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Developing a parental mediation scale of digital games for children

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Abstract

The aim of this study is to develop a scale comprising parental mediation strategies while their children are playing digital games. The participants of the research consist of 643 parents with the 48-72 months of age children living in Ankara and Kars city centers between the years 2018-2019. In the study, the screening model of the quantitative research method was adopted. For the structure validity, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were administered. The exploratory factor analysis was carried out with the participation of 343 parents with the 48-72 months of age children attending the officially independent kindergartens regulated by the Ministry of National Education in central Ankara. A 40-item scale structure in a five-factor structure was determined in consequence of the exploratory factor analysis. To test the validity of the scale, confirmatory factor analysis was conducted. The exploratory factor analysis was carried out with the participation of 300 parents with the 48-72 months of age children attending the official independent kindergarten under the Ministry of National Education in central Kars. As a result of the validity studies conducted, the five-factor structure was named as viewing, laissez faire, technical, restrictive and active co-playing.

Keywords: Parental mediation, Early childhood, digital games, scale development, kindergartens

1. Introduction

Technology has a critical impact on children's life-long learning. Technology can affect children's learning positively (Annetta, 2008; Cordes & Miller, 2000; Clements & Sarama, 2007; Druin, 2002; Plowman, Stephen, & McPake, 2010) , as well as negatively (Wack & Tantleff-Dunn, 2009; Bluemke, Friedrich, & Zumbach, 2010; Fischer,

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Kastenmüller, & Greitemeyer, 2010; Gentile, Swing, Lim, & Khoo, 2012). Children interact with their parents and siblings in relation to physical, emotional, social experiences as a result of the use of technology in social life. Vygotsky's (1986) theory of child development, in the learning process that occurs as a result of children's social interaction, also sheds light on the interaction that children engage in with technology. The digital devices used by children in the process of using technology cause a change in the zone of proximal development, acting as a scaffold in the wake of the interaction of their parents and peers (Vygotsky, 1978). Parents are expected to provide guidance to support their children's development without being exposed to adverse effects at the scaffolding that will be set up depending upon their technology use (Schofield Clark, 2011).

There has been a lot of research on guidance of parents to children on the use of technology. When these studies are examined, the types of guidance that parents' control, supervision, or interpret in the process of children's use of media, technology, television, and video games have been described as "parental mediation" (Warren, 2001, p. 212). Parental mediation is the divergent communication strategy that parents have exercised to reduce the negative effects of media on children's lives (Clark, 2011, p. 325). Parental mediation is the strategy practiced by parents in order to reduce the negativities children face during the internet use and to take advantages of the internet (Kirwil, 2009, p. 395).

It is observed that there are differences between strategies that parents establish with children in terms of the types of technological tools of children when researches on parental mediation (Valkenburg, Krcmar, Peeters, & Marseille, 1999; Eastin, Greenberg, & Hofschire, 2006; Lwin, Stanaland, & Miyazaki, 2008; Livingstone, & Helpser, 2008; Kirwil, 2009; Hasebrink, Görzig, Haddon, Kalmus, & Livinstone, 2011) are analyzed. The mediation strategies that parents exercise for their children in the use of digital media were first made on television. According to a study conducted by Valkenburg et al. (1999, p. 53), parents identify three mediation strategies for children's use of television. Parental mediation strategies for television are active/instructive mediation, rule-making/restrictive mediation, and co-viewing mediation. The internet use of children that become widespread after television use, parents started to develop mediation strategies for internet use, which has a different use and effect than television. Three different parental mediation strategies for internet use have been defined by Eastin et al. (2006, p. 486). These strategies are factual, evaluative and restrictive mediation strategies. Lwin et al. (2008, p. 208) stated that parental mediation for internet use has two dimensions as active and regulated mediation. The dimensions of active and regulated mediation constitute four different types of mediation strategy, namely restrictive, instructive, selective and laissez faire. Livingstone and Helsper (2008, p. 589) described four different parental mediations on children's internet use. These are active co-play, interaction and constraints, technical constraints and viewing. Parental mediation strategies for children's internet use have been studied in different European countries by Kirwil

(2009, p. 398). As a result of the research, five types of strategies were identified: social co-viewing, time restriction, website restriction, technical restriction, and unrestricted rule-based. In a different study on parental mediation for Internet use, Hasebrink et al. (2011, p.11) identified four strategies: active mediation, restrictive mediation, viewing, and technical mediation. The European Union Kids Online Platform (EU Kids Online) defines the mediation strategies that parents use for 9-16-year-old children, dividing into five. These strategies are active mediation, security mediation, restrictions, technical mediation and, viewing (Livingstone et al., 2015, p. 4).

Parental mediation strategies have been recorded in light of researches conducted on the use of television and then the use of internet. However, since television and internet use require different skills, different parental mediation strategies are defined (Wang et al., 2005, p. 1251). Parental mediation strategies may vary depending on how the digital tool is used. As a matter of fact, children use digital media tools such as television and the internet, as well as play video games. As a result of a research conducted in the United States in 2015; it was stated according to 90% of parents that their children between the ages of 6-17 watch television, video or movie among their daily activities. Moreover, 79% of parents have stated that their children also play video games (PEW, 2015, p. 14). Is it possible to use the mediation strategies used by parents for children's television and internet use in video games? The answer to this question was found out in a study conducted by Nikken and Jans (2014). Three types of strategies have been adopted as a result of factor analysis to determine the mediation strategies of parents for the use of video games. These strategies are restrictive mediation, active mediation, and co-playing. As a result of the study, parents who were concerned about the negative effects of video games preferred the strategy of co-playing. Furthermore, the behavior and attitude of the parents toward the game and the age of the children were found to be the most effective variables on parental mediation.

Parental mediation for digital media is critical to early childhood years when children's ages are considered. In the research conducted by Beyens, Valkenburg and Piotrowski (2019), it was found that parents increased their mediation strategies between the ages of 3-6, and that they used the mediation strategies most at the age of 8. In a study conducted on parents living in Europe, it was found that considerable use of parental mediation strategies in a country can reduce the risks children face online in digital media (Kirwil, 2009, p. 405). When the attitudes of parents towards mediation in early childhood were analyzed; It was determined that active and restrictive parental mediations are used much between the ages of 3-8 (Piotrowski, 2017). It was determined that more facilitating parental mediation is performed as the ages of children and parents decrease (Livingstone et al., 2017, p. 91). It can be said that the effects of parental mediation differ in different age groups and that mediation strategies tend to be adopted by children in early childhood much more compared to adolescence (Ho et al., 2017, p. 77).

Cultural structure is extremely important in preference of parents on mediation strategies (Piotrowski, 2017; Wright, 2017, p. 194). The mediation strategies used by parents may vary according to the cultural elements of different countries. Parental mediation can be shaped by culture and vary from country to country (Livingstone et al., 2017, p. 99). Moving from this point, the research problem of the present study is the question of *"What are the parental mediation strategies for digital games played by children in early childhood in Turkish culture?"*. In this research, both the technology and the natural interaction process of the digital game may have different effects from the internet and television since this study examines the parental mediation strategies for the use of digital games played with different technological tools such as smart phones, computers, tablets. Moreover, considering the influence of culture on parental mediation strategies, the need to develop a data collection tool to be investigated according to Turkish culture also arises.

Parallel to this, the aim of this study is to develop a valid and reliable scale for determining parental mediation strategies in the process that children 48-72 months old play digital games.

2. Method

In this research the screening method was adopted based on the quantitative research methods. The screening method is a suitable model for researches aiming to describe a situation that has existed in the past or still as it exists (Karasar, 2009). At this point, it was aimed to develop a scale of parental mediation for digital games suitable for Turkish Culture. In line with this purpose, Exploratory Factor Analysis was conducted to discover the mediation strategies of the parents. The structure of the mediation strategies discovered in Turkish culture was determined through the Confirmatory Factor Analysis (CFA).

2.1. Participants

Participants of the study were selected according to the criterion sampling of the research objective sampling methods (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2012). In the selection of the participant families with the children of 48-72 months of age, two criterias were employed; the first one was the voluntary basis, and the second one their children play digital games.

This study was conducted through two different study groups with the same psychometric properties. The first study group was the EFA group where Exploratory Factor Analysis was administered, and the second study group was the CFA group where Confirmatory Factor Analysis was used. A total number of 643 volunteer parents participated in the study. 343 of these parents participated in the EFA study group and

the rest 300 participated in the CFA study group. Path analysis was performed on the data set consisting of 300 participants in the CFA study group.

2.1.1. EFA Study Group

EFA was conducted in order to discover the dimensions of the psychometric feature regarding parental mediation during the digital game playing process of 48-72 months old children. For this reason, the study group was named as EFA study Group. The EFA study group consists of 343 parents with 48-72 months old children who attend the official independent kindergarten under the Ministry of National Education in central Ankara in the 2018-2019 academic year. 200 of the parents were female and the rest 143 were male.

In scale development researches, the number of participants in the study group was an important criteria to carry out the factor analysis (Floyd & Widaman, 1995). In this context, there are different views regarding the number of participants in body of literature. According to Comrey and Lee (1992), a study group of 300 participants is described as *"good"* for conducting exploratory factor analysis. According to Kline (2016), the number of participants in the study group in scale development studies as 200 is sufficient for EFA. It is also argued in the field literature that the number of participants in the study group correlates with the number of items on the scale. Stevens (2002) argues that the number of participants in the study group must be between 5 and 20 times of the number of items on the scale. When the opinions regarding the number of participants in the study group are examined in the body of literature, it is considered that the number of participants in this research is sufficient to conduct EFA.

2.1.2. CFA Study Group

In order to verify the dimensions discovered after EFA, the validity of the dimensions was tested by performing "CFA" on similar groups with the same psychometric property. Therefore, that working group was also named as CFA study group. The CFA study group consisted of 300 parents with children 48-72 months of age who attend the official independent kindergarten regulated by the Ministry of National Education in central Kars in the 2018-2019 academic year. Out of 300 parents, 180 were female and the rest 120 were male.

In the field literature, the criteria for the number of participants for CFA are expressed as data set size. Since data set size varies according to different parameter estimation method, number of items, and number of factors, a generally accepted number of participants is not specified (MacCallum, Widaman, Preacher, & Hong, 2001; Wolf, Harrington, Clark, & Miller, 2013). However, according to Worthington and Whitaker (2006), the number of participants to conduct CFA ought to be 300 and above. In the field

literature, the number of participants required to conduct CFA is thought to meet the number of participants in this research.

2.2. Data Collection Tool

The theoretical arrangement of the scope of the data collection tool, the item writing phase, and the validity and reliability studies in the scale development process can be described as follows:

2.2.1. Arrangement of the Scope of the Data Collection Tool

Determining the scope of the Parental Mediation Scale of Digital Games for Children (PMSDGC), it comprises the behaviors of parents towards children who play digital games, the aims of children to play digital games, the role of parents in the selection of digital games, observing children playing digital games, evaluating the impact of digital games, and getting expert opinions about digital games. The theoretical structure of the scope of "PMSDGC" is given in Table 1.

Table1. The theoretical structure and indication of PMSDGC

Type of Mediation	Indicator	Source
Viewing	Control, observe	(Hasebrink et al., 2011; Livingstone & Helsper, 2008; Livingstone et al., 2015; Valkenburg et al., 1999)
Laissez faire	Allowing, ignoring	(Lwin et al., 2008)
Technical	Technical adjustment, setting	(Livingstone & Helsper, 2008)
Restrictive	Block, restrict	(Livingstone et al., 2015)
Active Co-Play	Support, speak, co-play	(Hasebrink et al., 2011; Livingstone & Helsper, 2008; Nikken & Jans, 2014)

According to Table 1, a systematic sequence was followed when determining the scope of the "PMSDGC". In the systematic order, indicators for parental mediation strategies were identified. The indicators determined according to parental mediation strategies are as follows:

Viewing Mediation: Parents research, study, control, and observe the playing process digital games that are appropriate for children's developmental level and age (Hasebrink et al., 2011; Livingstone & Helsper, 2008; Livingstone et al., 2015; Valkenburg et al., 1999)

Laissez faire Mediation: When the indicators under behavior are analyzed, parents do not have restrictions and viewing tendencies for their children to play digital games. Parents do not intervene in their children to play digital games, they do not monitor (Lwin et al., 2008).

Technical Mediation: Parents take expert opinions on the digital games children play or want to play. They explore digital games that can positively affect children's development. They want their children to play games in consultation with experts (Livingstone & Helsper, 2008).

Restrictive Mediation: Parents restrict, stop, and modify digital games, which can negatively affect children's development. They intervene when necessary in the game process (Livingstone et al., 2015).

Active Co-playing Mediation: Parents play digital games together with child, which favorably support children's development, education, and learning levels (Hasebrink et al., 2011; Livingstone & Helsper, 2008; Nikken & Jans, 2014).

2.2.2. Item Writing for Data Collection Tool

The provisions of the PMSDGC are written according to the specified scope. The behavior of parents in children's digital game playing the process has been observed. During the observation process, different socio-economic and educational level variables were considered in the behavior of parents during their children's digital gaming.

In this context, researches on the types of parental mediation strategies (Valkenburg et al., 1999; Hasebrink et al., 2011; Livingstone &Helsper, 2008; Livingstone et al, 2015; Lwin et al., 2008; Livingstone et al., 2015; Nikken & Jans, 2014; Hasebrink et al., 2011; Livingstone & Helsper, 2008), the parental mediations (Cabello-Hutt, Cabello, & Claro, 2018; PEW, 2015, p. 71; Helsper, Kalmus, Hasebrink, Sagvari, & de Haan, 2013), and the development, gender and age of the child in terms of digital games (Chaudron, 2015; Livingstone & Helsper, 2008; Wright, 2017) were examined. Scale studies developed about parental mediation (Lwin et al., 2008; Valcke et al., 2010; Valkenburg , Piotrowski, Hermanns, & Leeuw, 2013; Nikken & Jansz, 2007) were examined.

In this context, the observed parental behaviors constituted the item pool of the data collection tool starting from the suggestions for the parents about the indicator of the behavior of the parents towards digital games, which were given before the exploratory factor analysis is conducted. A single judgment was tried to be expressed in the preparation process of the items. Without the purpose of event and fact-finding in the items, the appropriate indicators for the mediation behavior of the parents of children playing digital games were taken into account.

2.2.3. Scope and Face Validity of the Data Collection Tool

At this stage, the statements in the item pool were examined, considering the validity of the scope, language and manner of expression, and parental behavior towards digital games by the faculty members who have researches and expertise in the related subjects.

The scope validity of the scale was examined by consulting three experts who have conducted studies in the fields of preschool education, family, and digital games, respectively. Understandability, fluency, and evaluation of the items in the trial form according to the spelling and writing rules were made by 2 faculty members who have academic studies in the field of Turkish education. An evaluation form has been prepared by the researchers to evaluate the scope and face validity. The scope and items of the scale were re-evaluated according to feedback given by the experts through the evaluation form. After the examinations and evaluations, a trial scale form consisting of 40 items of parental mediation scale for digital games was prepared. The items on the scale can be responded to according to the 5 point likert scale. Likert expressions included in the scale are scored as follows: Never 1 point, rarely 2 points, sometimes 3 points, most often 4 points, always 5 points. In this context, parents can get minimum 40 points and maximum 200 points from the scale.

2.3. Process

In this step of the study, the pilot implementation was conducted using the "PMSDGC" trial form and the difficulties that may occur during the actual application were tried to be determined. The understandability of the guidelines set in the implementation process of the scale form was also tested during the pilot implementation.

In the pilot implementation the trial form of the "PMSDGC" was conducted with 5 female and 5 male parents on the understandability of the items.

During the interview, items from the trial scale form were read by the parents respectively and their opinions on the understandability of the items were recorded. Items that are not understood or difficult to understand by parents were identified. Parental recommendations were taken and rearranged to make the relevant items understandable. n the study on how long the parents can fill the trial form, it was determined that the parents filled all the scale items in 12 minutes.

According to the implementation guidelines determined after the pilot implementation, the construct validity, reliability and item analysis of the parental mediation scale for digital games are as follows: Two separate applications were made to determine the construct validity. In the first application, the validity and reliability of the data collection tool, whose scope was determined by EFA, were carried out. Internal consistency, substance total correlation and substance differentiation analyses were performed on the items collected under the identified factors of the scale. In the second application, CFA was conducted in a different study group with similar characteristics to test the factor structure identified with EFA.

2.4. Data Analysis

It was thought that the scope of "PMSDGC" could be a multi-factor scale considering the observation results for parents' behaviors in digital game environments and theoretical suggestions made to parents about digital games. Starting from that point, first of all, it was aimed to explore the factors to ensure the validity of the structure. After the factor structure was determined; item analysis was conducted.

The data analysis process followed of two steps. The first step was to organize the data for analysis. The second stage was the statistical tests administered to the edited data set.

In the first stage, outliers, missing data or incorrect input data were detected and corrected over the data set obtained from the data collection tool applied to the EFA working group. The data of 15 participants that were detected to be block marked or empty for the same degree of participation in the Likert degree for the items of the scale were excluded from the data set. 343 data remaining in the data set were analyzed. Negative items in the data collection tool were re-scored by performing rotation (5-1, 4-2, 3-3, 2-4, 1-5) before factor analysis. After rotating the negative items, the total score of each item was determined and assumptions were examined according to the criteria accepted in the literature for normal distribution values.

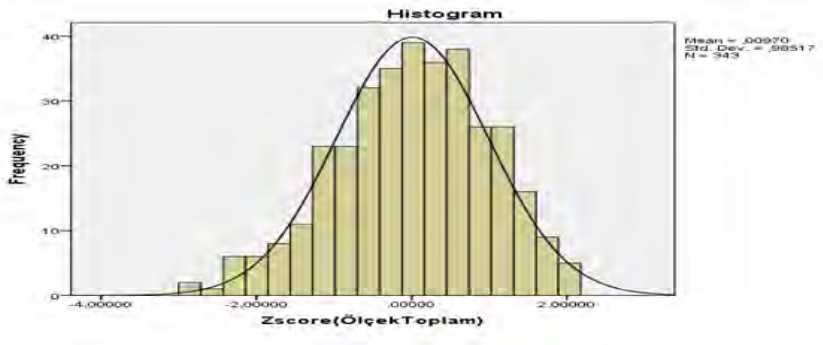


Figure 1. Z-Score Histogram Chart

According to Figure 1, it was determined that the total score converted to Z score is in the range of -3 <z <+3. It is emphasized that the normal distribution of the data set can be examined by interpreting the descriptive statistics results in the examinations for the normality assumption (McKillup, 2012; Abbott, 2011; Gnanadesikan, 1997). For this reason, skewness value, kurtosis value, skewness standard error value, kurtosis standard error value and central tendency measures, central distribution measures were specified in Table 2.

Table 2. Central tendency and distribution measures of item total and z scores

Score Distributions	Central Tendency Measures			Central Distribution Measures				Skewness		Kurtosis		
	N	Average	Median	Mode	Min	Max	Range	SS	SV	SSE	KV	KSE
Total Score	343	152.81	153.00	153.00	103.00	189.00	86.00	17.11	-.285	.132	-.225	.263
Z Score	343	.00	0.20	0.20	-2.85	2.09	4.95	.985	-.285	.132	-.225	.263

SV: Skewness Value, SSE: Skewness Standard Error, KV: Kurtosis Value KSE: Kurtosis Standard Error

According to Table 2, the skewness value of the data set is -.285 and the kurtosis value is -.225. It was determined that the kurtosis and skewness values of the data set were within ± 1 limits and approached to 0. The results of kurtosis and skew values reveal that the data set shows normal distribution. In addition, when the ratio of kurtosis and skewness values to kurtosis and skewness standard errors is examined, it is determined that it is within ± 2 limits and approaches 0. This result is a different indicator that the data set shows normal distribution. When the central tendency measures of the dataset are analyzed, the fact that the average, median, and mode values are equal or close to each other is another indicator of the normal distribution (Tabachnick & Fidell, 2013; McKillup, 2012; Wilcox, 2012; Howitt & Cramer, 2011). The data set is thought to meet the normality assumption when central tendency measures, skewness and kurtosis values are examined.

In the second stage, EFA and CFA were performed for validity studies. Kaiser Mayer Olkin (KMO) and Barlett Sphericity Test values were determined to examine whether the data set was suitable for performing EFA. As it was thought that factoring process would occur as a result of the determined values, in order to determine under which factor the items suitable for the factor structure may be linked or not to each other, oblimin rotation technique and promax rotation technique, which is also the hybrid rotation technique, was applied in EFA. Factor analysis process was considered as a dynamic process. In the factor analysis process, the items removed from the scale were removed one by one and the factor analysis process was repeated. The factor structure formed as a result of repeated factor analysis was analyzed for item and load values under the factors in each repeated operation. Cronbach Alpha value, which is the internal consistency coefficient, was determined in reliability processes. In item analysis, item total correlation and item discrimination values were calculated. In the third stage, the findings of testing the factor structure and reliability of the scale with a different study group with CFA and testing the factor structure are included.

3. Findings

The findings of the research can presented in three stages as in the following. In the first stage, the findings of AFA to explore the structure of the scale, in the second stage, the findings of the item analysis and reliability, and in the third stage, the findings for exploring the structure of the data collection tool.

3.1. First Stage: Findings of Exploratory Factor Analysis (EFA)

Findings to discover the construct validity of "PMSDGC" were included at this stage. The Kaiser-Meyer-Olkin (KMO) coefficient was determined to determine the sample adequacy of the data set consisting of the EFA study group. Barlett Sphericity values were given in Table 3 to determine whether the data set was distributed normally or not.

Table 3. Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's sphericity test values

Kaiser-Mayer-Olkin (KMO) Coefficient		.813
Bartlett's Sphericity Test Values	Approximate Chi Square Value	6111.700
	Sd	780
	p	.000

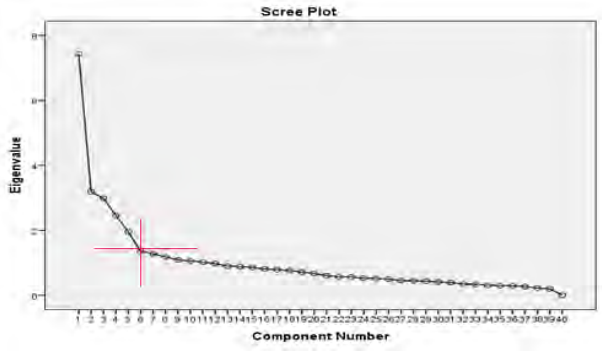
According to Table 3, Kaiser-Mayer-Olkin (KMO) value is 813 and Barlett Sphericity test value is determined to be 6111.700. For EFA, the sample size is expected to differ significantly with the KMO value greater than 0.50 and the Bartlett Sphericity Test value. (Hair, Anderson, Tattham, & Black, 1995; Tabachnick & Fidell, 2013). According to Kaiser (1974), having the KMO value in the range of 80-90 means that the data set has a "very good" sample size. In this context, the data set of the research can be said to be a "very good" degree for factor analysis. When the multivariate normality assumptions of the data set are examined ($p = .000$; $p < .05$), it is understood that they show normal distribution.

According to Kline (2016), factor analysis is the most effective statistical analysis in determining the number of factors and the explained variance based on the covariance matrix or correlation according to simple item analysis aimed at reducing or simplifying complex data. More than one criterion may be taken into account in the decision-making process of the number of factors. Some of these criteria are Kaiser criterion (eigenvalues ≥ 1), scree plot test, total explained variance (Hair et al., 1995). Starting from this point, the values of explained variance percentage and eigenvalue coefficient are given in Table 4 to determine the number of factors. The scree plot is included in Graph 1.

Table 4. Total explained variance and eigenvalues of components after rotation

Components	Eigenvalues	Variance%	Cumulative %
1	7.431	18.579	18.579
2	3.186	7.964	26.543
3	2.982	7.454	33.997
4	2.457	6.143	40.140
5	1.949	4.874	45.013

According to Table 4, it is determined that the number of components whose eigenvalue coefficient is 1 and greater than 1 after rotation is 11. The content validity of the factor structure formed by the total explained variance and items was also taken into consideration in determining the number of factors. In determining the number of factors, scree plot was also examined. The scree plot is included in Graph 1.



Graph 1. Screen plot

According to Graph 1, it is observed that the eigenvalue load consists of 11 components above 1. The first 5 of the 11 components are larger than the scree of the number of other components. To determine the number of factors, it is necessary to determine the breaking point in the scree plot test. The data set must consist of at least 200 people in order to determine the breaking points on the scree plot (Cattell, 1978). The cutting point is determined by drawing horizontal and vertical lines from the end point where the curve of the scree plot decreases (Yong & Pearce, 2013). According to Büyüköztürk (2010), "high accelerated and rapid declines from the components give the number of important factors". Based on this point, it is thought that the number of components in horizontal and vertical lines up to the breaking point where the scree of the scale decreases constitutes a 5-factor structure (Gorsuch, 1983).

The total variance rate explained by the 5-factor structure consisting of "PMSDGC" 40 items is 45.013%. According to Kline (2016), the total variance rate of 40% can be considered as the lower limit. After the number of important factors determined for "PMSDGC" was limited to 5, it was stated in the relevant literature that the factor sub-load values of an item can vary between 30 and 40 (Cathell &Baggaley, 1960; Neale &Liebert, 1980). The subload value of a item in the "PMSDGC" is set to be 40. In EFA, factor rotation is performed in order to increase the load of each item below a certain factor to the highest value and to allow the structure to emerge better by separating the factors from each other (Rummel, 1988; Yong & Pearce, 2013). Different rotation techniques were applied to determine under which factor the items would be collected in the determined 5 factor structure. Since the factors were thought to be related to each other in the research, oblimin rotation technique was preferred in the analysis of principal components.

Oblimin rotation technique has been used in the research of the development of parental mediation scales for media tools (Nikken & Jansz, 2012;). In order to control the factor structure obtained by oblimin rotation technique, promax rotation technique, which is referred to as hybrid rotation technique in the literature, was also used (Can, 2013; Ho, 2006; Şencan, 2005). In both rotating techniques, it was determined that the locations of the items under the factors did not change. However, it was observed that there was a change in the factor load values of the items. Factor load values and factor names of the items after oblimin rotation technique are given in Table 5.

Table 5. Factor Load Values of the Scale Items After Oblimin Rotation Technique and Item Analysis

Factor	Factor Load Values of the Scale Items						Item Analysis Values					
	No	F1	F2	F3	F4	F5	r	$\bar{x}$	% 27($\bar{x}$) L.G.	% 27($\bar{x}$) U.G.	t	p
Viewing(F1)	M13	.731	.005	.009	.114	.060	.647	4.48	3.90	4.91	8.392	.000***
	M02	.694	.106	.030	.108	.016	.555	4.77	4.38	4.99	8.601	.000***
	M15	.680	.082	.248	.154	.020	.632	4.28	3.44	4.68	5.699	.000***
	M01	.675	.109	.198	.171	.043	.678	4.15	3.31	4.75	10.760	.000***
	M08	.655	.215	.054	.089	.061	.547	4.25	3.68	4.67	6.838	.000***
	M07	.643	.006	.334	.138	.071	.633	4.05	3.19	4.67	10.179	.000***
	M14	.611	.114	.177	.258	.070	.505	4.68	4.27	4.89	5.053	.000***
	M10	.610	.117	.262	.152	.107	.531	4.46	3.91	4.87	7.213	.000***
	M12	.608	.074	.088	.014	.034	.516	4.49	3.90	4.89	7.459	.000***
	M06	.605	.083	.383	.218	.029	.630	4.01	3.20	4.64	10.889	.000***
	M04	.604	.114	.030	.001	.045	.654	4.05	3.15	4.80	13.451	.000***
	M11	.576	.090	.153	.046	.208	.534	4.24	3.72	4.79	8.098	.000***
	M05	.536	.026	.386	.159	.135	.567	4.09	3.41	4.77	11.819	.000***
Laisse Faire(F2)	M31	.030	.601	.047	.072	.208	.477	4.19	3.78	4.68	6.203	.000***
	M37	.058	.589	.009	.119	.077	.429	3.46	3.06	4.05	5.288	.000***
	M23	.062	.572	.052	.154	.150	.422	3.81	3.58	4.34	5.191	.000***
	M33	.104	.552	.181	.116	.158	.417	4.03	3.55	4.65	5.638	.000***
	M25	.098	.545	.091	.036	.216	.422	3.66	3.32	4.18	5.189	.000***
	M19	.118	.540	.069	.072	.003	.451	3.97	3.47	4.70	9.336	.000***
	M30	.180	.536	.191	.090	.005	.408	3.97	3.39	4.43	5.922	.000***
	M17	.189	.530	.186	.135	.210	.433	3.39	2.94	4.00	6.922	.000***
	M20	.129	.502	.133	.026	.167	.374	3.30	2.70	3.95	7.374	.000***
	M27	.134	.499	.037	.048	.087	.385	4.26	4.05	4.71	5.066	.000***
Technical (F3)	M03	.145	.047	.892	.016	.096	.711	2.43	1.71	3.21	9.825	.000***
	M09	.136	.037	.886	-.008	.084	.581	2.70	2.07	3.49	8.138	.000***
	M35	.149	.058	.792	.042	.101	.353	3.40	2.83	4.35	3.372	.000***
	M44	.046	.013	.410	.018	.253	.703	2.40	1.74	3.16	9.217	.000***
Restrictive (F4)	M36	.013	.062	.015	.645	.024	.452	4.26	3.85	4.57	5.520	.000***
	M43	.172	.227	.042	.593	.086	.475	4.28	3.69	4.79	9.179	.000***
	M32	.148	.165	.008	.582	-.137	.424	4.03	3.46	4.47	6.330	.000***
	M40	.118	.075	.072	.570	.161	.437	4.13	3.61	4.48	5.832	.000***
	M38	.034	.110	.091	.552	.086	.387	4.17	3.75	4.42	4.134	.000***
	M42	.148	.123	.186	.525	.114	.389	4.12	3.55	4.56	8.465	.000***
	M34	.067	.210	.006	.427	.051	.341	3.28	2.95	3.60	3.613	.000***
	M39	.089	.111	.081	.418	.035	.354	3.71	3.22	3.81	3.039	.000***
	M41	.039	.096	.112	.404	.071	.388	3.79	3.27	4.28	5.814	.000***
Active Co Playing (F5)	M22	.111	.028	.064	.112	.826	.723	2.90	2.46	3.39	6.070	.000***
	M21	.128	-.020	.122	.058	.803	.660	3.05	2.64	3.57	6.188	.000***
	M24	.076	.034	.108	.196	.801	.654	2.77	2.22	3.32	7.093	.000***
	M28	.016	-.204	.141	.026	.528	.344	2.72	2.23	3.39	7.052	.000***
Factor				F1			F2		F3	F4		F5
Cronbach's Alpha (α)				.891			.757		.710	.786		.784

L.G= Lower Group, U.G= Upper Group

When the items under the structures of the factors determined as a result of oblimin rotation technique are examined in Table 5, 2 items below .40 were removed from the scale. No contradictions were found among the remaining items. The variance rate explained for the five-factor structure is 45,013%.

3.1. Second Stage: Findings Related to Item Analysis and Reliability

The item analysis findings regarding the internal consistency, item total correlation and item discrimination of sub-factors of "PMSDGC" are given in Table 5.

When Table 5 is examined, it can be said that "PMSDGC" (α = .813) and its sub-factors are a reliable measurement tool in terms of internal consistency since Cronbach's Alpha (α) values are greater than .70 (Murphy & Davidshofer, 1994).

According to Table 5, if the r value is less than .30 (r <.30) in item total correlation analysis, the relation of the relevant item with the factor is weak. This item should be removed from the scale. If the r value takes values between .30 and .70, it is medium level. If r value is greater than .70, it is related to a good level (Büyüköztürk, 2011). The sample item, which is moderately related to the viewing factor (r = .647), is item 13 *(I check the game classification for the age restriction of the digital game my child plays)*. The sample item which is moderately related (r = .477) with the Laisse Faire factor is item 31 *(My child fulfills the responsibilities given to him/her in return for playing digital games)*. The sample item that is related to the technical factor in a good degree (r = .711) is in item 3 *(I tell my child to ask me for the password I put on the digital device so that s/he can play digital games.)*. The sample item, which is moderately related to the restrictive factor (r = .452), is item 36 *(I prohibit my child from playing digital games that I think are harmful for his/her socialization)*. Sample item, which has a good level of correlation with active acting factor (r=.723), is item 22 *(I make an explanation of the digital games that support my child's language development by playing together.)*.

According to Table 5, the discrimination of the test items in the scale is the power to distinguish between parents with psychometric characteristics and parents without them (Kalaycı, 2008, p. 170). When the item discrimination was examined by applying independent t-test to 27% lower and 27% upper groups, it was determined that all of the items in the scale showed a significant difference at p <.001 level.

3.2. Third Stage: Findings Related to Verification of the Structure of the Data Collection Tool

As a result of exploratory factor analysis, the construct validity was tested on the CFA study group, which has the same psychometric properties of the structure discovered. χ2/df Chi-square/Degree of freedom, Root Mean Square Error of Approximation (RMSEA), Good-ness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI) and Comparative Fit Index (CFI) values are considered and accepted as acceptable criteria in the literature. CFA fit index values for the five-factor factor structure of the scale (χ2= 1518.070; sd= 719; p= .000) are χ2/sd= 2.11 and below 3. RMSEA= .057; GFI = .914; AGFI = .918; CFI= .918; NFI = .906. The (χ2/sd) value below 3 is good concordant (Jöreskog & Sörbom, 1984). RMSEA value is .057 and shows concordance (Hu & Bentler, 1999). The NFI value is .906 and shows concordance (Tabachnick & Fidell, 2013). The CFI value is

.918. The GFI value is .914 and shows concordance (Hooper et al., 2008). The AGFI value is .918 and shows concordance good (Hooper et al., 2008). The IFI value is .984 and shows concordance (Marsh & Hau, 1996). When the concordance values of the scale are examined, it is understood that the scale has acceptable concordance values. In Figure 2, standardized estimates values are given for CFA.

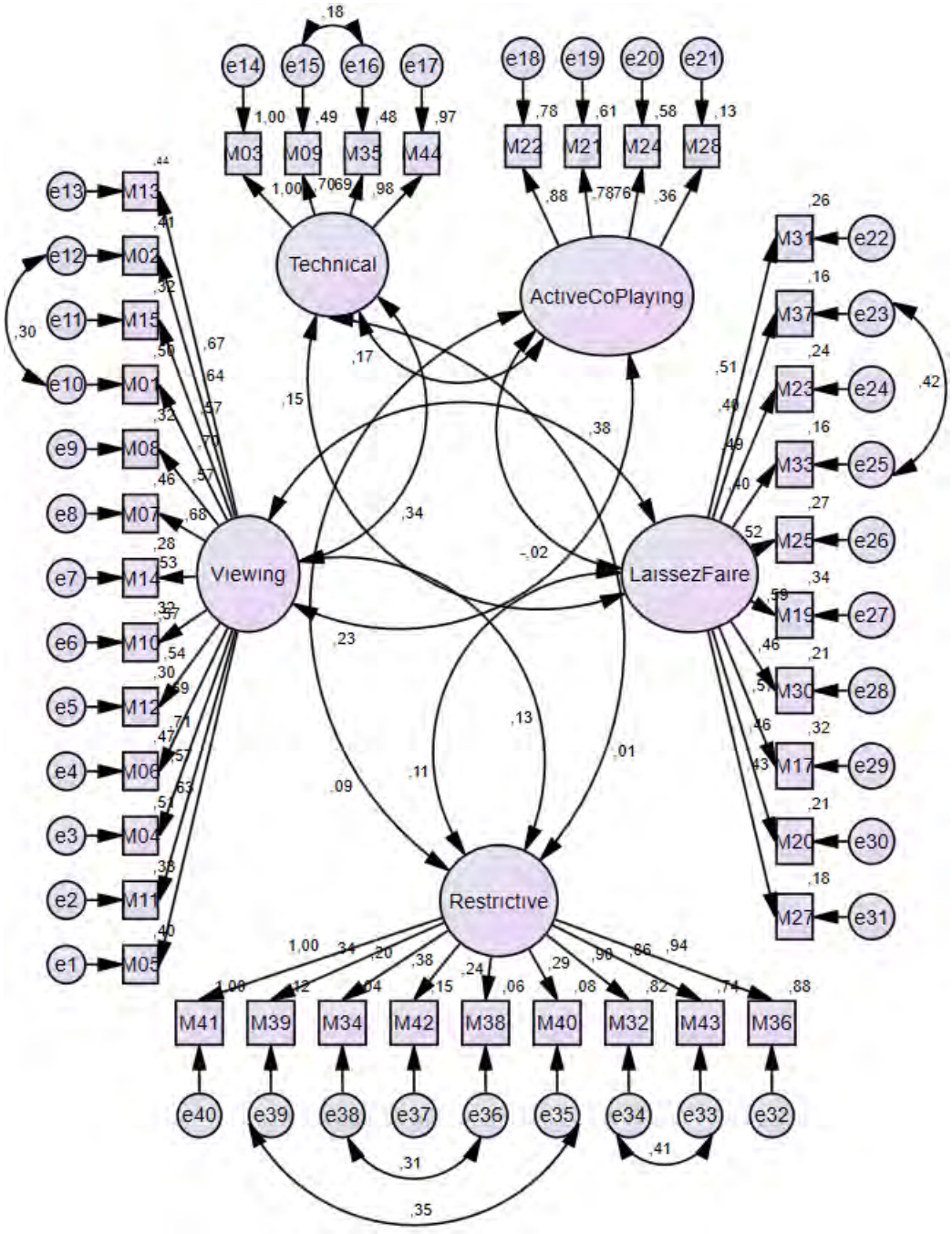


Figure 2. Standardized estimates values for CFA

4. Discussion and Conclusion

In the light of the findings of the research, when the mediation strategies of parents regarding digital games played by children are examined; It has been determined that a valid and reliable scale of factor structure consisting of active co-playing, technical and laissez faire mediation strategies has been formed. The fact that the parental mediation strategies that were discovered in the factor structure of the scale and tested later were in the factor structure has been discussed according to the results of the related research and the factor pattern has been examined.

Parents prefer active and restrictive parental mediation in early childhood (Piotrowski, 2017). As in the mediation strategies (active co-use, technical, laissez faire, viewing, interaction and restrictive) that parents use for digital games in early childhood, they use similar mediation strategies (Lwin et al., 2008, p. 208; Hasebrink et al., 2011, p.11; Livingstone et al., 2015, p.4) in the use of other media tools such as the Internet (Eastin et al. 2006, p. 486), and television (Valkenburg et al., 1999, p.53). However, the types of mediation detected in the study of digital games by Nikken and Jans (2014) are restrictive mediation, active mediation and co-playing. In this research, besides the mediation strategies determined by Nikken and Jans (2014), technical and laissez faire parental mediation strategies were also determined. The mediation strategies used in this context are affected by the cultural factor, as well as the study shows the technology use of people living in a particular culture. In addition, as a result of the research carried out by Nikken and Jans (2014), it was found that parents who were worried about digital games mostly used the strategy of co-playing for their children at younger ages.

According to Piotrowski (2017), parents mostly prefer active and restrictive mediation strategies in early childhood. The reliability and useful effects of online digital games played by children in early childhood are not fully known (Holloway, Green, & Livingstone, 2013). It can be said that children are more prone to online risks in early childhood (Ey & Cupit, 2011). In addition, as children get younger, they cannot decide whether online games are reliable or not, and it is extremely difficult to share their opinions with parents about game content (Eastin, Yang, & Nathanson, 2006). In this context, parents' mediation based on active co-playing strategy, viewing strategy and restrictive strategies can help protect children from various risks. From this point of view, it is thought that active co-playing, restrictive and viewing mediation strategies should be in the scale structure to reduce digital risks for children in early childhood.

Parents can apply technical mediation strategy to the content or risk-containing activities that they do not want their children playing digital games to reach (Eastin et al., 2006, p. 486). Parents who implement a technical mediation strategy can secretly and clearly control the digital games that children play with viewing mediation (Livingstone & Bober, 2006). Parents can use the restrictive mediation strategy according to the risk situations they detect after viewing mediation. In this context, the fact that the factor for

parents to monitor their children through technical mediation strategy in their early childhood is included in the scale shows that it is a meaningful structure.

The active co-playing strategy that parents use to prevent the negative effects of digital games also shows that parents should spend time with their children. However, the time that parents spend with their children on media tools may differ according to the form of family communication (Buijzen & Valkenburg, 2005; Padilla-Walker, et al., 2011), the level of education of the parent (Fujiko & Austin, 2002), the race of the parent and the culture they live in (Hoffman, 2003; Warrens, 2005; Anand & Krosnick, 2005; Rideout, 2011; Wartella, Rideout, Lauricella, & Connell, 2013) the technological knowledge of the parent (Eynon & Malber, 2012; Livingstone, et al., 2011) the socio-economic level (Hoffman, 2003; Warren, 2005),the gender of the parent (Nikken & Jans, 2011; Warren, 2005; Lamb, 200), and the gender of the child (Pleck, 1997; Coyne, et al., 2011). In the light of the relevant literature, they do not use active co-playing mediation when parents spend less time on their child against the risks of digital games or cannot contribute to the child's upbringing (Warren, 2005). Especially working parents have less information about the media tools that their children play at home (Koolstra & Lucassen, 2004). This will reduce the mediation strategies that they will apply to the risks of children's digital games. As a matter of fact, due to the increase of media tools, it becomes difficult for parents to protect their children from the risks of the digital games (Rideout, Foehr, & Roberts, 2010).

Due to the low effort of parents to raise children, work intensity and various cultural reasons, and habits that occur in children, laissez faire parental mediation emerges where the parents cannot implement parental mediation strategies for digital games children play. In fact, laissez faire mediation does not comply with the parental mediation definitions for media, but it is extremely important in the interpretation of the mediation strategies applied by parents. General restrictions by parents on the use of media tools to children are more commonly observed in early childhood (Hasebrink et al., 2009). Digital games that children play can turn into application tools to reach the parents' goals. This situation may lead to the development of laissez faire mediation strategy or it can be used for supervision. Supervision is the most common form of guidance for young children. For example, while parents are doing chores, the children may be given the responsibility of doing various activities during the process of internet use. Parents can supervise children with their observations while doing their work (Nikken & Jans, 2014). However, the parents' failure to observe the children while they are doing their work and to perform a post-game examination will cause the laissez faire mediation strategy. From this point on, laissez faire mediation can be a mediation strategy that occurs in the absence of other strategies. In family environments where there is laissez faire mediation, the negative effects of digital games, tendency to violence (Fischer, Kastenmüller, & Greitemeyer, 2010), attention-gathering problem (Gentile, Swing, Lim, & Khoo, 2012), musculoskeletal system problems (Jacobs, Hudak, &

McGiffert, 2009), and obesity (Ballard, Gray, Reilly, & Noggle, 2009) can be observed in children. In this context, laissez faire mediation determined in the structure of the scale is thought to constitute a meaningful factor structure.

5. Suggestions

The scale, whose validity and reliability were determined as a result of this study, is recommended to be tested by other researchers in different cultural contexts and with vider groups of samples.

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