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The Role of Self-Regulation Skills and Digital Game Addiction Tendencies in Predicting Preschool Children's Prosocial Behaviors

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Abstract

In the study, the role of self-regulation skills and digital game addiction tendencies in predicting the prosocial behavior of preschool children were examined. The study group of the research, which was conducted using the correlational model, consisted of 255 children aged 5-6 years who were studying in the kindergartens of the primary schools affiliated to the Ministry of National Education in the Efeler district of Aydın province in the 2022-2023 academic year. The data of the study were collected through the General Information Form filled by their parents for their children, The Digital Game Addiction Tendency Scale, The Self-Regulation Skills Scale for 4-6 Years-Old Children-Mother Form and The Child Prosociality Scale-Teacher Form filled by their teachers for children. In the research findings, a negative significant weak relationship was determined between the prosocial behaviors of preschool children and the conflict and reflection sub-dimensions of digital game addiction tendencies. A positive and significant weak relationship was determined between pre-school children's prosocial behaviors and the sum of their self-regulation skills and sub-dimensions of attention, working memory, inhibitory control-emotion, and inhibitory control-behavior. As a result of regression analysis, it was determined that self-regulation skills and digital game addiction tendencies of 5-6 year old children together predicted prosocial behavior variability by 14%. The findings showed that the most powerful predictors of the child's prosocial behavior were self-regulation skills, attention and inhibitory control-behavior sub-dimensions, and the tendency for digital game addiction to be the conflict sub-dimension. The findings were discussed in the light of the literature, and suggestions were made to those concerned that prevention and intervention studies should be given importance to the negative effects of digital games that contain negative elements and are exposed for long periods of time, and that it would be effective to address self-regulation skills in interventions and programs aimed at encouraging children's prosocial behaviors.

Keywords: Digital game, self-regulation, prosocial behavior.

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Introduction

Play, which is considered to be the most important occupation of children, has a significant impact on the development of the child and supports many skills such as problem solving, discovery, creativity, and communication (Gözüm & Kandır, 2021; Kennedy-Behr, Rodger & Mickan, 2015; Lillard, Lerner & Hopkins et al., 2013). Today, in parallel with technological developments, children's games and play tools, even playgrounds, have changed and the concept of digital games has emerged and taken place in children's lives (Bird & Edwards, 2015; Gözüm & Kandır, 2020a; İnan & Dervent, 2016). In studies on the concept of digital games, which have increased in recent years, the frequency of children playing digital games (Akçay & Özcebe, 2012; Gözüm & Kandır, 2021; Işıkoğlu-Erdoğan, 2019;), game preferences (Tuğrul et al., 2014), game addiction (Ünsal, 2019), parents' views (Gözüm, 2022; Işıkoğlu-Erdoğan et al., 2019; Mercan-Uzun, Bütün-Kar & Özdemir, 2023; Yiğit & Alat, 2022), the effects of digital tools and games on their children's development (Gözüm & Kandır, 2020b; Taş & Güneş, 2019; Toksoy, 2018) are included. When these studies are examined, it is seen that the number of studies with children in the early childhood period is very limited and the study group of the studies generally consists of children aged six and over. However, it is known that digital games, which are increasingly preferred by all age groups, are also used in early childhood (Genç, 2014; Gözüm, 2022; Papadakis et al., 2022; Plowman, Stevenson, Stephen & McPake, 2012; Yılmaz & Gözüm, 2023). Research has revealed that the number of children online doubled between 2010 and 2015 in Türkiye, the age of using the internet decreased to two years old, and and the majority of children can access to their own mobile devices before the age of four (Aldemir-Engin, 2023; Aslan, 2016, cited in Avcı & Er, 2019; Radesky et al., 2020). The massive increase in the adoption and use of digital tools among children (Rideout & Robb, 2019, cited in Domoff, Borgen & Radesky, 2020) has raised concerns about excessive or problematic use for healthy child development (Common Sense Media, 2018, cited in Domoff, Borgen & Radesky, 2020; Gözüm & Kandır, 2020b). Because the increased interaction with digital games at an early age can increase the risk of digital game addiction (Bülbül, Tunç, & Aydil, 2018).

In the literature, there are studies reporting that digital games with educational content provide a desired learning environment for children (Plowman, Stevenson, Stephen & McPake, 2012), support children's problem-solving, attention skills and memory (Greenfield, 1996) and provide positive contributions to emotional discharge and relaxation (Prot, Anderson, Gentile et al., 2014; Young, 2009). However, long hours spent with digital tools are associated with loneliness (Wack & Tantleff-Dunn, 2009), depression and anxiety (Mentzoni et al., 2011), aggression (Adachi & Willoughby, 2011), violence tendency (Williams, Kennedy & Moore, 2011), low self-regulation (Hosokawa & Katsura, 2018), and a decrease in prosocial behaviors (Greitemeyer & Müge 2014) for young children. It is seen that the findings about the negative effects of violent digital games are remarkable. In the study of Anderson et al. (2010), it was detected that violent digital games increased violent thoughts, behaviors and physical impulses towards violence, depersonalization against violence increased, and empathic and social tendencies decreased. In the report made by the Ministry of Health (2018), it was emphasized that aggressive games negatively affected the development of prosocial behaviors such as helping, sharing, empathizing, protecting, and comforting. Holman, Hansen, Cochian, and Lindsey (2005) found regression in social development, low self-confidence, excessive anxiety in social relations and high level of aggressive behavior in children who spent most of their time with computer games. It is very important to support the social and emotional skills and development of children in the pre-school period. In this period, the child can see the effects of his own behavior by showing awareness of the feelings and behaviors of others as a result of the interactions he/she experiences with his/her environment. This socialization process, which becomes more complex over time, brings with it the risk of increasing problem behaviors. Reducing problem behaviors and encouraging prosocial behaviors make an important contribution to the development of social and emotional skills of children at an early age (Darling-Churchill & Lippman, 2016; Malti & Noam, 2016; San-Bayhan & Artan, 2009; Ülgen & Fidan, 2003). Prosocial behavior, which serves as an important factor in adaptation to the society in terms of psychological and socialization, is defined as a voluntary behavior aimed at providing benefit to others (Eisenberg & Mussen, 1997). Prosocial behaviors include behaviors such as cooperation, empathy, sharing, helping, inclusion, and comforting peers (Honig, 2004). Fisch, Truglio, and Cole (1999)

suggested that friendship, conflict resolution, cooperation, sharing, taking turns, and entering social groups are the most important aspects of social and emotional interactions. Playing digital games, which is one of the variables thought to affect the development of prosocial behavior, becomes a problem when individuals cannot control their desire to play, when they have difficulty in quitting playing and this situation begins to affect their lives (Young, 2009). Digital game addiction means excessive and compulsive use of digital games, causing emotional and social problems, but still not being able to stop playing games (Lemmens et al., 2011). Gökçearslan and Durakoğlu (2014) define digital game addiction as "incompatible and stubborn behavior towards playing games" (p.422). It is thought that digital game addiction may occur more in young children than adults. The self-control mechanism that develops with age can prevent adults from behaviors that will reveal addiction. However, without this control, children can play digital games for a long time whenever they have the opportunity (Alter, 2018). For this reason, children's acquaintance with the digital environment at a very early age brings the possibility of digital addiction. As a matter of fact, studies have revealed that the symptoms of internet and game addiction are also seen in preschool (Akçay & Özcebe, 2012; Ünsal, 2019) and primary school children (Bilgin, 2015). The fact that children in this age group are in a critical developmental period suggests that possible addiction symptoms may cause permanent behavioral problems in children. For this reason, early intervention and preventive services in early childhood have an important place in addiction studies.

Another developmental skill that is closely related to the prosocial behavior of children in the preschool period is self-regulation (Gözüm & Aktulun, 2021). It is stated as a multidimensional structure that expresses the ability to control self-regulation, emotions, cognition and behavior that begins to develop in the preschool period and affects all aspects of individuals' attitudes, behaviors and adaptations throughout life (Birgisdóttir, Gestsdóttir & Thorsdóttir, 2015; Eisenberg, Eggum, Sallquist & Edwards, 2010). Vallotton and Ayoub (2011) defined self-regulation as a critical social skill that supports children's ability to act prosocially with peers and adults, participate efficiently in learning activities, and adapt successfully to new or challenging situations. The role of self-regulation skills in both showing constructive behaviors and controlling negative social behaviors has been emphasized in many studies (Aras, 2015; Fındık-Tanrıbuyurdu & Güler-Yıldız, 2014; Gözüm & Aktulun, 2021; Montroy et al., 2016; Trommsdorff & Cole, 2011). Because, in order to exhibit prosocial behavior, children need to be able to regulate their own emotions and behaviors or exhibit actions that can help others regulate their emotions. Children with high self-regulation skills are able to focus their attention on the feelings and needs of others rather than their own negative emotions by regulating their emotional arousal levels, and thus exhibit prosocial behavior (Eisenberg, Fabes & Spinrad, 2006; Gözüm, 2020b). When the relevant literature is examined, it is found that the capacity to regulate children's negative emotions (Eisenberg et al., 1993) as well as their excessive emotions (Cole et al., 1994) is associated with aggressive behaviors and it is seen that high regulatory capacity supports cooperative behaviors by reducing the rate of exhibiting externalized behaviors (Gilliom et al., 2002) and increasing the level of social competence (Işıksolu-Aysel, 2020). There are research findings stating that the level of prosocial behavior is associated with low impulsivity and high self-regulation capacity (Bronson, 2019), and that self-regulation skill is a strong predictor of moral rules and social behaviors (Kochanska, 2002; Lewin-Bizan et al., 2010). It is stated that the self-regulation skills of children who can make effort without giving up in challenging tasks, are successful in tasks requiring attention, and show social behaviors such as sharing toys and waiting their turn more frequently are higher (Gözüm, 2020a; Vasseleu, Neilsen-Hewett, Ehrich, Cliff & Howard, 2021). Children's self-control as a feature of inhibitory control is frequently discussed as one of the positive social skills that should be taught to all children (Diamond, 2012; Gözüm, 2020a). Some researchers have stated that prosocial behavior includes features such as "following directions" and "controlling anger with peers" (Lane, Givner & Pierson, 2004, p.106). Considering the importance of regulating children's emotions and behaviors in their socialization processes and social relations in supporting prosocial behaviors in the preschool period, studies on these variables are important.

In the context of the perspective mentioned above, it is seen that playing digital games has an increasingly important place in children's lives and directly affects their lives (Kabakçı, Yurdakul, Dönmez, Yaman & Odabaşı, 2013). In this respect, it is thought that examining the variables that are causally related to the development of prosocial behavior revealed by literature studies will be beneficial

in terms of giving important clues about the process of supporting the development of prosocial behavior in preschool children. While there are many studies on the variables affecting the development of prosocial behavior (Aydın, 2021; Bağcı-Çetin & Öztürk-Samur, 2018; Coyne et al., 2017; Denham, 1986; Karaman & Dinçer, 2020; Ostrov, Gentile & Crick, 2006; Saygılı & Akkaynak, 2021) have not found any studies examining the co-predictive effect of self-regulation skills and digital game addiction tendencies. In this context, this study, which aims to determine the predictive role of pre-school children's self-regulation skills and digital game addiction tendencies, is expected to contribute to the literature, which has been found to have a limited number of studies in the conceptual framework.

Purpose (Sub-purposes)

In this study, the role of digital game addiction tendencies and self-regulation skills in predicting the prosocial behavior of preschool children was examined. In parallel with this aim, sub-objectives of the study were determined.

1. Is there a relationship between pre-school children's prosocial behaviors, self-regulation skills and digital game addiction tendencies?

2. Do preschool children's self-regulation skills and digital game addiction tendencies together predict their prosocial behavior?

Method

Research Model

In the study, the correlational model used to determine the existence and/or degree of change between two and more variables was applied (Karasar, 2015).

Participants

The population of the study consisted of children aged 5-6 years who were studying in the kindergartens of primary schools affiliated to the Ministry of National Education in Aydın in the 2022-2023 academic year. In the research, convenient sampling method, which allows easy access and application, was used (Büyüköztürk et al., 2018). The study group consisted of 255 children aged 5-6 years who volunteered to be participants from the study population. The distribution of the study group according to their demographic characteristics is presented in Table 1.

Table1.
Distribution of the Study Group by Demographic Characteristics

		N	%
Gender	Female	130	51
	Male	125	49
Number of siblings	Single child	16	6.3
	Has a sibling	116	45.5
	Has two or more siblings	123	48.2
Previous pre-school education status	Yes	40	15.7
	No	215	84.3
Family income level	Very low	8	3.1
	Low	65	25.5
	Middle	140	54.9
	Good	42	16.5
	Very good	0	0

When Table 1 is examined, it is seen that 51% of the sample group consists of girls and 49% of boys. It was determined that 6.3% of the children had only one child, 45.5% had a sibling, and 48.2% had two or more siblings. It is seen that 15.7% of the children have received pre-school education before, while 84.3% of them have not received pre-school education before. When the family income levels of the children are examined, it is seen that 3.1% of them are very low, 25.5% are low, 54.9% are medium, and 16.5% are good.

Data Collection Tools

In this section, the explanation of the measurement tools used in the research and the reliability data obtained within the scope of the current research are given.

General Information Form

The data on the gender of the children in the study group, the number of siblings, previous pre-school education status and family income level were collected through a personal information form created by the researcher.

Child Prosocialness Scale (CPS-Teacher Form)

The original scale consists of the Child Rating Questionnaire (Strayer, 1985) and the Prosocial Behavior Questionnaire (Weir, Stevenson, & Graham, 1980). Edited by Bower (2012). Adaptation to Turkish culture and validity, reliability study were conducted by Bağcı and Öztürk-Samur (2016). The scale is a five-point Likert scale. A high score from the scale indicates that children's prosocial behaviors are high. With the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), it was determined that the CPS Teacher form was formed in a one-dimensional structure consisting of 22 items. The reliability coefficient of the Child Prosocialness Scale Teacher Form was calculated as .96. Accordingly, it is stated that the Child Prosocialness Scale is a valid and reliable measurement tool. The Cronbach Alpha reliability coefficient calculated for the scale within the scope of the study was found to be .95.

Digital Game Addiction Tendency Scale (DGAT)

The scale, which aims to determine the digital game addiction tendencies of preschool children, was developed by Budak and Işıkoğlu (2022). In the scale consisting of four sub-dimensions (breaking from life, conflict, constant playing and reflecting on life) and 20 items, each dimension can be evaluated within itself as well as the total score can be calculated. The five-point Likert scale does not have a reverse scored item. It is stated that as the total score obtained with the scale, which can be scored as the lowest "20" and the highest "100", increases, the digital game addiction tendencies of children increase. Expert opinion was taken to determine the content validity of the scale, and EFA and CFA techniques were applied in the process of determining the construct validity. As a result of the analyses made, the total variance rate of the scale was determined as 63.06%. The obtained model fit indices were determined to be sufficient. The total Cronbach Alpha reliability coefficient of the scale was calculated as .93, and for the sub-dimensions conflict .90, disconnection from life .88, reflection on life .70, continuous play .82. The Cronbach Alpha reliability coefficient calculated for the scale within the scope of the research was found to be .83 for the total digital game addiction tendency, and .76 for conflict, .74 for disconnection from life, .82 for reflection on life, and .80 for continuous play for the sub-dimensions.

Self-Regulation Skills Scale for 4-6 Years-Old Children (Mother Form)

The scale was developed by Erol and İvrendi (2018) to determine the self-regulation skills of children aged 4-6 based on parental views. Concurrent criterion validity, EFA and CFA techniques were used in the construct validity analyses of the scale. With EFA, it was observed that the scale was formed in 20 items and four sub-dimensions (attention, working memory, inhibitory control-emotion and inhibitory control-behavior), which explained 61% of the total variance. As a result of the CFA performed to validate the model obtained, the fit indices were found to be sufficient. The item-total correlations ranged from .36 to .70, and the Cronbach Alpha internal consistency coefficient of the scale was determined as .90. Concurrent validity was found to be .84 and test-retest reliability was found to be .77. In line with the findings, it is stated that the scale is a valid and reliable measurement tool for determining the self-regulation skills of children aged 4-6 based on the opinions of their mothers. The Cronbach Alpha reliability coefficient calculated for the scale within the scope of the study was found to be .81 for self-regulation skills, .73 for attention, .79 for working memory, .77 for inhibitory control-emotion, and .80 for inhibitory control-behavior.

Data Collection

The data were collected from the mothers and teachers of children aged 5-6 years studying in the kindergartens of primary schools affiliated to the Ministry of National Education in Aydın in the 2022-2023 academic year. After obtaining the permission of the research and ethics committee, the teachers and mothers of the children were reached through the school administration and informed about the study. Participants' files, which included an information note about the study, forms of data collection tools (Digital Game Addiction Tendency Scale, Self-Regulation Skills Scale for 4-6 Years-Old Children -Mother Form), personal information form and consent form, were distributed to families. The Child Prosocialness Scale-Teacher Form to be filled in by the children's teachers was delivered to the classroom teachers. The data of the children who volunteered to participate in the study were transferred to the SPSS program by the researcher and analyzed.

Analysis of Data

The research data were evaluated through the SPSS 22.00 statistical program. In the analysis of the data using the multiple linear regression analysis technique, first of all, the assumptions of normality, autocorrelation and multicollinearity related to the data set were examined. The normality of the variables was examined both graphically and statistically. In the normal Q-Q graph, which is one of the graphical methods, the observed values are on the X axis and the expected values are on the Y axis. It is interpreted that the deviations from the normal are not excessive as the values of the variables get closer to the line and gather close to the below, above and below (Mertler & Vannatta, 2005, akt. Çokluk, Şekercioğlu & Büyüköztürk, 2018). In this direction, it was seen that the Q-Q plot graphs examined showed a distribution close to the normal. According to the Skewness-Kurtosis normality test, which is one of the statistical options for evaluating normality, the values related to prosocial behavior scores were Skewness= -.542, Kurtosis= -.531; values for the sum of self-regulation skills Skewness= -.868, Kurtosis= .110. The values for the total score of digital game addiction tendency were determined as Skewness= .246, Kurtosis= -1.00.These values were found to be between +1.5 and -1.5, and based on this, it was determined that the data showed a normal distribution (Tabachnick & Fidell, 2015). The analysis of the relationship between the error terms was carried out using the Durbin Watson test. The value calculated as DW= 1.847 is between 1.5 and 2.5, which is an indication that there is no autocorrelation between the error terms. In the literature, it is stated that multicollinearity problem occurs when the correlation between independent variables is greater than .90 and the tolerance value is less than .10 (Çokluk et al., 2018). The correlation coefficients between the independent variables of the study were between -.326 and .013, and the tolerance values were between .16 and .63. According to the findings, there is no multicollinearity between the independent variables and the data set meets the necessary conditions. First of all, Pearson product-moment correlation coefficient was used in the analysis of the data. The coefficient obtained in correlational studies takes a value ranging from +1 to -1, and a value of +1 indicates a perfect relationship between the variables, while a value of 0 indicates no relationship. If this value is less than .30, it is interpreted as weak, if it is between .30 and .70, it is moderate, and if it is greater than .70, it is interpreted as a high level of relationship. A positive coefficient indicates that while an increase occurs in one variable, there is an increase in the other variable, while a negative coefficient indicates that there is an increase in one variable and a decrease in the other (Köklü, Büyüköztürk, & Çokluk, 2007).

Research Ethics Committee Approval

In the process of conducting the research, all ethical rules were followed during the data collection and analysis stages. In addition, ethical approval of the research was obtained from Adnan Menderes University Educational Research Ethics Committee with the date of 27.02.2023 and E-84982664-050.01.04-320578, 2023/2-XIII permission number.

Findings

The arithmetic mean, standard deviation, and minimum and maximum values of the children aged 5-6 years regarding the scores they got from the child prosocialness scale, the self-regulation skills scale, and the digital game addiction tendency scale are presented in Table 2.

Table 2.
Minimum, Maximum, Arithmetic Mean and Standard Deviation Values of Scores From Scales

		n	Min.	Max.	$\bar{X}$	Sd
Prosocial Behavior		255	60	110	92.33	12.80
Self-regulation skills	Attention	255	9	30	21.26	5.06
	Working memory	255	10	25	21.48	3.45
	Inhibitory control-emotion	255	9	25	18.43	4.51
	Inhibitory control-behavior	255	7	20	13.29	2.90
	Self-regulation skills-total	255	40	94	74.47	12.77
Digital game addiction tendency	Detachment from life	255	7	27	14.16	5.62
	Conflict	255	5	24	12.48	4.66
	Continuous play	255	5	20	11.61	3.95
	Reflection on life	255	3	13	7.25	2.60
	Digital game addiction tendency-total	255	20	70	45.51	14.13

When Table 2 was examined, the mean scores of children aged 5-6 years from the child prosocialness scale were $\bar{X}$ =92.33 (SD=12.80). When the arithmetic averages of the scores of the children from the self-regulation skills scale were examined; attention was calculated as $\bar{X}$ =21.26 (SD=5.06), working memory $\bar{X}$ =21.48 (SD=3.45), inhibitory control-emotion $\bar{X}$ =18.43 (SD=4.51), inhibitory control-behavior $\bar{X}$ =13.29 (SD=2.90), self-regulation skills-total $\bar{X}$ =74.47 (SD=12.77). When the arithmetic averages of the scores they got from the digital game addiction tendency scale were examined; detachment from life was calculated as $\bar{X}$ =14.16 (SD=5.62), conflict $\bar{X}$ =12.48 (SD=4.66), constant playing $\bar{X}$ =11.61 (SD=3.95), reflection on life $\bar{X}$ =7.25 (SD=2.60), digital game addiction tendency total $\bar{X}$ =45.51 (SD=14.33).

The correlation values between the child prosocialness scale, self-regulation skills scale and digital game addiction tendency scale scores of 5-6 year old children are given in Table 3.

Table 3.
Correlation Results of Preschool Children's Prosocial Behavior, Self-regulation Skills and Digital Game Addiction Tendency Variables

Variables	1	2	3	4	5	6	7	8	9	10	11
Prosocial behavior	1										
DGAT-Total	-.063	1									
DGAT-Detachment from life	.000	.898	1								
DGAT-Conflict	-.172*	.867	.662	1							
DGAT- Continuous play	.080	.785	.607	.570	1						
DGAT- Reflection on life	-.156*	.742	.603	.615	.409	1					
SS-Total	.230**	-.260	-.162	-.326	-.180	-.205	1				
SS-Attention	.281**	-.238	-.098	-.316	-.215	-.186	.886	1			
SS- Working memory	.132*	-.285	-.265	-.215	-.253	-.206	.761	.581	1		
SS- Inhibitory control-emotion	.161*	-.260	-.206	-.306	-.091	-.276	.773	.511	.467	1	
SS- Inhibitory control-behavior	.112*	.013	.095	-.150	.026	.096	.745	.664	.419	.398	1

*p<.05, **p<.001 DGAT= Digital Game Addiction Tendency, SS= Self-regulation Skills

When Table 3 was examined, it was seen that there was a negative significant weak correlation between the prosocial behaviors of preschool children and the sub-dimensions of digital game addiction tendency conflict (r= -.172, p<.05) and reflection on life (r= -.156, p<.05). A positive significant weak correlation was determined between the sub-dimensions of self-regulainhibitory control-emotion (r= .161, p<.05), and inhibitory control-behavior (r= .112, p<.05), attention (r= .281, p<.001), working memory (r= .132, p<.05), and self-regulation skills-total (r= .230, p<.001) and preschool children's prosocial behaviors.

The results of multiple linear regression analysis regarding the prediction of prosocial behaviors of preschool children's self-regulation skills and digital game addiction tendencies are given in Table 4.

Table 4.
Multiple Linear Regression Analysis Results

		R	R^2	ΔR^2	β	B	Standard error	F	t	p
Predictor variables		.41	.16	.14		79.82	6.39	6.19	12.48	.00**
Self-regulation skills	Attention				.37	.94	.23		3.93	.00**
	Working memory				.03	.13	.29		.45	.64
	Inhibitory control-emotion				-.02	-.08	.20		-.40	.68
	Inhibitory control-behavior				-.18	-.82	.37		-2.20	.02*
Digital game addiction tendency	Conflict				-.36	-.99	.39		-2.53	.01*
	Continuous play				.21	.69	.38		1.80	.07
	Reflection on life				-.14	-.711	.50		-1.41	.15
	Detachment from life				.11	.25	.21		1.20	.22

*p<.05, **p<.001

According to Table 4, the regression model established based on the results of the multiple linear regression analysis was statistically significant ($F_{(8, 246)}$=6.19, p=.00). Accordingly, preschool children's self-regulation skills and digital game addiction tendencies together predict prosocial behavior variability by 14% (R=.41, R^2=.16, ΔR^2 =.14). Among self-regulation skills, attention (β=.37, p<.001) and inhibitory control behavior (β= -.18, p<.05) were significant predictors of the child's prosocial behaviors; working memory (β= .03, p>.05) and inhibitory control feeling (β= -.02, p>.05) were not significant predictors of the child's prosocial behavior. The conflict dimension of digital game addiction tendencies (β= -.36, p<.05) was a predictor of the child's prosocial behaviors, continuous playing (β= .21, p>.05), reflection on life (β= -.14, p> .05) and detachment from life (β= .11, p>.05) were not found to be significant predictors of the child's prosocial behavior.

According to the findings, attention, which is one of the self-regulation skills of preschool children, positively predicts their prosocial behavior, while inhibitory control behavior negatively predicts them. The conflict dimension of children's digital game addiction tendencies negatively predicts their prosocial behavior. One-unit change in attention level, one of the self-regulation skills of preschool children, creates a change of .94 units in their prosocial behavior, and a 1-unit change in the level of inhibitory control behavior creates a -.82-unit change in their prosocial behavior.

Discussion

In the study, the role of self-regulation skills and digital game addiction tendencies in predicting the prosocial behavior of preschool children was examined. For this, firstly, the relationship between children's digital game addiction tendencies, self-regulation skills and prosocial behavior levels was examined, then the predictive power of children's digital game addiction tendencies and self-regulation skills, and prosocial behaviors were tested by regression analysis. In the study, a statistically significant negative correlation was found between the prosocial behaviors of preschool children and the sub-dimensions of the tendency of digital game addiction to conflict and reflection on life. In the literature, it is seen that the studies examining the relations of the variables discussed in the research in the sample of preschool children are not sufficient, but the findings are in parallel with the research findings in the literature. The ever-expanding research literature on the concepts covered in this study has revealed many findings examining the positive and negative effects of digital games. It is seen that violent games attract the greatest attention regarding the negative effects of digital games. It is stated that the use of

such games by more and more individuals every day increases the tendency towards violence at the community level (Aydoğdu-Karaarslan, 2015). In the meta-analysis study of Anderson et al. (2010), it was found that violent digital games increase violent thoughts, aggressive behaviors and physical impulses towards violence, depersonalization towards violence, and decrease prosocial tendencies. Likewise, Anderson and Dill (2000) demonstrated the impulsive effects of violent elements in digital games on aggression. In addition, it is stated that playing digital games for a long time can lead to disruption of daily life activities, communication problems and insensitivity to social events (Ministry of Health, 2018). Digital games play an increasingly decisive role in children's lives and directly affect the physical and emotional environment of the child (Kabakçı, Yurdakul, Dönmez, Yaman & Odabaşı, 2013). In the study conducted by Holman, Hansen, Cochian and Lindsey (2005) to address the importance of this issue, it was determined that children spend most of their time on computer games and the Internet, as a result of which a significant regression in their social development, low self-confidence, excessive anxiety and aggression in social relations are observed. While Paulus et al. (2021) suggested that social skills were negatively affected by computers, mobile devices and video games, Canaslan-Akyar and Sevimli-Çelik (2022) associated the increase in time spent with digital media with low social self-regulation skills. In their research, Gözüm and Kandır (2020b) revealed that as the duration of digital game play of preschool children increased, their tendency to play and their concentration level decreased. Şenol, Şenol and Can-Yaşar (2023) found that digital game addiction tendencies increased and their social-emotional development was negatively affected due to the fact that children could not find the opportunity to open up to the environment during the Covid-19 pandemic.

In the current study, a statistically significant positive correlation was found between the prosocial behaviors of preschool children and the sum of their self-regulation skills and sub-dimensions of attention, working memory, inhibitory control-emotion, and inhibitory control-behavior. In the literature, the results of studies showing a significant relationship between self-regulation skills and prosocial behaviors show parallelism with the current research findings. Attention regulation skills, one of the sub-dimensions of self-regulation skills, are extremely important skills in terms of social skills (Williams & Berthelsen, 2017). Because the ability of an individual to voluntarily share his resources with others requires him to pay attention to the clues he conveys about the needs of others. In this regard, a study by Laible, Carlo, Murphy, and Augustine (2014) found that 4-year-olds with higher attention regulation and less emotional reactivity were rated more prosocial by their teachers compared to children with low attention regulation. Simonds, Kieras, Rueda, and Rothbart (2007) stated in their research that attention control was important in situations related to social relations. In the study conducted by Hughes, White, Sharpen, and Dunn (2000), it was determined that children with low empathy levels had low executive function controls. Inhibitory control skills are associated with behavioral problems in the preschool period (Schoemaker, Mulder, Dekovi´c, & Matthys, 2013). It has been determined that children with low inhibitory control skills have high levels of aggression (Raaijmakers et al., 2008), while children with low working memory skills exhibit less prosocial behavior (León, Dias, Martins, & Seabra, 2018). A meta-analysis study by Imuta et al. (2016) found a small but significant relationship between theory of mind development and children's helping, cooperating and comforting behaviors. Eke (2018) found that there was a statistically significant relationship between children's values, self-regulation skills and social behaviors. Pazarbaşı and Cantez (2019) found significant relationships between self-regulation skills and peer relationships in their research. Işıksolu-Aysel (2020) determined a positive low-level significant relationship between children's self-regulation and social competence skills and their self-regulation and problem-solving skills.

As a result of regression analysis, it was determined that preschool children's self-regulation skills and digital game addiction tendencies together predicted prosocial behavior variability by 14%. The findings showed that the most powerful predictors of the child's prosocial behavior were self-regulation skills, attention and inhibitory control-behavior sub-dimensions, and the tendency for digital game addiction to be the conflict sub-dimension. In predictive correlation studies, the relations between variables are examined and the unknown value of the other variable is tried to be determined by starting from the known value of one variable. It can be said that the higher the relationship between two variables, the more accurate this determination can be made (Fraenkel & Wallen, 2006). Various studies have been developed in the literature to determine whether the nature of digital gaming affects the formation of prosocial behaviors. Considering the effect of digital games, studies support the conclusion that violent

games tend to reduce prosocial behaviors (Anderson & Bushman, 2001; Anderson et al., 2010), playing games that include prosocial behaviors with the intention of helping another person in a situation other than gaming was also associated (Greitemeyer & Osswald, 2010). Cross-cultural and longitudinal studies reveal a relationship between the quantity and quality of game consumption and prosocial behavior (Anderson et al., 2010; Gentile et al., 2011; Prot, Anderson, Gentiler, Brown, & Swing, 2014). Accordingly, playing a game involving prosocial behavior patterns tends to reduce aggressive cognitions and increase accessibility to prosocial ones. Saleme et al. (2020) found that children exhibit prosocial behaviors by transferring their skills in digital games to real social interactions (Craig, Brown, Upright, & DeRosier, 2016; Sanchez, Brown, Kocher, & DeRosier, 2017). While research has highlighted the worrisome associations between the amount of digital gaming and emotional and behavioral problems in middle childhood, especially in boys (Mundy et al., 2017), well-designed digital games can help with self-regulation perspective (Williams & Berthelsen, 2017). It is stated that factors that support children's developing social skills, such as receiving and cooperation, also affect positively. For example; Multiplayer digital games encourage this behavior by requiring children to work towards a common goal with team members. This provides children with valuable experience working in groups and with others. Li and Zhang's (2022) research showed that children playing video games that involve positive social behavior for a short time increased their positive social thoughts and prosocial behaviors. The longitudinal study by Gentile et al. (2009) showed that while violent digital games increase aggressive thoughts and behaviors, prosocial game content increases prosocial thoughts and behaviors. Contrary to the findings of this study, it was stated that preschool children do not always realize the analogical connection between themselves and the fantastic (or animated) characters on the screen, or they cannot easily apply the prosocial behaviors learned through a game program to real-life social situations (Mares & Acosta 2008; Richert & Molly, 2017).

Since self-regulation includes both emotional regulation (Raver, 2002) and attention regulation (Blair, 2002), it is likely that children with high self-regulation skills have more capacity to exhibit prosocial behavior towards others (Eisenberg, Fabes & Spinrad, 2006). In the study conducted by Yurdakul, İlhan-Ildız and Tüm-Ayhan (2022), it was determined that the self-regulation skills of children aged 4-6 were a significant predictor of their prosocial behaviors. In addition, attention, working memory, and inhibitory control skills, which are the basic elements of self-regulation, were found to be positively related to the level of prosociality. In a longitudinal study on the development of prosociality, it was found that children who can effectively regulate their emotions at the age of two have a high level of prosocial behavior at the age of four (Scrimgeour, Davis, & Buss, 2016). Bierman, Nix, Greenberg, Blair and Domitrovich (2008), in their study with 4-year-old children, concluded that executive function skills positively affect children's prosocial behavior levels. In the study conducted by Rasmussen et al. (2019), it was found that children who played a game that focused on social and emotional competences used emotional regulation strategies more frequently than children in the control group who played an application that focused on teaching letters and numbers. In many studies, it is stated that children with high self-regulation skills are more competent in social skills (Yang & McGinley, 2022) and tend to avoid negative behaviors (Aydoğdu, 2022; Robson, Allen, & Howard, 2020). Gülbetekin and Yıldırım (2023) argued that there is a mutual interaction between self-regulation skills, behavioral problems and problematic internet use, and stated that as children's self-regulation skills increase, behavioral problems decrease, and as the level of problematic internet use increases, behavioral problems increase.

Conclusion and Suggestions

Considering the age range of the children constituting the study group of the current research, it is thought that they spend a significant part of the period that is important for their social-emotional development at home due to the Covid-19 pandemic. In this period, it is thought that the increase in children's playing habits by starting to play digital games with both parental guidance and imitation of the individuals around them continue after the pandemic. It is thought that the resulting excessive use of technology negatively affects children's acquisition of positive behavior patterns through social relations by reducing their interactions with their peers and their environment. In addition, looking at the research findings, it can be said that children tend to exhibit similar behaviors in their lives by being influenced by the examples of negative behaviors they encounter in digital games. It can be said that the determination of a positive relationship in the current study is in the expected direction, since the skills

required for the individual to be able to act prosocially towards the needs of others include the processes of directing attention, regulating emotions and behaviors. In this direction, it can be said that the development of self-regulation skills and playing digital games have important effects on the development of prosocial behaviors in terms of duration and content.

The rapid growth in research on digital games has important implications for increasing our understanding of both the positive and negative effects of digital games, public policy discussions, theory development, and planning possible intervention strategies. Considering the large proportion of children and adolescents playing these games, it is clear that prevention and intervention studies should be given importance to the negative effects of digital games that contain negative elements and are exposed for long periods of time. In this regard, it is recommended that families, who have an active role in meeting children with the digital world, actively participate in trainings conducted about the risks of excessive use of digital games and mediation strategies for prevention. Experts recommend that parents whose children are at risk should apply to psychological counseling services. However, traditional cultural views appear to be an important factor in ignoring this recommendation. It should be aimed to increase the active practical outputs of the studies and counseling centers carried out in order to combat this prejudice towards counseling and to provide the necessary treatment. It is important in terms of accessibility that consultancy services are carried out through public institutions and free of charge. Encouraging efforts should be initiated to create and use content that facilitates the control of digital games and their content by the necessary institutions and the emotional and attention regulation skills required to develop pro-social behaviors. In the research findings mentioned above, it was stated that self-regulation skills have a significant effect on prosocial behavior. At the same time, studies have revealed that awareness-based program practices for self-regulation skills provide positive gains in self-regulation and social-emotional skills. Regarding the findings and the literature, it is considered important to address self-regulation skills in interventions and programs to support children's prosocial behavior (Flook et al., 2015).

Limitations

The research is limited to 5-6 year old children who are studying in the kindergartens of primary schools determined in Aydın province Efeler district center in the 2022-2023 academic year. The research is limited to the data obtained through the Digital Game Addiction Tendency Scale, the Self-Regulation Skills Scale for 4-6 Years-Old Children-Mother Form, and the Child Prosociality Scale-Teacher Form.

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Ethic statement: In this study, I declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that I do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, that all the responsibility belongs to the article author in case of all ethical violations.
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