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RESEARCH ARTICLE

Scale for the Assessment of Attachment Security in Preschool Institutions: Turkish Adaptation and Psychometric Properties

Büşra ÇELIKEL[1], Mine Canan DURMUŞOĞLU[2]

[1]Department of Early Childhood Education, Institute of Educational Sciences, Hacettepe University, Ankara, Türkiye
[2]Department of Early Childhood Education, Hacettepe University Faculty of Education, Ankara, Türkiye

What is known about this topic?

- *The quality of secure attachment in early childhood has long-term and critical consequences for a child's development. In the later years of life, while securely attached children tend to become self-confident, emotionally healthy individuals who can reach their full potential, insecurely attached children are likely to experience cognitive, behavioral, social, and emotional difficulties (Bowlby, 2012; Busch and Lieberman, 2010; Granot and Mayseless, 2001; Prior and Glaser, 2006).*
- *Preschool environments offer an important compensatory context for children who are unable to develop secure attachment within the family. It has been suggested in the literature that secure relationships established with teachers in high-quality preschool institutions may positively support these children's attachment experiences and play a protective role in their development (Cárcamo et al., 2016; Geoffroy et al., 2007).*
- *While some aspects of attachment theory are considered universal (Cassidy et al., 2013; Mesman et al., 2016), it is also emphasized that attachment behaviors can differ according to cultural context (Boyd and Bee, 2009; Cárcamo*

Note: *This study is a preliminary work derived from the doctoral dissertation conducted by the first author under the supervision of the second author.*

Corresponding Author: Büşra Çelikel
E-mail: busracelikel93@gmail.com

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Abstract

This study aims to adapt the Scale for the Assessment of Attachment Security in Preschool Institutions, developed in Germany, to Turkish culture and to investigate its psychometric properties. The scale consists of four factors and 36 items. Although the original scale was developed for children aged 18–55 months, the present study expanded the age group and adapted it for children aged 18–55 months and 56–72 months. This study included 658 children selected using stratified purposive sampling. The results of the confirmatory factor analysis revealed that the four-factor structure of the scale was validated in Turkish culture. Measurement invariance analyses conducted for different age groups revealed that the scale yielded comparable measurements. The internal consistency of the scale was determined to be high for the overall scale (α = .96), while Cronbach's alpha values for the subscales ranged from .79 to .96. In addition to internal consistency reliability, test–retest reliability, split-half reliability, and inter-rater reliability results demonstrated that the scale possesses strong psychometric properties. The findings indicate that the scale is a valid and reliable measurement tool for assessing attachment security in the preschool period within Turkish culture.

Keywords: Attachment security, cross-cultural assessment, early childhood development, preschool education, scale adaptation

Introduction

The relationships a child forms with his/her immediate environment play a deterministic role in shaping his/her perspective on himself/herself and the world. Building positive relationships helps a child develop a sense of self and a love for the world. Feeling safe and happy in relationships supports increased life satisfaction. The foundation of all relationships throughout life is laid by attachment security established in early childhood (Evirgen Geniş and Gözün Kahraman, 2018; Nacar and Gökkaya, 2019; Soysal et al., 2005; Yıldızhan, 2017). In early childhood, attachment is defined as the emotional bond a child forms with their primary caregiver, based on trust and comfort (Güvendeğer Doksat and Demirci Çiftçi, 2016; Nacar and Gökkaya, 2019; Yörükân, 2020).

According to attachment theory, the attachment figure doesn't necessarily have to be the mother. This role is predominantly assumed by mothers. However, other individuals, such as fathers, siblings, or grandmothers, can also serve as attachment figures. Attachment can be formed with different people within a hierarchy (Bretherton, 1992). In the early years, children bond with their primary caregiver, while in the preschool period, their teacher can become a secondary attachment figure (Keskin and Çam, 2009). In recent years, research has also included adult–child relationships in schools within the scope of attachment. Attachment theory serves as a guide in understanding the relationship between children and teachers (Verschueren and Koomen, 2012, p. 205). A child's attachment security style can vary depending on the caregiver. For example, a child may have a secure attachment style with his/her mother but an insecure attachment style with his/her father (Kodak and Güzel, 2024). The significance of preschool education is further amplified for children who lack secure attachment experiences at home. These children are able to form secure attachments with their teachers in qualified, safe, and high-standard preschool institutions (Cárcamo et al., 2016). For these children, positive and supportive relationships with their preschool teachers play a compensatory role (Geoffroy et al., 2007).

The quality of secure attachment in childhood has critical consequences for a child's development in later years. In the later years of life, while securely attached children tend to become self-confident, emotionally

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et al., 2016; Shaver and Mikulincer, 2010; Strand et al., 2019). Scale adaptation studies support the identification of cross-cultural similarities and differences in the measured quality and foster collaboration among researchers through multicultural studies (Borsa et al., 2012; Çapık et al., 2018).

What does this study add to this topic?

- *Given the deterministic role of attachment security on developmental outcomes, reliable early-stage assessment of this structure remains crucial. This study adapts a multidimensional, observational, easy-to-use, and concise attachment security scale developed in Germany to the Turkish context, offering a valid and reliable assessment tool for use in preschool education institutions.*
- *Despite the increasing emphasis on the role of preschool teachers as attachment figures, it appears that there is no measurement tool in Türkiye that is based on teacher observations and examines the teacher's role as an attachment figure regarding attachment security. By allowing for the systematic evaluation of children's attachment patterns and the development of corresponding supportive interactions, this study addresses a significant gap in the existing literature. The adapted scale possesses several strengths, such as requiring no additional materials, being time-efficient to complete in a naturalistic setting, and allowing for administration by teachers or any child development specialist, expert, or researcher who has observed the child in the classroom for at least one month.*
- *Adapting the scale to Turkish culture offers a significant contribution in terms of both application and study. The scale's wide age range allows for both monitoring developmental processes in longitudinal studies and its use in pre-test and post-test measurements in teacher-child interaction-based intervention studies. Furthermore, the proven validity and reliability of the scale across diverse cultures facilitate its application in cross-cultural comparative research, offering a robust framework for international studies.*

healthy individuals who can reach their full potential, insecurely attached children are likely to experience cognitive, behavioral, social, and emotional difficulties (Bowlby, 2012; Busch and Lieberman, 2010; Granot and Mayseless, 2001; Prior and Glaser, 2006). Securely attached children have better emotion regulation skills (Ackerman and Dozier, 2005; Brumariu, 2015; Goodall et al., 2012; Kullik and Petermann, 2012; Roque et al., 2013; Şahin, 2015; Tulpar et al., 2019), better self-regulation skills (Bayındır and Ural, 2019), more positive emotion experiences (Seligman, 2019), and higher academic achievement (Ponitz et al., 2009) than insecurely attached children. Insecure attachment lies at the root of many psychological issues that manifest during childhood (Keskin and Çam, 2009; Soysal et al., 2005). Early identification of children at risk of insecure attachment is critical to preventing the development of psychopathology later in life. The identification of children at risk regarding attachment security allows for the implementation of early intervention programs (Dozier et al., 2016).

Supporting secure attachment in children requires the initial assessment of attachment security, followed by the implementation of interventions consistent with the child's identified attachment style. Bowlby, who developed attachment theory, focused on observable behaviors. Attachment security is an observable, measurable, and evaluable characteristic (Tüzün and Sayar, 2006). The majority of studies evaluating attachment security during the preschool years are based on story completion tasks or methods that necessitate extensive long-term observations. Cassidy (1988) developed the Incomplete Stories with Doll Family Scale. Seven and Güngör Aytar (2010) adapted this scale to Turkish culture for children aged 67–74 months. The scale, consisting of six stories each approximately three minutes long, identifies one of three attachment security levels: secure, avoidant, and hostile/negative. Similarly, a scale based on storytelling techniques for assessing attachment security in preschool children is the Safe Place Scenarios Test developed by Bretherton et al. (1990). Building upon this scale, Granot and Mayseless (2001) established the Doll Story Completion Task. Uluç (2005) adapted the Doll Story Completion Task to Turkish culture for children aged 66–78 months. The assessment is conducted on a one-on-one basis, employing doll figures and household objects as additional materials to facilitate storytelling. Based on the scale scores, attachment security is identified as secure, avoidant, or anxious. Sümer et al. (2009) adapted the Attachment Behaviors Classification Set (ABCS), originally called Attachment Q-Sort (AQS) (Waters, 1995), to Turkish culture for children aged 10–55 months. That scale consists of 90 items and is completed by observing children in their home environment for approximately three hours. It consists of three distinct factors: anxiety versus ambivalence, avoidance versus proximity, and failure in goal-corrected partnership behaviors. Another scale, developed by Cadman et al. (2018) and originally called Brief Attachment Scale-16, is designed as a shortened version of the AQS. This scale, called the Short Attachment Scale-16, was adapted to Turkish culture by Sümer et al. (2025) for children aged 12–36 months. This scale consists of two factors, each with eight items: interaction consistent with the primary attachment figure and seeking closeness. It is administered by observing mother–child interactions in a natural home environment. The Attachment Insecurity Screening Inventory, developed by Wissink et al. (2015) to assess attachment insecurity in children aged 2–5 years, was adapted to Turkish culture for 4–5-year-old children by Acar and Soydan (2023). Although the research sample is defined in the methodology section as 358 mothers and 182 fathers selected via convenience sampling, the abstract reports the sample as 540 mothers. The scale yields results based on three dimensions of insecure attachment: avoidant, ambivalent/resistant, and disorganized.

Although existing scales contribute significant data to the literature, there is a recognized need for an up-to-date, practical, and brief scale grounded in classroom observations that can be completed by teachers to serve as a complementary addition to the body of work. A crucial point to consider when measuring attachment security is that the world children inhabit is in a state of constant change and evolution from past to present. In light of the swift environmental shifts occurring particularly over the last few years, the necessity for current instruments to evaluate attachment security has become increasingly evident. In this respect, it is important to introduce to Turkish culture a current measurement tool (Fröhlich-Gildhoff and Hohagen, 2020a) developed in a comprehensive project that established German normative values for attachment security in preschool children. In Türkiye, the majority of scales concerning attachment security rely on either observational procedures that are time-consuming and require specialized expertise or on parental reports. There is a notable absence in the literature of a scale in Türkiye designed to assess attachment security in children aged 18–72 months through teacher-based observations. The fact that the scale adapted in this study requires no additional materials and can be completed quickly and comfortably in a natural setting constitutes its primary strengths in terms of practical utility. One of the advantages of the application is that the scale can be completed by teachers or any child development specialist, expert, researcher, etc., who have had the opportunity to observe the child in the classroom for at least a month. The scale is suitable for integration with routine child assessments conducted in schools. In preschool settings, teachers can use this scale to assess children's attachment security and tailor their interactions to their needs. In addition to these, the scale is expected to serve as a valuable tool not only for academic studies but also for preschool education and psychological counseling services catering to this period. The scale's capacity to cover a broad age range, from 18 to 72 months, is also considered a significant asset. Therefore, it is considered that this scale can be easily used in longitudinal studies in the future.

The universal and cultural components of attachment theory are balanced together (Mesman et al., 2016, pp. 791, 808). Although certain scholars argue that attachment features are consistent across cultures (Cassidy et al., 2013; Mesman et al., 2016), a considerable body of studies underscores the impact of cultural contexts on attachment processes (Boyd and Bee, 2009; Cárcamo et al., 2016; Shaver and Mikulincer, 2010; Strand et al., 2019). Collectivist and individualistic cultures differ from each other in their unique structures. Türkiye exhibits a collectivist culture, whereas Germany is marked by an individualistic cultural orientation (Hofstede, 2001; Kağıtçıbaşı, 2012). In order for attachment to be addressed appropriately in different societies, cross-cultural studies are needed (Shirvanian and Michael, 2017). According to Bretherton (1992), it is essential to develop culturally sensitive scales based on attachment theory to reveal diversities by approaching attachment from a cultural perspective. In this regard, this study involved adapting a scale from the individualistic German culture to the collectivist Turkish culture to measure attachment security in children, which will pave the way for new studies on attachment between the two cultures. Scale adaptation studies support the identification of cross-cultural similarities and differences in the measured quality and foster collaboration among researchers through multicultural studies (Borsa et al., 2012; Çapık et al., 2018).

Method

Sample Group

There are various suggestions regarding the statistical analyses to be used in determining sample size. Creswell (2012) suggests that approximately 350 participants are generally sufficient for sample size in research studies, but this number may vary depending on the characteristics of the study (p. 146). Another view suggests that the number of participants should be at least 10 times the number of items (Kline, 1994). Accordingly, the minimum sample size for this study, which included a 36-item scale, was calculated to be approximately 360. However, to ensure a highly representative sample, the study included 658 children. The sample group consisted of 658 children aged 18–72 months attending public and private preschools in Ankara, Türkiye. The entire sample consisted of typically developing children with no reported or known developmental or psychological diagnoses. The average age of the children was 51 months, with 332 (50.46%) being girls and 326 (49.54%) being boys.

To ensure representation of different institutional contexts, preschool education institution types were identified as strata. Therefore, the sampling process was planned using stratified purposive sampling. However, as access to institutions during the data collection process was largely dependent on institutional permissions and voluntary participation, accessibility and referral-based sampling methods were utilized to reach participants within each stratum. Stratified sampling can be utilized either randomly or purposefully when the representation of subgroups constituting the sample is desired (Teddlie and Yu, 2007, pp. 79, 98). Stratified purposive sampling is the process of creating strata by dividing a population into groups or categories based on the characteristics of specific subgroups deemed significant within that population (Nyimbili and Nyimbili, 2024, p. 96). Schools affiliated with the Ministry of National Education (MoNE, Türkiye) were included in the study through stratified purposive sampling within the scope of study permissions, while kindergartens and day care centers affiliated with the Ministry of Family and Social Services and other institutions were included in the study through snowball sampling. Snowball sampling was adopted to support and complement stratified purposive sampling, thereby enabling data collection from all strata and ensuring the targeted institutional diversity. Multiple sampling methods can be combined and used in studies (Teddlie and Yu, 2007). Snowball sampling is a method that allows for the expansion of a sample by having participants at the beginning of the study suggest new participants who meet the research criteria (Creswell, 2012; Nyimbili and Nyimbili, 2024, p. 96). The study included 194 children from kindergartens and day care centers affiliated with the Ministry of Family and Social Services, 157 from independent kindergartens affiliated with the MoNE, 137 from preschool classes affiliated with the MoNE, 104 from kindergartens and day care centers affiliated with institutions, 58 from private schools, two from an international embassy school, and one from a practice preschool. The support provided by Project No 125K019 played an instrumental role in reaching the sample group.

Data Collection Tools

Einschätzung der Bindungssicherheit in der Kita

Einschätzung der Bindungssicherheit in der Kita was developed by Fröhlich-Gildhoff and Hohagen (2020a) to assess attachment security in preschool education institutions. During the development of the scale, data were collected from 1014 children aged 18–55 months, who were selected via simple random sampling from public and private preschool institutions across ten states in Germany. The scale consisted of four dimensions. The Cronbach's alpha values for each dimension were as follows: a) desire for proximity and allowing proximity (.787), b) coping with socially challenging situations (.846), c) openness to novelty and joy of discovery (.930), d) expressing and regulating emotions (.855). The Cronbach's alpha value for the overall scale was determined to be .939. The dimension of desire for proximity and allowing proximity consisted of 7 points addressing information such as the child expressing his/her desire for physical proximity, allowing physical proximity, etc. The dimension of coping with socially challenging situations consisted of ten items, including information such as the child's reactions during activity transitions and separation situations. The dimension of openness to novelty and the joy of discovery consisted of 13 points, including information such as the child receiving support for exploration and independently pursuing new things. The dimension of expressing and regulating emotions consisted of 6 points, including information on how a child could calm down and express their emotions in an age-appropriate manner. Item analysis revealed that the scale items had values between .277 and .763, with all items having values greater than .30 except for item 17 (.277). Based on theoretical grounds, it was decided not to delete this entry. Inter-rater reliability was assessed through 267 observations involving two or three educators per child, followed by a correlation analysis of the scores. A total of 246 assessments were collected by having two educators rate each of the 123 children during the first evaluation, yielding a Pearson correlation coefficient of .377. Additionally, in the first evaluation, a total of 21 assessments were collected by having three educators complete the scale for each of the seven children, with a Pearson correlation coefficient of .46. Due to the low initial coefficients, two educators were requested to re-evaluate the scale for six children after carefully reviewing the item descriptions; this subsequent application yielded a correlation coefficient of .855. For construct validity, evaluations were obtained from ten experts regarding the appropriateness of the item scoring (low = 0, 1 and high = 4, 5) and the alignment with attachment types, including secure, insecure-ambivalent, insecure-avoidant, and insecure-disorganized. Items with 100% agreement among experts were used in assigning a type of attachment. This model was later validated by a cluster analysis. For criterion validity, Attachment-Q-Sorts (Waters, 1995) was completed in addition to EiBiS for 39 children. No significant correlation (0.234) was determined between the Attachment-Q-Sorts and the EiBiS general scale. This was explained by the small sample size, and it was suggested that the two scales may be measuring different aspects of attachment, and that this could be investigated further through qualitative interviews with the educators who completed the scales. EiBiS is a Likert-type assessment tool that uses a rating scale from 0 (almost never) to 5 (almost always). Based

on the scores obtained from items of all dimensions, one of four attachment types emerges during the evaluation phase: secure attachment, insecure-ambivalent attachment, insecure-avoidant attachment, and insecure-disorganized attachment (Fröhlich-Gildhoff and Hohagen, 2020a; b). Within the scope of this study, the scale was adapted into Turkish culture as the Scale for the Assessment of Attachment Security in Preschool Institutions (SAAS-PI).

Attachment Behaviors Classification Set

In the adaptation of the AQS (Waters, 1995) scale to Turkish culture by Sümer et al. (2009), data were collected by observing 110 children, 48 girls, and 62 boys aged between 10 and 55 months. The scale consisted of 90 items measuring children's attachment behaviors. Descriptive statistics revealed that the mean scores of the scale items ranged from 2.30 to 7.54. Factor analysis revealed a three-factor structure for the scale. It was determined that the anxiety versus ambivalence factor explained 14.60% of the total variance, the avoidance versus proximity factor explained 10.30%, and the failure in goal-corrected partnership behavior factor explained 7%. Cronbach's alpha values were determined to be .86 for anxiety versus ambivalence, .87 for avoidance versus proximity, and .80 for failure in goal-corrected partnership behavior. During the administration process, the researcher observes the child's behaviors and categorizes them into three groups: behaviors the child "never performs," performs with "moderate frequency," or performs "most frequently." Then, these three groups are further divided into three more, creating a total of nine groups. The scale consists of nine groups in total, ranging from Group 1, representing characteristics that are least descriptive of the child, to Group 9, representing those that are most descriptive. The items describing behaviors that the child "never performs" are assigned 1, 2, or 3 points; those describing behaviors performed with "moderate frequency" are assigned 4, 5, or 6 points; and items describing behaviors performed "most frequently" are assigned 7, 8, or 9 points. The item score is determined by the group to which each item belongs. In the final stage, the grouping is completed such that each of the nine score types contains exactly ten items; that is, ten items receive 1 point, ten items receive 2 points, and so forth, until the final ten items receive 9 points. If the number of items in the groups is not equally distributed, the sorting is reviewed, and the scores of certain items are adjusted to the nearest point level to ensure a balanced distribution. In the final phase of the assessment, the obtained scores are compared against the "secure attachment" criterion established by Waters (1995). The correlation between the scores obtained by the child and the "secure child" profile defined by Waters (1995) reveals the child's level of attachment security. This correlation ranges from −1 to +1; values approaching −1 indicate insecure attachment, whereas values approaching +1 indicate secure attachment (Sümer et al., 2009). For the purpose of criterion validity, the scale was administered by teachers who observed and evaluated 50 children within the scope of this study. Regarding the teachers' use of the scale, Prof. Dr. Nebi Sümer, the scholar responsible for the Turkish adaptation of the scale, was consulted via email, and his approval was secured for teacher-led administration.

Data Collection Process

The data collection process requires obtaining formal permissions from the institutional review boards of the researchers' affiliated organizations, regional educational authorities, school principals, teachers, and parents (Creswell, 2012). In the first stage of the data collection process, written permission was obtained from the researcher who developed the original scale to adapt the scale to Turkish culture and use it in Türkiye. Subsequently, ethical approval was obtained from the Hacettepe University Research Ethics Committee (Approval No: E-77278857-300-00003509842, Date: 10/05/2024). Following the ethical approval, administrative permissions were secured from the Ministry of National Education, the Ministry of Family and Social Services, and the respective institutions to which the participating preschools are affiliated. In the permission granted by the Ministry of National Education, the schools to be included in the study were designated by the Ministry. For other preschool institutions, the researcher introduced the study to preschool institutions across various districts of Ankara using a random sampling technique; subsequently, the sample size was expanded through snowball sampling, as interested administrators who agreed to participate referred the researcher to other institutions. Simultaneously, the study was promoted as a TUBITAK 125K019 project on the social media platforms of the researcher and other collaborating scholars; subsequently, contact was established with the institutions of interested teachers. The ethical approval certificate, scale administration guidelines, informed consent forms, and the scales themselves were sent to the participating institutions. Data were collected by distributing the personal information forms and scales as online survey links to the teachers via an instant messaging and calling application, as well as through email. During the online survey administration, participants were first provided with the necessary information regarding voluntary participation; access to the scale items was granted only after informed consent was explicitly obtained. Fröhlich-Gildhoff and Hohagen (2020a) report that the scale can be completed reliably without the need for extensive training, simply by reviewing the study notes and item descriptions (p. 35). In this regard, a scale administration manual has been developed for the version of the scale adapted into Turkish. This manual includes the requirements for completing the scale, instructions on the administration process, and annotated scale items with detailed explanations. Teachers who voluntarily participated in the study and reviewed the administration guidelines completed the personal information form for children on the first page, followed by the 36-item scale consisting of four sections across the next four pages, within an average duration of 10–15 minutes. To assess criterion-related validity for the scale adaptation study, the ABCS developed by Sümer et al. (2009) was used. Regarding the use of the ABCS, the necessary authorization was secured through email correspondence with Prof. Dr. Nebi Sümer. Upon obtaining signed informed consent from both parents and teachers for the administration of the ABCS, teachers were provided with an application manual containing the criteria for completion, procedural information, and annotated scale items. In addition to an approximately two-hour home observation at the residences of voluntarily participating families, teachers completed the 90-item scale by drawing upon their observations of the child's interaction with their family within the school environment. The linguistic and conceptual equivalence studies, which commenced with the translation of the EiBiS Manual, lasted approximately one year. The data collection process commenced on May 11, 2024, and was concluded on November 17, 2025. The data were then analyzed, and the findings were presented.

Limitations of the Study

This study had some limitations. Although all types of preschool institutions were included in the sample using stratified purposive sampling, a proportional sampling method could not be applied to the stratification due to the difficulty of data collection. Furthermore, no socioeconomic status criterion was included in the sample. It is considered that further research employing proportional sampling in stratified purposive sampling and conducting studies according to different socioeconomic levels will contribute to the field. In addition, this study was conducted as a cross-sectional study. Longitudinal studies can be used to investigate the scale's fit indicators and its continuity in terms of development.

Results

Linguistic and Conceptual Equivalence Studies

To use the scale in Türkiye, the scale adaptation process criteria of Borsa et al. (2012) and Gjersing et al. (2010) were first taken into

consideration. Accordingly, the culturally appropriate adaptation process, ensuring semantic equivalence with the original scale, is summarized in Figure 1.

The first step in scale adaptation processes is obtaining permission from the individual or individuals who developed the original scale. In the subsequent stage, translators should take into account the grammatical nuances and psychological differences of both the original scale and the target culture (International Test Commission, 2018). In accordance with these requirements, a signed document granting permission for the use of the scale was obtained from Prof Dr Klaus Fröhlich-Gildhoff, the developer of the original scale, as the first step. Furthermore, Fröhlich-Gildhoff provided a letter of support expressing his endorsement and emphasizing the significance of this study. Following this, the cultural translation process was initiated, prioritizing cultural adaptation over literal translation and ensuring that all nuances were meticulously reviewed. In the initial stage, to gain a deeper understanding of the instrument, the 80-page EiBiS Manual was translated from German into Turkish through Zoom meetings conducted over approximately three months by an early childhood education specialist and the primary author of the study. The second author of the study reviewed and approved the translated manual from an academic language standpoint. In-depth information regarding the scale was obtained from this manual, ensuring that all procedures employed in the original development of the scale could be replicated exactly in this adaptation study. Then, forms were prepared for translating the scale, with the German items on the left and the Turkish translations on the right. The items and their descriptions in the scale were translated into Turkish by three German/Turkish bilingual participants from the field of preschool education and a certified translator. The researchers held a Zoom meeting, compared the translations with those of the participants, and finalized the translation. Then, the scale was sent to an expert in early childhood education in Germany, who is bilingual in Turkish and German, to review the translations and make any necessary corrections. In collaboration with a bilingual subject matter expert, the researchers reviewed and revised the scale items and their descriptions during online Zoom sessions totaling approximately 10 hours. The translated scale, having undergone final revisions, was back-translated into German by another bilingual preschool teacher specializing in the field of early childhood education. The back-translation was evaluated for linguistic consistency and equivalence with the original assessment instrument. The back-translations and revised translations were compared in a two-column table and determined to be in alignment. The Turkish version of the scale was submitted for expert review to seven faculty members specialized in attachment security within the field of early childhood education to obtain their professional feedback. In addition, separate expert opinions were obtained to evaluate the appropriateness of using the scale to assess attachment security in children aged 56–72 months. Based on these expert opinions, the target age range of the scale was extended to include this age group. The scale, developed based on expert opinions, was reviewed and scored for the suitability of the translation by two subject matter experts with professional-level German-Turkish language skills. At this stage, a seven-column table was utilized, featuring the following headings from left to right: German items, Turkish translation, not appropriate (1), item requires revision (2), appropriate but minor changes required (3), highly appropriate (4), and suggestions for item improvement. Experts rated the translations between 0 and 4 points. In the evaluation, the first expert rated 35 items as "4" and one item as "3," whereas the second expert rated 31 items as "4" and five items as "3." Regarding the specific item rated "3" by both reviewers, the initial version stating that "the child acts interested and sensitive" was refined to "the child shows interest/sympathy" to better reflect the intended meaning. The reason four items were rated "3" was due to specific terminology choices: "teacher" was used instead of "caregiver" in two instances and instead of "pedagogical staff" in one, while "primary attachment figure" was used in place of "primary caregiver" in another. However, no further modifications were made to these items, as the current phrasing was deemed necessary for maintaining cultural equivalence in the translation. The final version of the scale was resubmitted to two experts with accompanying explanatory notes, and their formal approval regarding the scale's appropriateness was subsequently obtained. Subsequently, an online survey link was distributed to 13 preschool teachers working in various types of institutions and across different age groups to solicit their professional feedback regarding the clarity of the scale items. In this form, respondents were requested to rate each scale item and its corresponding description using a scoring system ranging from 1 to 3. The scoring criteria for the items were defined as follows: 1 point: The intended meaning of the item remains unclear even after reading the description; 2 points: The intended meaning is not sufficiently clear but can be understood after consulting the description; 3 points: The intended meaning of the item is clearly understood. In cases where teachers selected a score of "1" or "2" for any given item, they were required to provide a qualitative description of their interpretation and offer specific suggestions for refining the item's phrasing. The scale items were determined to be understandable in the teachers' evaluations, with only minor word

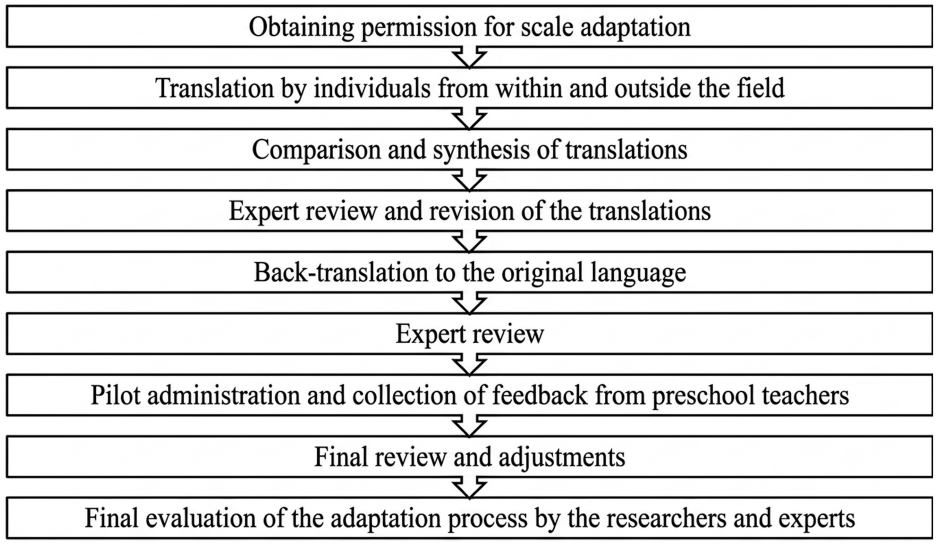

Figure 1.
Adapting the Scale to Turkish Culture in Terms of Language and Concepts.

changes required in two items. Subsequently, expert opinions were obtained from two faculty members in the measurement and evaluation department regarding compliance with scale development and adaptation rules, and the necessary minor adjustments were made. In the final stage, the scale was submitted to a Turkish language expert for review to ensure it conformed to Turkish language rules, and it was reported to be compliant with Turkish language rules. The scale was finalized after confirming its adequacy across multiple dimensions: expert reviews ensured alignment with early childhood education literature, teacher feedback verified its clarity for the target practitioners, measurement and evaluation experts confirmed adherence to scale adaptation protocols, and Turkish language experts validated its linguistic integrity and cultural relevance.

Correlation Between Turkish and German Scale Forms

One method for assessing the linguistic equivalence of an original scale and its adaptation is to administer the scale in two different languages to a group of participants proficient in both languages. Accordingly, one practitioner administers the original scale, and another administers the translated scale to the same individuals. Scores obtained from the same individuals are statistically compared to obtain information regarding translation validity (Hambleton et al., 2005, p. 123). In this study, the linguistic validity of the scale was analyzed by having two teachers in the same class, one completing the scale in Turkish and the other in German, for the same children. Significant challenges were encountered in identifying two teachers within the same classroom who were native speakers of Turkish and German, respectively. The researchers reached three rater pairs—six teachers in total—where one member of each pair spoke Turkish and the other spoke German. Working in pairs, the teachers completed eight Turkish and eight German versions of the scale for the same group of children. While the first pair of raters evaluated three children, the second pair assessed four, and the final pair provided ratings for one child. The mean quadratic weighted Cohen's kappa coefficient calculated across all students was determined to be 0.537. The results indicated a moderate degree of inter-rater reliability between the German- and Turkish-speaking teacher pairs.

Descriptive Statistics for the Scale for the Assessment of Attachment Security in Preschool Institutions

Descriptive statistics were analyzed using the dimensions of the adapted scale alongside abbreviated versions of the items. Descriptive statistics were conducted separately for children aged 18–55 months and those aged 56–72 months. The letter "r" appearing next to an item number (e.g., A6r, A7r, ... B15r) indicates that the item is reverse-scored. The presence of reverse-coded items requires careful consideration during administration, particularly because some items function to confirm the consistency of the respondent's answers. Table 1 presents the mean (M) and standard deviation (SD) values for each item of the Turkish version of the scale, providing a comprehensive overview of the mean and total score variables calculated for each sub-dimension and the scale as a whole.

The descriptive statistics calculated for each of the four dimensions of the SAAS-PI scale indicate that, overall, the items received high ratings (Table 1). The mean values of the subscales ranged from 3.75 to 4.03 for the 18–55-month age group, and from 3.98 to 4.17 for the 56–72-month age group. These values indicated that the observed attachment behaviors mostly pointed to a secure attachment pattern. Across all subscales, minimum values near 0 for the 18–55-month age group indicated that the relevant behaviors were almost never observed in some children; conversely, maximum values of 5 demonstrated that these behaviors were observed nearly always, confirming that the full response range of the scale was effectively utilized. In the 56–72-month age group, minimum scores fluctuated between 0.57 and 1.50 depending on the subscale. With maximum scores reaching 5, these results suggested that the ratings for this older group were clustered within a more restricted range. As a result of this, the SDs were higher for the 18–55-month age group, except for the first factor, compared to the 56–72-month age group. The high SDs, particularly in some items (e.g., B10r, B12r, C25, C27), indicated a wider distribution of behaviors among children and a greater variability in teacher assessments.

Evaluations Regarding the Subscales

A. Desire for proximity and allowing proximity: The mean score of this subscale was determined to be M = 4.03 for the 18–55-month group and M = 3.98 for the 56–72-month group. These results indicated that children's tendency to seek physical proximity and interaction with the teacher or attachment figure was generally high. The reverse-scored items included in the scale (A6r, A7r) exhibited a distribution similar to the other items, thereby supporting the structural integrity of the instrument.

B. Coping with socially challenging situations: The mean score of this subscale was determined to be M = 3.75 for the 18–55-month group and M = 4.16 for the 56–72-month group. This finding suggests that children generally exhibit adaptive responses in situations involving social stress. Among the subscales within the SAAS-PI scale, this specific subscale exhibits the most significant discrepancy in mean values between the 18–55 month and 56–72-month age groups. An examination of the SDs for the items within this subscale reveals that the 18–55-month group consistently exhibits higher SD values across all items. In particular, higher SDs were observed in certain items such as B13r and B17; this indicates that social stress responses may exhibit greater variability among younger children.

C. Openness to novelty and joy of discovery: The mean score of this subscale was determined to be M = 4.01 for the 18–55-month group and M = 4.17 for the 56–72-month group. This result suggests that children in both groups are inclined to try new activities, act independently, and participate in social play. An examination of the SDs for the items within this subscale reveals that the 18–55-month group consistently demonstrates higher SD values. In particular, SDs are markedly higher for certain items (e.g., C25, C27). This finding suggests that exploration-based behaviors are more susceptible to individual differences.

D. Expressing and regulating emotions: The mean score of this subscale was determined to be M = 3.88 for the 18–55-month group and M = 4.03 for the 56–72-month group. These results indicate that children generally demonstrate adequate skills in expressing and regulating their emotional responses. An examination of the SDs for the items within this subscale reveals that item D33 (self-soothing) has a lower average score than the other items for both groups: 18–55 months (M = 3.31) and 56–72 months (M = 3.73); this indicates that self-regulation behavior may be developmentally more challenging compared to other skills. Existing research in the literature also reports that self-regulation skills are limited during early childhood (Verschueren and Koomen, 2012, p. 207).

Overall assessment: The overall scale mean indicates that the responses provided for the SAAS-PI items point toward positive behavioral patterns associated with secure attachment. Similarly, the Turkish adaptation study of the Short Attachment Scale-16 reveals that secure attachment is the predominant finding within the sample, reflecting Turkish culture (Sümer et al., 2025).

Validity Findings

Procedures Performed Before Confirmatory Factor Analysis

In the scale adaptation process, the suitability of the data set was tested before confirmatory factor analysis (CFA). In this regard, the

Table 1.
Descriptive Statistics

		18–55 Months				56–72 Months			
SAAS-PI Scales (Dimensions)	**SAAS-PI Items (Short)**	**M**	**SD**	**Min.**	**Max.**	**M**	**SD**	**Min.**	**Max.**
A. Desire for proximity and allowing proximity (average variable)		4.03	0.85	0.43	5.00	3.98	0.98	0.57	5.00
A. Desire for proximity and allowing proximity (total variable)		28.19	5.86	3.00	35.00	27.86	6.87	4.00	35.00
	A1 “physical proximity”	4.04	1.31	0.00	5.00	3.82	1.42	0.00	5.00
	A2 “proximity to attachment figure”	4.03	1.25	0.00	5.00	3.78	1.48	0.00	5.00
	A3 “allowing proximity”	3.90	1.22	0.00	5.00	3.69	1.34	0.00	5.00
	A4 “active participation”	4.02	1.22	0.00	5.00	4.05	1.16	0.00	5.00
	A5 “happiness”	4.56	0.87	0.00	5.00	4.36	0.98	0.00	5.00
	A6r “lack of interest”	3.71	1.51	0.00	5.00	3.97	1.33	0.00	5.00
	A7r “inconsistent behaviors”	3.93	1.56	0.00	5.00	4.19	1.24	0.00	5.00
B. Coping with socially challenging situations (average variable)		3.75	1.04	0.50	5.00	4.16	0.81	1.50	5.00
B. Coping with socially challenging situations (total variable)		37.50	10.40	5.00	50.00	41.59	8.09	15.00	50.00
	B8r “unsettled transitions”	3.78	1.50	0.00	5.00	4.17	1.26	0.00	5.00
	B9r “clinging to the primary attachment figure”	3.51	1.63	0.00	5.00	4.00	1.42	0.00	5.00
	B10r “indifferent transition”	3.88	1.45	0.00	5.00	4.07	1.30	0.00	5.00
	B11r “separation anxiety”	3.81	1.54	0.00	5.00	4.39	1.00	0.00	5.00
	B12r “post-separation distress”	3.62	1.59	0.00	5.00	4.22	1.20	0.00	5.00
	B13r “clinging to the teacher”	3.53	1.77	0.00	5.00	4.35	1.13	0.00	5.00
	B14r “being easily unsettled”	3.86	1.42	0.00	5.00	4.14	1.24	0.00	5.00
	B15r “tension”	3.87	1.50	0.00	5.00	4.23	1.13	0.00	5.00
	B16 “acting calmly”	3.88	1.43	0.00	5.00	4.19	1.17	0.00	5.00
	B17 “expressing excessive proximity”	3.75	1.44	0.00	5.00	3.82	1.29	0.00	5.00
C. Openness to novelty and joy of discovery (average variable)		4.01	1.01	0.23	5.00	4.17	0.82	1.08	5.00
C. Openness to novelty and joy of discovery (total variable)		52.09	13.08	3.00	65.00	54.25	10.69	14.00	65.00
	C18 “engaging in new suggestions”	4.09	1.22	0.00	5.00	4.19	1.01	0.00	5.00
	C19 “cooperation with other children”	3.91	1.34	0.00	5.00	4.15	1.05	0.00	5.00
	C20 “focusing on play”	4.10	1.19	0.00	5.00	4.29	0.97	0.00	5.00
	C21 “demonstrating self-efficacy”	4.26	1.09	0.00	5.00	4.35	0.91	0.00	5.00
	C22 “seeking developmentally appropriate challenges”	3.94	1.26	0.00	5.00	4.07	1.07	0.00	5.00
	C23 “constructed play”	3.96	1.29	0.00	5.00	4.19	0.98	0.00	5.00
	C24 “independence”	4.10	1.21	0.00	5.00	4.25	0.98	0.00	5.00
	C25 “inviting to play”	3.79	1.44	0.00	5.00	4.11	1.09	0.00	5.00
	C26 “showing sympathy”	3.91	1.33	0.00	5.00	3.97	1.14	0.00	5.00
	C27 “accepting exploration support”	3.74	1.41	0.00	5.00	4.04	1.11	0.00	5.00
	C28 “communication”	4.10	1.23	0.00	5.00	4.21	1.04	0.00	5.00
	C29 “showing interest”	4.09	1.14	0.00	5.00	4.26	0.94	0.00	5.00
	C30 “seeking new options”	4.08	1.27	0.00	5.00	4.15	1.07	0.00	5.00
D. Expressing and regulating emotions (average variable)		3.88	0.97	0.00	5.00	4.03	0.86	0.67	5.00
D. Expressing and regulating emotions (total variable)		23.30	5.80	0.00	30.00	24.19	5.15	4.00	30.00
	D31 “being quickly comforted”	3.98	1.22	0.00	5.00	4.02	1.13	0.00	5.00
	D32 “being calmed in a manner appropriate to the situation”	4.05	1.21	0.00	5.00	4.09	1.10	0.00	5.00
	D33 “self-soothing”	3.37	1.39	0.00	5.00	3.78	1.20	0.00	5.00
	D34 “expressing emotions in various ways”	4.08	1.15	0.00	5.00	4.15	0.98	0.00	5.00
	D35 “intensity of emotions”	3.99	1.20	0.00	5.00	4.11	0.99	0.00	5.00
	D36 “help-seeking”	3.83	1.36	0.00	5.00	4.04	1.18	0.00	5.00
Total SAAS-PI Scale (average value variable)		3.92	0.79	1.11	36.00	4.11	0.70	1.92	36.00
Total SAAS-PI Scale (total variable)		141.07	28.44	40.00	180.00	147.88	25.19	69.00	180.00

Note: SAAS-PI= Attachment Security Assessment Scale in Preschools; M = Mean; Max = Maximum; Min = Minimum; SD = Standard deviation.

first step was to check for missing data, and it was determined that there was no missing data in the dataset. Next, the dataset was analyzed for outliers. The *z*-scores for the total points were analyzed as part of the process to identify and assess outliers within the dataset. In terms of *z*-scores, 11 data points with a *z*-score above ±3.00 were excluded from the analysis (Field, 2018).

Confirmatory Factor Analysis Findings

Confirmatory factor analysis was performed to test the construct validity during the adaptation process of the scale developed in Germany into Turkish. The analysis was conducted to confirm the four-factor structure of the 36-item scale. The key fit indices regarding the model's fit to the data are presented in Table 2.

Table 2 presents the CFA results for the scale adapted into Turkish. CFA results were analyzed separately for the entire sample group, for the 18–55-month age range, and for the 56–72-month age range. The fit indices were determined to be acceptable for the entire sample (RMSEA=.092, 90% CI=.090–.095, CFI=.932, TLI=.926, SRMR=.074), the 18–55-month age range (RMSEA=.082, 90% CI=.078–.086, CFI=.937, TLI=.932, SRMR=.076), and the 56–72-month age range (RMSEA=.096, 90% CI=.091–.100, CFI=.943, TLI=.939, SRMR=.079). Considering the criteria of Hu and Bentler (1999) and MacCallum et al. (1996), an RMSEA value below .10 and CFI and TLI values above .90 indicate that the model is generally consistent with the theoretical framework. An SRMR value below .08 indicates that the discrepancy between the observed covariance matrix and the covariance matrix predicted by the model is low. The standardized factor loadings of the items ranged from .50 to .94, and all were determined to be significant at the $p < .001$ level. This indicates that each item significantly predicts the factor to which it belongs.

The relatively high RMSEA values in some groups were carefully analyzed. Kline (2016) states that an increase in sample size can generally inflate the RMSEA value, which may depict the model's true fit as being weaker than it actually is. Given that the sample size is greater than 300, the somewhat elevated RMSEA was interpreted as a reflection of sample size sensitivity rather than a lack of model fit. Additionally, it is reported that as model complexity and *df* increase, the RMSEA index may become more sensitive to minor model misspecifications and exhibit an upward bias (Kenny et al., 2014). In complex measurement models containing a large number of items, it is recommended not to rely on a single index for evaluating model fit, but rather to investigate a combination of indices from different categories, such as CFI, TLI, and SRMR (Hu and Bentler, 1999; Kline, 2016). The fact that the adapted scale has a multi-item structure consisting of 36 items may also have contributed to the relatively high RMSEA value. Considering the RMSEA in conjunction with other indices, CFI and TLI scores exceeding .90 and an SRMR value under .08 indicate that the model provides an overall acceptable level of fit. In conclusion, the findings reveal that the Turkish-adapted version of the scale retains its original factor structure and maintains its structural validity.

Figure 2 presents the CFA model for the Turkish cultural adaptation of the scale developed in Germany. In the model, each item has significant and positive factor loadings under its corresponding factor. Positive correlations were observed among the four factors, supporting the premise that the factors represent the same latent construct. The standardized factor loadings of the items ranged from .57 to .95, and all were significant at the $p < .001$ level. The fact that the inter-factor correlation coefficients in the model range from .53 to .78 indicates that the factors are moderately correlated with each other yet represent distinct structures.

Findings Regarding Measurement Invariance

Once the model exhibited acceptable fit for both age categories, measurement invariance testing was conducted to compare the two groups. The findings regarding measurement invariance across subgroups are presented in Table 3.

Multi-group CFA was conducted to test the equivalence of the adapted scale's factor structure between the 18–55-month (Group 1) and 56–72-month (Group 2) age ranges. The results of the configural invariance model indicate that the factor structure is consistent across both groups (RMSEA=.084 (90% GA=.081–.087), CFI=.891, TLI=.883, SRMR=.078).

The metric invariance model was tested by constraining the factor loadings to be equivalent between the groups. The fit indices for the metric model were determined to be RMSEA=.057 (90% GA=.054–.060), CFI=.948, TLI=.946, SRMR=.079. Based on the DIFFTEST output, the chi-square difference between the configural model and the metric model was determined to be statistically non-significant ($\Delta\chi^2$ (32)=22.36, p=.897). This finding supports the assumption that factor loadings are equivalent across age groups, providing evidence for metric invariance.

Finally, the scalar invariance model, in which item intercepts were constrained to be equal across groups, was tested. The fit indices for the scalar model were determined to be RMSEA=.051 (90% GA=.047–.054), CFI=.954, TLI=.957, SRMR=.080. Upon transitioning from the metric model to the scalar model, an increase in the CFI value (ΔCFI=+.006) and a decrease in the RMSEA value (ΔRMSEA=-.006) were observed. The establishment of full scalar invariance indicates that it is appropriate to conduct latent mean comparisons across the age groups. Following the establishment of scalar invariance, latent mean comparisons were conducted between the age groups. The differences in latent means across age groups are presented in Table 4.

According to the results presented in Table 4, the group of children aged 18–55 months was established as the reference group. The results indicate that the 56–72-month group has statistically significantly higher latent means in factors F2 (Est.=0.60, $p < .001$), F3 (Est.=0.69, $p < .001$), and F4 (Est.=0.89, $p < .001$) compared to the reference group. In contrast, the 56–72-month group was found to have a significantly lower latent mean in the F1 dimension compared to the reference group (Est.=−0.37, p=.008).

Criterion Validity

To assess criterion validity, the ABCS (Sümer et al., 2009) was administered to the 50 children included in the study, and the results were compared. In correlational studies explaining the degree to which variables move in agreement with each other, a sample size of 50 is

Table 2.
Fit Indices for the CFA Model

Sample Group	N	χ^2	*df*	RMSEA	90% CI (Lower–Upper)	CFI	TLI	SRMR
Total group	642	3795.243	583	.092	.090–.095	.932	.926	.074
18–55 months	337	1894.820	583	.082	.078–.086	.937	.932	.081
56–72 months	305	2206.773	584	.096	.091–.100	.943	.939	.079

Note: 90% CI = 90% Confidence interval; CFA = Confirmatory factor analysis; CFI = Comparative fit index; df = Degrees of freedom; N = Sample size; RMSEA = Root mean square error of approximation; SRMR = Standardized root mean square residual; TLI = Tucker–Lewis index; χ^2 = Chi-square fit statistic.

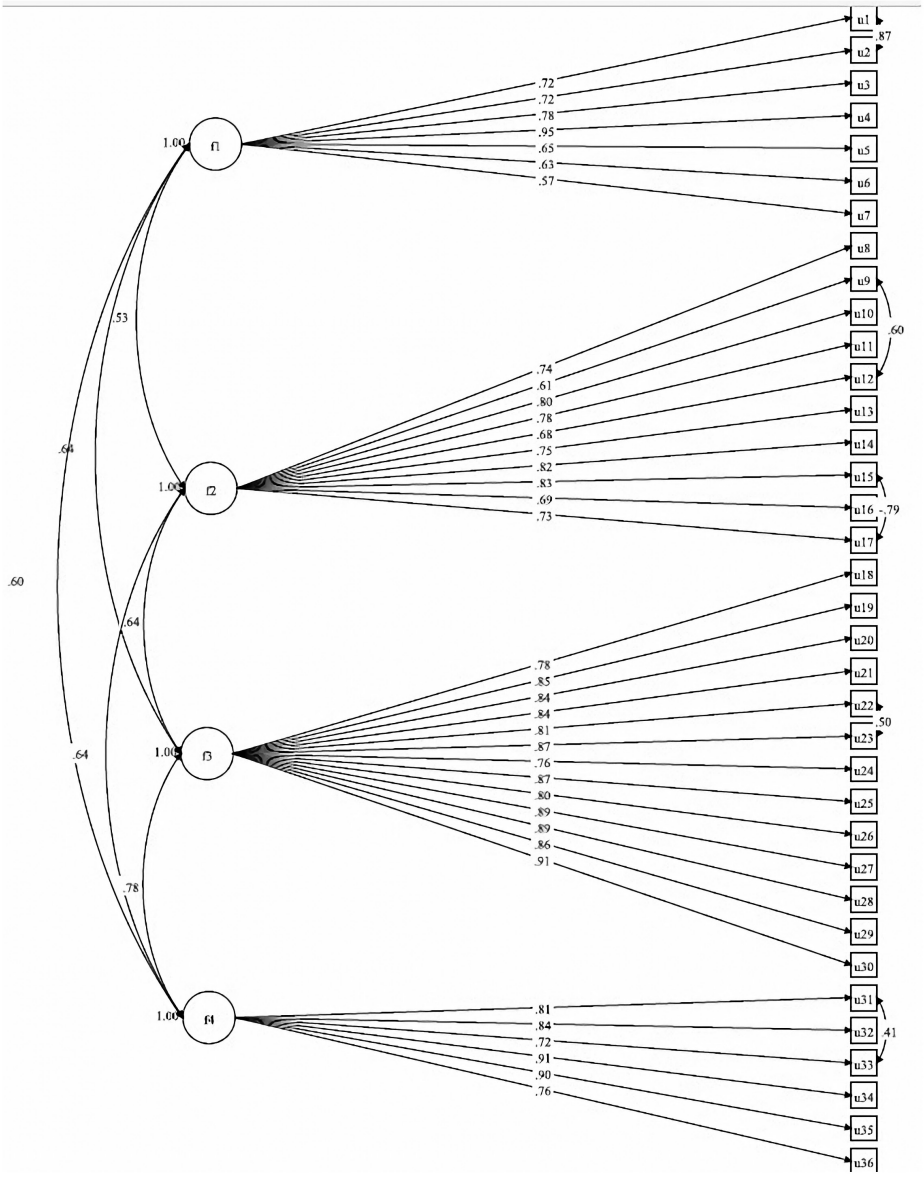

Figure 2.
Confirmatory Factor Analysis Model.

sufficient (Fraenkel et al., 2012, p. 103). In this regard, observations were also conducted using the ABCS scale for 50 children observed during the adaptation phase of the SAAS-PI scale. During the development phase of EiBiS, the criterion validity of the Attachment Behavior Q-Sort, which is the German version of the original ABCS used in this study for criterion validity, was analyzed (Fröhlich-Gildhoff and Hohagen, 2020b). Therefore, in this adaptation study, as in other stages, the criterion validity stage was also followed exactly as in the development of the original scale.

Correlation coefficients were calculated between the original criterion scores for ABCS and the children's observation scores. A correlation coefficient was calculated between the obtained correlation coefficients and the observed children scores. Correlation coefficients for the total score and sub-dimensions are presented in Table 5.

Correlation analysis conducted to test criterion validity revealed a positive and significant relationship between the total score of the adapted SAAS-PI scale and the total score of the ABCS scale used

Table 3.
Measurement Invariance Across Age Groups: Fit Indices (MG-CFA)

Model (Level of Constraint)	χ^2	*df*	CFI	TLI	RMSEA	90% CI (Lower–Upper)	SRMR	$\Delta\chi^2$ (DIFFTEST)	Δ*df*	*p*	ΔCFI
Configural	3849.251	1176	.891	.883	.084	.081–.087	.078				
Metric (equal loads)	2481.747	1208	.948	.946	.057	.054–.060	.079	22.36	32	.897	+.057
Scalar (threshold/ initial + equal loads)	2462.385	1348	.954	.957	.051	.047–.054	.080		140		+.006

Note. CFI = comparative fit index; CI = confidence interval; df = degrees of freedom; p = significance level; ΔCFI = change in comparative fit index; Δdf = change in degrees of freedom; MG-CFA = multigroup confirmatory factor analysis; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; TLI = Tucker–Lewis index; χ^2 = chi-square statistic; $\Delta\chi^2$ = chi-square difference statistic.

Table 4.
Latent Mean Differences Across Age Groups (Reference: GROUP 1)

Factor	Estimate	SE	z (Est./SE)	p
F1	−0368	0140	−2640	.008
F2	0596	0058	10243	<.001
F3	0694	0072	9610	<.001
F4	0887	0073	12203	<.001

Note: Estimate = Estimated latent mean difference; p = Significance level; SE = Standard error; z = Standardized test statistic (Estimate/SE).

as a criterion (r=.33, p < .05). Considering the sub-dimensions of the SAAS-PI scale, a significant relationship was determined only between the second sub-dimension and the ABCS scale (r=.39, p < .01). In other sub-dimensions, the correlation coefficient ranged from .20 to .25, but no significant relationship was determined (p > .05).

Reliability Findings

Internal Consistency (Reliability) of the SAAS-PI Scale and Its Subscales

The Cronbach's alpha coefficients calculated for each subscale and the total scale demonstrate that the Turkish adaptation of the scale exhibits a high level of internal consistency (Table 6).

According to Blanz (2015), > .70 is acceptable, >.80 is good, and >.90 is excellent. From this perspective, the SAAS-PI scale and all its subscales demonstrate high levels of statistical reliability. In particular, the high alpha value of dimension C (openness to novelty and joy of discovery) indicates that the items comprising this dimension are highly consistent with one another. The high reliability level of the overall scale demonstrates that the instrument reliably measures attachment behaviors within the context of Turkish culture.

Test-Retest Results

Two different reliability methods were applied to ensure the reliability of the measurements obtained from the SAAS-PI scale. First, a test-retest method was used to evaluate the stability of the data obtained from the scale over time. Although the time interval between the initial and follow-up administrations in a test-retest procedure varies depending on the research's target population, a four-week interval is generally considered appropriate (Büyüköztürk, 2016). In correlational studies, a sample size of approximately 30 (Creswell, 2012, p. 146) or 50 (Fraenkel et al., 2012, p. 103) is considered sufficient. Accordingly, 50 children were observed again by raters at four-week intervals. The correlation coefficient between the scores obtained from the two observations was determined to be high, r = .85 (p < .001) (Cohen, 1988).

Split-Half Reliability Results

To provide additional evidence of reliability, the split-half method was used. When the test was halfway through, the odd-numbered items and the even-numbered items formed the two halves. Then, the correlation coefficient was calculated between the scores obtained from odd-numbered items and the scores obtained from even-numbered items. After applying the Spearman-Brown correction, the correlation coefficient calculated between the two halves was determined to be high, r = .97 (p < .001).

Table 5.
Criterion Validity Results

Adapted Scale (SAAS-PI)	r	p
Total Points	.33*	.020
Sub-dimension 1	.25	.075
Sub-dimension 2	.39**	.006
Sub-dimension 3	.24	.095
Sub-dimension 4	.20	.175

Note. SAAS-PI = Attachment Security Assessment Scale in Preschools.
*p < .05.
**p < .01.

Table 6.
Cronbach's Alpha Values for the SAAS-PI Scale and Its Subscales

Scale	Internal Consistency (Cronbach's Alpha)
A. Desire for proximity and allowing proximity	.794
B. Coping with socially challenging situations	.887
C. Openness to novelty and joy of discovery	.961
D. Expressing and regulating emotions	.883
Overall scale	.957

Note: SAAS-PI = Attachment Security Assessment Scale in Preschools.

Inter-Rater Agreement Analysis

Inter-rater reliability analyses were conducted to evaluate the reliability of the scores assigned to the items of the assessment scale. To evaluate reliability, some children were observed by two raters, while others were observed by three raters. Since the item scores on the scale range from 0 to 5, the use of unweighted coefficients was deemed inappropriate for evaluating inter-rater agreement. Inter-rater agreement coefficients were calculated individually at the child level: In cases involving two raters, quadratic weighted Cohen's kappa was utilized, whereas Weighted Fleiss' kappa was employed for cases with three raters. The classification proposed by Landis and Koch (1977) was adopted as the basis for interpreting the kappa coefficients.

Coefficients of agreement calculated by two raters: In the Turkish adaptation of the scale, 19 children were scored by six different pairs of raters (12 teachers) to calculate the rater agreement coefficients. Cohen's kappa value was calculated first for each individual child and then for the average. The average quadratic weighted Cohen's kappa value was determined to be 0.442. According to Landis and Koch (1977), an average kappa value between 0.40 and 0.60 indicates a moderate level of agreement.

Coefficients of agreement calculated by three raters: In the Turkish adaptation of the scale, 14 children were observed and scored by three different raters. The mean Weighted Fleiss' kappa value calculated for the three raters was determined to be 0.429. This calculated value indicates a moderate level of agreement among the raters (Landis and Koch, 1977).

Discussion

This study aimed to adapt a 36-item, four-factor scale developed in Germany for assessing children's attachment security—categorized as secure attachment, insecure-ambivalent, insecure-avoidant, and insecure-disorganized attachment—in preschool settings in Türkiye and to investigate its psychometric properties. To ensure the scale's content validity within Turkish culture, all necessary steps were systematically carried out, resulting in a culturally appropriate translation. Following a meticulous translation process and applying the method described by Hambleton et al. (2005, p. 123) for linguistic equivalence, eight Turkish and eight German scales were completed by teachers for the same children. The mean quadratic weighted Cohen's kappa value across the scales was determined to be 0.537, indicating an acceptable level of agreement. All stages conducted for linguistic and content validity have yielded strong evidence regarding the scale's usability in Turkish culture.

Descriptive item and scale analyses revealed that the scale distinctly demonstrated attachment security. Considering the sub-dimensions, it was determined that children's proximity-seeking behavior toward the teacher/attachment figure was generally high, children mostly acted adaptively in social stress situations, and social stress responses were

more variable among younger children. The findings suggested that while children generally showed a tendency to engage in new activities, independent movement, and social play, their exploration patterns varied significantly based on individual differences. It was also determined that while children were generally proficient in expressing their emotional responses, they experienced difficulties with self-regulation. These findings obtained from the sub-dimensions of the scale are consistent with previous research demonstrating that attachment security is related to emotion regulation skills (Tulpar et al., 2019) and self-regulation skills (Bayındır and Ural, 2019). Thompson (2008) reported that attachment security was associated with children's social problem-solving skills, peer relationships, emotionality, and their emotion regulation and self-regulation skills. It was determined that the four sub-dimensions of the scale generally yielded high mean values in both the 18–55 and 56–72-month age groups. Similarly, descriptive item and scale analyses conducted with the original version of the instrument also revealed high levels of secure attachment (Fröhlich-Gildhoff and Hohagen, 2020a). This finding was also consistent with research indicating that secure attachment was observed more intensely within the Turkish sample (Sümer et al., 2025). The mean scores of the total scale and its subscales indicated that children predominantly exhibited secure attachment behaviors in preschool settings. The scores of children in the 18–55-month age group exhibited a wider distribution, and their SDs were higher compared to the older age group. This suggested that attachment security tended to be more variable during the early stages of early childhood, whereas it might show a tendency to become more consistent in the later stages.

As a result of the CFA, it was concluded that the four-factor structure of the original scale was acceptable in the Turkish culture. The preservation of the factors established within the theoretical framework in Turkish culture is consistent with the view that attachment theory has universal elements, but these elements can be exhibited through different behaviors depending on the culture (Mesman et al., 2016). In this study, the original age range of the adapted scale, which was 18–55 months, was expanded to include children aged 56–72 months. In Türkiye, preschool education is provided institutionally until the age of 72 months. Participation in preschool education is higher for children older than 56 months compared to younger age groups (MEB, 2023). Taking this into consideration, expert opinion was obtained via email from Prof. Dr. Klaus Fröhlich-Gildhoff, one of the researchers who developed the original scale. Prof. Dr. Klaus Fröhlich-Gildhoff noted that expanding the scale's application to include older children (e.g., up to 72 months) could constitute an intriguing study. Accordingly, to extend the target age range of the scale, expert opinions were obtained from field specialists in Türkiye regarding its applicability to children aged 56–72 months. With the permission of the developer of the original scale and based on the expert opinions obtained, the target age range was extended. CFA was subsequently conducted for the 56–72-month age group, and the model fit was determined to be at an acceptable level. However, the fit indices for the older age group were relatively weaker. This can be explained by the easier and more distinct activation of the attachment system in younger children. The role of teachers as a source of support and as an attachment figure is considered more crucial for younger children (Verschueren and Koomen, 2012, p. 207). Children exhibit a higher demand for secure attachment during their initial transition into preschool, a seeking behavior that gradually diminishes as they spend more time in the educational setting (Koomen and Hoeksma, 2003). Consequently, the relative weakening of fit indices as the age group increases can be explained by the fact that attachment behaviors manifest more prominently at earlier ages. Nevertheless, the relatively high RMSEA values observed in some groups during the CFA should be evaluated with caution. Considering the RMSEA in conjunction with other indices, CFI and TLI scores exceeding .90 and an SRMR value under .08 indicate that the model provides an overall acceptable level of fit. The expansion of the scale's age range has both enabled the testing of measurement sensitivity across different developmental periods and broadened the scale's scope of application.

Measurement invariance analyses conducted for different age groups revealed that the adapted scale provided comparable measurements at the baseline level. To assess criterion-related validity, the relationship between the SAAS-PI scale and the ABCS scale (Sümer et al., 2009) was analyzed; the results revealed a moderately positive and significant correlation ($r = .33$, $p < .05$) between the two scales. Since correlation coefficients of $r = .10$, $r = .30$, and $r = .50$ are considered small, medium, and large effect sizes in the social sciences, respectively (Cohen, 1988), the obtained correlation coefficient indicates a moderate relationship in terms of criterion validity. Regarding the sub-dimensions of the SAAS-PI scale, a significant correlation was found only between the second sub-dimension and the BDSS scale ($r = .39$, $p < .01$); no significant correlation was found in the other sub-dimensions. The fact that average scores were generally high across the sample might have resulted in limited variance in the distribution, potentially suppressing the observed correlations. A more suitable approach would be to interpret the criterion-related validity results in light of the SAAS-PI scale's framework, centered on the teacher–child relationship and the specific dynamics of the institutional environment. While the ABCS scale is completed by observing the child's relationship with the mother in the home environment, the SAAS-PI scale is administered within the school setting. In future studies, criterion validity should be supported with additional evidence through a multi-method/multi-informant approach (e.g., different observers, various settings). The original study also reported lower criterion-related correlations, which were explained by the marginal sample size and the likelihood that the scales assessed distinct aspects of attachment or reflect variations in how different observers conducted their assessments (Fröhlich-Gildhoff and Hohagen, 2020a). Similarly, the criterion validity analyses in the present study were also conducted on a limited sample. Since the ABCS scale used for criterion validity requires observations lasting approximately two hours for each child, making the data collection process highly time-consuming, the analyses were conducted with a sample of 50 children. The support provided by the TUBITAK 125K019 project played a significant role in encouraging teacher participation, which was instrumental in reaching a sample of 50 children for the criterion validity phase.

To test the reliability of scores obtained from a research study, one or more methods such as alternative-form reliability, test-retest reliability, inter-rater reliability, and internal consistency reliability can be utilized (Creswell, 2012). In this study, internal consistency reliability, test-retest reliability, split-half reliability, and inter-rater reliability were employed in combination to investigate the reliability results. Cronbach's alpha coefficients were determined to be .957 for the overall scale, while the values for the sub-factors were .794 for desire for proximity and allowing proximity, .887 for coping with socially challenging situations, .961 for openness to novelty and joy of discovery, and .883 for expressing and regulating emotions. Internal consistency reliability is considered acceptable for values of .70 and above, good for .80 and above, and excellent for .90 and above (Blanz, 2015). The test-retest analysis indicated that there was a strong correlation between the initial and subsequent applications of the scale. The split-half analysis further revealed a strong correlation between the two halves of the test, indicating a high level of internal reliability. The inter-rater agreement analysis was determined to be at a moderate level. Reliability analyses suggested that the scale possessed strong psychometric properties.

Conclusion and Recommendations

In this study, the Scale for the Assessment of Attachment Security in Preschool Institutions was adapted into the Turkish culture, and the psychometric properties of the scale were comprehensively analyzed.

The findings indicate that the scale's four-factor structure, which was theoretically grounded in Germany, is preserved within the Turkish sample and demonstrates adequate psychometric properties in terms of both validity and reliability. Expanding the scale's scope to include children aged 18–72 months facilitates evaluating the tool's responsiveness throughout various developmental stages and permits a comprehensive assessment of the whole preschool period.

The findings of this study indicate that this assessment instrument, developed based on teacher observations, can be utilized to systematically evaluate children's attachment security within preschool educational settings. The concise, observation-based nature of the scale, combined with its ease of administration, suggests that it could serve as a functional assessment tool, particularly in early intervention programs and in practices aimed at strengthening teacher–child interactions.

Future studies should consider addressing the socioeconomic backgrounds of the participants to provide a more nuanced understanding of the results. Studies incorporating children from diverse socioeconomic backgrounds will contribute to a more comprehensive understanding of how attachment security manifests across different social contexts. To improve the generalizability of the results within the stratified purposeful sampling framework, it is suggested that a proportional weighting method be used. This study has a cross-sectional design. Future longitudinal studies are recommended to investigate the stability of the scale's psychometric properties over time and the continuity of attachment security throughout the developmental process.

Data Availability Statement: For the secondary use of the data collected in this project, researchers are expected to adhere to ethical principles and refrain from using the data in a manner that implies they were responsible for its original collection. The data will be maintained by the research team and shared only upon submission of an appropriate justification and receipt of written approval from the research team. To protect participant confidentiality, only an anonymized dataset will be shared..

Ethics Committee Approval: This study received ethical approval from the Research Ethics Committee of the Hacettepe University Graduate School of Educational Sciences (Approval No. E-77278857-300-00003509842; May 10, 2024).

Informed Consent: All participants were informed about the study and voluntarily agreed to participate. They were also informed of their right to withdraw from the study at any time without providing a reason. The confidentiality of all data collected during the study was ensured, and participants were assured that the data would be used solely for scientific purposes and that no information that could reveal their identities would be disclosed. Informed consent was obtained from all participants.

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