018 academic year. The children in the study group ware within 48 -72 months. In this study, since more than one measurement was carried out, especially in early reading writing skills and behavioral regulation skills the application of measurement tools were made by taking a break.

Demographic characteristics of the children participated in the study are presented in Table 1.

Table 1.

Demographic Characteristics Of Children

		n	%
Children's ages	4	36	26.3
	5	89	65
	6	12	8.8
Sex	Boy	76	52.8
	Girl	68	47.2
Number of siblings	1	35	25
	2	72	51.4
	3 and above	33	23.6
Duration Of The Child's Education	1	89	64.5
	2	36	26.1
	3 and above	13	9.4
Socioeconomic Level	Low-Income	81	63.3
	Middle-Income	47	36.7

Total sample, n=144

Table 1 shows that the majority of the children participated in the study were in the group of five (65%) and four (26%), 53% were boys, 47% were girls, 51.4% were two siblings, 64.5% were continuing pre-school education for 1 year and their socioeconomic levels were mostly low. It was applied in public schools situated in regions where the socioeconomic status of the families is low and middle-class.

Data Collection Tool and Process

Three different tools were used in the research in order to collect data. First, a personal data form prepared by the researchers, secondly for measuring the early literacy skills of the children, the sub-tests for Phonological Awareness, Visual Matching and Pre-writing Skills in the Early Literacy Skills Evaluation Instrument developed by Karaman (2013) was used. For measurement of the children's self-regulation skills, the Head-Toes-Knees-Shoulders (HTKS) Functional Assessment Tool developed by Cameron, Ponitzet, et al.

(2009) and McClelland et al. (2007) and analyzed for reliability and validity in Turkey by Sezgin and Demiriz (2015) was employed.

The Personal Information Form contains information on the socio-economic level of the family, the number of siblings, the duration of pre-school education of the children, age and gende. The Early Literacy Skills Assessment Tool - The Phonological Awareness, Visual Matching and Pre-writing Skills Sub-Test, and the Early Literacy Skills Assessment Tool developed by Karaman (2013) consist of five subtests and 96 items in total. The first sub-test developed to evaluate early literacy skills is the sub-test to assess Phonological Awareness Skills.

The sub-test of the Phonological Awareness Skills was consist of 5 factors and a total of 53 items. These are as follows; their early sounds awareness 21 items, synthesizing sounds 7 items, Syllables and Throwing the Sounds 10 items, matching the Words that Start with the Same Voice 6 items and match the words that are composed of synonyms 9 items. The reliability value of sub-test of Evaluation of Phonological Awareness Skills KR-20 was found to be 0.91. The reliability value of the Evaluation of Phonological Awareness Skills Assessment subtest value was found to be similar with other scales in the literature (Karaman, 2013).

In the visual matching subtest, children are expected to identify the set of letters, numbers, or letters and numbers showed as stimulants from the options presented. It consists of one factor and 9 items. The KR-20 reliability of the Visual Matching sub-test is 0.71. The KR-20 reliability of the "Visual Matching" subtest has been determined to meet the internal consistency value accepted as criteria for a psychological test (Karaman, 2013; Karaman and Güngör-Aytar, 2016).

Pre-Writing Skills Assessment Sub-test consists of a single factor and a total of 9 items. The KR-20 reliability of the subtest was found to be 0.77. This sub-test includes instructions on how to evaluate the name writing skills of the children. As in all subtests, in this subtest, 1 is scored for the correct answers and 0 for the wrong answers. Karaman, 2013; Karaman and Güngör-Aytar, 2016).

The original term, Head-Toes-Knees-Shoulders (HTKS) scale was developed by Megan McClelland and Pointz (2011) to assess behavior regulation skills for 3-7 year old children. It is easy to use the self-regulation measurement tool. In the study on the reliability of the measurement tool, the Cronbach alpha value for the total score was found to be 0.98. The Turkish form of the scale was used. The measurement tool was adapted to Turkish by Sezgin and demirız (2015). Cronbach's alpha values of Head-Toes-Knees-Shoulders (HTKS) Functional Assessment Tool was found as; for section 1 is 0.93, for section 2 is 0.95, for section 3 is 0.94 and in total 0.96 were found (Sezgin and Demir, 2015).

The measurement tool consists of three sections. Each section is consisting of 10 tasks, 30 in total. These tasks measure children's ability to use attention, working memory, preventive control skills, and behavior in social interaction at the same time. In the functions, children are expected to respond behaviourally to four different verbal

commands, and these responses are monitored and recorded. A short training is required to apply the measurement tool, it does not require special materials, and the application is based on the interaction between the practitioner and the child (Sezgin and Demiriz, 2015).

In the measurement tool, there are tasks that are expected from children. In these tasks, the child is asked to follow certain rules to touch the body parts, in a way that is contrary to what the teacher says. This task is based on the child's ability to apply working memory, flexible attention and preventive control, which are central elements of behavioral regulation. In order to successfully carry out a task, a child must observe instructions, remember instructions throughout the test, prevent him or her from spontaneously responding to his or her own impulse, and react and change his or her attention flexibly when the rules change. The instructions barely increase as the mission progresses (McClelland and Cameron, 2011). The Head-Toes-Knees-Shoulders (HTKS) Functional Assessment Tool used in this study is consists of three parts. In the first part, children are instructed to touch their heads and toes in the opposite way. Throughout the test, they are asked to continue doing the opposite. In the second part, knees and shoulders are added. the opposite way. In the third part, to change the rules, the head and knees joined together, the shoulders and toes joined together. Each part has 10 items with the following scores: 0 ¼ wrong, 1 ¼ self and 2 ¼ right. In this way, the child can achieve a maximum of 60 points with a maximum of 20 points in each section.

Prior to the start of the study, permission was taken from the institutions to which the study will be conducted and from the families of the children who will form the study group. All necessary permissions ware taken from the writing awareness, visual matching, and phonological awareness sub-tests of the Early Literacy Skills Assessment Tool were obtained from Karaman (2013) and for application of the Head-Toes-Knees-Shoulders (HTKS) Functional Assessment Tool was obtained from the original developers of the scale Megan McClelland and Pointz (2011), and for the reliability and validity tests was obtained from Sezgin and Demirız (2015) who performed the test. For the application procedure and implementation, the video footage for the application of the Head-Toes-Knees-Shoulders (HTKS) Functional Assessment Tool was obtained by an electronic mail from McClelland, one of the researchers who developed the original scale. Video footage has been analyzed. Before the actual implementation, two scales were applied to 10 children attending an independent preschool in a quiet room of the school to enable researchers to get familiar with the scale's implementation guidelines. The research began in February 2017. The study was started by applying the Writing Awareness Sub-test of their early literacy kills assessement tool to the children paticipating in the study. The measurement tool was applied individually in a quiet and separate room of the school. Since the duration of the phonological awareness test was long, the visual matching and writing awareness test were applied the same day, a day after the phonological awareness test applied. During the application of two sub-tests, when the children were distracted or bored, they were allowed to go to their classes to play with their toys. The questions of the subtests were scored as 1 for correct answers

and 0 for incorrect answers. If there was no response from the children, the question was repeated three times, and if there was no response, 0 scores were given. A week after the application of the Early Literacy Skills Assessment Tool's Writing awareness, visual matching, and Phonological awareness subtests were completed, the Head-Toes-Knees-Shoulders (HTKS) Functional assessment tool was applied individually by researchers in a separate and quiet room. Each part of the measurement tool is scored separately for the correct behavior. Each correct response given by the child is recorded on the coding page for each child.

Analysis of Data

In the study, Shapiro Wilks test was applied for the normal distribution test of the data. Since the data is not suitable for normal distribution, Kruskal-Wallis test and Mann Whitney U test were used for comparisons between groups. Descriptive statistics are given as median (minimum-maximum) value. The correlation coefficients between the variables were calculated with the Spearman correlation coefficient. Statistical significance level $\alpha = 0.05$ was used.

3. FINDINGS

The findings of the study are given in this section. Table 2 shows the behavioral regulation, sound scientific awareness, and visual matching skills compared to age.

Table 2.

Analysis of Scale Points by Age

	4 Age		5 Age		6 Age		p	Differences Between Ages	
	n	Median (Min-Max)	n	Median (Min-Max)	n	Median (Min-Max)			
Head Toes Knees Shoulders (HTKS)	35	41 (0-53)	85	43 (3-58)	12	44.50 (28-53)	0.132	-	
Phonological awareness.	35	20 (0-47)	89	29 (6-53)	12	30 (18-50)	**0.001**	4-5 4-6 5-6	**<0.001** **0.004** 0.407
Visual Matching	30	4	86	6	11	6	**<0.001**	4-5	**<0.001**

		(0-8)		(0-9)		(2-9)		4-6	**0.019**
								5-6	0.620
Pre-Writing	35	6 (0-8)	86	7 (2-9)	12	6.5 (1-9)	0.081	-	

When table 2 was examined, there was a statistically significant difference between the age groups for the total difference scores of phonological awareness (p=0.001). This difference was found between 4 and 5 years, 4 and 6 years (p<0.001, p=0.004). It was found that children in the 5 and 6 age groups had higher levels of phonological awareness than the 4-year-olds. When visual matching scores are examined, there is a significant difference between age groups (p<0.001). Visual matching scores of 5 and 6 age group children were found to be higher than 4 year olds (p <0.001, p = 0.019). There was no significant difference found between the age groups for the Head Toes Knees Shoulders (HTKS) and pre-writing total scores (p=0.132, p=0.081).

Table 3 shows the comparison of behavioral regulation, phonological awareness, and visual matching skills according to the number of siblings.

Table 3.

Comparison of the scale point differences according to the number of siblings

	Only child		2 siblings		3 and more siblings			Pairwise	
	n	Median (Min-Max)	n	Median (Min-Max)	n	Median (Min-Max)	p	comparison	
Head Toes Knees Shoulders (HTKS)	33	41 (3-58)	70	42(0-57)	22	43(17-56)	0.924	-	
phonological awareness.	34	26.50 (6-47)	72	27 (0-53)	21	29 (4-53)	0.731	-	
Visual Matching	31	5 (0-9)	67	6 (0-9)	19	6 (2-9)	0.933	-	
Pre-Writing	34	7 (3-9)	71	7 (0-9)	20	6 (1-7)	**0.019**	1-2 1-3 2-3	0.485 **0.005** **0.018**

When Table 3 is examined, a significant difference was observed for the pre-writing total score, compared to the number of siblings (p = 0.019). This difference is due to the fact that those with one and two siblings get a higher score than those with three or more siblings. There was no significant difference in the number of siblings for the total scores of behavior regulation skills, phonological awareness and visual matching (p=0.924, p=0.731, p=0.933). In this study, the comparison of behavior regulation, Phonological Awareness, and visual matching skills in terms of duration of school attendance is shown in Table 4.

Table 4.

Analysis of Scale Score Differences According to School Attendance Duration

	Only child		2 siblings		3 and more siblings		
	n	Median (Min-Max)	n	Median (Min-Max)	n	Median (Min-Max)	p
Head Toes Knees Shoulders (HTKS)	86	41 (0-58)	34	43 (31-58)	10	48 (28-56)	0.058
Phonological awareness.	88	27 (4-50)	35	30 (4-53)	10	24 (7-38)	0.361
Visual Matching	80	6 (0-9)	35	5 (1-9)	8	7.5 (3-9)	0.153
Pre-Writing	87	7 (2-9)	36	6 (2-9)	8	6 (4-9)	0.927

Table 4 shows that there is no significant difference between the duration of school attendance for behavioral regulation, phonological awareness, visual matching and pre-writing scores (p=0.058, p=0.361, P=0.153,p=0.927).

In this study, the comparison of behavior regulation, Phonological Awareness, and visual matching skills by gender is shown in Table 5.

Table 5.

Comparison of scale scores by gender

	Boy		Girl		
	n	Median (Min-Max)	n	Median (Min-Max)	p
Head Toes Knees Shoulders	75	42 (16-58)	64	42 (0-58)	0.337

(HTKS)					
phonological awareness.	74	27 (0-53)	68	27.50 (3-53)	0.625
Visual Matching	69	5 (0-9)	63	6 (0-9)	0.255
Pre-Writing	74	6 (0-9)	66	7 (2-9)	**0.024**

When Table 5 was examined, there was a difference between the genders for the total scores of pre-writing. (p=0.024). This difference occurred as a result of girls getting higher scores than boys. No statistically significant difference was found between sexes for behavioral regulation, phonological awareness and visual matching total scores (p = 0.337, p = 0.625, p = 0.255).

In this study, the relationship between behavioral regulation and phonological awareness, pre-writing and visual matching skills were given in Table 6.

Table 6.

The relationship between behavior regulation skills total scores and other scale subtests

	Head Toes Knees Shoulders (HTKS)	
	R	p
Phonological awareness.	**0.275**	**0.001**
Visual Matching	0.040	0.651
Pre-Writing	**0.302**	**<0.001**

When Table 6 was examined, it was observed that there was a positive significant relationship between behavior regulation skill scores and pre-writing scores (p = 0.001, r = 0.275, p <0.001, r = 0.302). However, no significant relationship was found between behavior regulation and visual matching skills.

4. DISCUSSION, CONCLUSIONS AND SUGGESTIONS

In this study, the relationship between pre-school children's early reading skills and phonological awareness, visual matching and pre-writing skills and behavioral regulation skills were investigated in terms of age, gender, school attendance period, number of siblings.

Behavior regulation skills, phonological awareness, pre-writing skills, and visual matching skills were analyzed by intergroup comparisons to determine whether the children differed according to their age. In results of the analysis, there was a difference between age groups in terms of phonological awareness and visual matching skills. It

was found that the phonological awareness levels of children in 5 and 6 age groups were higher than those of 4 year olds. There was no difference between the age groups in terms of behavior regulation scores and total pre-writing scores. Accordingly, as age increases, Phonological Awareness and visual matching skills are increasing. The results support the literature. In the study conducted by Gündüz and Çalışkan (2013),it was found that children in the age group of five, six and seven had higher reading literacy skills than children of 5-5 and 5 years old. Similarly, in the study conducted by şen, Yıldız Çiçek, and Yılmaz (2010), it was found that six-year-old children were more successful in separating sentences into words and separating the words into syllables than the five-year-old children. In study conducted by Acarlar, Ege and Turan (2002), when the performance of the children in identifying the word at the beginning of a given sound, separating the word into syllables was examined, it was found that the performance of children increased with age and there was a significant difference between the ages. The results of study conducted by Crone and Whitehurst (1999) shows similar results with this study. Older children who attend preschool and kindergarten are found to have higher literacy skills than their classmates, who are younger with 10 months or less. In a study conducted by Sharma, Joshi, and Sood (2015) showed significant improvements in literacy skills, such as reading and writing skills, as age increases. The results of this current study indicate that it is compatible with the literature. This may be explained by cognitive maturity. Cognitive skills develop together with age. In children with normal development, as in all developmental areas, as the age progresses, cognitive skills are developed. Cognitive skills play an important role in the development of early literacy skills. In other words, separating words into syllables and syllables from the words, knowing that the syllables are composed of sounds, which are important skills of phonetical awareness develops with age. As the child's age increases, he/she realizes that the words are composed of some syllables (Goswami and Bryant, 1990). The study was found to be similar with the results of the study conducted by Burrage, Ponitz, McCready, Shah, Brian et al. (2008). In this study, it was found that children aged 5 to 6 had better performance than children aged 3-4 in terms of word reading, word coding, but there was no relation between the children's age and their behavior regulation skills in inhibitory control.

The raw data obtained from the study were analyzed to determine whether the children's number of sibling data, behavior regulation skills, phonological awareness, pre-writing skills, and visual matching skills differed according to the number of their siblings. As a result, a significant difference was found in total scores of pre-writing skills according to the number of siblings. Children with one and two siblings were found to have higher writing skills than children with three and more siblings. No significant difference was found for behavioral regulation skills, phonological awareness, and visual matching total scores. This may be due to the fact that families with only one or two children can spend more time with their children at home than families with three or more children, therefore they support more in activities that will make their children achieve school preparation skills. According to Erdoğan, şimşek-Bekir, and Erdoğan-

Araz (2005), the number of family populations affects the interest and time of parents to their children. Having many children reduces the interest and time spends on children by parents. Families with one and two children can spend more time supporting their child's development at home, more especially if they are interested in school preparation skills of their children. The results of this present study clearly show that the families who have few children support writing skills such as pencil cutting, cutting with scissors, drawing given shapes.

The raw data obtained from the study were analyzed to determine whether the data related to the duration of school attendance, behavior regulation skills, phonological awareness, pre-writing skills, and visual matching skills differ according to the school attendance duration of the child. When the results of the analysis were examined in terms of school attendance duration, it was concluded that there was no difference in phonological awareness, visual matching and writing skills. This situation can be explained that literacy skills for early literacy are not fully supported in pre-school education institutions. This may be due to teachers' beliefs and practices towards early reading. The pre-school education teachers lack or do not apply the classroom practicals related to the phonological awareness, pre-writing skills in the classes. The results of this current study are in consistent with the studies done in the field literature. Ergül, Karaman, Akoğlu, and Tufan (2014) found that materials containing letters or writings in preschool classes were quite limited or even none. In their study, Deretarla-Gül and Bal (2006) found that teachers think that writing in classrooms is not necessary. Even though there are some gains related to phonological awareness in the program, this phonology awareness was not fully support, however, teachers also have both knowledge and skills deficiencies in their work on phonological awareness and they do not give enough space for supportive studies because of their weak beliefs about these studies. In the study conducted by Muzevich (1999), found that teachers who do more reading and writing activities give more importance to the development of literacy skills. In the study conducted by Lynch (2009), it was found that preschool teachers had uncertainty and change in their beliefs on how and when to teach children reading and writing, and also determined that they have deficiencies in involving parents to their application to children's literacy development. Such uncertainties and deficiencies can cause teachers to feel inadequate. In consequence of this, all studies aimed at improving early literacy skills are not implemented in the class. In the study conducted by Cash, Cabell, Hamre, DeCoster and Pianta (2015) found that teachers' literacy skills were predictive of children's writing skills. In the study conducted by McCutchen, Abbott, Green ve Beretvas (2002) found that the phonological knowledge possesses by the teachers leads the children to do the works that direct their attention to the voices of the language and the symbols/sounds of the writings. Research results show that the knowledge related to early literacy, skills, and beliefs of the teachers, are important factors for early reading and writing activities. Therefore, based on the results of the current research, children's school attendance time may not be influenced by the

development of these early literacy skills, which can only be interpreted as lack of teacher's knowledge, skills, and belief.

In the raw data obtained in this study, children's gender data were analyzed to determine whether the behavior regulation skills, phonological awareness, pre-writing, and visual matching skills differed according to the gender of the children. As a result, it was found that there was a difference between the genders for pre-writing skills and the pre-writing skills of girls were higher than boys. However, there was no statistically significant difference found in gender for total scores of behavior regulation, phonological Awareness, and visual matching. The findings are in consistent with previous studies related to gender literacy. It is stated that small muscle development of girls developed earlier than boys (Dağlıoğlu and Deniz, 2011). Girls are more likely to perform better than boys in the development of writing skills (Bourke and Adams, 2011). When the field literature is examined, it is stated that girls have a better performance in writing (Barrs and Pidgeon, 2002). Pre-writing and writing skills are early literacy skill that requires little muscle skills. Includes the skills for small muscle development of children. In the literature related to writing skills, results of some studies were found in accordance. In the study conducted by Temel, Kaynak, Paslı, Demir ve Çemrek (2016), it was found that drawing skills of girls were higher than drawing skills of boys. Gaining pre-writing skills is considered to be an important early literacy skill (Grisham-Brown, Ridgley, Pretti-Frontczak, Litt and Nielson, 2006). In a study conducted by Bourk and Adams (2011) it was found that girls performed better on assignments given on writing skills (e.g. writing their own name, writing the letter shown in a word, holding the pen properly etc.). On the other hand, in the present study, there was no difference in terms of gender in the skills of phonological awareness and behavior regulation. The results of this study were in consistent with some while contrary to the results of other stusies in the literature. In this study, as girls tend to have more advanced behavioral regulation and control skills than boys, girls' school preparation levels were also found to be higher than boys (Matthews, Ponitz and Morrison, 2009). In the study conducted by Størksen, Ellingsen, Wanless ve McClelland (2015) showed that girls were better than boys in behavior regulation, verbal awareness, and vocabulary performance.

In the literature of some cultural-based studies, there were significant differences between the gender in terms of behavior regulation, girls are found to be better than boys in behavior regulation skills (Von Suchodoletz et al., 2013; Matthews, Ponitz and Morrison, 2009; Piotrowski, Lapierre and Linebarger, 2012), In the study conducted in some Asian countries such as Taiwan, North Korea, and China, it was found that there was no difference in behavior regulation skills in terms of gender (Wanless, McClelland, Lan and Son, 2013). As showed in this study, the effect of gender on behavior regulation varies between cultures. In this study, it was found that there was a significant relationship between behavioral regulation skill scores with phonological awareness scores and pre-writing skills scores and there was no relation between visual matching

skill scores. Based on this result, as the behavior regulation skill score increases, the total scores of the pre-writing and phonological awareness also increase. It is stated in the literature as well as the results of relevant field studies that, behavior regulation skills have a significant effect on early academic skills acquisition in early childhood (Von Suchodoletz et al., 2013; Matthews, Ponitz, and Morrison, 2009; Lan, Legare, Ponitz, Li and Morrison, 2011). The behavioral regulation skills, even though behavioral regulation has a greater relationship with children's academic skills, it also has a significant relationship with administrator functions (McClelland, Cameron Ponitz, Messersmith and Tominey, 2010). In one study, it showed that children's academic achievement at other academic stages were based on their pre-school behavior-regulation skills (McClelland, Acock and Morrison, 2006; McClelland et al., 2000). The results of the study showed that there was a strong relationship between early literacy and behavior regulation skills found in early academic skills. The results of the current research are consistent with the results of the literature. In the study conducted by Last, Lee and sung (2013) found that behavioral regulation has an impact on early reading skills in preschool children. in the study conducted by Shaul and Schwartz (2014), found that behavior regulation skills contributed significantly to the development of early literacy. Similarly, in a study conducted by McClelland et al. (2007) found that behavioral regulation positively predicted the early literacy, vocabulary and mathematics skills significantly. Furthermore, the development of behavioral regulation predicted the development of early literacy skills, vocabulary, and math skills in the preschool period (McClelland et al., 2007). In this study, it was found that behavioral regulation skills have a significant relationship with phonological awareness and pre-writing skills. The results of this study are in consistent with the results of studies conducted by Lonigan, Allan, Goodrich, Farrington, and Phillips (2017). . In this study, it was concluded that behavior-regulation skills were significantly associated with phonological awareness skills, but not with language and writing skills (Lonigan et al., 2017). The results of some research also emphasize that behavior regulation supports writing skills. Pre-writing skills require little muscle skills. in pre-school children, muscle skills are a powerful predictor of later reading success compared to great muscle skills (Wolff, Gunnoe, & Cohen, 1985). In addition, Murrah (2010) reported that the first, third and fifth-grade achievement in mathematics and reading was strongly contributed by the fine motor and executive functions (attention control, working memory, and preventive control). In particular, strong shape copying performance tends to be associated with literacy skills. Children with strong copy skills can learn numbers and letters, and can complete basic classroom assignment faster than children with weak copying skills; this allows them to read sounds within words, manipulate words, and learn to do simple arithmetic operations (Cameron, Brock, Murrah and Bell, 2012). Writing skills require the control of related behaviors. According to Graham, Harris, and Mason (2005), writing skills require planning and organizing skills. The results of this study were in consistent with the results of the study conducted by Cameron et al. (2012). In the study, it was found that executive functions were related to fine motor skills, especially in children's ability to

copy designs, decoding, reading comprehension, and general reading skills, executive functions significantly predicted form performance, phonological awareness gains. It shows similarity with the study conducted by Puranik, Boss and Wanless (2018). In this study, a positive relationship was found between behavioral regulation skills and early writing skills. However, In this study it was concluded that, the ability to conduct behaviour in pre-school children between 4-6 years of age was significantly associated with the ability to spell and spell letters, but no relashion with ability to write names, while in children with 6 years of age, there was no relationship with letter writing, but there was relationship with spelling skill. In the study of Skibbe, Montroy, Bowles, and Morrison (2018) found that, children who previously developed behavioral regulation skills had better phonological awareness skills. In this study, it is emphasized that the development of behavior-regulation skills differs from individual and the children who develop behavior-regulation skills develop their reading and writing skills at an early stage. In this study, there was no relationship between behavioral regulation skills and visual matching skills. It was observed that it's not compatible with the results when similar studies are examined. In the study conducted by Becker, Miao, Duncan, and McClelland (2014) showed that, working memory and behavior-regulating skills are directly related to visual motor, behavior-regulating skills with visual motor skills are related to mathematics as well as early literacy skills.

The findings of this study show that, early literacy skills of children are important for phonological-awareness, pre-writing skills, and visual matching skills found in their behavioral regulating skills. Behavior regulation skills of children should be supported in the pre-school period. It is important to understand how to support behavioral regulation and to implement supportive activities of preschool teachers in educational programs. In addition, these results suggest that interventions to improve behavioral regulation are justified to strengthen these skills before the child begins formal education, i.e. in the pre-school period. In the study, only one measurement tool was used to measure behavior regulation skills. Future studies may be recommended to use a large number of measuring tools for these skills (e.g. attention, working memory and Kettering control), and ideally, multidimensional and multiple way data collection on children's skills can be proposed to include characteristics of early academic writing, such as early reading and math skills, in home and classroom environment. Other studies with more socio-demographic diversity are considered necessary for the extraction of important results. In addition, research can be repeated in a wider sample. Programs to aim to support behavior regulation skills can be prepared and the effects of behavior regulation skills and early literacy skills on children can be examined.

References

Acarlar, F., Ege, P., & Turan, F. (2002). Türk çocuklarının üstdil becerilerinin gelişimi ve okuma ilişkisi. *Türk Psikoloji Dergisi*, *17*(50), 63-73.

Allan, N.P., & Lonigan, C.J. (2011). Examining the dimensionality of effortful control in preschool children and its relation to academic and socio-emotional indicators. *Developmental Psychology*, *47*, 905–915.

Best, J.R., & Miller, P.H. (2010). A developmental perspective on executive function. *Child Development*, *81*, 1641–1660.

Bourke, L. & Adams, A. M. (2011). Is it differences in language skills and working memory that account for girls being better at writing than boys? *Journal of Writing Research*, 3(3), 249-277.

Burrage, M, Ponitz, C.C, McCready, E.A, Shah, P. Brian C. Sims, Abigail M., & Frederick J. Morrison (2008). Age and Schooling-Related Effects on Executive Functions in Young Children*: A Natural Experiment, Child Neuropsychology*, *14*(6), 510-524.

Barrs, M., & Pidgeon, S. (2002). *Boys and writing*. London: CLPE.

Becker, D.R., Miao, A., Duncan, R., & McClelland, M.M. (2014). Behavioral self-regulation and executive function both predict visuomotor skills and early academic achievement. *Early Childhood Research Quarterly*, *29*(4), 411-424.

Becker, D. R., McClelland, M. M., Loprinzi, P., & Trost, S. G. (2014). Physical activity, self-regulation, and early academic achievement in preschool children. *Early Education & Development*, *25*(1), 56-70.

Bull, R., & Scerif, G. (2001). Executive functioning as a predictor of children's mathematics ability: Inhibition, switching, and working memory. *Developmental Neuropsychology*, *19*, 273–293.

Blair, C., & Razza, R.P. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development, 78*, 647–663.

Bronson, M.B., Tivnan, T., & Seppannen, P.S. (1995). Relations between teacher and classroom activity variables and the classroom behaviors of prekindergarten children in Chapter 1 funded programs. *Journal of Applied Developmental Psychology*, *16*, 253–282.

Bodrova, E., & Leong, D. (2007). *Tools of the mind: The Vygotskian approach to early childhood education.* Columsutton, OH: Pearson.

Crone, D.A. & Whitehurst, G.J. (1999). Age and schooling effects on emergent literacy and early reading skills. *Journal of Educational Psychology, 91*(4), 604.

Cash, A. H., Cabell, S.Q., Hamre, B. K., DeCoster, J. & Pianta, R.C. (2015). Relating prekindergarten teacher beliefs and knowledge to children's language and literacy development. *Teaching and Teacher Education, 48*, 97-105.

Cameron, C. E., Brock, L. L., Murrah, W. M., Bell, L. H., Worzalla, S. L., Grissmer, D., & Morrison, F.J. (2012). Fine motor skills and executive function both contribute to kindergarten achievement. *Child Development*, *83*(4), 1229-1244.

Cameron Ponitz, C.E., McClelland, M. M., Matthews, J. M., & Morrison, F. J. (2009). A structured observation of behavioral self-regulation and its contribution to kindergarten outcomes. *Dev. Psychol*. *45*, 605–619.

Deretarla-Gül, E., & Bal, B. (2006). Anasınıfı öğretmenlerinin okuma yazmaya hazırlık çalışmalarına ilişkin bakış açıları, sınıf içi kullanılan materyal ve etkinlikler ile çocukların okuma yazmaya ilgilerinin incelenmesi. *Çocuk Gelişimi ve Eğitimi Dergisi, 1(2),* 33-51.

Dağlıoğlu, H. E., & Deniz, Ü. (2011). Okul öncesi dönem çocuklarının insan figürü çizimlerinin gelişimsel açıdan cinsiyete göre incelenmesi. *Elektronik Sosyal Bilimler Dergisi*, *10*(35), 16-30.

Dowsett, S.M., & Livesey, D. J. (2000). The development of inhibitory control in preschool children: Effects of ‘‘executive skills’’ training. *Developmental Psychobiology*, *36*, 161–174.

Erdoğan, S., Şimşek-Bekir, H., & Erdoğan-Aras, S. (2005). Alt sosyoekonomik bölgelerde ana sınıfına devam eden 5-6 yaş grubundaki çocukların dil gelişim düzeylerine bazı faktörlerin etkisinin incelenmesi. *Çukurova Üniversitesi, Sosyal Bilimler Enstitüsü Dergisi, 14*(1), 231-246.

Ergül, C., Karaman, G., Akoğlu, G., Tufan, M., Kesiktaş, D., & Bahap-Kudret, Z. (2014). Okul öncesi öğretmenlerinin “erken okuryazarlık” kavramına ilişkin bilgi düzeyleri ve sınıf uygulamaları. *İlköğretim Online, 13*(4), 1449-1472.

Gathercole, S.E., Alloway, T. P., Willis, C., & Adams, A. (2005). Working memory in children with reading disabilities. *Journal of Experimental Child Psychology*, *93*(3), 265–281.

Gathercole, S.E., Pickering, S.J., Knight, C., & Stegmann, Z. (2004). Working memory skills and educational attainment: Evidence from national curriculum assessments at 7 and 14 years of age. *Applied Cognitive Psychology, 18*, 1–16.

Gathercole, S.E., & Pickering, S.J. (2000). Working memory deficits in children with low achievements in the national curriculum at 7 years of age. *British Journal of Educational Psychology, 70*(2), 177-194.

Graham, S., Harris, K.R., & Mason, L. (2005). Improving the writing performance, knowledge, and self-efficacy of struggling young writers: The effects of self-regulated strategy development. *Contemporary Educational Psychology*, *30*, 207–241.

Gündüz, F., & Çalışkan, M. (2013). 60-66, 66-72, 72-84 Aylık Çocukların Okul Olgunluk ve Okuma Yazma Becerilerini Kazanma Düzeylerinin İncelenmesi. *Electronic Turkish Studies, 8*(8), 379-398.

Goswami, U., & Bryant, P.E. (1990). *Phonological skills and learning to read.* London: Erlbaum.

Grisham-Brown, J., Ridgley, R., Pretti-Frontczak, K., Litt, C., & Nielson, A. (2006). Promoting positive learning outcomes for young children in inclusive classrooms: A preliminary study of children's progress toward pre-writing standards. *Journal of Early and Intensive Behavior Intervention, 3*(1), 171-183.

Karaman, G., & Güngör-Aytar, A. (2016). Erken okuryazarlık becerilerini değerlendirme aracı'nın (EOBDA) geliştirilmesi. *Mersin Üniversitesi Eğitim Fakültesi Dergisi*, 12(2): 516-541.

Karaman, G. (2013). *Erken Okuryazarlik Becerilerini Değerlendirme Araci'nin Geliştirilmesi, Geçerlik ve Güvenirlik Çalışması,* Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, Yayınlanmamış Doktora Tezi, Ankara.

Kochanska, G., Aksan, N., Prisco, T. R., & Adams, E. E. (2008). Mother–child and father–child mutually responsive orientation in the first 2 years and children's outcomes at preschool age: Mechanisms of influence. *Child Development*, *79*(1), 30-44.

Lynch, J. (2009). Print literacy engagement of parents from low-income backgrounds: implications for adult and family literacy programs. *Journal of Adolescent & Adult Literacy, 52*(6), 509-521.

Lan, X., Legare, C.H., Ponitz, C.C., Li, S., & Morrison, F. J. (2011). Investigating the links between the subcomponents of executive function and academic achievement: A cross-cultural analysis of Chinese and American preschoolers. *Journal of Experimental Child Psychology*, *108*(3), 677-692.

Lonigan, C. J., Allan, D. M., Goodrich, J. M., Farrington, A. L., & Phillips, B.M. (2017). Inhibitory control of Spanish-speaking language-minority preschool children: Measurement and association with language, literacy, and math skills. *Journal of Learning Disabilities*, *50*(4), 373-385.

Lonigan, C. J., Lerner, M. D., Goodrich, J. M., Farrington, A. L. & Allan, D.M. (2016). Executive function of Spanish-speaking language-minority preschoolers: Structure and relations with early literacy skills and behavioral outcomes. *Journal of Experimental Child Psychology*, *144*, 46-65.

Muzevich, K. (1999). Emergent writing in the kindergarten classroom. *Reading Today*, *17*(2), 2-9.

McCutchen, D., Abbott, R.D., Green, L. B., Beretvas, S.N., Cox, S., Potter, N. S., ... Gray, A. L. (2002). Beginning literacy: Links among teacher knowledge, teacher practice, and student learning. *Journal of Learning Disabilities*, *35*(1), 69-86.

McClelland, M.M., Acock, A.C., Piccinin, A., Rhea, S. A., & Stallings, M.C. (2013). Relations between preschool attention span-persistence and age 25 educational outcomes. *Early Childhood Research Quarterly*, *28*(2), 314-324.

McClelland, M.M., Morrison, F. J., & Holmes, D.L. (2000). Children at risk for early academic problems: The role of learning-related social skills. *Early Childhood Research Quarterly, 15*(3), 307-329.

Matthews, J.S., Ponitz, C.C., & Morrison, F. J. (2009). Early gender differences in self-regulation and academic achievement. *Journal of Educational Psychology, 101*(3), 689-704

McClelland, M.M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., & Morrison, F. J. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. *Developmental Psychology, 43*(4), 947.

McClelland, M.M., Acock, A.C., & Morrison, F.J. (2006). The impact of kindergarten learning-related skills on academic trajectories at the end of elementary school. *Early Childhood Research Quarterly, 21*, 471–490.

McClelland, M.M., & Cameron, C.E. (2011). Self-regulation and academic achievement in elementary school children. *New Directions for Child and Adolescent Development*, *133*, 29–44.

McClelland, M.M., & Cameron, C.E. (2012). Self-regulation in early childhood: Improving conceptual clarity and developing ecologically valid measures. *Child Development Perspectives*, *6*(2), 136-142.

McClelland, M.M., Cameron, C.E., Wanless, S. B., & Murray, A. (2007). Executive function, behavioral self-regulation, and social-emotional competence. *Contemporary Perspectives on Social Learning in Early Childhood Education*, *1*, 113-137.

McClelland, M. M., Ponitz, C. C., Messersmith, E. E., & Tominey, S. (2010). Self-regulation: Integration of cognition and emotion. In W. F. Overton ve R. M. Lerner (Eds.), *The Handbook of Life-Span Development, Vol. 1. Cognition, Biology and Methods*. Hoboken, NJ, US: John Wiley & Sons Inc.

National Institute of Child Health and Human Development Early Child Care Research Network. (2003). Do children's attention processes mediate the link between family predictors and school readiness? *Developmental Psychology*, *39*, 581–593

Jarrold, C. ve Bayliss, D.M. (2007). *Variation in working memory due to typical and atypical development*. In A. R. A. Conway, C. Jarrold, M. J. Kane, A. Miyake, ve J. N. Towse (Eds.), Variation in working memory. New York, NY: Oxford University Press.

Piotrowski, J.T., Lapierre, M.A., & Linebarger, D.L. (2012). Investigating correlates of self-regulation in early childhood with a representative sample of English-speaking American families. *Journal of Child and Family Studies*, *22*, 423–436.

Ponitz, C. E., McClelland, M.M., Jewkes, A.M., Connor, C.M., Farris, C.L., & Morrison, F.J. (2008). Touch your toes! Developing a direct measure of behavioral regulation in early childhood. *Early Childhood Research Quarterly*, *23*(2), 141-158.

Puranik, C.S., Boss, E., & Wanless, S. (2018). Relations between self-regulation and early writing: Domain specific or task dependent? *Early Childhood Research Quarterly*.1-12.

Pianta, R. C., Barnett, W. S., Burchinal, M., & Thornburg, K. R. (2009). The effects of preschool education: What we know, how public policy is or is not aligned with the evidence base, and what we need to know. *Psychological Science in The Public İnterest*, *10*(2), 49-88.

Sezgin, E., & Demiriz, S. (2015). Davranış düzenleme becerileri ölçme aracı baş-ayak parmakları- dizler-omuzlar (BADO) görevleri'nin geçerlik ve güvenirlik çalışması. *Uluslararası Aile Çocuk ve Eğitim Dergisi, 7*(3), 53-71.

Siegler, R.S., & Alibali, M.W. (2005*). Children's thinking (4th ed.).* Upper Saddle River, NJ: Prentice Hall.

Shaul, S., & Schwartz, M. (2014). The role of the executive functions in school readiness among preschool-age children. *Reading and Writing*, *27*(4), 749-768.

Skibbe, L.E., Montroy, J.J., Bowles, R.P., & Morrison, F.J. (2018). Self-regulation and the development of literacy and language achievement from preschool through second grade. *Early Childhood Research Quarterly*. doi:10.1016/j.ecresq.2018.02.005.

Sharma, M.N., Joshi, M.N., & Sood, M.N. (2015). Curriculum-based language skills in Hindi for Students between 12 to 15 years of age. *Language in India*, *15*(8), 146-167.

Son, S.H., Lee, K., & Sung, M. (2013). Links between preschoolers' behavioral regulation and school readiness skills: The role of child gender. *Early Education & Development, 24*(4), 468-490.

Størksen, I., Ellingsen, I.T, Wanless, S.B., & McClelland, M.M. (2015). The Influence of parental socioeconomic background and gender on selfregulation among 5-year-old children in Norway. *Early Education and Development*, *26* (5-6), 663-684.

Şen, S., Çiçekler, C.Y., & Yılmaz, R. (2010). Okul öncesi eğitim kurumlarına devam eden ve etmeyen 5-6 yaş çocukların üstdil becerilerinin incelenmesi*. Ondokuzmayis University Journal of Education, 29*(2), 37-54.

Temel, Z.F., Kaynak, B., Paslı, H., Demir, H., & Çemrek, B. (2016). Montessorı eğitim kurumlarındaki çocukların görsel algı ve çizim becerileri arasındaki ilişkinin incelenmesi. *Kastamonu Education Journal, 24*(5), 2595-2608

Wanless, S.B., McClelland, M.M., Lan, X., Son, S.H., Cameron, C.E., Morrison, F.J., ... Sung, M. (2013). Gender differences in behavioral regulation in four societies: The United States, Taiwan, South Korea, and China. *Early Childhood Research Quarterly*, *28*(3), 621-633.

Wanless, S.B, McClelland, M.M., Acock, A.C., Chen, F.M., & Jo-Lin Chen (2011). Behavioral regulation and early academic achievement in Taiwan, *Early Education & Development, 22*(1), 1-28.

Wanless, S.B., McClelland, M.M., Tominey, S. L., & Acock, A.C. (2011). The influence of demographic risk factors on children's behavioral regulation in prekindergarten and kindergarten. *Early Education and Development*, *22*, 461–488.

Wolf, P., Gunnoe, C., & Cohen, C. (1985). Neuromotor maturation and psychological performance: A developmental study. *Developmental Medicine and Child Neurology, 27*, 344–354.

Von Suchodoletz, A., Gestsdottir, S., Wanless, S. B., McClelland, M. M., Birgisdottir, F., Gunzenhauser, C., & Ragnarsdottir, H. (2013). Behavioral self-regulation and relations to emergent academic skills among children in Germany and Iceland*. Early Childhood Research Quarterly*, *28*(1), 62-73.

Von Suchodoletz, A., Trommsdorff, G., Heikamp, T., Wieber, F., & Gollwitzer, P.M. (2009). Transition to school: The role of kindergarten children's behavior regulation. *Learning and Individual Differences*, *19*(4), 561-566.

Vohs, K. D., & Baumeister, R. F. (2004). Understanding self-regulation: An introduction. *Handbook of Self-Regulation: Research, Theory and Applications*, 1-9.

Vohs, K. D. & Baumeister, R. F. (2004). *Understanding self-regulation: An introduction.* In K. D. Vohs, R.F. Baumeister (Eds.), Handbook of Self-Regulation: Research, Theory, and Applications, Guilford Press. New York

Yalçıntaş-Sezgin E. & Ulus L. (2017). *Emergent Literacy*. in: Educational research and practice, Koleva, I.; Duman, G., Eds., St. Kliment Ohridski University Press, Sofia.