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Developing Screen Use Scales for Mothers and 4-5-Year-Old Children

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Abstract

This study aimed to develop two valid and reliable measurement tools to determine the screen use of 4- and 5-year-old preschool children and their mothers. The construct validity of the scales was tested using exploratory factor analysis and confirmatory factor analysis. The reliability of the scales was measured using Cronbach's alpha reliability coefficient, item-total correlation, and a discrimination test for the upper and lower 27%. The study was conducted with 382 4- and 5-year-old children and their mothers' attending kindergartens in a province in the Eastern Anatolia Region of Türkiye during the 2024-2025 academic year. As a result of the exploratory factor analysis, it was determined that the tool measuring mothers' screen use consisted of 6 factors and 24 items, while the tool measuring children's screen use consisted of 3 factors and 17 items. The structures emerging from the exploratory factor analysis were confirmed by confirmatory factor analysis. In the reliability analysis of the scales, the Cronbach's alpha reliability coefficient was determined to be .844 for the instrument measuring mothers' screen use and .845 for the instrument measuring children's screen use. The Child Screen Use Scale (CSUS) can validly and reliably measure screen use in 4- and 5-year-old children, and the Mother Screen Use Scale (MSUS) can measure mothers' screen use. The Child Screen Use Scale and the Mother Screen Use Scale will enable a better understanding, explanation, and prediction of the behaviors and contexts of 4- and 5-year-old children and mothers.

Keywords: Child, Mother, Scale Development, Screen Use

Highlights

- Measuring screen usage contextually has become essential.
- Measuring screen usage will provide a basis for intervention programs.
- The purpose of this study was to develop two scales**.**

1. Introduction

The television program 'Howdy Doody' (which tells the adventures of a puppet), which aired on a television channel in the United States in 1947 and holds the distinction of being the first children's program, and the television program that aired in 1969 and entered the literatureas the 'Sesame Street' phenomenon, constitute milestones in children's adventures with screens (Palmer, 2003). Since those years, several changes have occurred in children's adventures with screens: the size and names of the screens children watch have changed, their content has diversified, and children have become able to manipulate the images on the screen through computer games. With these changes, screens have become an important factor affecting children's development and have approached the focus of academic research (Jovell et al., 2024).

The concept of 'screen,' which began to emerge with television, was initially used as a mass communication tool, but today, screens have undergone revolutionary transformations and are present almost everywhere and at all times in life (Comstock & Scharrer, 2012). Indeed, babies spend over 1 hour a day on screens, preschoolers 2.5 hours, elementary school children 5 hours, and adolescents over 8 hours (Rideout et al., 2022). When this excessive screen time is combined with uncontrolled screen content, children's development and health begin to suffer seriously (Perez et al., 2023). Children's exposure to the rapid flow of images in screen content negatively affects their cognitive control and emotion regulation, while also undermining their social skills and pushing them towards antisocial behavior (Lissak, 2018). Children's exposure to violent images in screen content causes them to perceive the world as a bad place, to see violence as an acceptable phenomenon, and to inflict violence on others (Wilson, 2008).

Screens have both positive and negative effects. When used with appropriate educational and interactive content suitable for children's development and for appropriate durations, screens are beneficial to children (Santos et al., 2022). Screens positively influence children's creativity, early language skills (Canadian Paediatric Society's Digital Health Task Force, 2017), and problem-solving skills (Xie et al., 2018), and are also related to children's motor skills (Bedford et al., 2016). The positive and negative effects of screens on children show us that understanding the impact of screens on children's development is crucial, and that negative effects should be reduced while positive effects are increased (Madigan et al., 2019). Therefore, screen use is of critical importance for child development.

Today, children and adults live in a virtual screen ecosystem (Muppalla et al., 2023). This necessitates understanding and controlling the role of screens in the world of children (Qi et al., 2023) and promoting their conscious use (Santos et al., 2022). Whether the impact of this screen ecosystem on children is positive or negative depends on whether screen use occurs unchecked and excessively (Perez et al., 2023). In 1990, the United States enacted the Children's Television Act to reduce the negative effects and increase the positive effects of television, which was the main screen at the time. More recently, developed countries such as the UK and France have severely restricted smartphone use until adolescence (Jovell et al., 2024). The threshold for limiting screen time is determined in accordance with guidelines published by relevant authorities.

According to the average values of the guidelines published by the American Academy of Pediatrics (2016) and the World Health Organization (2019), children aged 0-2 should not be exposed to screens – except for short-term video chats – and provided that positive screen content is used, children aged 3-6 should not exceed an average of 1.5 hours per day, children aged 7-12 should not exceed an average of 2 hours per day, and children aged 13-18 should not exceed an average of 3 hours per day. Whether children's screen use aligns with these guidelines is shaped by several factors (Vedechkina & Borgonovi, 2021). These factors include whether the child is watching the screen alone or with an adult, the adult's reactions to the content, the appropriateness of the screen content for interaction, and the suitability of the content to the child's developmental level (Guellai et al., 2022). Parents are the dominant factor in shaping children's screen use (Konca, 2022), and it is known that mothers' own screen use is related to their children's screen use (Dong & Mertala, 2021). Therefore, mothers can manage their children's screen use by mediating it (Ata Aktürk & Akman, 2024).

For mothers to manage their children's screen use, they must first be aware of and manage their own screen use (Muppalla et al., 2023). This requires measurement tools related to screen use. The literature includes studies on adults' social media use (Ozimek et al., 2023; Wartberg et al., 2023), parenting approaches to screen use (Andiç & Durak Batıgün, 2022), their mediation of their children's media use (Şen et al., 2020), multiple screen addiction (Sarıtepeci, 2021); parents' digital parenting awareness (Manap & Durmuş, 2020), self-efficacy (Yaman et al., 2019), and attitudes (İnan Kaya et al., 2018). Psychometric scales have been developed to measure the digital media use of adolescents (Antons et al., 2025; Martins, 2023), excessive screen use (Elhatip & Işık, 2024), and screen addiction (Gökçe Tekin, 2024); the screen media use of preschool children (Klakk et al., 2020), screen addiction (Domoff et al., 2019), and the assessment of problematic screen exposure (Yalçın et al., 2021); and the digital technology use of infants (Harmandar Ergül & Işıkoğlu, 2024). As can be seen, there is a need for psychometric measurement tools that will evaluate the screen use of mothers and preschool-aged children through different dimensions such as duration, content, and interaction. In this research, the aim was to develop two tools that will measure the screen use of 4 and 5-year-old preschool children and their mothers in contexts such as duration, content, and interaction. The research is considered important because the psychometric measurement tools to be developed are expected to fill a gap in the literature.

2. Method

2.1. Research Design

This research was conducted using a descriptive survey model, a quantitative research method, as it aimed to develop scales to determine the screen usage of mothers and their 4 and 5-year-old children attending preschool. In a descriptive survey model, information is sought on general issues such as thoughts, beliefs, attitudes, and skills through a sample group representing the population (Fraenkel et al., 2011). In this context, the following steps are generally taken to develop the scale: a literature review is conducted, an item pool is created, expert opinions are sought, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are performed; Cronbach's alpha reliability coefficient, item-total score correlations, and differences between item scores of the 27% lower and upper groups are evaluated (DeVellis & Thorpe, 2021).

2.2. Study Group

This research was conducted with 4 and 5-year-old children and their mothers attending independent kindergartens in only one district center of a province in the Eastern Anatolia Region of Türkiye during the 2024-2025 academic year. The sample was obtained using a convenience sampling technique. Convenience sampling ensures that participants suitable for the intended measurement are reached during the scale development process and allows for validity and reliability analyses of the scale (Cohen et al., 2018). It is recommended that the number of participants in the sample should be between 5 and 10 times the number of items expected to be included in the scale (Bryman & Cramer, 2002). Accordingly, data was collected from 382 mothers for the 46 items in the draft Mother Screen Use Scale (MSUS) and from 382 4 and 5-year-old children attending preschool (through their mothers' proxy responses) for the 41 items in the draft Child Screen Use Scale (CSUS). Table 1 shows the number of participants involved in the scale development stages, categorized by their participation in the analyses.

Table 1. *Number of Participants Included in the Analyses*

Scale	Age	Exploratory Factor Analysis (EFA)	Confirmatory Factor Analysis (CFA)
MSUS		382	229
CSUS	4	169 (44.3%)	98 (45.4%)
	5	213 (55.7)	118 (54.6%)
	Total	382 (100%)	216 (100%)

Table 1 shows that during the development phase of MSUS, EFA was conducted with 382 participants and CFA with 229 participants. During the development phase of CSUS, EFA was conducted with 382 participants and CFA with 216 participants. Furthermore, in the CSUS development process, approximately 44.3% of the 382 participants in the EFA phase were 4 years old and 55.7% were 5 years old, while in the CFA phase, approximately 45.4% of the 216 participants were 4 years old and 54.6% were 5 years old. Since it was recommended that data used in the EFA phase should not be used in the CFA phase (Worthington & Whittaker, 2006), data was collected again after the EFA was performed and CFA was conducted within the scope of this research.

2.3. Data Collection Tools and Process

The study utilizes two scales: MSUS, to measure mothers' own screen use, and CSUS, to measure the screen use of 4 and 5-year-old children through their mothers' proxy responses. During the development of MSUS and CSUS, the literature was reviewed, a conceptual framework was established, and the structure was clarified. In this context, when creating the item pool, 'duration' (World Health Organization, 2019), 'content' (Guellai et al., 2022), 'management' (Dong & Mertala, 2021), 'control' (Perez et al., 2023), and 'effect' (Santos et al., 2022) were evaluated as possible factors related to screen use based on the literature. Subsequently, an item pool was created with 46 items considered to measure the construct for MSUS and 41 items for CSUS. The item pool was first presented to a language expert and then to three field experts for their opinions. In the form created by the researcher for expert evaluations, experts were asked to indicate one of the following options for each item: 'should be removed', 'should be revised', and 'suitable', and to provide an 'explanation and suggestion'. Some items were revised based on the feedback. The scale does not contain any reversed items, and responses are on a 5-point Likert scale: '1=Strongly disagree', '2=Disagree', '3=Neutral', '4=Agree', and '5=Strongly agree'. Subsequently, a pilot study was conducted with 30 mothers for the MSUS and CSUS, and they were asked to provide feedback. The draft scales were finalized taking into account the pilot study and expert feedback. Validity and reliability analyses were then conducted with the MSUS, consisting of 46 items, and the CSUS, consisting of 41 items.

2.4. Data Analysis

During the scale development process, IBM SPSS Statistics 27 was used for EFA, Cronbach's alpha coefficient, item-total score correlation, and correlation analysis between the upper and lower 27% groups, and IBM SPSS AMOS 26 Graphics was used for CFA analysis. EFA was performed first, followed by CFA, for MSUS and CSUS. The normality of the MSUS and CSUS datasets was evaluated by examining the kurtosis-skewness coefficients. The skewness-kurtosis coefficient values were found to be between -.10 and -.15 for MSUS and -.37 and -.24 for CSUS. Since these values fall within the ±3.29 range and the sample size is at least 100, the dataset was considered to exhibit a normal distribution (Mayers, 2013).

In the scale development process, validity analyses of normally distributed datasets are usually started by performing Exploratory Factor Analysis (EFA) to test structural suitability. In construct validity, the validity of structures that cannot be directly measured is evaluated indirectly through observable variables (Çokluk et al., 2010). Factor analysis is used to test construct validity in the scale development process. Factor analysis consists of two separate tests: EFA and Confirmatory Factor Analysis (CFA). First, EFA is performed to define the dataset, i.e., to determine the structure through factors, and then CFA is performed to test this structure that emerges after EFA (Pallant, 2020). Before the EFA stage, the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's Sphericity Test values are examined to determine the suitability of the dataset for factor analysis. When performing EFA, the number of factors and the items grouped under the factors are determined by examining the factor loadings of the items, the common factor variances of the items, the total variance explained, and the semantic and content consistency of the items (Tabachnick & Fidell, 2013).

3. Findings

3.1. Exploratory Factor Analysis Findings

Separate Exploratory Factor Analysis (EFA) was performed to examine the construct validity of MSUS and CSUS. First, the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's Sphericity Test values were examined to assess the suitability of the dataset for factor analysis. Then, the suitability of the obtained data for EFA was evaluated. The results of the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's Sphericity Test analyses, eigenvalues, and variances for MSUS and CSUS are shown in Table 2.

Table 2. *Analysis of KMO and Bartlett's Sphericity Test for MSUS and CSUS, Eigenvalue and Variance Results*

Scale	Factor	Eigenvalue	Variance	Cumulative Variance	Bartlett's Test of Sphericity			KMO
					x^2	sd	p	
MSUS	1	5.67	23.64	23.64	5664.32	1035	.000*	.817
	2	3.26	13.59	37.23				
	3	1.95	8.13	45.37				
	4	1.72	7.16	52.54				
	5	1.50	6.28	58.82				
	6	1.17	4.89	63.72				
CSUS	1	5.05	29.73	29.73	3017.90	136	.000*	.860
	2	3.73	21.96	51.69				
	3	1.59	9.39	61.09				

* $p < .05$

Table 2 shows that the Kaiser-Meyer-Olkin (KMO) coefficient for MSUS is .817 and the Bartlett Sphericity Test value (x^2=5664.32 and p=.000) is significant, and the Kaiser-Meyer-Olkin (KMO) coefficient for CSUS is .860 and the Bartlett Sphericity Test value (x^2=3017.90; p=.000) is significant. These values indicate that the datasets are suitable for EFA (Özdamar, 2017). Accordingly, EFA was performed with MSUS consisting of 46 items and CSUS consisting of 41 items. The eigenvalues of 6 factors for MSUS and 5 factors for CSUS are greater than 1, and the 6 factors explain 63.72% of the total variance of MSUS and the 3 factors explain 61.09% of the total variance of CSUS, which are considered sufficient explanation rates (Başol, 2020).

During EFA, some items may fall under more than one factor. These items are defined as overlapping items, and the difference between the two factors must not be less than 0.10, and the item loadings must be greater than 0.30

(Büyüköztürk, 2010). Accordingly, 22 items for MSUS and 24 items for CSUS that did not meet the specified conditions were removed from the scale during EFA.

The calculated loading values and literature-based nomenclature for the items grouped under factors for MSUS and CSUS are shown in Table 3.

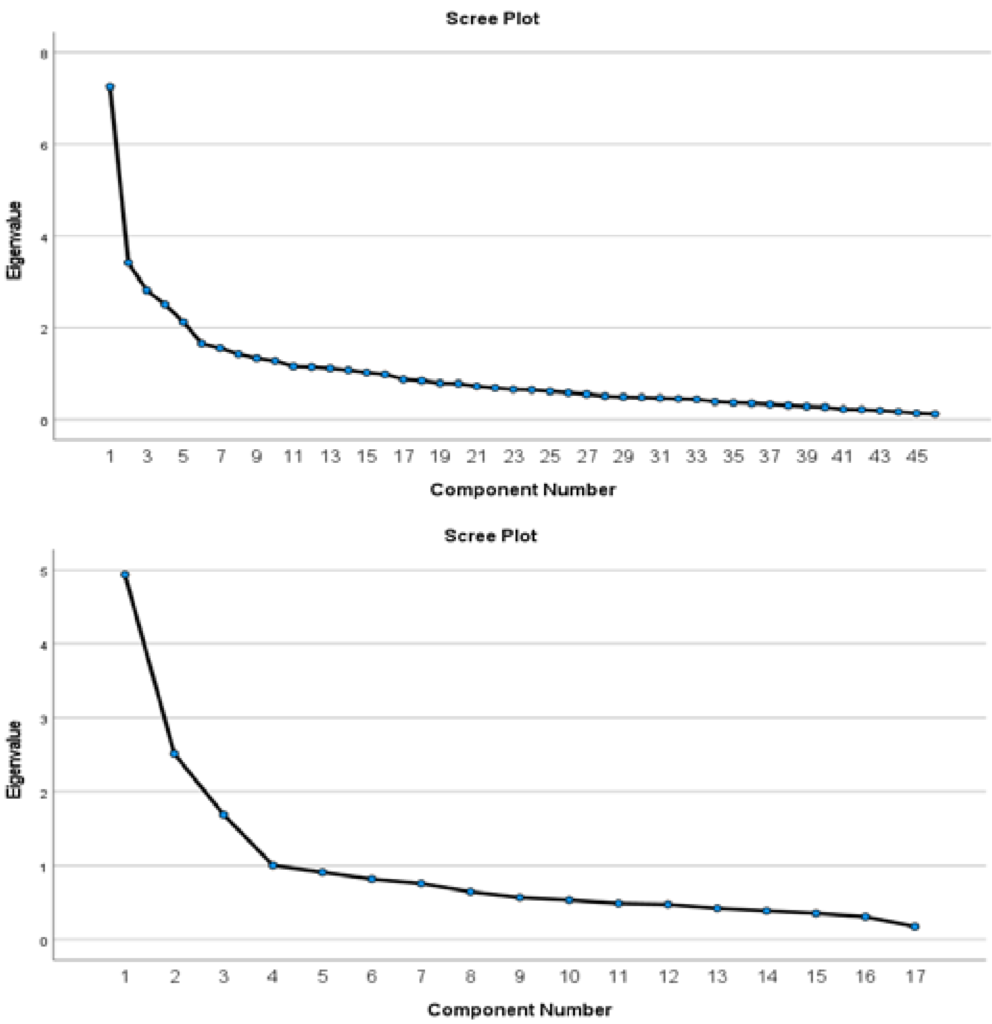
Table 3. *Factor Loading Values and Factor Nomenclature for MSUS and CSUS*

Scale	Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
MSUS	1	.763					
	4	.588					
	9	.712					
	16		.648				
	17		.698				
	19		.601				
	20		.608				
	21		.800				
	22		.779				
	23		.733				
	27			.849			
	28			.795			
	29			.763			
	32				.725		
	33				.845		
	34				.832		
	35					.828	
	36					.871	
	37					.799	
	38					.782	
	40						.778
	41						.868
	42						.836
	44						.707
		Duration/ Frequency	*Content/ Purpose*	*Interaction*	*Emotional Effect*	*Physical Effect*	*Awareness/ Management*
CSUS	7	.821					
	8	.858					
	9	.682					
	15	.696					
	23	.682					
	11		.563				
	24		.706				
	25		.717				
	26		.790				
	27		.671				
	33			.824			
	34			.858			
	35			.884			
	36			.861			
	37			.826			
	38			.767			
	41			.711			
		Parental Control	Parent-Child Interaction	Effects of Use			

Table 3 shows that the MSUS scale consists of 6 factors and 24 items. The item loadings of the MSUS range from .588-.763 for factor 1, .601-.800 for factor 2, .763-.849 for factor 3, .725-.845 for factor 4, .782-.871 for factor 5, and

.707-.868 for factor 6, respectively. Factor 1, consisting of items 1, 4, and 9, is named 'Duration/Frequency'; Factor 2, consisting of items 16, 17, 19, 20, 21, 22, and 23, is named 'Content/Purpose'; Factor 3, consisting of items 27, 28, and 29, is named 'Interaction'; Factor 4, consisting of items 32, 33, and 34, is named 'Emotional Effect'; Factor 5, consisting of items 35, 36, 37, and 38, is named 'Physical Effect'; and Factor 6, consisting of items 40, 41, 42, and 44, is named 'Awareness/ Management'. The CSUS scale is seen to consist of 3 factors and 17 items. The item loadings for CSUS ranged from .682-.858 for factor 1, .563-.790 for factor 2, and .711-.884 for factor 3, respectively. Factor 1, consisting of items 7, 8, 9, 15, and 23, was named 'Parental Control'; Factor 2, consisting of items 11, 24, 25, 26, and 27, was named 'Parent-Child Interaction'; and Factor 3, consisting of items 33, 34, 35, 36, 37, 38, and 41, was named 'Effects of Use'. The factor numbers determined for MSUS and CSUS can also be seen in the slope plot (Figure 1).

Figure 1. *Category Probability Curves for the MSUS and CSUS (*)*



(*) The graph at the top belongs to MSUS, and the graph at the bottom belongs to CSUS.

Looking at Figure 1, it can be seen that the vertical axis represents the eigenvalues and the horizontal axis represents the factors. Each interval on the horizontal axis represents a factor (Çokluk et al., 2010). The graphs show that high-speed drops decrease after the sixth point for MSUS and after the fourth point for CSUS.

3.2. Reliability Analysis Findings

For MSUS and CSUS reliability analyses, Cronbach's alpha reliability coefficient, item-total score correlation, and discrimination test value for the upper and lower 27% percentile were calculated. The Cronbach's alpha reliability coefficient and item-total correlation analysis performed for MSUS are shown in Table 4.

Table 4. *Reliability Analysis Results for the MSUS*

Factor	Item	Corrected Item-Total Correlation	Cronbach's alpha	
Duration/Frequency	1	.365	.604	.844
	4	.348		
	9	.399		
Content/Purpose	16	.501	.851	
	17	.501		
	19	.522		
	20	.448		
	21	.589		
	22	.615		
	23	.479		
Interaction	27	.340	.776	
	28	.413		
	29	.274		
Emotional Effect	32	.247	.770	
	33	.204		
	34	.255		
Physical Effect	35	.421	.858	
	36	.440		
	37	.388		
	38	.373		
Awareness/Management	40	.427	.841	
	41	.386		
	42	.352		
	44	.309		

Table 4 shows that the Cronbach's alpha reliability coefficient for the entire MSUS is .844. The Cronbach's alpha reliability coefficients for the sub-dimensions of the MSUS are .604 for Duration/Frequency, .851 for Content/Purpose, .776 for Interaction, .770 for Emotional Effect, .858 for Physical Effect, and .841 for Awareness/Management. Since a Cronbach's alpha coefficient around .700 indicates sufficient reliability and around .800 indicates very good reliability (Kline, 2023), the MSUS scale is considered reliable. However, the item-total correlation values for the sub-dimensions were found to range from .365-.399 for Duration/Frequency, .448-.615 for Content/Purpose, .274-.413 for Interaction, .204-.255 for Emotional Effect, .373-.440 for Physical Effect, and .309-.427 for Awareness/Management. Since item-total correlation values above .200 indicate that the items are discriminatory (Tavşancıl, 2010), it can be said that the MSUS items are discriminatory.

The Cronbach's alpha reliability coefficient and item-total correlation analysis performed for CSUS are shown in Table 5.

Table 5. *Reliability Analysis Results for the CSUS*

Factor	Item	Corrected Item-Total Correlation	Cronbach's alpha	
Parental Control	7	.314	.824	.845
	8	.395		
	9	.485		
	15	.342		
	23	.370		
Parent-Child Interaction	11	.338	.751	
	24	.351		
	25	.305		
	26	.316		
	27	.286		
Effects of Use	33	.607	.920	
	34	.584		
	35	.649		
	36	.593		
	37	.603		
	38	.515		
	41	.530		

Table 5 shows that the Cronbach's alpha reliability coefficient for the entire CSUS is .845. The Cronbach's alpha reliability coefficients for the sub-dimensions of the CSUS are .824 for Parental Control, .751 for Parent-Child Interaction, and .920 for Effects of Use. Since a Cronbach's alpha coefficient around .700 indicates sufficient reliability and around .800 indicates very good reliability (Kline, 2023), the CSUS scale is considered reliable. Furthermore, the item-total correlation values for the sub-dimensions ranged from .314-.485 for Parental Control, .286-.351 for Parent-Child Interaction, and .515-.649 for Effects of Use. Since item-total correlation values above .200 indicate that the items are discriminatory (Tavşancıl, 2010), it can be said that CSUS items are discriminatory.

The t-test analysis of the differences in item scores between the 27% lower and upper groups of MSUS and CSUS is shown in Table 6.

Table 6. *Independent Samples t-Test Analysis of the Upper and Lower 27% Groups for the MSUS and CSUS*

Scale	Group	N	$\bar{X}$	s	t	sd	p
MSUS	Lower 27% Group	103	42.79	5.12	34.91	375	.001*
	Upper 27% Group	103	72.25	6.85			
CSUS	Lower 27% Group	103	45.54	4.86	40.59	375	.001*
	Upper 27% Group	103	72.30	4.59			

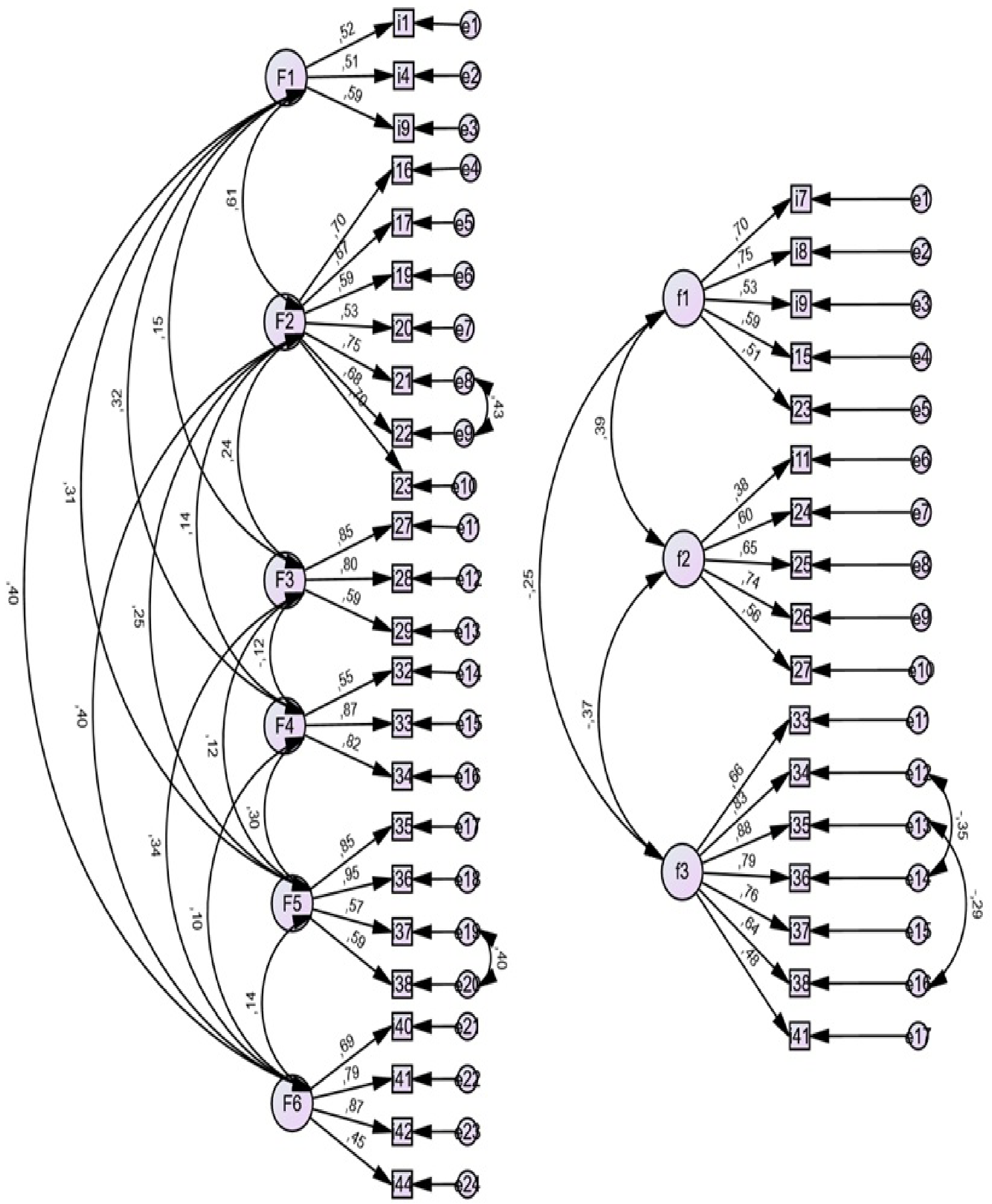
* p < .05

Table 6 shows a significant difference between the scores of the 27% lower and upper groups for both MSUS and CSUS (p<.05). Since the significant difference between the 27% lower and upper groups indicates high discriminatory power and good internal consistency (Büyüköztürk, 2010), MSUS and CSUS are seen to have discriminatory qualities.

3.3. Confirmatory Factor Analysis Findigs

Confirmatory factor analysis (CFA) was conducted to test the structural validity of the 24-item MSUS and the 17-item CSUS. The CFA was performed while taking into account certain proposed modifications between some variables, and no participants were excluded from the dataset due to outliers. The CFA diagrams for the MSUS and CSUS are shown in Figure 2.

Figure 2. *CFA Diagrams for the MSUS and CSUS (*)*



(*) The diagram on the left is the CFA diagram of the MSUS, and the diagram on the right is the CFA diagram of the CSUS.

When Figure 2 is examined, the factor loadings of the items for both scales are between .38 and .95, and these values are acceptable as they are above .30 (Tabachnick and Fidell, 2013). Similarly, the correlation between the factors for both scales is between .10 and .61, and these values are acceptable as they are below .85 (Kline, 2023). However, since the correlations between factors were not at a high level, a second-order factor analysis was not deemed necessary (Brown, 2015). For acceptable model-data fit in CFA, the goodness-of-fit values must be as follows: χ^2/sd ratio between 2-5 (below 2 is perfect fit), GFI, AGFI, NFI and CFI values above .90 (.80-.89 is acceptable fit and above .95 is perfect fit), and RMSEA, RMR and SRMR values below .08 (below .05 is perfect fit) (Erden et al., 2025; Hair et al., 2019). The goodness-of-fit values obtained from CFA for MSUS and CSUS are shown in Table 7.

Table 7. *Model Fit Indices for the MSUS and CSUS*

Scale	x^2/df	GFI	AGFI	NFI	CFI	RMSEA	SRMR
MSUS	1.440	.892	.863	.854	.949	.044	.054
CSUS	1.564	.915	.886	.870	.948	.051	.057

Table 7 shows that the goodness-of-fit values obtained from the CFA results for MSUS and CSUS (x^2/df<2; RMSEA and SRMR<.80; GFI, AGFI, NFI, CFI>.80) are at an acceptable level, and the structure is confirmed by these results (Erden et al., 2025; Hair et al., 2019). Furthermore, the AVE and CR values for convergent validity in CFA are presented in Table 8.

Table 8. *AVE and CR values for MSUS and CSUS*

Scale	Factor	AVE	CR
MSUS	Duration/Frequency	.54	.65
	Content/Purpose	.66	.84
	Interaction	.74	.79
	Emotional Effect	.74	.80
	Physical Effect	.74	.84
	Awareness/Management	.70	.80
CSUS	Parental Control	.62	.75
	Parent-Child Interaction	.57	.73
	Effects of Use	.72	.89

Table 8 shows that AVE values are greater than .50 and CR values are greater than .60. This indicates that the scale is reliable and valid (Hair et al., 2019; Nunnally & Bernstein, 1994).

3.4. Scoring and Interpretation of the Scales

In the evaluation of the MSUS scale; the lowest possible score in the Content/Purpose subscale is 7 and the highest is 35, the lowest possible score in the Awareness/Management and Physical Effect subscales is 4 and the highest is 20, and the lowest possible score in the Duration/Frequency, Interaction, and Emotional Effect subscales is 3 and the highest is 15. The lowest possible overall score is 24 and the highest is 120. As the overall score increases, it can be interpreted as a decrease in positive screen use or an increase in negative screen use.

In the evaluation of the CSUS scale; the lowest possible score in the Effects of Use subscale is 7 and the highest is 35, the lowest possible score in the Parental Control and Parent-Child Interaction subscales is 5 and the highest is 25. The lowest possible overall score is 17 and the highest is 85. As the overall score increases, it can be interpreted as an increase in positive screen use or a decrease in negative screen use.

4. Discussion, Conclusion, and Recommendations

The aim of this study is to develop two valid and reliable scales to determine the screen use of mothers and their 4 and 5-year-old children. The development process for the Mother Screen Use Scale (MSUS) and the Child Screen Use Scale (CSUS) involved a step-by-step item pool creation, expert opinions for content and face validity, a pilot study, and construct validity and reliability analyses. The exploratory factor analysis revealed that the MSUS consists of 6 factors and 24 items, and the CSUS consists of 3 factors and 17 items. The confirmatory factor analysis showed acceptable fit index values, confirming the intended constructs. Cronbach's alpha reliability coefficients were .844 for the MSUS and .845 for the CSUS, and item-total correlations were found to be significantly above .30. Furthermore, a significant difference of 27% was detected between the upper and lower groups. Based on the findings, two valid and reliable scales were developed to measure mothers' screen use and the screen use levels of 4 and 5-year-old children.

Regarding screen use, the effects of different screen types (smartphones, tablets, televisions, and computers), durations (active and passive screen time), content (interactive and non-interactive), use of screens alone or in combination, and multiple screen use on children and mothers have not been clearly determined (Muppalla et al., 2023). It is necessary to characterize children's and mothers' screen use as positive or negative in terms of screen time, screen content, and interactive use (Ophir et al., 2021). Since it is believed that the uncertainties regarding the measurement of contextual dimensions of screen use can be addressed with the developed measurement tool, MSUS and CSUS are thought to fill a significant gap in the literature.

This research was developed by applying MSUS to mothers and CSUS to 4 and 5-year-old children attending preschool education. Within the context of this research, a tool can be developed to measure fathers' screen usage. However, this research could be replicated with children in different age groups (such as elementary school students and adolescents) and those with special needs. Using these scales, the relationships and effects of screen use in different contexts (cognitive, language, and socio-emotional development) can be examined, as well as the relationship between screen use and variables considered potentially related to screen use—such as temperament, and father's and/or sibling's screen use.

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