

The relationship between Turkish preschool children's delay of gratification and self-regulation skills

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ABSTRACT

In the early childhood period, self-regulation and delay of gratification are important skills. The lack of these skills may have a negative impact on children's development and learning. In this study, the relationship between pre-school children's delay of gratification and self-regulation skills was examined. Fifty-seven preschool children from Ankara, the capital of Turkey, aged between four and five, participated in this study. Delay of gratification was measured with Marshmallow Test, whereas self-regulation skills were assessed with Preschool Self-Regulation Assessment. Logistic regression analysis was performed to determine the variables that predict the delay of gratification. The results indicated that self-regulation, particularly in terms of impulse control and effortful control, affects the delay of gratification, and that gender is not a determining factor in the delay of gratification. Besides, children's success, particularly in impulse control and effortful control, was found to increase the delay of gratification. Identifying children with extreme difficulty in the delay of gratification may help to detect those with poor self-regulation skills. Accordingly, various tasks could be designed to improve self-regulation skills in early childhood, and potential problems regarding delay of gratification and self-regulation could be minimized. This is likely to have a positive impact on society as a whole.

Keywords: Delay of gratification, self-regulation, impulse control, preschool children, Turkish preschoolers.

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INTRODUCTION

A growing body of research emphasizes that self-regulation and delay of gratification are important skills from early childhood onwards (Blair and Diamond, 2008; Hautakangas et al., 2021; McClelland et al., 2013; McClelland and Cameron, 2011; Mischel, 2016; Ormrod et al., 2017; Posner and Rothbart, 2009; Rademacher and Koglin, 2018). This is because lack of self-regulation and delay of gratification in early childhood may have a negative impact on children's development; and those with such skills will have a considerable advantage in the future (Mischel, 2016; Posner and Rothbart, 2009). It is particularly well known that a lack of self-regulation skills in the early childhood period has significant effects on children's adaptation to school (Blair, 2002; Blair and

Diamond, 2008; McClelland and Cameron, 2011; Pears et al., 2014), problem behaviors and impulsiveness (Eisenberg et al., 2003), peer relations, cognitive abilities (Kiss et al., 2014), peer rejection, low academic performance (Blair, 2002; McClelland et al., 2007), and attention deficit and hyperactivity disorder (Silverman and Ragusa, 1992). Moreover, poor self-regulation may cause a series of mental health problems. Impulsive and aggressive behavior, attention deficit, withdrawal, self-harm, and substance abuse may be observed amongst children and adolescents lacking these skills (Murray et al., 2014).

On the other hand, self-regulation enables children to avoid inappropriate behaviors (e.g. responding to the

teacher loudly and impulsively in class) and control their emotional reactions to a situation (e.g. reducing and preventing episodes of anger) (McClelland et al., 2013). Undoubtedly, self-regulation investment may help build a healthier society since it predicts higher income, better financial planning, lower rates of substance abuse and violence, and decreased long-term health costs (Rosanbalm and Murray, 2017). In light of these arguments, the current study aims to analyze the relationship between self-regulation and delay of gratification among preschool children.

Self-regulation is an important construct in developmental psychology, which has profound implications for the successful socialization of children and their academic and social success. (Posner and Rothbart, 2009). It is also crucial for children's long-term academic achievement (Dan, 2016; McClelland and Cameron, 2011; Ormrod et al., 2017). Research has shown that self-regulation skills in preschool predict higher mathematical skills and better performance throughout school years as well as successful college completion (McClelland et al., 2013). Besides, being more skilled at the delay of gratification and self-regulation predicts better adult adjustment as well as a better performance at school, higher self-worth, the ability to cope with stress, and lower drug use (Ayduk et al., 2000). On the other hand, the costs of failure in self-regulation range from crime and teen pregnancy to alcoholism and drug addiction, to domestic violence, and even academic failure (Metcalf and Mischel, 1999). Considering these negative outcomes, examining self-regulation, impulse control, and delay of gratification in early development is crucial.

Difficulties experienced by children in self-regulation have a negative impact on their adjustment to school. Each year, millions of preschool children graduate to a more structured school environment. This poses a problem for children who are not good at such basic skills as following instructions, avoiding inappropriate behavior, and paying attention, all of which are also called behavioral regulation skills (McClelland et al., 2007). Research has shown that half or more than half of the preschool children experience problems in certain areas when they graduate to kindergarten and lack certain abilities and experiences that will help them function efficiently (Rimm-Kaufman et al., 2000), and kindergarten teachers are seriously concerned about children's regulatory behaviors, which are deemed essential and important to school readiness (Lewit and Baker, 1995). This indicates that many children come to school without having self-regulation skills (Blair, 2002), and they face challenges due to a lack of these skills (Rimm-Kaufman et al., 2000). In this sense, it is obvious that at the beginning of both preschool and primary school, self-regulation is a necessary skill for children to be successful at school (McClelland et al., 2007).

Self-regulation in early childhood is typically assessed

through Walter Mischel's delayed gratification procedures (2016; Mischel and Ebbesen, 1970; Schlam et al., 2013; Mischel et al., 1989). The skill of delaying gratification develops as children get mature and learn to pursue valuable, long-term pleasures rather than less valuable, short-term pleasures. This is significantly related to executive function (i.e cognitive control), distracting oneself effectively, cognitive functions underlying self-monitoring and planning (Schlam et al., 2013), attention strategies (Shoda et al., 1990) and children's impulsiveness. Moreover, findings support the idea that a common mechanism lies behind attention, activity and impulse (aggressive or other) regulation (Silverman and Ragusa, 1992). In the delay of gratification paradigm, an investigation of clear connections between self-regulatory behaviors, as well as the variables and processes to be used in the early development stage, which underlies these permanent competencies, are crucial (Sethi et al., 2000). Within this context, the present study discusses delay of gratification as one dimension of self-regulation, referring to Mischel's classical work (Mischel, 2016). By understanding the processes regarding the development of self-regulation skills, it is believed this study may help educators to design parental involvement activities for adults to help their impulsive children.

Self-regulation reinforces one to intentionally align with the rules and expectations (Augustine and Stifter, 2019). It is accepted that it requires awareness of socially accepted behaviors, thus it is an important aspect of children's socialization (Kopp, 1982). Silverman and Ragusa (1992) contend that 24-month-old children who are considered careless and impulsive and have difficulty in the delay of gratification are similarly perceived as careless, hyperactive, and impulsive four years later. In other words, if these children are not diagnosed and proper action is not taken, no decrease or a positive change in their problem behaviors will be observed. Especially in early childhood, children may suffer the negative outcomes of impulsiveness, inattentiveness and inability to delay gratification. Undoubtedly, it is hard to teach children with problem behaviors since they spend less time on task and receive fewer instructions and feedback. Besides, these children with maladaptive behavior are less likely to benefit from learning experiences based on peer cooperation (Blair et al., 2004). Hence, children's ability to control their actions and behaviors is crucial for their successful integration into society. While children's motivation to control their actions and behaviors is affected by temperament, biological factors such as the maturity of certain brain structures, and environmental factors such as culture (Dan, 2016), delay of gratification is affected by intercultural or ethnic differences (Bembenuddy, 2007; Chua and Kang, 2012). Moreover, culture is a vitally contextual constituent of children's self-regulation (Sun and Kang, 2020), and only a small number of researchers studied the culture-specific development of self-regulation

and delay of gratification in children. A limited number of studies have implemented the delay of gratification paradigm in a non-western traditional context (Chua and Kang, 2012; Lamm et al., 2017). In Turkey, delay of gratification and self-regulation in Turkish culture is not contextualized together in any of the studies conducted, and particularly in early childhood, there are not an adequate number of studies. In terms of delay of gratification in individuals above 18, Avcı (2013) analyzed the relationship between self-regulation, future-time perspective and delayed academic satisfaction in Turkish teacher candidates. İscan and Aydın (2018) examined how individuals' time preferences and their ability to delay gratification affect their tendency to participate in individual pension schemes. There are only three studies examining the delay of gratification in early childhood. Ertugrul-Yasar and Karakelle (2020) studied language, working memory, executive functions (delay of gratification in measuring executive functions) and theory of mind; Hascuhadar and Coskun (2018) investigated the intermediary role of flexibility in the relationship between the delay of gratification and creativity, and Can (2015) examined delay of gratification in relation to mothers' parenting styles. With a view to understanding the critical role self-regulation and delay of gratification play in early childhood, this study aims to examine the relationship between children's delay of gratification and self-regulation by asking the following questions: (1) What are the variables that predict preschool children's delay of gratification skill? (2) Is the delay of gratification in preschool related to gender?

METHOD

Participants

57 preschool children aged 4 to 5, who are attending a private nursery school, participated in this study. Demographic information was collected through a consent form, which parents completed. In order to obtain information about gender and age, the questions "What is your child's gender?" and "What is your child's date of birth?" were used. Children were aged between 4 and 5 (mean age = 58.12 months, SD = 7.38; exact age calculated with the date of birth and date of the assessments). 26 of them were girls (46%), while 31 were boys (54%). Most children were from middle-class families.

Measures

Marshmallow test

Classical Marshmallow Tests started in Bing Nursery School of Stanford University in the 1960s. The

marshmallow test is named the delayed short-term gratification paradigm for a more valuable long-term reward (Mischel, 2016). The preschool delayed gratification paradigm developmentally offers a self-control mechanism for children (Sethi et al., 2000). Additionally, it helps to understand how children resist temptation, how they accomplish delay, and how different levels of acquisition of this skill emerge in various ways in their lifetime (Mischel, 2016).

Marshmallow Test is conducted by asking children individually to choose between a small but immediate reward (for example a candy) or more rewards (two candies) which they can get only after waiting on their own for about 20 minutes. Children choose their favorite treats among candies, cookies, crackers, and so on. Children are asked to sit alone at a table, looking at the one candy, which they can eat immediately, or thinking about the two candies that they can have after waiting for some time. Next to the treats is a bell that they can ring and call the researcher to eat the candy on the table anytime they want. If children have not left their chairs or started eating their candy, they can get the second one (Mischel, 2016).

Preschool self-regulation assessment (PSRA)

Preschool Self-regulation Assessment (Smith-Donald et al., 2007) (PSRA) is a two-part scale that assesses children's self-regulatory performance. The first part consists of the PSRA battery of tasks, namely self-regulation tasks, and the second part involves an assessor report of children's self-regulation that could potentially be used in any test-taking situation. In the PSRA battery part, brief and structured tasks are used to assess children's emotional, attentional, and behavioral domains. These tasks function within two subdimensions: Impulse Control and Compliance/Executive Control. The assessor report in the second part of PSRA is comprised of two subdimensions that reflect children's "Attention/Impulse Control" and "Positive Emotion," and throughout the interaction between the assessor and the child, it allows a detailed specification of children's emotion, attention and behavior (Smith-Donald et al., 2007). Assessor Report Examiner Rating Scale is a rubric-type assessment tool that includes items to be coded between 0 and 3. The items consist of behavioral indicators. 0 denotes the lowest score and 3 denotes the highest score. Some items, however, are reverse-coded in order to reduce automatic responses and increase assessor reliability. In the adaptation study for Turkey, the scale showed the same factor structure as its original version. The reliability coefficients (α) for Attention/Impulse Control and Positive Emotion subdimensions were respectively 0.88 and 0.80, and the overall reliability coefficient was .83 (Findık-Tanrıbuyurdu and Güler-Yıldız, 2014).

Procedure

Data were collected by the authors of this article and the volunteering research assistant. The assessments were carried out from December 2019 to March 2020 in the nursery school children were attending. Prior to the research, consent was obtained from both the school and parents. Parents were given an information form explaining the overall aim of the study and asked to sign the consent form to permit their children to participate in the study. No payment was offered to parents, yet children took the candies they earned during the administration of the Marshmallow Test.

Delay of gratification situation

Delay of gratification was assessed through the Marshmallow Test (Ayduk et al., 2000; Mischel, 2016; Mischel and Ebbesen, 1970; Mischel et al., 1989). There were no toys, books, pictures or distracting objects in the room, but a table, chair and video camera, which were placed in a box not to distract children, and positioned opposite to the chair where the children were to sit. Also in the ceiling of the room was another camera that recorded sound and images synchronously. In order to make the children feel comfortable, the researcher met them prior to the test and played some games with them. The room where children were going to take the test was introduced to children as a “surprise room.” The researcher told each child: “We are going to play a game with you.” Then each child was asked to choose one of their favorite treats (chocolate bars, marshmallows, M&M, etc.). After the child chose his/her treat, the researcher told him/her: “I will give you one “candy, but I have to leave now. If you do not eat this candy until I come back, I will give you a second candy. If you do not wait for me and eat this candy, I will not give you the second one. While you are waiting for me to come back, you are not going to leave this chair. If you eat the candy or leave your chair as you are waiting for me, you will not get the second candy. In order to ensure that children understood the instructions, the researcher said: “Now let’s repeat together. If you eat this while you are waiting for me, and if you leave your chair, you will not get a second one.” The researcher left the room, leaving the child alone with the candy. She did not return until 15 minutes had passed, or the child ate the candy, left the chair, or showed a sign of a problem. The child’s behaviors at the time were monitored and recorded in the video room. At the end of the test, if the child waited for 15 minutes and met the conditions, the researcher came to the room with the second candy to give the child and said: “Yes, I have finished my work, and because you waited for me successfully, here is your second candy. If the child left the chair, ate the candy, or showed any sign of a problem within 15 minutes, the experiment was

ended.

Self-regulation situation

Preschool self-regulation assessment (PSRA) was used to assess self-regulation. Assessments were carried out in a quiet environment in the school that the children were attending. Any stimuli distracting children were taken out of the room. Materials to use in tasks were prepared based on the instructions. Each child was taken from his/her classroom and individual tasks were assigned. In order for the assessors to meet each child and ensure a positive interaction, a warm-up session was carried out for about 3 to 5 minutes. Each assessment took about 20 to 25 minutes. At the end of the assessments, children were sent to their classrooms.

Data analysis

In the analysis of the data regarding self-regulation, in the PSRA battery part, performance-based assessments were carried out (e.g. Smith-Donald et al., 2007). In addition to the performance data, assessors noted down the items on the assessor form based on the live-coded latencies or performance levels for each task (e.g., the child is defiant, the child engages the assessor). These codes were averaged at intervals and used as global ratings along with the assessor report. Visual codes regarding delay of gratification were based on previous research (Mischel and Ebbesen, 1970; Mischel et al., 1989). The delay of gratification was calculated as 15 minutes (900 seconds). For each child, the exact times of the behaviors of not delaying gratification –eating the candy, leaving the chair, calling the researcher, or leaving the room– were coded precisely. When a child first exhibited the behavior of not delaying, the analysis was ended. For a child to delay gratification successfully, waiting for 900 seconds, not leaving the chair, not calling the researcher, or not leaving the room were required. Children exhibiting any such behavior were excluded from the category of delay of gratification. Logistic regression analysis was carried out to determine the variable predicting delay of gratification. Logistic regression analysis was preferred because the delay of gratification is a binary categorical variable. In order to ensure the validity of the data, the assumptions of logistic regression analysis were tested. For linearity assumption, the independent variable was log-transformed and the relationship between the variables was examined. All values were found to be greater than .05. For multicollinearity, the variance inflation factor (VIF) was analyzed and it was found to vary between 1.12 and 3.41. According to Bowerman and O’Connel (1990), it is adequate when the VIF value is greater than 1. Within this context, it was determined that logistic regression

was a good fit for this study. In order to determine the relationship between the delay of gratification and gender, a chi-square test was conducted. The Chi-square test was preferred because dependent and independent variables are categorical.

RESULTS

Findings regarding variables predicting children's delay of gratification

Logistic regression analysis results revealed that Balance Beam (OR = 0.71, 95% CI: 0.57 – 0.89) and Pencil Tap (OR = 0.97, 95% CI: 0.94 – 0.99), which are related to children's effortful control significantly predicted delay of gratification (Table 1).

When attention/impulse control skills such as Snack Delay, Toy Wrap–Toy Peek, and Toy Wrap–Toy Wait were included in the model together, the results were

significant ($X^2(3) = 7.86, p < .05, OR = 337.07$). In other words, impulse control was a significant predictor of delay of gratification. A one-unit increase in impulse control increases the delay of gratification by 337.07 times.

Likewise, when effortful control skills, including Toy Sort, Tower Cleanup, Balance Beam, and Pencil Tap were integrated into the model, the results were significant ($X^2(4) = 27.56, p < .05, OR = 6.76$). That is, effortful control skills were a significant predictor of delay of gratification. A one-unit increase in effortful control increases the delay of gratification by 6.76 times.

Delay of gratification and gender

As illustrated in Table 2, there was not a significant relationship between the delay of gratification and gender ($X^2 = 1.659, p > .05$). In other words, gender differences were not significantly related to delay of gratification skills.

Table 1. Logistic regression analysis results as a predictor of delay of gratification.

	B	S.E.	Wald (X^2)	p	O.R.	95% C.I. OR*
Delay of Gratification	.04	.09	.24	.627	1.05	[.88, 1.25]
Attention/Impulse Control	.12	.30	.17	.683	1.13	[.63, 2.04]
Positive Emotion	.08	.15	.27	.606	1.08	[.81, 1.44]
Snack Delay	-1.63	1.48	1.22	.270	.20	[.01, 3.55]
Toy Wrap –Toy Peek	-.88	.49	3.23	.072	.41	[.16, 1.08]
Toy Wrap –Toy Wait	1.18	1.08	1.19	.276	3.24	[.39, 26.85]
Toy Sort	.01	.02	.05	.819	1.00	[.97, 1.04]
Tower Cleanup	.03	.02	1.72	.190	1.03	[.99, 1.08]
Balance Beam	-.34	.11	9.29	.002	.71	[.57, .89]
Pencil Tap	-.04	.01	10.14	.001	.97	[.94, .99]

* OR: odds ratio.

Table 2. Chi-Square test results for delay of gratification and gender.

		Delay of gratification		Total
		Non-delayer	Delayer	
Gender	Female	17	9	26
	Male	15	16	31
Total		32	25	57

DISCUSSION

The aim of this research is to examine the relationship between preschoolers' delay of gratification and self-regulation skills. As we hypothesized, our data show that self-regulation skills, mainly impulse control and effortful control, have a considerable effect on the delay of gratification. It is particularly remarkable that children's

success in impulse control and effortful control considerably increases the delay of gratification. Therefore, in the present study conducted with Turkish children, by considering cultural differences, skills of delaying gratification could be accepted as an indicator of self-regulation skills. It is emphasized that the ability to delay immediate gratification in order to achieve long-term goals forms a dimension of self-regulation that is

essential for goal-directed behavior (Lamm et al., 2017). Self-regulation skills also vary depending on cultural differences. (Keller et al., 2004). In a study conducted with Korean and Malaysian children, it was found that Korean children are more successful at delaying academic gratification than Malaysian children (Chua and Kang, 2012). In a comparison of the self-regulatory competencies of German and rural Cameroonian Nso preschoolers, the Marshmallow test revealed that Cameroonian Nso children showed higher performance in the delay of gratification than their German counterparts (Lamm et al., 2017). In terms of executive functioning, Chinese preschoolers performed better than their American peers did on all measures of executive functioning (Sabbagh et al., 2006). Similarly, 3- and 4-year-old Korean children had an advantage over their British peers in their Inhibitory Control abilities (Oh and Lewis, 2008). All these findings suggest that self-regulation and delay of gratification skills differ culturally. Therefore, the underlying reasons should be examined, especially for further studies in Turkey.

In this study, impulse control and effortful control skills in self-regulation significantly affect the delay of gratification. Impulse control in the face of temptation is an important construct (Eigsti et al., 2006). Children with self-control abilities may resist short-term temptations in order to pursue difficult goals. In contrast, children who possess less self-control are less likely to persist toward these goals, so they achieve less (Kidd et al., 2013). Notably, stronger self-regulation skills are also related longitudinally to developmental advantages (Pahigiannis and Glos, 2018). For instance, preschoolers' ability to delay gratification predicts their body mass index (BMI) 30 years later, and those who are more successful at delaying gratification at the age of 4 are more likely to be successful in regulating their calorie intake throughout life. (Schlam et al., 2013). Resisting temptation for the sake of long-term goals is important for the individual, social and economic functioning. Findings suggest that the delay of gratification skill, assessed in the early years of life, predicts how well individuals can regulate their behavior later in life, especially when they are required to repress their thoughts and actions toward tempting social cues (Casey et al., 2011).

Surprisingly, research findings did not reveal a significant relationship between preschoolers' delay of gratification and gender. Evidence in the literature, however, suggests that girls perform better in self-regulation and delayed gratification than boys. Mischel and Underwood (1974) contend that girls are better at delaying gratification than boys. Blair et al. (2004) also maintains that girls are socially more competent, more externalizing and less internalizing. Likewise, Kochanska et al. (2000) states that girls possess more effortful control skills compared to boys. Raffaelli et al. (2005) also suggest girls at ages 4-5, 8-9, and 12-13 perform considerably better self-regulation than boys do. In a

study conducted in Turkey, gender is a factor affecting children's self-regulation skills, and boys are less skilled at self-regulation than girls (Tutkun et al., 2016). Nevertheless, in line with the findings of this study, some studies found no significant relationship between gender and delay of gratification (Steelandt et al., 2012), self-control skills (Logue et al., 1996) and self-regulation (Smith-Donald et al., 2007). One reason why this study revealed no significant relationship between self-regulation and gender may be attributed to the number of children who participated in the research.

Limitations

The current study has a number of limitations. Firstly, it is not possible to make causal inferences about the relationship between the delay of gratification and self-regulation. Besides, delay of gratification increases with age. Yet this study did not consider age as a variable. The main reason for excluding age as a variable in this study is a narrow range of age. A wider age range would possibly reveal different results. Another limitation is caused by the socio-economic status of the participants. In this study, the sample was comprised of the children of middle-class families.

Conclusions and implications

The results of this study provided evidence that delay of gratification is interrelated with self-regulation, mainly impulse control and effortful control skills. Particularly, the finding that children's success in impulse control and effortful control effect delay of gratification contributes to the current literature. In this way, the results can help to identify children with difficulties in delaying gratification or those who may have poor self-regulation skills. Basic tasks for parents to help their children develop self-regulation skills can be designed, and it can have positive outcomes for society. Additionally, preschool teachers can integrate delay of gratification and self-regulation into their existing activities that develop impulse control and effortful control skills. Longitudinal studies exemplified in this study (Casey et al., 2011; Schlam et al., 2013) prove that delay of gratification and self-regulation skills may yield many positive and negative consequences for the future of children. This research may pioneer such longitudinal studies in Turkey, and the variables such as school adaptation, academic success, body mass index, and behavioral and neurological connections could be tested longitudinally. These future studies would provide a framework for how children can develop delay of gratification and self-regulation skills.

In this research, the classical Marshmallow Test was conducted to assess the delay of gratification. An immediate reward was left on the table for children to see

and their delay-of-gratification performance for a more valuable reward was tested. Further research may focus on the delay of gratification paradigm, and whether rewards are exposed or obstructed in the delay situation. For instance, as Shoda et al. (1990) set forth, whether rewards are initially exposed to the child or not yields different results. Besides, in this study, variables resulting from the environmental factors or the child himself/herself were not considered. Thus, further studies may focus more on how such variables affect self-regulation. Overall, more research needs to be done in this field in order to understand how children interact with their environment to support their own innate, biological capacities for self-regulation.

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