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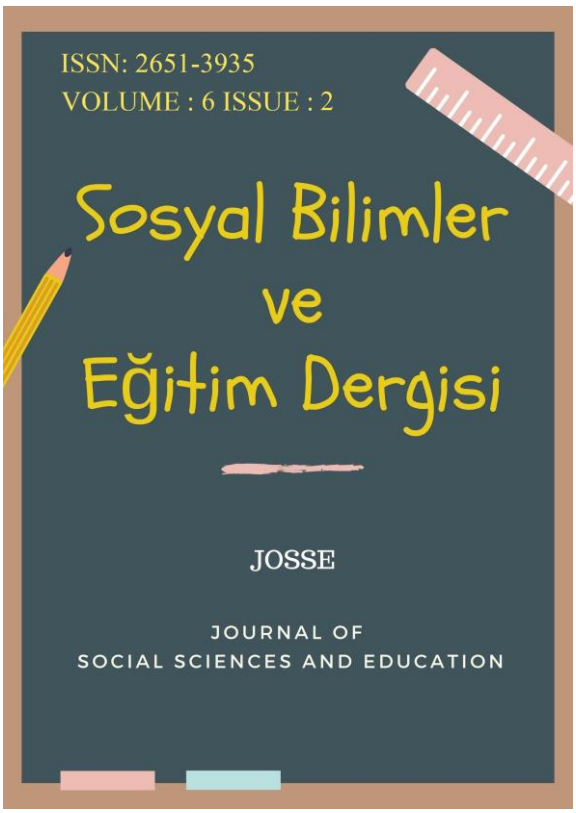

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Validation and Reliability Study of The Aggression Proneness Scale for Children Aged 60-72 Months

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Abstract

This study aims to conduct the validity and reliability analysis of the "Aggression Tendency Scale" developed by Cassidy et al. (1996), in children aged 60-72 months. The study group of the research consists of 221 children aged 60-72 months who attend pre-school educational institutions in Antalya's city center and have different sociodemographic characteristics. In the analysis of the data; exploratory factor analysis, confirmatory factor analysis, content validity, test-retest reliability, and internal consistency coefficient (Cronbach's alpha) have been calculated. Opinions have been obtained from 12 experts to determine content validity. Based on expert opinions and suggestions, it has been decided to retain 6 items in the scale. Confirmatory factor analysis has been conducted with the data obtained from the applications performed with the scale that achieved content validity. As a result of the analyses performed, it has been determined that the 6-item structure of the scale generally complies with the collected data. The internal consistency coefficient of the scale has been found to be 0.772. Additionally, the correlation coefficient was found to be 0.782 as a result of the test-retest reliability analysis of the scale. These results have shown that the Aggression Tendency Scale is a valid and reliable tool in evaluating the aggression tendencies of children aged 60-72 months.

Keywords: Pre-school period, aggression tendency, validity, reliability

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Introduction

The early childhood period is a significant time when rapid progress is seen in the child's physical, cognitive, and language development, as well as social-emotional development, forming the foundation for later years (Ersan, 2017). Theorists such as Piaget, Erikson, and Freud, who are accepted in the field of development, emphasize the importance of childhood in acquiring many behaviors. Referred to as "one of the most critical periods of life" most of the child's personality development is completed in the early childhood period (Akcan and Ergün, 2017). In this period, children who need adult support grow rapidly and begin to interact socially, starting from their immediate environment. Environmental factors may affect a child's development positively or adversely due to negative environmental conditions. Studies exist showing that the probability of being at risk in later years is high for children who do not acquire a certain level of social skills at a young age (Parker and Asher, 1987). Therefore, it is considered important for children to have adequate positive social behaviors during their early years (Yeşilyaprak, 2004)."

"Social competence" is expressed as the adequacy of children's relationships with the people in their environment. It has been defined by Goldfried and D'Zurilla (1969) as "an individual's ability and effectiveness to respond appropriately to various problem situations that will comfort him" (Seven, 2010). In other words, it can also be explained as behaviors that enable an individual's functional participation and adaptation in social life. Children who have problems in social-emotional development struggle to establish healthy relationships with their families, teachers, and peers. They have difficulty controlling and regulating their emotions, and they cannot control interpersonal relationships. It is stated that children with good social competence also have good peer relationships, and this supports their academic success (Asher and Taylor, 1981). Furthermore, it has been determined that social competence, which is not sufficiently developed at a young age, affects the subsequent years and negatively impacts social-emotional development (Loeber, 1985)."

Aggression, one of the negative social behaviors, is defined as intentionally inflicting verbal, physical, or psychological harm on another person or object, and it encompasses detailed and complex behaviors (Monks et al., 2011). In another definition, aggression is "any form of behavior that aims to physically or psychologically injure someone" (Berkowitz, 1993).

In recent years, studies have increasingly focused on the types of aggression (Liu, 2004; Wang et al., 2015), and it is generally observed to be divided into physical and relational aggression. Physical aggression includes actions such as hitting and kicking that cause physical harm to others, while relational aggression includes actions and threats that cause psychological harm, such as belittling, excluding from a group, or mocking (Crick et al., 1997). Relational aggression is also considered to be a form of indirect and social aggression (Herrenkohl et al., 2009).

From a developmental perspective, aggression that emerges in the first years of life significantly increases until the age of 3 and then shows a gradual decline towards the age of 5 (Crick and Rose, 2000). In early childhood, aggression is generally regarded as a sign of growth and is not taken seriously by adults (Reebye, 2005). However, in later years, the use of physical force during adolescence becomes a concern for parents (Joussement et al., 2008). Yet, this negative behavior, which is considered normal in childhood, carries a significant risk for the child's future if exhibited excessively at an early age. Children who show aggressive behavior from early childhood tend to continue exhibiting aggressive behavior in later years (Bay-Hinitz, 2001).

Studies have found that aggression is associated with academic failure (Stipek and Miles, 2008), a propensity to commit crimes (Pingault et al., 2013), and social behavior problems (Coie and Dodge, 1998; Daff et al., 2014; Hay et al., 2010; Ersan, 2022; Huitsing and Monks, 2018; Landy and Menda, 2001; Turney and McLanahan, 2015).

A child's propensity to exhibit aggressive behavior can be influenced by various factors such as parental attitudes, spousal relationships, and exposure to violent content in films and videos. These negative variables can cause the child to display aggressive behavior, adversely affecting their relationships with peers and others (Taylor et al., 2007). Therefore, imparting social competence skills to children during the preschool years can reduce the risk of negative social behaviors like aggression in later years, and support their adaptation to society (Pekdoğan and Kanak, 2019).

In the related field literature, different scales are found to measure the concept of aggression. The "Aggression Orientation Scale" developed by Kaynak et al. (2016) for children aged 36-72 months consists of four sub-dimensions. These sub-dimensions are "physical aggression towards others," "relational aggression towards others," "self-directed aggression," and "object-directed aggression," and it includes a total of 27 items. Another scale used is the "Ladd-Profilet Child Behavior Scale," developed by Ladd and Profilet (1996)

and adapted into Turkish by Gülay (2008). This scale, with "aggressive behavior" as one of its sub-dimensions, is often preferred in peer relationship studies due to the characteristics measured by its other five sub-dimensions (Gülay Ogelman, 2013; Kadan, 2010). The "Aggression Scale Parent Form for Children," which was developed to measure the intensity, frequency, prevalence, and variety of aggressive behaviors, was validated by Ercan et al. (2016). The scale consists of 33 items and five sub-dimensions. The Preschool Social Behavior Scale, developed by Crick et al. (1997) and adapted into Turkish by Karakuş (2008), aims to determine preschool children's social behaviors from a teacher's evaluation perspective. The five-point Likert-type scale consists of four sub-dimensions: physical aggression (e.g., "This child kicks or hits others."), relational aggression (e.g., "This child tells others not to play with peers or be friends with them."), positive social behavior (e.g., "This child helps peers."), and depressive feelings (e.g., "This child does not have much fun.") (Karakuş, 2008). In a study conducted by Ersan in 2017, confirmatory factor analysis was performed for the physical and relational aggression sub-dimensions of the Preschool Social Behavior Scale-Teacher Form.

The early childhood period is a critical time that can form the basis for aggressive behavior (Keenan, 2001). In this context, it is important to introduce a measurement tool applied to children aged 60-72 months into the field of early childhood education in our country. Additionally, it is considered important to evaluate children's tendencies towards aggressive behavior with this measurement tool and to provide necessary support to both educators and children based on these evaluations. With these points in mind, the study aims to conduct a validity and reliability study of the Aggression Tendency Scale, developed by Cassidy et al. (1996), for children aged 60-72 months.

Method

Model

This study, conducted to perform the validity and reliability of the Aggression Tendency Scale in children aged 60-72 months, has been implemented with a psychometric, cross-sectional, and descriptive design. There has been no clear consensus on the sample size for testing the psychometric properties of the scales. However, to ensure a more robust structure of the scale factor and to generalize the results obtained, it is recommended to reach as large a sample as possible (Carpenter, 2018).

Sample and Population

The sample of the study consists of 221 children aged 60-72 months. It is stated that there should be a minimum of five and a maximum of ten individuals for each item in factor analyses (Reio and Shuck, 2015; Watkins, 2018). Considering the sample reached and the number of items, the sample appears to be sufficient. The study group consists of 116 girls and 105 boys. The children in the study group are on average 68 months old. The youngest child is 60 months old, and the oldest child is 72 months old.

Data Collection Tools

The data collection tool consists of two parts. The first part includes the "Personal Information Form" and the second part contains the "Aggression Tendency Scale."

Personal Information Form: This is a form developed by the researcher that includes demographic variables such as the child's age, gender, number of siblings, and birth order.

Aggression Tendency Scale: It was developed by Cassidy et al. (1996) to measure the mental representations that children in middle childhood develop in response to specific situations. The scale includes positive, neutral, and hostile mental representations.

The scale consists of six stories, three related to strangers and three related to familiar peers. For these stories, three structured options are provided: one positive, one hostile, and one neutral. Two of the stories are narrated with a male peer, two with a female peer, and two are ambiguous. Stories related to familiar peers take place in school, while stories related to stranger peers occur in public places. For each story, children's positive-prosocial peer intention, negative-hostile peer intention, and neutral peer intention are determined. For example, you are walking in the shopping mall, and you dropped your paper money. When you turn back to find it, you see a stranger picking up the money. What do you think about the person who picked up the money?

a. They picked it up to take it for themselves.
b. They picked it up to give it back to you.
c. They did not know that the money was yours. One of these options is asked to be chosen.

Collection of Data

Before starting the data collection process, necessary permissions and an ethics committee report were obtained, and then data collection tools were applied to the children of parents who accepted the study. Ethic approval has been obtained from the Osmaniye Korkut Ata University Social Sciences Scientific Research and Publication Ethics Committee with the decision numbered 2023/8/4 on 02.08.2023. The children were asked if they wanted to participate in the study, and the data collection tool was applied if they volunteered.

For test-retest studies, a minimum sample size of 30 is recommended to accurately estimate reliability (Tavşancıl, 2019). At this stage, children who accepted the application of the scale twice participated in the application. The scale was administered to the children face-to-face with a two-week interval. At this stage, to maintain anonymity and match the first and second applications, numbers were given to the forms as they were filled out. To prevent scoring bias, the order of the scale items was ideally changed (Polit, 2014). The application of the data collection tool for each child took approximately 8-10 minutes.

Data Analysis

IBM SPSS Statistics Version 26 (IBM Inc., Armonk, NY, USA) and AMOS 24 (Scientific Software International, Skokie, IL, USA) were chosen for the analysis of the data. Descriptive statistics (number, age percentage, mean, standard deviation), correlations (Pearson product-moment correlation), and psychometric tests (content validity ratio, item-total correlation, Kaiser Meyer Olkin [KMO] adequacy measure, and Bartlett's test of sphericity, Exploratory Factor Analysis [EFA] and Confirmatory Factor Analysis [CFA], internal consistency coefficient, composite reliability coefficient (CR), extracted average variance value (AVE)) were used in the analysis. Before the CFA, the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's test of sphericity were conducted to evaluate the sample adequacy and the suitability of the relationship between variables for factor analysis. The following fit indices were used to test model fit in this study ($\chi 2$= chi-square, $\chi 2/df$= chi-square/degrees of freedom, GF= goodness of fit index, AGFI= adjusted goodness of fit index, CFI= comparative fit index, RMSEA= root mean square error of approximation, RMR= root mean square residual). The internal consistency of the scale was analyzed by calculating the Cronbach's Alpha coefficient. The test-retest method was used to assess the temporal stability of the scale, and the intraclass correlation coefficient (ICC) was calculated.

Ethics Committee Approval

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Findings

In this study, it was aimed at conducting a validity and reliability study of the "Aggression Tendency Scale" developed by Cassidy et al. (1996) for children aged 60-72 months, opinions were obtained from twelve experts for content validity. The prepared form has been evaluated by 12 experts, outside the research team, who work in the field of child development and have experience in scale validity and reliability. Content validity was assessed using the Lawshe technique. The content validity index has been calculated as 0.87.

Item analysis was performed to reveal the discriminative power and quality of the scale items. In the aggression scale, the corrected item-total correlation coefficients are r>30 for the item total in the 6-item scale (Table 1).

The aggression scale item analysis and Exploratory Factor Analysis (EFA) factor loads are shown in Table 1. For structural validity, initially, EFA (principal component analysis/varimax rotation) was conducted in scale development studies. In the 6-item scale, the item factor load is above 0.40 for all items. The KMO value in the scale is 0.825, and the result of the sphericity test is Approx Chi-Square= 291.108 (df = 15, p< 0.001). It has been determined that the aggression scale items are gathered under a single factor, and the item factor loads range between 0.435 and 0.715. The total explained variance value of the single-factor structure with a scale item eigenvalue coefficient over 1 is 46.91% (Table 1).

Table 1

Item Analysis and EFA Factor Loads of The Aggression Tendency Scale

Scale Items	M (SD)	Corrected Item-Total Correlation	Cronbach's Alpha Coefficient When Item is Removed	Factor Loading	Explained Variance
I-1	1,73 (0,76)	,477	,749	,539	
I-2	2,16 (0,67)	,530	,735	,625	
I-3	1,85 (0,75)	,603	,715	,697	46,91
I-4	1,81 (0,62)	,377	,769	,435	
I-5	2,16 (0,71)	,504	,741	,588	

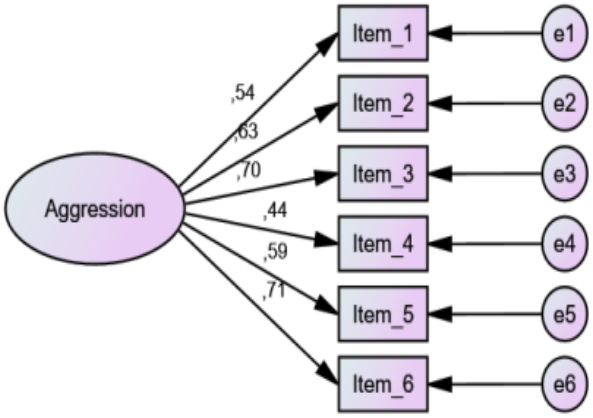
I-6	1,91 (0,79)	,609	,712	,715

M=Ortalama SD=Standart Sapma

A DFA (Discriminant Function Analysis) has been applied to evaluate the single-factor structure of the scale consisting of 6 items. The scale model is shown in Figure 1.

Figure 1

Scale model



The goodness-of-fit values obtained for the model are presented in Table 2.

Table 2

Aggression Tendency Scale DFA Test Results and Model Fit Indices

Criterion	**χ2/sd**	**RMR**	**GFI**	**AGFI**	**NFI**	**IFI**	**TLI**	**CFI**	**RMSEA**
Good Fit	≤2	≤,05	≥,95	≥,95	≥,95	≥,95	≥,95	≥,95	≤,05
Acceptable	≤5	≤,08	≥,90	≥,90	≥,90	≥,90	≥,90	≥,90	≤,08
Model Fit Index	1,43	,017	,982	,959	,959	,989	,982	,989	,039

When Table 2 is examined, it can be seen that the obtained goodness-of-fit index values are at a good fit level.

For this study, the reliability level of the scale has been evaluated with the Cronbach's Alpha coefficient. In the study, the Cronbach's Alpha value of the scale is 0.772. Additionally, in the study, the composite reliability coefficient (CR) is 0.776, and the extracted average variance value (AVE) is 0.607 (Table 3).

Table 3

Aggression Tendency Scale Cronbach Alpha Value

	Cronbach Alpha	Min-Max	M (SD)	Skewness	Kurtosis	CR	AVE
Scale overall	0,772	1-3	1,49 (0,49)	,227	-,978	0,776	0,607

The stability of the scale has been evaluated using the test-retest method, and ICCs (Intraclass Correlation Coefficients) have been calculated. The average measurement ICC of the aggression tendency scale is 0.782, with a 95% confidence interval (CI) ranging from 0.722 to 0.815 ($F = 23.320$, $p < 0.001$). In the correlation analysis between the scale scores of the two measurements, a statistically significant and positive relationship has been determined ($p < 0.01$).

Discussion and Results

In the research, the validity and reliability study of the Aggression Tendency Scale, developed by Cassidy et al. (1996) and adapted to Turkish by Seven (2010), has been conducted on children aged 60-72 months. Content validity has been realized with the opinions taken from 12 experts, using the technique proposed by Lawshe (Lawshe, 1975). Within the context of 12 experts, the content validity index according to Lawshe's technique is ≥0.56 (Wilson et al., 2012). The study has shown that the content validity index of the items is at a sufficiently high level.

Within the scope of item analysis, the corrected item-total correlation values are $r \geq 0.30$ (Büyüköztürk et al., 2018; Karaman, 2023). In light of these results, it can be seen that the items are homogeneous and related to each other (Tavşancıl, 2019).

In the initial stage, the result of the EFA (Exploratory Factor Analysis) shows a KMO (Kaiser-Meyer-Olkin) value of 0.825. In the literature, a KMO value over 0.80 indicates an excellent level (Marofi et al., 2020). Also, a KMO value over 0.80 shows that the sample is sufficient (Tabachnick & Fidell, 2018; Karaman, 2023). Another point to consider during the EFA stages is the explained variance value. In the literature, it is reported to be suitable if this value is between 0.40 and 0.60 (Çokluk et al., 2014). For this study, the total explained variance value of the single-factor structure is 46.91%. Additionally, the skewness and kurtosis values of the aggression scale are showing a normal distribution (Hair et al., 2013).

In the second stage, the model proposed in the single-factor structure with 6 items has been formulated in TLI (Tucker-Lewis Index). The testing of TLI has been carried out according to the model fit index values. There is no consensus on the sheer number of model fit values and which ones should be taken into consideration at the point of evaluation (Seren et al., 2018). The results of χ^2/sd, RMR, GFI, AGFI, NFI, IFI, TLU, CFI, and RMSI have been taken as the most commonly used fit indices in this study (Hu & Bentler, 1999; Afthanorhan, 2013; Kwon & Marzec, 2016). In this study, it has been determined that the model fit values show a good fit.

In scale development studies using Likert-type ratings, Cronbach's Alpha analyses are used to test the internal consistency of items (Polit & Beck, 2012). In a dataset analysis, the Cronbach's Alpha value range of 0.70-0.79 is considered acceptable, and 0.80-0.89 indicates a good level (Tavşancıl, 2019; Karaman, 2023). It can be seen that the Cronbach's Alpha value for the single-factor structure with 6 items is within an acceptable range and is almost approaching a good fit level. The composite reliability coefficient value is 0.776. In the literature, it is stated that this value should be greater than CR>70 (Hair et al., 2011; Sharif et al., 2020).

Criterion validity has been implemented in scale development studies by considering test-retest correlations and intraclass correlation values. For the test-retest, measurements were taken from 30 individuals two weeks apart, and a dependent sample test was applied to determine the difference between the two measurements, and intraclass correlation values were calculated (Alpar, 2018). In the correlation analysis between the scale scores of the two measurements, a statistically significant and positive relationship has been determined ($p < 0.01$). Considering the analyses performed and the findings obtained, it can be said that the scale is a usable one.

At this point, all researchers working with children, especially preschool teachers, can use the Aggression Tendency Scale for their own purposes. In particular, researchers who will prepare an educational program to prevent aggression in preschool children can use this measurement tool in their experimental studies. In future studies, researchers are recommended to confirm the existing factor structure of the scale by conducting confirmatory factor analysis. In addition, it can be suggested to conduct studies on the concept of aggression using the related scale.

Ethics Committee Approval

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