Development of the 'Teacher Self-Efficacy Scale on Activities Supporting Motor Development (MSS-S)' in Preschool Education

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The main aim of this study was to develop a comprehensive scale to assess preschool teachers' self-efficacy to facilitate motor development activities. Scale validation was assessed through content, construct, and criterion validity, while reliability was determined through Cronbach's alpha and test-retest analyses. It was found that the content validity ratio of the items exceeded the threshold of 0.56 after content validity analysis. In addition, the content validity index for the scale was calculated to be a robust 0.903. A sample of 361 preschool teachers were then administered the scale. Exploratory factor analysis (EFA) was performed on the data obtained. The results of the EFA showed that the factor loading values ranged from 0.52 to 0.83. Following the EFA, a confirmatory factor analysis (CFA) was carried out, which resulted in a $\chi2/df$ value of 1.657. Other goodness of fit indices were as follows: GFI=0.90, TLI=0.94, IFI=0.95, CFI=0.95, RMSEA=0.043, SRMR=0.052. Overall, the scale explained 51.242% of the total variance. Consequently, the initial form was refined into a 27-item, 3-factor structure as a result of factor analysis. In terms of the criterion validity analysis, a significant positive relationship emerged between the scale and a comparable instrument measuring a related construct. Furthermore, regarding reliability analysis, the scale showed a high Cronbach's Alpha reliability coefficient of 0.88. The scale's test-retest reliability was confirmed with an intraclass correlation coefficient (ICC) of 0.77. In conclusion, this study provided a scale that can be deemed both valid and reliable for the assessment of the self-efficacy of preschool teachers in implementing motor development activities.

Introduction

From the moment they are born, babies have some control over their bodies. However, this control is limited. The development of motor skills in the first few years of a child's life is

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crucial for them to be independent individuals in the next stage (Stephani et al, 2018). The preschool years are known to be the golden age for the development of motor skills. During this period, participation in activities that support children's motor skills is crucial for laying the foundations of specialised movement forms that they will use in later stages for physical activity and sports skills (Engel et al., 2018; Shenouda et al., 2021). In the process of supporting children's development, teachers are one of the most fundamental elements of education when it comes to the implementation of these planned activities (Exley, 2016; Güneş, 2014; Kaur, 2019; Şişman, 2007). In the education process, which is a concept encountered in every aspect of life, teachers have a crucial role in the enhancement of the expected quality (Buldu, 2014; Doğan, 2015; Şimşek, 2012). Teachers are no longer seen as individuals who simply transmit knowledge, but rather as individuals who serve as role models and have a significant impact on their students' development (Oktay, 2015). In this context, teaching is a multifaceted profession encompassing educator, advisor, and coordinator roles (Xhemajli, 2016). Teaching requires significant competencies from individuals practicing it in various aspects (Verešová & Malá, 2012). The competence of a teacher is based on two dimensions: the instructional competence and the personal competence. The first dimension has to do with the motivation of students for learning. The second dimension is related to personal beliefs in the transfer of instructional behaviours that have an impact on students' learning (Shaukat & Iqbal, 2012). Besides the competencies that teachers possess to perform their profession effectively, their perceived self-efficacy also constitutes an important factor (Kurt, 2012; Yeşilyurt, 2013). Self-efficacy beliefs tend to be higher among teachers who perceive themselves as competent in their profession. These beliefs are found to affect their job satisfaction (Kasalak & Dağyar, 2020). The concept of self-efficacy was introduced by Bandura and is associated with an individual's ability to have an accurate assessment of their own abilities (Bandura, 1982). While terms such as self-confidence and self-esteem are sometimes used interchangeably, self-efficacy specifically refers to an individual's beliefs about his or her ability to perform a particular task (Hussain & Khan, 2022; Senemoğlu, 2015). The concept of self-efficacy concerns individuals' abilities to organise their plans, thoughts or actions, as well as strategies to cope with efforts and challenges (Tschannen-Moran & Hoy, 2007). Self-efficacy theory suggests that by establishing and reinforcing expectations of personal efficacy, coping behaviour can be changed. Perceptions of efficacy can influence behaviour in a variety of ways, such as through the selection of activities and environmental settings (Bandura, 1978). Self-perceptions of efficacy revolve around an individual's belief in his or her ability to successfully perform the necessary behaviour to achieve a particular outcome. Expectations of efficacy play a role in determining an individual's choice of activity, level of effort, and persistence in the face of obstacles or negative stimuli (McAuley, 1985). The degree to which you believe in yourself influences your choices, the intensity of your effort, and your persistence, especially during difficult times. Feeling more confident tends to lead to greater determination in overcoming challenges (Bandura & Adams, 1977). Self-efficacy involves judging one's own ability to effectively organise and carry out the actions needed to cope with future situations characterised by many ambiguous, unpredictable, and often stressful components (Bandura & Schunk, 1981). In order to be effective and successful in any endeavour, a strong belief in one's own abilities is crucial. An individual's thoughts, beliefs, and feelings have an impact on his or her behaviour. In this regard, believing in self-efficacy constitutes a key factor at the core of human action (Arifin et al., 2020; Cocca et al., 2018). Teachers' beliefs about their self-efficacy are very important both for their professional development and for the achievement of desired changes in students' behaviour and achievement (Dellinger et al., 2008; Guo et al., 2011; Lazarides & Warner, 2020; Martin & Mulvihill, 2019; Zhou et al., 2020). In many studies, teacher self-efficacy has been shown to

be positively correlated with students' academic adjustment, teachers' behavioural patterns, and practices related to the quality of teaching. It is also associated with factors that contribute to teachers' psychological well-being, such as personal satisfaction, job satisfaction and commitment (Corry & Stella, 2018; Friedman & Kass, 2002; Mojavezi & Poodineh Tamiz, 2012; Perera, Calkins & Part, 2019; Skaalvik & Skaalvik, 2010; Vieluf, Kunter, van de Vijver, 2013; Zee & Koomen, 2016).

Preschool education is an educational process that contributes significantly to the development of children compared to other levels of education. It is during this period that the most important stages of the life of a human being take place (Ertan, 2016). Preschool teachers' self-efficacy perceptions play an important role in achieving desired goals in preschool education. One of the most fundamental factors affecting the quality of preschool education and children's development is the characteristics of preschool teachers. In this process, teachers are expected to enhance children's existing skills and help them acquire new skills on the basis of their individual development characteristics, needs and abilities (Republic of Turkey Ministry of National Education, 2013). Teachers' continuous self-improvement, cultivation, and openness to innovation enable students to reach higher levels according to the evolving and changing world (Yılmaz et al., 2016). Preschool teachers are well aware of children's developmental domains when they have high self-efficacy beliefs. As a result, they can prepare plans with activities that have an impact on and support children's developmental domains (Republic of Turkey Ministry of National Education, 2016). Pre-primary education is too important and too valuable to be left to chance. The knowledge, skills and habits that are acquired during this period form the basis for the later stages of children's development. Motor development refers to the organism's acquisition of voluntary mobility, which occurs as the body grows and the central nervous system develops. This process continues throughout the entire life of an individual (Gümüşdağ & Yıldırım, 2018). The domain of motor development is an important area of development that enables children's exploration and understanding of their environment. During this period, activities that support motor development are crucial for healthy growing and developing (Topkaya, 2014). In this context, teachers play a crucial role in the planning, preparation, and implementation of purposeful activities to support children's motor development during the educational process. Teachers' attitudes, opinions, and perceptions regarding the preparation of motor development activities, in other words, their self-efficacy beliefs, are of great importance for achieving the targeted goals related to motor development in preschool education (Kadim, 2013).

Purpose and Significance of the Study

Teachers' self-efficacy perceptions play a crucial role in supporting children's development in the preschool years, according to a review of the relevant literature. The quality of educational and teaching processes designed for children is directly influenced by teachers' high self-efficacy perceptions. Motor development during the critical period of early childhood has a direct impact on all other areas of development. The implementation of quality motor development activities by teachers from the early years not only contributes to children's healthy growth and development, but also lays the foundation for the skills they will acquire in the future. In this context, the study of teachers' perceptions of self-efficacy in relation to motor development activities that are critical for children to be supported is of great importance. It helps to understand teachers' behavior, the quality of the activities implemented and their impact on the children. In the literature of this field, it is observed that there are several measurement tools available to examine preschool teachers' self-efficacy (Buldur, 2014; Çam, 2013; Çapa et al., 2005; Gençtürk et al., 2010; Kadim, 2012; Koç et al.,

2015; Tepe & Demir, 2012; Tortpo & Yılmaz, 2018). As no measurement tools or previous studies have focused on assessing preschool teachers' self-efficacy specifically in the context of activities that support motor development, this study addressed an important gap in the existing literature. To fill this gap, the study aimed to develop a scale that could effectively measure preschool teachers' self-efficacy in this area. By conducting this scale development study, the research aimed to address the need for a reliable and valid measurement tool that could assess the self-efficacy of preschool teachers in relation to motor development-supporting activities. It was anticipated that the literature would be innovative and make a significant contribution to the field with the introduction of this measurement tool. It was also expected to add to the diversity of studies conducted on this topic through the use of this measure in future research.

Method

Research Model

This study is a scale development study. It aims to measure the self-efficacy of preschool teachers in supporting motor development activities. The following information is provided regarding the study group, the development of the measuring instrument, and the techniques used to analyze the data.

Participants

The study group consisted of 361 preschool teachers. Purposive sampling was used to select the participants. Purposive sampling was used to ensure that participants met specific criteria relevant to the research objectives. Using this method, the study group was determined based on criteria such as being a preschool teacher, actively working in the field, and voluntarily participating in the research. There is variability in the optimal ratio of subjects to sample size in many studies. In a study conducted by Anthonie et al. (2014), it is pointed out that the subject/sample size ratio varies from 1.2 to 10 times in the studies. In a study by White (2022) it is stated that 89% of the articles under review had a sample size greater than 100. It is mentioned that study sample size should be at least 5 times the number of scale items (Büyüköztürk et al., 2014; Erkuş, 2012). Therefore, the number of participants in the study group was determined to be at least 10 times the number of items in the scale. The demographic characteristics of the participants were as follows: 93.6% (n=338) were female. The majority of the participants (36.3%) belonged to the age group of 26-30, followed by those aged 21-25 with a percentage of 28%. Of the participants, 80.3% (n=290) were graduates with a Bachelor's degree. In terms of work experience, the majority of participants (33%) have had 2-4 years of work experience. A significant proportion of the participants (49.3%) work with children between the ages of 49-60 months and 93.6% of them work in official pre-schools affiliated to the Ministry of National Education. The Marmara region accounts for the majority of participants (32.1%). Participants working in districts represent 42.7% of the total. The majority of them are permanent teachers (47.4%). 60.9% of the participants stated that they had not taken part in any training related to motor skills in the past.

Scale Development Process

The development of a robust scale involves three stages: item development, scale development and scale evaluation (Boateng et al., 2022). In this context, the scale development process consists of three stages: item/question pool creation, scale construction,

and scale finalization. Each stage is further divided into sub-stages. Figure 1 illustrates the scale development process.
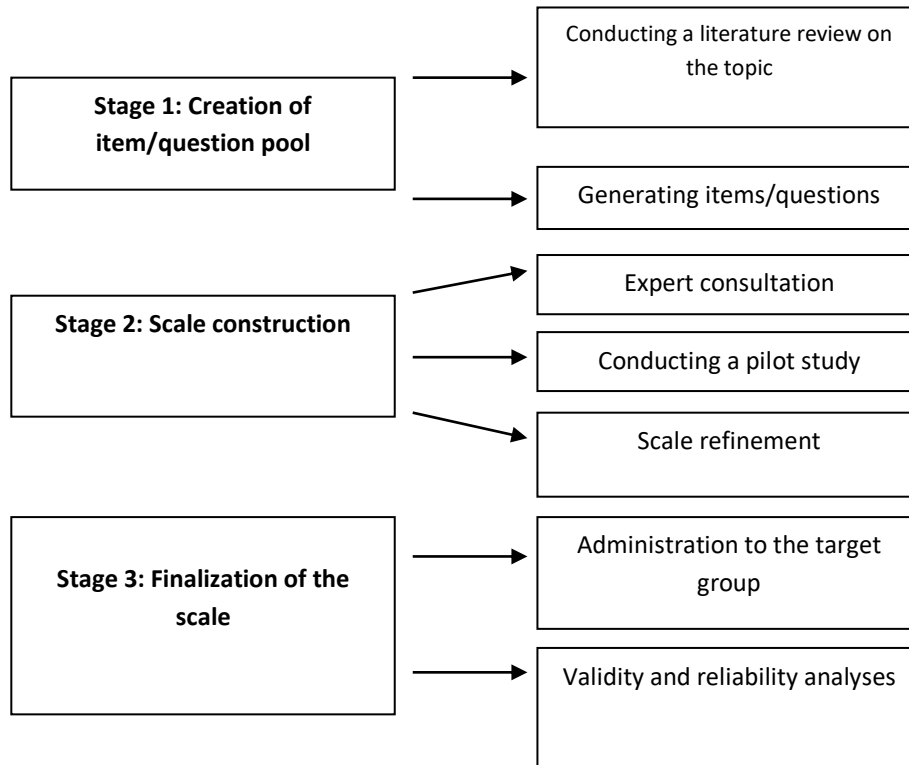

Figure 1. Scale Development Stages

As observed, the scale development process consisted of three stages, as shown in Figure 1. In this context, a review of the national and international literature on the subject was carried out in the first stage, which is the creation of the item/question pool. The dimensions of teacher self-efficacy and the target behaviors covered by these dimensions have been the subject of research. As a result of the review, a draft form was created. It consisted of 72 items based on the target behaviors. The high number of items in the initial phase was maintained. This was because some of the items in the created form could be eliminated during the analysis phase. In order to increase validity and reliability during the form development process, similar questions measuring the same construct were included. Negative items were also included. When writing the items, care was taken to use simple and understandable language. Each item focused on measuring only one construct.

In the second stage of the study, the process of scale construction, the 72-item form was presented to twelve experts for their opinion. Two of the experts are professors in the field of child development, six are associate professors in the field of early childhood education, two are associate professors in the field of child development and two are associate professors in the field of preschool education. The opinions of the 12 experts were evaluated. The content validity ratios of the items were found to be higher than 0.56. The CVI of the scale is 0.903. The CVI of the scale is 0.903. Based on the 12 experts involved in the evaluation, the items with CVR values greater than 0.56 were considered to have content validity and therefore no items were removed from the form. As a result of the feedback received from the experts, revisions were made to the items in the form. The revised items in the form were converted to a 5-point Likert scale format. In this scale, item responses are rated as 'always (5)', 'often (4)', 'sometimes (3)', 'rarely (2)' and 'never (1)'. Subsequently, a pilot study was conducted using the developed scale form and administered to 50 preschool teachers to assess the

comprehensibility of the form. Based on the feedback received, the form was prepared for the validity and reliability study. In the third stage of the study, the form was administered to 361 preschool teachers for the purpose of conducting validity and reliability studies. Due to the coincidence with the Covid-19 pandemic, the data was collected online using Google Forms. The data collection was based on voluntary participation. The necessary ethical approvals were obtained prior to data collection. Once the form was administered, the data analysis process was initiated.

Data Analysis

The study used SPSS and AMOS software for data analysis. Several validity tests were carried out to assess the quality of the scale, including content validity, construct validity and criterion validity. The content validity ratio (CVR) and the content validity index (CVI) were calculated. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's sphericity test were used in the exploratory factor analysis to assess the sampling adequacy and the presence of correlations among the items. Confirmatory factor analyses were then carried out. The variance explained by the scale was also calculated, indicating the proportion of total variance accounted for by the identified factors. Criterion validity was examined by conducting a Pearson correlation analysis between the developed scale and a similar measurement scale for the target construct. Reliability analysis was carried out to assess the internal consistency and stability of the scale. Cronbach's alpha coefficient was calculated to assess the internal consistency of the scale and its subscales. Test-retest reliability was assessed by comparing scores obtained from the scale on two different occasions using the intraclass correlation coefficient (ICC). Descriptive statistics were also used to examine the relationships between the subscales of the scale, providing additional insight into the interrelationship of the factors being measured.

Findings

The findings of the study were presented under separate headings based on the results of the validity and reliability analyses conducted during the scale analysis process. First, descriptive findings about the scale and its subscales were presented. Then, the findings related to validity and reliability were discussed. Table 1 presents the descriptive statistical findings for the scale and its subscales.

Table 1 *Descriptive Statistics for Scale and Subscales*

Scale-Subscales	Mean	Standard Deviation	Minimum	Maximum
Self-efficacy for planning and implementation	65,00	4,87	42	70
Self-efficacy for assessment	19,91	3,23	10	25
Professional self-efficacy	29,94	6,31	8	40
Scale total	114,85	10,74	79	135

Table 1 shows the results of the sub-dimensions of the scale and the total scores. The sub-dimension of self-efficacy for planning and implementation consists of 14 items with a possible score range from 14 to 70. The average score of the participants in this sub-dimension is reported as 65.00±4.87. The highest score achieved by a participant in this sub-dimension is 70, while the lowest score is 42.

The second sub-dimension, self-efficacy for assessment, consists of 5 items with a score range from 5 to 25. The mean score for this sub-dimension is 19.91±3.23. The highest score in this sub-dimension is 25 and the lowest score is 10.

The third sub-dimension, professional self-efficacy, consists of 8 items with a score range from 8 to 40. The average score for this sub-dimension is 29.94±6.31. The highest score in this sub-dimension is 40 and the lowest score is 8.

The total scale consists of 27 items with a possible total score ranging from 27 to 135. The average total score of the participants on the scale is reported as 114.85±10.74. Participants' scores range from a high of 135 to a low of 79 on the scale.

Findings of the Validity Analysis of the Scale

This section presents the results of the analysis of the validity of the scale. In this context, the findings relating to the content validity, construct validity and criterion validity of the scale are presented below under separate headings.

Findings of Content Validity

During the scale development process, a draft form consisting of 72 items was prepared according to the relevant literature in the field. The draft form was sent to 12 experts in the field. The experts were asked to rate each item on a four-point scale based on its degree of measurement. The Davis technique was used for content validity. According to this technique, a minimum CVR value of 0.56 is expected in the presence of 12 experts. A CVI greater than 0.80 is considered sufficient for the content validity of an item (Davis, 1992). Based on this information, Table 2 presents the results of the CVR and CVI values for the scale items.

Table 2 *Validity Ratios for Scale Items*

Item No.	CVR	Item No.	CVR	Item No.	CVR	CVI
1	0,917	25	0,833	49	1,000	
2	0,917	26	1,000	50	0,917	
3	0,833	27	1,000	51	0,917	
4	0,750	28	1,000	52	1,000	
5	0,833	29	0,917	53	0,750	
6	0,917	30	1,000	54	1,000	
7	0,917	31	0,833	55	0,917	
8	0,750	32	0,917	56	0,917	
9	0,917	33	1,000	57	0,667	
10	0,833	34	0,917	58	1,000	
11	0,833	35	0,750	59	1,000	
12	1,000	36	1,000	60	0,917	
13	0,917	37	0,917	61	0,917	0,903
14	1,000	38	0,917	62	1,000	
15	0,667	39	0,917	63	0,750	
16	1,000	40	0,917	64	1,000	
17	0,917	41	1,000	65	0,833	
18	1,000	42	0,917	66	0,917	
19	0,833	43	0,833	67	0,833	
20	1,000	44	0,833	68	0,917	
21	0,833	45	0,833	69	0,833	
22	1,000	46	0,917	70	0,833	
23	0,917	47	0,917	71	0,917	
24	0,917	48	0,750	72	1,000	

Looking at Table 2, it can be seen that the content validity ratios for all the items are greater than 0.56. The content validity index of the scale is 0.903. In this respect, it is accepted that all items are sufficient in terms of content validity and no items have been removed from the scale.

Findings of Construct Validity

Exploratory Factor Analysis

The data for this study were collected from a sample of 361 participants. In order to analyse this data set, an exploratory factor analysis was carried out using the principal components method for factor extraction. The varimax rotation method was used with no restriction on the number of factors. Two statistical tests were used to assess the suitability of the data for exploratory factor analysis: the Kaiser-Meyer-Olkin (KMO) test and Bartlett's sphericity test. Table 3 shows the results of these two tests.

Table 3 *Results of KMO ve BartlettTests*

Kasiyer Meyer Olkin (KMO)		0,925
Bartlett Sphericity Test	X^2	4336,620
	Sd	351
	p	0,000***

*:p<0,05   **:p<0,01   ***:p<0,001

Before conducting factor analysis, it is crucial to assess the Kaiser-Meyer-Olkin (KMO) value, which reflects the extent to which the variables within the scale can effectively predict each other. A high KMO indicates strong relationships between the variables, making factor analysis an appropriate approach. Conversely, a KMO value close to zero indicates a lack of coherence between the variables, making factor analysis inappropriate. Specifically, if the KMO value falls below 0.50, it is not advisable to proceed with factor analysis (Çokluk et al., 2012).

Table 3 shows a remarkably high KMO value of 0.925. This high KMO value strongly suggests that the results of the factor analysis applied to the data set are both valuable and reliable for the purposes of the study.

Furthermore, the results of Bartlett's sphericity test indicate the existence of significant and robust relationships between the variables (X^2: 4336.620, df: 351, p<0.001). This further confirms the suitability of the data for factor analysis. Consequently, these results provide robust support for the inclusion of the factor analysis results in Table 4.

Table 4 *Scale Factors and Total Variances*

Sub-Dimension	Item No.	Item Load	Eigenvalue	Proportion Explained	Variance
Self-efficacy for planning and implementation	13	0,743			
	12	0,718			
	11	0,697			
	7	0,679			
	2	0,677	6,284	23,273	
	9	0,656			
	3	0,652			
	6	0,649			
	10	0,613			
	4	0,605			
	8	0,595			
	5	0,545			
	1	0,522			
Self-efficacy for assessment	18	0,761			
	19	0,740			
	17	0,717	3,169	11,736	
	16	0,678			
	15	0,609			
Professional self-efficacy	23	0,829			
	25	0,794			
	27	0,777			
	24	0,707	4,383	16,233	
	20	0,692			
	22	0,677			
	21	0,660			
	26	0,608			
Total				51,242	

In Table 4, the 27-item scale was successfully reduced to three sub-dimensions, with factor loadings above 0.50 for all items. These three sub-dimensions are self-efficacy for planning and implementation (14 items), self-efficacy for assessment (5 items) and professional self-efficacy (8 items).

In the sub-dimension of self-efficacy for planning and implementation, which accounts for 23.27% of the variance, the factor loadings of the items range from 0.522 to 0.743. The sub-dimension of self-efficacy for assessment explains 11.73% of the variance and consists of 5 items, with factor loadings ranging from 0.609 to 0.761. The sub-dimension of professional self-efficacy explains 16.23% of the variance and consists of 8 items, with factor loadings ranging from 0.608 to 0.829.

The full scale consists of 27 items. It explains 51.24% of the total variance. The factor loadings for these items range from 0.522 to 0.829. An important criterion in factor analysis is that the variance explained should exceed 50% of the total variance. If the constructed factor structure explains less than half of the total variance of the variable, it would not be accurate to claim that it is representative (Yaşlıoğlu, 2017).
Based on these findings, it can be confidently concluded that the scale has variance validity as it explains a significant amount of the total variance and has satisfactory factor loadings for all items.

The relationship between the scale and its sub-dimensions was examined by means of inter-factor correlations. The results are presented in Table 5.

Table 5 *Correlation Values between the Scale and Sub-Dimensions*

Sub-Dimension		Self-efficacy for planning and implementation	Self-efficacy for assessment	Professional self-efficacy	Teacher self-efficacy scale for supporting motor development
Self-efficacy for planning and implementation	r	1	0,541	0,328	0,809
	p		0,000*	0,000*	0,000*
Self-efficacy for assessment	r		1		0,606
	p				0,000*
Professional self-efficacy	r		0,103	1	0,767
	p		0,051		0,000*
Teacher self-efficacy scale for supporting motor development	r				1
	p				

*:p<0,05

According to Table 5, the applied Pearson correlation analysis shows a significant positive relationship (p<0.05) between the teacher self-efficacy scale for supporting motor development and the sub-dimensions. This indicates that there is a meaningful correlation between the scale measuring self-efficacy in motor development activities and the sub-dimensions.

Comfirmatory Factor Analysis

Confirmatory factor analysis (CFA) is a factor analysis method used to test the fit of factors identified from exploratory factor analysis to the hypothesized factor structure (Yaşlıoğlu, 2017). In this study, CFA was conducted on 361 participants using IBM SPSS AMOS 23 software.

At the initial stage, a first-order CFA model (Figure 2) was created with three latent variables (F1, F2, F3) representing the factors and indicators representing the expressions that make up these factors. Since latent variables are not metric, in order to estimate the parameter values, it was necessary to ensure that either one of the paths drawn from the latent variables to the observed (indicator) variables was assigned a value of 1 (setting the factor loading equal to 1), or that the variance of the latent variable was assigned a value (usually 1) (Haig, 2005).

In the second stage, the model estimation process used the maximum likelihood method, a widely used technique in structural equation modelling. This method is used to estimate a number of parameters, including the errors associated with the observed variables, the variances of the latent variables, and the regression coefficients for the paths from the latent variables to the observed variables. To improve the model fit, adjustments were made by identifying and addressing high modification indices, thereby improving the model fit indices. Specifically, a bidirectional relationship was established between the error terms of items 'S2' and 'S3' in the 'self-efficacy for planning and implementation' sub-dimension and items 'S21', 'S22', 'S24' and 'S26' in the 'professional self-efficacy' sub-dimension. In addition, a relational structure was created between the dimensions in order to determine the correlations between the dimensions. These modifications aimed to improve the fit indices of the model and provide a better explanation of the relationships between the dimensions. The revised model incorporating these modifications was analysed to assess its fit to the data. Figure 2 shows the resulting relational structure between the dimensions, reflecting the revised model with the modifications made. The fit indices of the revised model were evaluated to determine the goodness of fit and to confirm the factor structure identified by EFA.
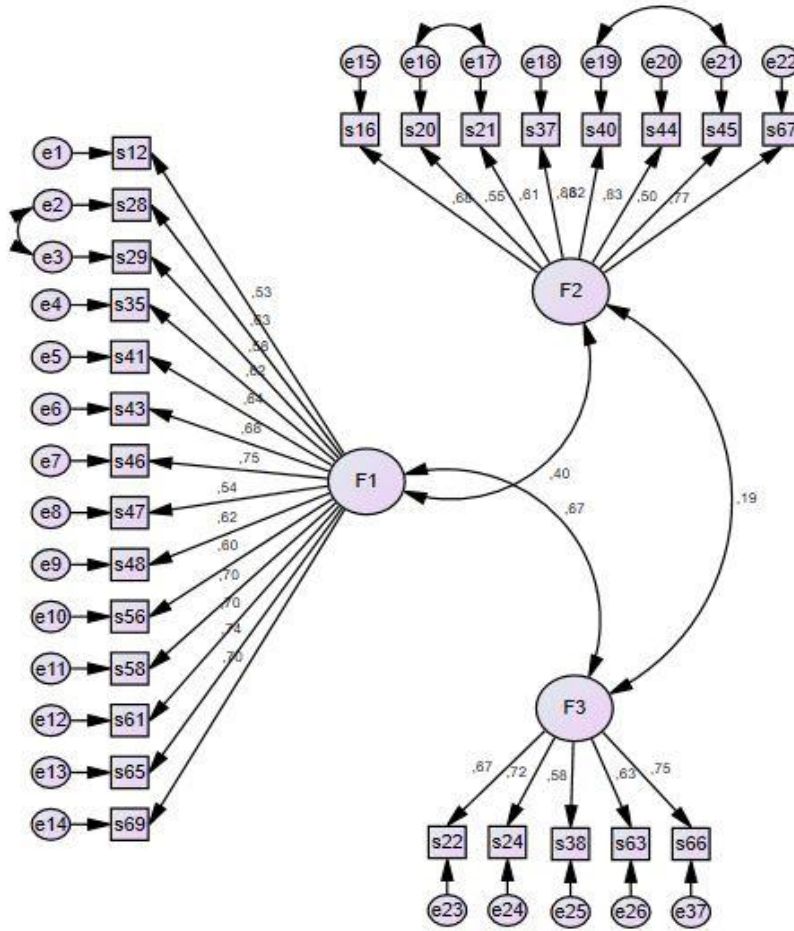
Figure 2. CFA Model

Finally, the goodness of fit indices of the three-dimensional first-order CFA model were examined. Examining the results from Figure 2, it can be seen that the three-factor structure of the teacher self-efficacy scale for supporting motor development, consisting of 27 items and three dimensions, generally provides a good fit.

Table 6 presents the results of the goodness of fit indices and their corresponding ranges used in the study.

Table 6 *Goodness-of Fit Indices Used in the Study and Acceptable Value Ranges*

Indices	Good Fit	Acceptable Fit	Results
χ^2/df	$0 \leq \chi^2/df \leq 3$	$3 \leq \chi^2/df \leq 4$	1,657
GFI	$0.95 \leq GFI \leq 1$	$0.90 \leq GFI \leq 0.95$	0,902
TLI	$0.95 \leq TLI \leq 1$	$0.90 \leq TLI \leq 0.95$	0,944
IFI	$0.95 \leq IFI \leq 1$	$0.90 \leq IFI \leq 0.95$	0,950
CFI	$0.95 \leq CFI \leq 1$	$0.90 \leq CFI \leq 0.95$	0,949
RMSEA	$0 \leq RMSEA \leq 0.05$	$0.05 \leq RMSEA \leq 0.08$	0,043
SRMR	$0 \leq SRMR \leq 0.08$	$0.05 \leq SRMR \leq 0.10$	0,052

According to the results of the factor analysis presented in Table 6, the obtained goodness of fit values indicate that the factor a χ^2/df value is 1.657. Furthermore, the other goodness of fit indices are determined as GFI=0.90, TLI=0.94, IFI=0.95, CFI=0.95, RMSEA=0.043 and SRMR=0.052. These values are considered acceptable in the literature (Meydan & Şeşen,

2011; Hu & Bentler, 1999; Tabachnick & Fidell, 2001). The obtained goodness of fit indices show that the scale is in good agreement with the data and the analyses conducted are reliable. Based on these results, it can be stated that the teacher self-efficacy scale for supporting motor development is an acceptable scale.

Criterion Validity Findings

The study used the 'Preschool Play Teaching Self-Efficacy Questionnaire', developed by Kadim (2012), to assess criterion validity. This questionnaire, which measures a similar construct to the scale to be developed, was administered to 361 preschool teachers. The correlation analysis between the scale to be developed and the scale measuring a similar construct is presented in Table 7.

Table 7 *Criterion Validity*

		Self-efficacy scale for planning play activities
Teacher self-efficacy scale on	r	0,471
activities supporting motor development	p	0,000*

*p<0,05

Based on the results of the Pearson correlation analysis shown in Table 7, there is a significant positive correlation between the two measures (p<0.05). This finding indicates that the two scales measure a similar construct and show a consistent relationship between them.

Reliability Findings

In the study, the reliability of the scale was assessed using both Cronbach's alpha coefficient and test-retest reliability analysis. The results of these assessments are presented separately in the following sections.

Cronbach's Alpha Reliability Findings

Cronbach's alpha is a method of assessing reliability based on a single administration and provides an indication of the internal consistency of the scale. The results of the alpha values for both the subscales and the total scale are shown in Table 8.

Table 8 *Reliability of the Scale and Subscales*

Sub-Dimensions	Item No.	Item Cronbach's Alpha	Cronbach's Alpha
	i1	0,882	
	i2	0,881	
	i3	0,881	
	i4	0,881	
	i5	0,880	
	i6	0,880	
Self-efficacy for planning and implementation	i7	0,879	0,907
	i8	0,882	
	i9	0,881	
	i10	0,881	0,885
	i11	0,880	
	i12	0,880	
	i13	0,880	
	i14	0,879	

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Self-efficacy for assessment	i15	0,881	
	i16	0,880	
	i17	0,888	0,791
	i18	0,883	
	i19	0,880	
Professional self-efficacy	i20	0,879	
	i21	0,883	
	i22	0,880	
	i23	0,877	0,871
	i24	0,883	
	i25	0,875	
	i26	0,888	
	i27	0,877	

Cronbach's alpha values are usually considered acceptable when they exceed 0.70 (Nunnally, 1978: 245-246). A good indicator of reliability is an item-total score correlation coefficient of 0.30 or higher (Alpar, 2012; Şencan, 2005).

When examining Table 8, it can be seen that the items in the self-efficacy for planning and implementation subscale have alpha values ranging from 0.879 to 0.882, and the total alpha value obtained from this subscale is 0.907. Therefore, it can be concluded that the subscale and its items have high alpha reliability values, indicating good internal consistency.

According to the results presented in Table 8, when evaluating the self-efficacy for assessment subscale, it is observed that the alpha values of the scale items range from 0.880 to 0.888. The total alpha reliability value for this subscale is 0.791. Therefore, it can be concluded that the subscale and its items have high alpha reliability values, indicating good internal consistency.

Similarly, when looking at Table 8, it can be seen that for the professional self-efficacy subscale, the alpha values of the items range from 0.875 to 0.888, and the alpha value for the subscale is 0.871. This indicates that the subscale and its items have high alpha reliability values.

Furthermore, the overall alpha reliability coefficient for the entire scale is 0.885, which indicates a very good level of reliability.

The Test-Retest Reliability Findings

The test-retest reliability of the study was carried out after 21 days. The results are shown in Table 9.

Table 9 *Test-Retest Reliability Findings*

	Mean	**Standard Deviation**	**Minimum**	**Maximum**	**ICC**
Pretest	102,80	8,69	87	134	0,773
Posttest	103,67	6,55	87	114	

As can be seen from the results presented in Table 9, the Intraclass Correlation Coefficient (ICC) obtained from the test-retest analysis for the scale was 0.773. This value indicates an acceptable level of agreement, confirming the reliability of the scale in terms of repeatability and stability over time.

Discussion and Conclusion

The study was conducted as a scale development study to assess the self-efficacy of preschool teachers in relation to activities that support motor development. In the existing literature, several measurement tools are available to assess the self-efficacy of preschool teachers in this context (Buldur, 2014; Çapa, Çakıroğlu, & Sarıkaya, 2005; Çam, 2013; Gençtürk et al., 2010; Kadim, 2012; Koç et al., 2015; Tepe & Demir, 2012; Tortop & Yılmaz, 2018). However, no measurement tool has been found that specifically assesses preschool teachers' self-efficacy regarding activities that support motor development. The preschool period is considered the golden age of motor development. During this period, it is crucial to engage children in activities that promote their motor skills and lay the foundation for specialised forms of movement that they will use later for physical activity and sports skills (Engel et al., 2018; Shenouda et al., 2021). In the process of supporting children's development, teachers play an important role in the implementation of planned activities (Exley, 2016; Güneş, 2014; Kaur, 2019; Şişman, 2007). In addition to their competencies, teachers' self-efficacy perceptions are also important for them to perform their profession effectively (Kurt, 2012; Yeşilyurt, 2013). Preschool teachers with high self-efficacy beliefs in early childhood education can effectively prepare plans that include activities that affect and support children's developmental domains, as they have a good understanding of these domains (Republic of Turkey Ministry of Education, 2016). In early childhood education, teachers play an important role in planning, preparing and implementing motor development activities to achieve motor development goals. In this study, a scale development study was conducted to measure the self-efficacy of preschool teachers in supporting motor development activities. Validity analyses included content validity, construct validity and criterion validity, while reliability analyses included Cronbach's alpha coefficient and test-retest reliability using ICC.

According to the study results, all items showed a content validity ratio greater than 0.56, indicating good content validity. The scale showed strong content validity with a content validity index of 0.903. Exploratory factor analysis revealed a three-factor structure of 27 items, effectively reducing the original 72-item version. Factor loadings for the scale exceeded 0.500, indicating a robust relationship between items and their respective factors. Confirmatory factor analysis yielded favourable fit indices, including a $\chi2/df$ value of 1.657, as well as other fit indices (GFI=0.90, TLI=0.94, IFI=0.95, CFI=0.95, RMSEA=0.043, SRMR=0.052), which together indicated a strong fit for the proposed factor structure. Criterion validity analysis revealed a positive and significant correlation between the developed scale and another similar scale measuring the same construct. This finding supports the criterion validity of the newly developed scale. Reliability analysis indicated that the scale had strong internal consistency, as evidenced by a Cronbach's alpha coefficient of 0.88, indicating robust inter-item correlations within each sub-dimension. In addition, test-retest reliability, as measured by the ICC, yielded a value of 0.773, indicating satisfactory stability over time. These results indicate that the scale is reliable and consistent in its assessment of preschool teachers' self-efficacy in facilitating motor development activities. Based on the findings of the study, the following recommendations are made:

- The study conducted a scale development study using data from 361 preschool teachers. In future studies, research could be conducted with a larger sample group.
- The study developed a self-efficacy scale regarding motor development activities for preschool teachers. In future studies, different measurement tools could be developed to assess teachers' competence in motor development or other activities.

- The majority of participants in the study are female teachers. In future studies, data could also be collected from male teachers.
- In this study, the validity of the scale was assessed through content validity, construct validity and criterion validity, while reliability was determined through Cronbach's alpha and test-retest analyses. In future studies, different methods of validity and reliability analysis could be used.
- A review of the literature revealed an abundance of instruments designed to assess preschool teachers' self-efficacy. However, there is a noticeable gap in terms of a specific measure to assess their self-efficacy in facilitating motor development activities. Consequently, there is an urgent need for measurement tools that can effectively measure different dimensions within this specific domain.
- Whilst reviewing the relevant national literature, it was noted that there is a lack of studies specifically focusing on preschool teachers' self-efficacy in motor development activities, which are crucial during the preschool period. Therefore, it is recommended to increase research efforts in this area. It is believed that the developed measurement tool will contribute to the dissemination of research on this topic.
- Motor skills are developed from an early age through a combination of informal and formal approaches. In this context, there is potential for the development of a measurement tool that can be used by parents to support the development of their children's motor skills.
- In addition to assessing children's motor development skills, other factors such as motivation, attitude and behaviour also play a crucial role in their motor performance. Therefore, it is possible to develop measurement tools to investigate these factors that influence motor performance and to conduct further studies in this area.
- Supporting the development of children's motor skills from an early age lays the foundation for their later acquisition of movement skills and a healthy lifestyle. The developed measurement tool will be used to investigate teachers' perceptions of their self-efficacy in supporting children's motor skills. The data obtained on teachers' self-efficacy levels can contribute to improvement efforts, highlighting the importance of the measurement tool. On the basis of the results, various training courses, seminars and similar activities can be offered to teachers in this area.
- To support teachers' self-efficacy in this area, a supplementary activity book can be prepared, including supportive planning, implementation, and evaluation processes for teachers.
- Various projects can be carried out to support teachers' professional development in this area. It is important that these projects are not only theoretical, but also include practical examples.

Note

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