ORIGINAL ARTICLE / ÖZGÜN ARAŞTIRMA

DOI: 10.4274/tjcamh.galenos.2025.24119

Turk J Child Adolesc Ment Health 2026;33(2):129-40

Differences Between Mother-Toddler and Father-Toddler Interaction and Psychiatric Clinical Utility of Parent-Toddler Interaction Multiaxial Assessment (PTI-MAXA) Scale

Anne-Bebek ve Baba-Bebek Etkileşimi Arasındaki Farklılıklar ve Ebeveyn-Bebek Etkileşimi Çok Eksenli Değerlendirme (PTI-MAXA) Ölçeğinin Psikiyatrik Klinik Kullanımı

Koray Karabekiroğlu[1], Esra Yürümez[2], Hatice Aksu[3], Mustafa Dinçer[3], Ayhan Göngöloğlu[4], Berkan Şahin[5], Yasemin Taş Torun[6], Gülsüm Yitik Tonkaz[5], Cansu Çobanoğlu Osmanlı[5], Bedia Sultan Önal[5], Burçin Özlem Ateş[4], Oya Güleşen[4], Hazal Selin Soyugür[4], Hande Ayraler Taner[7], Elif Pekmezci Yazgı[1], Hakan Öğütlü[8], Damla Eyüboğlu[9], Yusuf Yasin Gümüş[1], Miraç Barış Usta[1], Merve Çıkılı Uytun[2], Şermin Yalın Sapmaz[10], Didem Öztop[2], Berna Gündüz Çıtır[11], Aylin Deniz Uzun Çakır[12], Burak Çakır[12], Hatice Gülşen[1], Burcu Akın Sarı[7]

[1]Ondokuz Mayıs University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Samsun, Türkiye
[2]Ankara University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Ankara, Türkiye
[3]Adnan Menderes University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Aydın, Türkiye
[4]Universtiy of Health Sciences Türkiye, Gülhane Training and Research Hospital, Clinic of Child and Adolescent Psychiatry, Ankara, Türkiye
[5]Giresun University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Giresun, Türkiye
[6]Gazi University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Ankara, Türkiye
[7]Başkent University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Ankara, Türkiye
[8]Private Office, Child and Adolescent Psychiatrist, Ankara, Türkiye
[9]Eskişehir Osmangazi University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Eskişehir, Türkiye
[10]Manisa Celal Bayar University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Manisa, Türkiye
[11]Nazilli State Hospital, Clinic of Child and Adolescent Psychiatry, Aydın, Türkiye
[12]Uşak University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Uşak, Türkiye

ABSTRACT

Objectives: The Parent-Toddler Interaction Multiaxial Assessment (PTI-MAXA) was developed to evaluate the interaction between a parent and their 1-3-year-old toddler and to score dimensions of interaction quality. In this study, we aimed to assess the differences in interaction dimensions between mother-toddler and father-toddler dyads. In addition, we aimed to examine the distinctive utility of PTI-MAXA with respect to psychiatric and neurodevelopmental morbidity in toddlers.

Materials and Methods: Participants were 105 children aged 13-40 months [mean: 27.28±6.7 months; (male, n=63; female, n=42)] and their mothers aged 22-46 (mean: 31.5±4.8) years and fathers aged 26-47 (mean: 34.7±4.7) years. Various psychometric measures, including the Brief Infant and Toddler Social Emotional Assessment Scale, Aberrant Behavior Checklist, Brief Symptom Inventory, and Beck Depression Inventory, were employed alongside the PTI-MAXA assessment. Toddlers participated significantly more in interactions with their mothers than with their fathers, and mothers had substantially higher reciprocity scores than fathers.

Address for Correspondence/Yazışma Adresi: Esra Yürümez Assoc. Prof., Ankara University Faculty of Medicine, Department of Child and Adolescent Psychiatry, Ankara, Türkiye

E-mail: esrayurumez@gmail.com **ORCID:** orcid.org/0000-0002-7051-5662

Received/Geliş Tarihi: 19.12.2024 **Accepted/Kabul Tarihi:** 16.12.2025 **Epub:** 29.06.2026 **Publication Date/Yayınlanma Tarihi:** 09.07.2026

Cite this article as/Atıf: Karabekiroğlu K, Yürümez E, Aksu H, Dinçer M, Göngöloğlu A, Şahin B, Taş Torun Y, Yitik Tonkaz G, Çobanoğlu Osmanlı C, Önal BS, Ateş BÖ, Güleşen O, Soyugür HS, Ayraler Taner H, Pekmezci Yazgı E, Öğütlü H, Eyüboğlu D, Gümüş YY, Usta MB, Çıkılı Uytun M, Yalın Sapmaz Ş, Öztop D, Gündüz Çıtır B, Uzun Çakır AD, Çakır B, Gülşen H, Akın Sarı B. Differences between mother-toddler and father-toddler interaction and psychiatric clinical utility of Parent-Toddler Interaction Multiaxial Assessment (PTI-MAXA) Scale. Turk J Child Adolesc Ment Health. 2026;33(2):129-40

ABSTRACT

Results: Regardless of autism status, boys had significantly lower PTI-MAXA scores, particularly when assessed with their mothers. PTI-MAXA discriminated among clinical diagnostic groups, particularly the autism spectrum. Mothers demonstrated more participatory and reciprocal interactions with their 1-3-year-old children than did fathers. Moreover, mother-toddler and father-toddler interactions differed significantly, especially between genders. The PTI-MAXA demonstrated reliable global ratings of mother-toddler and father-toddler interactions during 40-50 minutes of videotaped play in a laboratory setting.

Conclusion: These findings underscore the usefulness, validity, and reliability of PTI-MAXA for clinical applications.

Keywords: Mother-toddler, father-toddler, interaction, PTI-MAXA

ÖZ

Amaç: Ebeveyn-Bebek Etkileşimi Çok Eksenli Değerlendirme (PTI-MAXA), anne/baba ve 1-3 yaş arası bebekleri arasındaki etkileşimi değerlendirmek ve etkileşim kalitesinin farklı boyutlarını puanlamak için geliştirilmiştir. Bu çalışmada, anne-çocuk ve baba-çocuk çiftleri arasındaki etkileşim boyutlarındaki farklılıkların değerlendirilmesi amaçlanmıştır. Ayrıca, bu değerlendirmenin erken dönemde çocuğun psikiyatrik ve nörogelişimsel morbiditesi açısından ayırt edici özelliğinin incelenmesi amaçlanmıştır.

Gereç ve Yöntem: Katılımcılar 13-40 aylık [ortalama: 27,28±6,7 ay; (erkek, n=63; kız, n=42)] 105 çocuk ve 22-46 (ortalama: 31,5±4,8) yaşlarındaki anneleri ve 26-47 (ortalama: 34,7±4,7) yaşlarındaki babalarından oluşmaktadır. PTI-MAXA değerlendirmesinin yanı sıra Kısa Bebek/Çocuk Sosyal ve Duygusal Değerlendirme Ölçeği, Anormal Davranış Kontrol Listesi, Kısa Semptom Envanteri ve Beck Depresyon Envanteri gibi çeşitli psikometrik ölçümler kullanılmıştır.

Bulgular: Otizmden bağımsız olarak, erkek çocukların özellikle annelerinde PTI-MAXA skorları anlamlı derecede düşük bulunmuştur. PTI-MAXA'nın başta otizm spektrumu olmak üzere klinik tanı grupları açısından ayırt edici olduğu görülmüştür. Anneler, babaların aksine 1-3 yaşındaki çocuklarıyla daha katılımcı ve karşılıklı etkileşimler sergilemiştir. Ayrıca, anne-çocuk ve baba-çocuk etkileşimleri özellikle cinsiyetler arasında önemli farklılıklar göstermiştir. PTI-MAXA, laboratuvar ortamında videoya kaydedilen 40-50 dakikalık oyun sırasında anne/baba-çocuk etkileşimlerinin güvenilir genel derecelendirmeler ile ortaya çıkmıştır.

Sonuç: Bu bulgular, PTI-MAXA'nın klinik uygulamalar için kullanışlılığını, geçerliliğini ve güvenilirliğini vurgulamaktadır.

Anahtar Kelimeler: Anne-çocuk, baba-çocuk, etkileşim, PTI-MAXA

Introduction

The early years of life are fundamentally important for healthy development across all areas of functioning (emotional, linguistic, cognitive, and sensory). In terms of early childhood brain development and mental health, the importance of the quality of the toddlers' interaction with their primary caregivers, especially parents, has been emphasized for many years.[1-3] Research indicates that parental psychopathology and genetic predispositions for psychiatric disorders heighten the risk of developmental challenges, stemming from parental conflicts, disruptions in parent-child relationships, and elevated interpersonal stress levels.[4] In particular, it is stated that the mother's ability to respond to the toddler's cues/messages in an appropriate, finely-tuned manner is pivotal for the toddler's emotional control.[5,6] And emotional sharing/empathy.[7] For the toddler to achieve autonomy and safely explore their environment, both the mother and father must possess adequate parenting skills during this process.[8,9]

Parents are regarded as the primary socializers of children's emotions, especially for toddlers.[10,11] Through responsive parent-child interactions - particularly by their capacity for mentalization - parents help children recognize, understand and resolve negative emotional experiences.[12] Emotional regulation and adaptation in early childhood are influenced by the emotional climate within the family.[11] Social learning theory relates to play in various ways, but the most important of these is the way parents may use "play as practice". Essentially, through play, parents can impart cognitive and social skills such as communication and language, turn-taking, and autonomy development to their young child.[13,14] Evidence suggests that toddlers learn through their parents' play. For instance, cross-cultural findings have shown that toddlers tend to engage in similar types of play when their parents emphasize specific types of play.[15,16] Lamb[17] has emphasized the importance of parental warmth, support, accessibility, and responsiveness during interactions. Higher levels of caregiver sensitivity have been consistently associated with more positive child development.[18]

Children exhibiting high levels of irritability, negative mood, and irregular behavioral and biological patterns appear to engage in lower-quality interactions with their parents.[19] Parental sensitivity is defined as the parent's ability to perceive and interpret the child's signals and needs accurately, and respond appropriately and promptly.[20] Parental sensitivity is considered a fundamental parenting behavior and serves as a key antecedent in establishing a secure caregiver-child attachment relationship.[20,21]

On the other hand, "new fathers" are increasingly striving to establish close relationships with their children from the earliest stages of development and are actively involved in parenting responsibilities.[22] Recent findings from a study[23] indicate that father-child, but not mother-child, synchrony was associated with less distress in toddlers and that reported interparental relationship satisfaction by fathers was significantly associated with children's coping skills. Positive father-toddler interactions contribute positively to children's cognitive and socio-emotional development directly[24] and indirectly (e.g., by influencing mother-toddler interactions).[25-27] Fathers who are highly involved (in terms of time spent with their children) are likely to have more empathetic sons and daughters showing more internal locus of control.[28,29] The interaction style of fathers with young children differs from that of mothers and is characterized by more physical contact and rough-and-tumble play.[30-32]

Support and responsiveness from fathers during stimulating play activities are also associated with higher father-child attachment security.[33] Additionally, paternal responsiveness during play is related to a child's self-regulation and language skills.[34-36]

A number of structured assessment methods are available to evaluate mother/father-toddler interactions using objective criteria. The Parental Playfulness Scale,[25] the Rough and Tumble Play Questionnaire[37] and the Père-En-Jeux Questionnaire[38] are some of the self-report measures available.[18] However, self-report measures may be considered for ensuring the validity of scientific data. Another method used to evaluate mother-toddler interaction is "emotional availability," but it does not address the mother and child separately, and no structured format is recommended in this assessment method.[39] Another assessment method is the "Parent-Child Interaction Teaching Task".[40] Parents are asked to teach their children how to perform an activity, which lasts between 1 and 7 minutes. In the "Frustration Task,"[41] the researcher presents the child with 3 toys, and the child chooses one to play with for one minute. This method evaluates the child's interaction with the parent in a single situation. The Play Scale[42] is a global rating scale developed to assess mother-toddler/child play interactions. Recently, Olofson and Schoppe-Sullivan[43] developed a coding system for measuring the quality of parenting behavior to examine associations with children's social-emotional development.

As previously Gardner,[44] and recently Funamoto and Rinaldi[45] and Dishion et al.[46] addressed the methodological issues in the direct observation of parent-child interactions, and there are several instruments to assess the interaction between parent and toddler, there is a limited number of recommended structured interview/play formats for interpreting these dimensions. In addition, parents and their child are not assessed separately in these evaluations. The ratings obtained may sometimes be subjective and oversimplified. In terms of clinical assessment, it seems very important to observe parent-toddler/child interactions not only in environments where the child and/or parent is distressed but also in environments where activities may be enjoyable.[47-49] There is evidence that observation settings such as free play enhance the validity of the interpretation of general observations.[42,50] Developing a standardized set of measurement tools, consistently employed across studies, would significantly bolster the field's advancement with heightened confidence.[18]

The Parent-Toddler Interaction Multiaxial Assessment (PTI-MAXA) developed by Karabekiroğlu et al.[51] is an original method designed to evaluate the quality of the interaction between toddlers aged 1-3 years and their mothers in a laboratory setting and scoring the components of the interaction. As the dyad is observed in different semi-structured interaction settings and toddlers and parents are scored separately on different dimensions of interaction and attachment, PTI-MAXA is termed a multiaxial assessment. Subsequently, this method also showed robust validity-reliability outcomes for father-toddler dyads as well.[52] This method addresses parent-toddler interaction across various dimensions, observes the child's attachment pattern, and offers the opportunity to work with parents to improve parent-toddler interaction constructively and functionally. In this study, we aimed to assess differences in dimensions of interaction between mother-toddler and father-toddler couples. In addition, we aimed to examine the distinctive utility of PTI-MAXA in terms of toddlers' psychiatric and neurodevelopmental morbidity, such as differences between autism cases, language development, and social and emotional problem scores. In this study, we aimed to investigate the differences between mothers and fathers in the quantity and quality of interactions with their toddlers. In addition, we aimed to assess the clinical utility of PTI-MAXA scores, including their capacity to differentiate typically developing children from children with neurodevelopmental disorders.

Materials and Methods

Participants

The required sample size for each group was calculated to be a minimum of 40, with 95% power and a 5% Type 1 error, using the Minitab 17.0 program. However, since various subgroup analyses were planned, the aim was to include a total of 100 children and their parents, with backups for potential data loss (110 mother-father-toddler triads included). A total of 11 centers, involving 105 children aged 13-40 months and their mothers and fathers, participated in the study. The participants were recruited from pediatric and psychiatry clinics to enable the inclusion of individuals with psychiatric conditions and control subjects. The subjects were randomly selected. The evaluators were blinded to the clinical symptoms and/or developmental problems of the toddlers and their parents. Both coders of PTI-MAXA at each center were specialists in child and adolescent psychiatry and/or residents, and they underwent training in scoring the scales to ensure consistency and accuracy.

Measures

1. Sociodemographic and Clinical Data Form (SCDF)

This form, created by the researchers, records sociodemographic information such as age, gender, children's developmental stages, educational status, medical history, presence of past or current psychiatric disorders, use of psychotropic medication, and history of psychiatric illness among close relatives. This was completed by the researcher during the clinical interview.

2. Assessment Tools for Parents

2.1. Brief Symptom Inventory (BSI)

BSI is a 53-item self-report version derived from the 90-item revised symptom checklist, developed by Derogatis and Melisaratos[53] to assess psychiatric problems across various medical conditions. Using a 5-point Likert-type scale, participants are instructed to select one of the following options: "not at all," "a little bit," "moderately," "quite a bit," and "extremely," corresponding to scores of 0, 1, 2, 3, and 4, respectively. Both mothers and fathers completed this inventory.

2.2. Beck Depression Inventory (BDI)

The BDI consists of 21 items assessing symptoms over the past week. Each item is scored on a scale of 0 to 3, with 0 indicating the absence of depressive symptoms and 3 indicating severe depressive symptoms.[54] The Turkish version has undergone validity and reliability assessments.[55] Both mothers and fathers completed this inventory.

3. Assessment Tools for Children

3.1. Brief Infant and Toddler Social Emotional Assessment (BITSEA)-Turkish

The BITSEA was developed to assess the severity of psychiatric symptoms and psychosocial development issues in children aged 1-3 years.[56] This scale comprises 42 items, with 31 items assessing psychiatric problems and 11 items assessing psychosocial development. Each item is scored using 0 (not true/very rare), 1 (somewhat true/sometimes), or 2 (fairly true/frequently). Higher psychiatric problems scores indicate severe psychiatric problems, whereas higher psychosocial development scores signify better psychosocial development. The Turkish validity and reliability study of BITSEA was established by Karabekiroğlu et al.[57] with subsequent demonstration of its clinical validity.[58] Internal consistencies of the BITSEA–problem (P) and competence (C) scales were good to excellent (Cronbach's α=0.82 and 0.72, respectively). Interrater reliability between parents and test–retest reliability were both good. BITSEA/P scores were significantly correlated with Child Behavior Checklist internalizing, externalizing, and total problem scores ($p<0.001$).

3.2. Aberrant Behavior Checklist (ABC)-Community

The ABC[59] comprises 58 items and is scored on a Likert-type scale ranging from 0 to 3. It encompasses five subscales and a total score: (I) Irritability, agitation, and crying (15 items); (II) Lethargy and social withdrawal (16 items); (III) Stereotypic behaviors (7 items); (IV) Hyperactivity/non-compliance (16 items); and (V) Inappropriate speech (4 items). Clinical validation has been conducted for patients aged 1-4 years.[60] Internal consistency of the Turkish version of the ABC appeared to range from adequate to high. Cronbach's alpha values were as follows: irritability, 0.94; lethargy/social withdrawal, 0.92; stereotypic behavior, 0.87; hyperactivity, 0.65; and inappropriate speech, 0.87.

4. Tools for Assessing the Mother/Father-Child Relationship

4.1. PTI-MAXA

This study aims to investigate the clinical validity of the PTI-MAXA. The PTI-MAXA[51] was developed to assess mother-toddler/child interactions and later adapted for father-toddler interaction and its validity and reliability were reported.[52] The inter-rater reliability of PTI-MAXA scores ranged from good to excellent: mothers (rho=0.33, $p<0.05$), children (rho=0.55, $p<0.001$), and total (Spearman's rho=0.52, $p=0.001$). The internal consistency scores of PTI-MAXA were near-perfect (Cronbach's α scores: mother index =0.94, child index =0.95, total =0.94; control mother =0.94, control child index =0.92, control total =0.94).[51,52] The PTI-MAXA-mother scores were positively correlated with the child's Bayley mental and motor development scores and negatively correlated with the BITSEA problem scores.[51,52] Additionally, PTI-MAXA-child scores showed a significant correlation with BITSEA competence scores and Bayley mental development scores.[51,52] The PTI-MAXA provides reliable global ratings of mother-toddler and father-toddler interactions based on 40-50 minutes of videotaped play in a laboratory setting. Video recordings encompass five segments: free play, clean-up, questionnaire completion, structured play, and separation-reunion. Using a Likert-type scale (1=very poor to 5=highly adequate), two trained raters independently rated both the parents and the child on 10 items: physical involvement, affective expressiveness, pleasure, responsiveness, reciprocity, joint attention, non-intrusiveness, adaptive flexibility, support, and acceptance. In addition to the child total, parent total, and overall total scores, both parent and child are assigned three sub-scores each: involvement (items 1, 2, and 3), reciprocity (items 4, 5, and 6), flexibility-adaptation (items 7, 8, 9, and 10). The details that should be taken into consideration for each item during scoring and the details of the Marmara mother/father-toddler observation, which is recommended for the use of the PTI-MAXA, were presented in the previous article.[52] Parental permission for video recording is obtained in advance. This assessment comprises four parts: (1) free play, (2) questionnaire completion, (3) educational play, and (4) separation-reunion. The internal consistency scores , interpersonal correlations, and construct validity scores of the PTI-MAXA were significantly high for both mother-toddler and father-toddler dyads (both mothers and fathers; child and total scores). After receiver operating characteristic and assessment of sensitivity and specificity, a PTI-MAXA total score of 75 or higher was considered the cut-off point for "healthy" interaction.

Procedure

Parents were informed about the study, and their consent was obtained. The SCDF was completed, along with assessments such as the BSI and BDI for fathers and the BITSEA and ABC for children. Separate appointments were scheduled for mothers and fathers to complete the mother-infant/toddler observation (MITO), a structured assessment. MITO was recorded with a video camera. Two clinicians, blinded to the children's scale scores, independently scored the MITO, Child's Attachment Pattern, and Parent-Toddler Relationship Global Assessment Scale by reviewing the video recordings. Both coders were trained by the first author in scoring the scales to ensure consistency and accuracy. This investigation was approved by the Ondokuz Mayıs University Clinical Research Ethics Committee, with decision number 2019/424 and date 24.05.2019. The study was conducted following the Declaration of Helsinki.

Statistical Analysis

In this cross-sectional study, the Statistical Program for Social Sciences (SPSS) version 22.0 was used. Missing data (maximum

4% for each measurement) were imputed using multiple imputation in SPSS. All scores were determined to be normally distributed using the Kolmogorov-Smirnov test and histograms. Descriptive statistics were given as mean ± standard deviation or median (minimum-maximum) for continuous variables and frequency (percentage) for categorical variables according to the suitability of the data for normal distribution. Results are given with 95% confidence intervals. Analysis of variance (ANOVA) was used to compare scale scores between groups.

Chi-square (X^2) tests were used to compare categorical data, and Student's t, Mann-Whitney U, or Wilcoxon tests were used to compare continuous data. Correlations between scales were analyzed using parametric (Pearson) or non-parametric (Spearman) tests. The scores determined by the first coder were taken as the index scores for the PTI-MAXA. Validity measures included correct classification rate, sensitivity, specificity, positive predictive value, negative predictive value, detection rate, and area under the curve. p-values <0.05 were considered statistically significant. All values are reported as either percentage or mean ± standard deviation.

We performed multivariate ANOVA (MANOVAs) to examine the quality of interaction patterns between fathers and their children and between mothers and their children. For all MANOVA results, subsequent univariate analyses were performed on significant effects, and contrasts were evaluated using the Duncan test with Bonferroni correction. We also aimed to assess additional factors predicting higher PTI-MAXA scores. Therefore, we applied multiple regression models; potential predictors included gender, age, maternal and paternal BDI and BSI scores, maternal and paternal educational levels, and the presence of autism.

Results

A total of 11 centers, involving 105 children aged 13-40 months [mean: 27.28±6.7 months; (boys, n=63; girls, n=42)] and their mothers aged 22-46 years (mean: 31.5±4.7) and fathers aged 26-47 years (mean: 34.7±4.7) participated in the study. The participants' demographic and scale data are presented in Table 1.

The mothers had significantly higher BDI and BSI scores than fathers (Table 1). In addition, mothers scored their children's BITSEA-competence significantly higher than fathers did (Table 1).

The comparison of the mother-toddler and father-toddler PTI-MAXA scores is presented in Table 2. Toddlers participated significantly more in interactions with their mothers than with their fathers, and mothers had significantly higher reciprocity scores than fathers did (Table 2).

When the children were divided into two age groups, 13-24 months and above 24 months, no significant difference in PTI-MAXA scores was found between the groups. The variation in mother-toddler and father-toddler PTI-MAXA scores by the child's gender, birth order, and parental education level is presented in Table 3. Because boys have a higher likelihood of autism spectrum disorder (ASD) and this could affect PTI-MAXA scores, gender differences were analyzed in the non-ASD group. In mother-toddler interactions, girls scored significantly higher across all domains, whereas in father-toddler interactions, girls scored significantly higher than boys only in participation (Table 3). While the fathers' PTI-MAXA scores did not reveal significant gender differences in any of the sub-parameters, mothers had significantly higher participation scores in their interactions with daughters than with sons (Table 3). Although PTI-MAXA sub-scores and total scores were higher in first-born children, the differences were not significant (Table 3). On the other hand, as the education levels of both mothers and fathers increased, the PTI-MAXA subscores of their children were significantly higher (Table 3).

Table 4 also presents comparisons of PTI-MAXA scores by presence or absence of ASD and by diagnostic subgroup. As expected, children with ASD scored significantly lower in all subtests of the PTI-MAXA. Both mothers and fathers of children in the ASD group also scored significantly lower on all PTI-MAXA subscores (Table 4).

Significant differences were also found among psychiatric and developmental diagnostic subgroups. Mother-toddler PTI-MAXA (mother, child, and total) scores were significantly lower in those with ASD and cognitive developmental delay (CDD) than in those with language delay or no diagnosis (Table 4). In addition, father-toddler PTI-MAXA (father, child, and total) scores significantly differentiated those with ASD from those with CDD (Table 4). Tukey honestly significant difference tests showed that mother-toddler PTI-MAXA scores significantly differentiated the groups with no diagnosis and with language impairment only from the group with CDD and ASD. Father-toddler PTI-MAXA scores additionally discriminated between the CDD and ASD groups. The correlations of all scale scores with the PTI-MAXA scores are presented in Table 5. Almost all subscores of both mother-toddler and father-toddler PTI-MAXA showed a significant correlation with the child's ABC scores and BITSEA-competence subscores.

We conducted multiple regression analyses to identify cofactors predictive of higher PTI-MAXA scores. Means, standard deviations, and correlations are presented in Tables 6 and 7. Not all factors are presented in the tables, as some are highly and/or statistically significantly correlated with each other. The combination of variables presented significantly predicted the PTI-MAXA-total scores [mother: R^2=0.42, F(9,85)=8.63, p<0.001]. The adjusted R-squared value is 0.42. These results indicate that the model explained 42% of the variance in the total (mother-toddler) PTI-MAXA scores. In terms of mother-toddler interaction quality, the child's BITSEA competence score, gender, presence of autism, and age were the main predictors (Table 6). In terms of father-toddler interaction quality, the child's ABC total score and the presence of autism stood out as the main predictors [father: R^2=0.50, F(9,86)=11.53, p<0.001] (Table 7).

Table 1. Demographic data and scale scores		
Gender (boy/girl) (n)		63/42
Age of the child (months) (mean ± SD)		13-40 (27.7±6.7)
	Firstborn (n/%)	63/60.0
Is there sentence formation/speaking?	Yes (n/%)	74/70.5
Basic psychiatric diagnosis in the child	None (n/%)	57/54.2
	Autism spectrum disorder	22/21.0
	Language impairment	15/14.3
	Mental developmental delays	11/10.5
Age of the mother (years) (mean ± SD)		22-46 (31.5±4.8)
Maternal education (>12 years) (%)		(61.0%)
Does the mother work?	Yes (n/%)	49/46.7
Father's age (years) (mean ± SD)		26-47 (34.7±4.7)
Father's education (>12 years) (%)		(61.0%)
Maternal BDI [med (25-75%)]		**10 (5-15)***
Father BDI [med (25-75%)]		**7 (3-12)***
Maternal BSI [med (25-75%)]		**34 (17-75)****
Father BSI [med (25-75%)]		**23 (13-44)****
(Mother) BITSEA-problem (mean ± SD)		15.2±7.8
(Father) BITSEA-problem (mean ± SD)		15.3±8.6
(Mother) BITSEA-competence (mean ± SD)		**15.3±4.7*****
(Father) BITSEA-competence (mean ± SD)		**14.0±5.1*****
(Mother) ABC-total (mean ± SD)		24.6±20.8
(Father) ABC-total (mean ± SD)		24.9±22.8

Missing data were excluded. *p=0.004 (between mother and father scores) (Wilcoxon test), **p<0.001(between mother and father scores) (Wilcoxon test), ***p=0.02 (between mother and father scores) (t-test), SD: Standard deviation, BDI: Beck Depression Inventory, BITSEA: Brief Infant and Toddler Social Emotional Assessment, BSI: Brief Symptom Inventory, ABC: Aberrant Behavior Checklist

Table 2. Comparison of PTI-MAXA-father and PTI-MAXA-mother scores				
(mean±sd)	**Mother**	**Child (with mother)**	**Father**	**Child (with father)**
1. Physical participation	**4.41±0.9**[a]	**4.21±0.9**[d]	**4.16±0.9**[a]	**3.96±1.1**[d]
2. Affective expressiveness	4.16±1.0	3.85±1.0	4.34±3.0	3.76±1.2
3. Pleasure	3.89±1.0	3.87±1.1	3.79±1.0	3.87±1.2
4. Responsiveness	4.31±0.8	3.80±1.1	4.15±0.9	3.78±1.2
5. Reciprocity	**4.10±0.9**[b]	3.64±1.1	**3.95±0.8**[b]	3.71±1.2
6. Joint attention	4.23±0.8	3.81±1.2	4.12±0.9	3.85±1.2
7. Non-intrusiveness	4.13±0.9	3.87±1.0	4.08±0.9	3.77±1.1
8. Adaptive flexibility	4.22±0.8	3.69±1.1	4.16±0.9	3.69±1.2
9. Support	4.30±0.9	3.67±1.2	4.24±0.8	3.68±1.2
10. Acceptance	4.36±0.8	3.91±1.1	4.27±0.9	3.83±1.2
Involvement	12.46±2.7	**11.92±2.8**[e]	12.30±3.7	**11.59±3.3**[e]
Reciprocity	**12.64±2.4**[c]	11.26±3.2	**12.23±2.3**[c]	11.34±3.5
Flexibility-adaptation	17.01±3.0	15.13±3.7	16.74±3.1	14.96±4.4
Total	42.11±7.5	38.31±9.3	41.27±7.7	37.90±10.7
PTI-MAXA-total	80.42±15.0		79.16±17.0	

[a]: p=0.007 (between mother and father scores) (Wilcoxon test), [b]: p=0.05 (between mother and father scores) (Wilcoxon test), [c]: p=0.03 (between mother and father scores) (Wilcoxon test), [d]: p=0.002 (child; between scores with mother and scores with father) (Wilcoxon test), [e]: p=0.024 (child; between scores with mother and scores with father) (Wilcoxon test), SD: Standard deviation, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale

Table 3. Variation of PTI-MAXA scores with child gender, birth order and parental education

	(mean ± sd)	Mother	Child (with mother)	Father	Child (with father)
Boy (No autism) (n=48)	Involvement	**12.31±2.6[a]**	**12.38±2.0[b]**	12.83±4.6	**12.25±2.7[g]**
	Reciprocity	12.88±2.3	**11.74±2.7[c]**	12.52±2.1	12.04±2.8
	Flexibility-adaptation	16.98±2.9	**15.40±3.1[d]**	16.96±2.8	15.69±3.9
	Total	42.17±7.1	**39.52±7.0[e]**	42.31±7.3	39.99±8.7
	PTI-MAXA-total	**81.69±12.3[f]**		82.29±14.6	
Girl (No autism) (n=35)	Involvement	**13.55±1.5[a]**	**13.55±2.0[b]**	12.60±2.0	**13.37±2.2[g]**
	Reciprocity	13.45±1.5	**13.03±2.2[c]**	13.06±1.6	13.23±2.0
	Flexibility-adaptation	18.09±1.9	**17.12±3.1[d]**	17.77±2.2	17.14±2.9
	Total	45.09±4.2	**43.70±6.6[e]**	43.43±5.1	43.74±6.6
	PTI-MAXA-total	**88.79±9.6[f]**		87.17±10.7	
First born	Total	43.26±6.7	39.64±8.6	42.43±7.2	39.46±10.0
	PTI-MAXA-total	82.93±13.6		81.89±15.6	
Not first	Total	40.5±8.3	36.49±9.9	39.52±8.1	35.55±11.4
	PTI-MAXA-total	77.00±16.2		75.07±18.3	
Parent education					
(More than 12 years)	Total	42.53±6.9	**39.85±8.8[h]**	41.89±6.3	**39.47±10.0[i]**
	PTI-MAXA-total	82.38±14.0		81.36±15.3	
(Less than 13 years)	Total	41.43±8.4	**35.81±8.7[h]**	40.29±9.5	**35.44±11.4[i]**
	PTI-MAXA-total	77.24±16.2		75.73±19.0	

[a]: p=0.05, [b]: p=0.003, [c]: p=0.023, [d]: p=0.009, [e]: p=0.004, [f]: p=0.007, [g]: p=0.029 (between genders) (Mann-Whitney U tests), [h]: p=0.03 (between mother education groups) (Mann-Whitney U tests), [i]: p=0.05 (between father education groups) (Mann-Whitney U tests), SD: Standard deviation, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale

Table 4. Variation of PTI-MAXA scores with the presence of autism spectrum disorder, language delay and cognitive developmental delay

	(mean ± sd)	Mother	Child (with mother)	Father	Child (with father)
ASD (+) (n=22)	Involvement	**11.14±3.5[a]**	**8.59±2.7[b]**	**10.64±2.9[a]**	**7.32±2.4[b]**
	Reciprocity	**10.95±2.8[b]**	**7.68±2.7[b]**	**10.27±2.7[b]**	**6.82±2.6[b]**
	Flexibility-adaptation	**15.45±3.9[a]**	**11.64±3.5[b]**	**14.64±4.1[c]**	**9.91±3.6[b]**
	Total	**37.55±9.7[b]**	**27.95±8.3[b]**	**35.55±9.4[b]**	**24.05±7.8[b]**
	PTI-MAXA-total	**65.45±15.6[b]**		**59.59±15.3[b]**	
ASD (-) (n=83)	Involvement	**12.85±2.3[a]**	**12.89±2.0[b]**	**12.73±3.7[a]**	**12.72±2.5[b]**
	Reciprocity	**13.13±2.0[b]**	**12.31±2.6[b]**	**12.75±1.9[b]**	**12.54±2.6[b]**
	Flexibility-adaptation	**17.47±2.5[a]**	**16.16±3.2[b]**	**17.30±2.6[c]**	**16.30±3.6[b]**
	Total	**43.45±6.1[b]**	**41.36±7.1[b]**	**42.78±6.4[b]**	**41.57±8.1[b]**
	PTI-MAXA-total	**84.81±11.7[b]**		**84.35±13.2[b]**	
Child diagnosis[d]					
(No diagnosis) (A)	Total	**44.11**	**43.08**	**44.23**	**43.42**
	PTI-MAXA-total	**87.17**		**87.55**	
(Language delay) (B)	Total	**46.20**	**42.88**	**41.13**	**40.47**
	PTI-MAXA-total	**87.30**		**81.60**	
(Cognitive development delayed) (C)	Total	**37.73**	**32.73**	**37.55**	**33.45**
	PTI-MAXA-total	**71.00**		**71.00**	
(ASD) (D)	Total	**37.55**	**27.91**	**35.55**	**24.05**
	PTI-MAXA-total	**65.45**		**59.59**	

[a]: p=0.03, [b]: p<0.001, [c]: p=0.23 (with or without autism) (Mann-Whitney U tests), [d]: p<0.001(between diagnosis groups) (Kruskal-Wallis tests), ASD: Autism spectrum disorder [mother in total: A-B>C-D, child (with mother) in total: A-B>C-D, mother-child in total: A-B>C-D, father in total: A>C-D, child (with father) total: A-B>C>D; father-child in total: A-B>C>D], sd: Standard deviation, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale

Table 5. Correlations of PTI-MAXA scores with other scale scores

	(Spearman's rho)	Mother	Child (with mother)	Father	Child (with father)
Mother/father BDI score	Involvement	NS	NS	NS	NS
	Reciprocity	NS	NS	NS	NS
	Flexibility-adaptation	NS	NS	NS	NS
	Total	NS	NS	NS	NS
	PTI-MAXA-total	NS		NS	
Mother/father BSI-total score	Involvement	NS	NS	NS	NS
	Reciprocity	NS	NS	NS	NS
	Flexibility-adaptation	NS	NS	NS	NS
	Total	NS	NS	NS	NS
	PTI-MAXA-total	NS		NS	
BITSEA problem score	Involvement	NS	NS	NS	NS
	Reciprocity	NS	**-0.20***	NS	NS
	Flexibility-adaptation	NS	**-0.33****	**-0.21***	NS
	Total	NS	**-0.25***	NS	NS
	PTI-MAXA-total	**-0.26***		**-0.22***	
BITSEA competence score	Involvement	**0.26***	**0.48*****	**0.24***	**0.47*****
	Reciprocity	**0.28****	**0.57*****	**0.34****	**0.52*****
	Flexibility-adaptation	**0.23***	**0.48*****	**0.30****	**0.48*****
	Total	**0.28****	**0.53*****	**0.33****	**0.51*****
	PTI-MAXA-total	**0.48*****		**0.48*****	
ABC total score	Involvement	NS	**-0.27****	NS	**-0.33****
	Reciprocity	**-0.25***	**-0.37*****	**-0.21***	**-0.34****
	Flexibility-adaptation	NS	**-0.40*****	**-0.28****	**-0.40*****
	Total	**-0.22***	**-0.38*****	**-0.24***	**-0.37*****
	PTI-MAXA-total	**-0.35*****		**-0.36*****	

NS: Non-significant, *p<0.05, **p<0.01, ***p<0.001, BDI: Beck Depression Inventory, BITSEA: Brief Infant and Toddler Social Emotional Assessment, BSI: Brief Symptom Inventory, ABC: Aberrant Behavior Checklist, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale

Table 6. Simultaneous multiple regression analysis predicting mother-toddler PTI-MAXA total score (n=94)

Variable	B	SEB	β	Sig.
Gender of the child	-5.56	2.50	-0.18	0.029*
Age of the child	0.45	0.19	0.20	0.019*
Presence of ASD	-11.50	3.38	-0.32	0.001**
BITSEA-competence score	0.83	0.38	0.26	0.030*
Constant	79.92	11.9		0.000

R^2=0.42, F(9,85)=8.63, p<0.001, *p<0.05, **p<0.01, Sig: Significance, ASD: Autism spectrum disorder, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale, BITSEA: Brief Infant and Toddler Social Emotional Assessment, SEB: Standard error of B

Table 7. Simultaneous multiple regression analysis predicting father-toddler PTI-MAXA total score (n=95)

Variable	B	SEB	β	Sig.
Presence of ASD	-14.84	2.09	-0.58	0.000**
ABC total score	-0.11	0.04	-0.23	0.015*
Constant	48.13	7.29		0.000

R^2=0.50, F(9,86)=11.53, p<0.001, *p<0.05, **p<0.01, Sig: Significance, ASD: Autism spectrum disorder, ABC: Autism Behavior Checklist, PTI-MAXA: Parent-Toddler Interaction Multiaxial Assessment Scale, SEB: Standard error of B

Discussion

We aimed to examine the distinctive characteristics of PTI-MAXA in terms of psychiatric morbidity. In addition, we aimed to assess differences in dimensions of interaction between mother-toddler and father-toddler dyads. To the best of our knowledge, this study represents the first attempt to systematically evaluate and score both the father-toddler and the mother-toddler relationships in a laboratory setting using a multi-axis approach. Furthermore, previous studies and assessment tools to date have not adequately addressed, using clinical data, the elements comprising mother-toddler and father-toddler interaction content or the scoring of different interaction dimensions. In this study, we present the clinical validity —in other words, the clinical usefulness in psychiatry— of the PTI-MAXA, which enables scoring of mother-toddler and father-toddler interactions.

Validity and reliability data for mothers and fathers have been presented previously.[51,52] The Play Scale consists of 32 items (24 parent items and 8 child items). This methodology, at that scale, bears some similarities to that of the PTI-MAXA. Considering all the data, the PTI-MAXA has several advantages over other assessment methods currently used for similar purposes. In addition to the total scores, PTI-MAXA provides sub-scores for fathers and children and for involvement, reciprocity, and flexibility and adaptation, allowing for the assessment of the underlying elements of parent-child interaction and relationship. The standardized approach proposed for the PTI-MAXA assessment has also been highly beneficial for both PTI-MAXA scoring and observing the mother/father-toddler dyad in detail. This approach also enables the evaluation of children's attachment patterns.

This study also examined differences in mother-toddler and father-toddler interactions. Although mothers reported higher BDI and BSI scores, they demonstrated significantly greater interaction with their children. This may reflect a compensatory caregiving pattern, in which psychological distress coexists with heightened relational investment. The overlap between mother-child play and father-child play is likely greater than the differences across many cultures.[18] However, a review of the evidence to date suggests that fathers' play is often more physical than mothers' play and may have important effects on children's self-regulation skills.[32] Our findings indicate that mothers exhibit significantly higher levels of involvement and reciprocity in interactions with their 1-3-year-old children than fathers do, and that children also show significantly greater involvement with their mothers than with their fathers. Numerous studies highlight differences between mothers and fathers in the relationships between parenting and children's emotion regulation, with many showing more robust connections between fathers' behavior and children's emotion regulation than mothers' behavior.[23] For instance, one study found that emotional support and enjoyment of children's autonomy in father-child interactions, but not in mother-child interactions, was associated with better emotion regulation in toddlers.[35] Another study reported that emotional availability of both mothers and fathers during a teaching task was associated with more effortful attention in toddlers, but fathers' parenting was also associated with more positive affect in the toddler.[61] In contrast, some studies found stronger effects for mothers than for fathers. For example, mothers were found to be more emotionally available than fathers,[61] mothers exhibited more positive and less negative parenting compared fathers,[62] mother-child interactions were of higher quality than father-child interactions,[19] and mothers had higher levels of responsiveness.[63,64] While there are studies assessing the quality of fathers' parenting through observational measures, few include observations of both mothers' and fathers' interactions with their children. Nevertheless, the use of dyadic analyses allows for the examination of all data in a single analysis, accounting for the dyad in analyses, and directly measuring the independence of dyad members.[23]

An increasing number of studies have outlined pathways to father involvement, such as fathers' education, occupation, beliefs, and motivations in their role. For instance, more educated fathers engage in direct interaction with their children to a greater extent.[65,66] Our data revealed that, as both mothers' and fathers' education levels decreased, PTI-MAXA-total and PTI-MAXA-parent subscores did not change, while PTI-MAXA-child subscores decreased significantly. In this study, the child's gender was also found to directly affect the quality of parent-child interaction. Because ASD is more prevalent in males, an analysis excluding the ASD group revealed that boys had lower PTI-MAXA scores than girls for each sub-parameter, particularly in their interactions with their mothers. Regarding interaction with the father, only the participation subscores were lower in boys than in girls (Table 3). Our data provide strong evidence of significant gender differences in the quality of interaction between children aged 1-3 years and their parents. Some previous studies have also indicated that fathers tend to treat boys and girls differently.[67,68] Fathers of young children are more sensitive to their daughters' submissive emotional facial expressions[69] and are more likely to show greater attention and express more warmth in their daughters' prosocial behaviors.[70] It should also be noted that when evaluating the role of gender in these interactions, it should not be forgotten that cultural influences may also play a role.[71,72] In a study conducted in our country, an association was found between the diagnosis and severity of depression in mothers of children aged 1-3 years and the internalizing, externalizing, and total psychiatric problem levels in girls. Additionally, a significant relationship was identified between the diagnosis and severity of depression in fathers and externalizing problem levels in boys.[73]

In this study, when parents with children aged 1-3 years were compared, mothers exhibited significantly higher levels of psychopathology than fathers, as reflected by depressive symptoms and overall psychiatric symptom distribution. the rate of mothers diagnosed with depression during interviews was found to be 23.6%, while in fathers, it was 9.5%.[73] These rates are consistent with the results of studies indicating that the prevalence of depression in women is 2-3 times more

frequent than in men.[74] Our regression analyses showed that parental depressive symptoms or psychological symptom levels did not predict PTI-MAXA total scores. On the other hand, it was observed that the child's levels of psychiatric problems and general developmental problems disrupted the quality of the parent-toddler interaction.

Study Limitations

This study has several limitations. For instance, the qualitative aspects of parent-child interaction were not systematically identified when determining the items of the PTI-MAXA. A more detailed scoring could have been performed, followed by a systematic reduction of the number of items through factor analyses. However, because scoring and distinguishing highly similar expressions can be confusing, the aim during the development of PTI-MAXA was to identify items as independently as possible of one another. Future research may utilize more complex statistical analyses and determine, in modeling, which variables moderate or mediate the quality of parent-child interaction. Future studies may benefit from more complex statistical analyses and modeling to determine which variables govern or mediate the quality of parent-child interaction. In subsequent studies, much larger sample sizes can be used to identify relationships between all sub-scores of PTI-MAXA and various psychopathologies in parents or children. On the other hand, considering the possibility that parenting behaviors include socio-cultural differences,[18,71,72] it would also be appropriate to examine the possible influence of cultural processes on the PTI-MAXA assessment. Further research could include the temperament characteristics of children and the attachment patterns of both children and parents.

In this study, parents with children aged 1-3 years showed differences in involvement and reciprocity in their interactions with their children. The quality of parent-child interaction varied significantly with the presence of a clinical psychiatric or developmental diagnosis in the child, especially ASD, but not in the parent. Additionally, gender was found to be a significant variable in this age group, independent of the presence of a clinical diagnosis. Furthermore, the educational levels of the mother and father were also found to be associated with impaired interactional quality in the child.

Conclusion

All findings obtained in this study support the validity and reliability of the PTI-MAXA for assessing mother/father-child interaction and suggest that its use in clinical samples may be highly beneficial. The PTI-MAXA provides reliable global ratings of parent-toddler interactions during a 40-50-minute videotaped play session in a laboratory setting. In future studies, many clinical (e.g., child's developmental problems, psychiatric diagnosis, among others) or socioeconomic factors (e.g., child's gender, parents' age and education level, among others) that predict the global quality and subcomponents of these interactions can be examined using multidimensional regression analyses. Longitudinal study designs could explore whether the sub-dimensions of the parent-toddler interaction assessed by the PTI-MAXA in children aged 1-3 years predict future psychopathologies. Interaction-based parent education models could be developed based on objective observational data. The PTI-MAXA is a highly useful tool for assessing parent-child relationships in psychiatry, pediatrics, and child development clinics. It is also designed to be a highly effective method for identifying the quality of interactions and problem areas for parents, and for providing feedback. The findings of this study indicate that it can serve as a valuable tool in clinical practice in the field of neurodevelopmental disorders. Future research, such as studies examining long-term validity or applications in different cultural contexts, would be appropriate.

Ethics

Ethics Committee Approval: This investigation was approved by the Ondokuz Mayıs University Clinical Research Ethics Committee, with decision number 2019/424 and date 24.05.2019.

Informed Consent: Parents were informed about the study, and their consent was obtained.

Footnotes

Authorship Contributions

Concept: K.K., Design: K.K., Data Collection or Processing: K.K., E.Y., H.A., M.D., A.C., B.Ş., Y.T.T., G.Y.T., C.Ç.O., B.S.Ö., B.Ö.A., O.G., H.S.S., H.A.T., E.P.Y., H.Ö., D.E., Y.Y.G., M.B.U., M.Ç.U., Ş.Y.S., D.Ö., B.G.Ç., A.D.U.Ç., B.Ç., H.G., B.A.S., Analysis or Interpretation: K.K., Literature Search: K.K., Writing: K.K., E.Y., H.A., M.D., A.C., B.Ş., Y.T.T., G.Y.T., C.Ç.O., B.S.Ö., B.Ö.A., O.G., H.S.S., H.A.T., E.P.Y., H.Ö., D.E., Y.Y.G., M.B.U., M.Ç.U., Ş.Y.S., D.Ö., B.G.Ç., A.D.U.Ç., B.Ç., H.G., B.A.S.

Conflict of Interest: The authors declare no conflicts of interest.

Financial Disclosure: The authors declare that this study received no financial support.

References

1. Karabekiroğlu KMZ. Anne babalar için bebek ruh sağlığı rehberi: 0-4 yaş. Ankara: Nobel Yayınevi; 2024.
2. McCain MN, Mustard JF, Shanker S. The long reach of early childhood. In: Early Years Study 2: Putting Science into Action. Toronto: Council for Early Child Development; 2007. p. 17-58.
3. Ramchandani PG, Domoney J, Sethna V, Psychogiou L, Vlachos H, Murray L. Do early father-infant interactions predict the onset of externalising behaviours in young children? Findings from a longitudinal cohort study. J Child Psychol Psychiatry. 2013;54:56-64.
4. Babadagi Z, Karabekiroglu KMZ, Ucar F, Say GN, Yuce M, Yildirim ZG. Associations between father temperament, character, rearing, psychopathology and child temperament in children aged 3-6 years. Psychiatr Q. 2018;89:589-604.
5. Field T. The effects of mother's physical and emotional unavailability on emotion regulation. Monogr Soc Res Child Dev. 1994;59:208-227.
6. Thompson RA. Emotion regulation: a theme in search of definition. Monogr Soc Res Child Dev. 1994;59:25-52.

7. Emde RN. The infant's relationship experience: developmental and clinical aspects. In: Relationship disturbances in early childhood. New York: Basic Book; 1989. p. 33-51.
8. Karabekiroğlu K. Baba olmak: babanın ruhsal rehberi. 4. baskı. İstanbul: Say Yayınları; 2022.
9. Zeanah PD, Stafford B, Zeanah CH. Clinical interventions to enhance infant mental health: a selective review. Los Angeles (CA): UCLA Center for Healthier Children, Families and Communities; 2005.
10. Eisenberg N, Morris AS. Children's emotion-related regulation. In: Kail RV, editor. Advances in child development and behavior. Vol. 30. San Diego (CA): Academic Press; 2002. p. 189-229.
11. Morris AS, Silk JS, Steinberg L, Myers SS, Robinson LR. The role of the family context in the development of emotion regulation. Soc Dev. 2007;16:361-388.
12. Afek E, Lev-Wiesel R, Federman D, Shai D. The mediating role of parental embodied mentalizing in the longitudinal association between prenatal spousal support and toddler emotion recognition. Infancy. 2022;27:609-629.
13. Valentino K, Cicchetti D, Toth SL, Rogosch FA. Mother-child play and maltreatment: a longitudinal analysis of emerging social behavior from infancy to toddlerhood. Dev Psychol. 2011;47:1280-1294.
14. Bernier A, Calkins SD, Bell MA. Longitudinal associations between the quality of mother-infant interactions and brain development across infancy. Child Dev. 2016;87:1159-1174.
15. Bornstein MH, Haynes OM, Pascual L, Painter KM, Galperín C. Play in two societies: pervasiveness of process, specificity of structure. Child Dev. 1999;70:317-331.
16. Tamis-LeMonda CS, Bornstein MH, Cyphers L, Toda S, Ogino M. Language and play at one year: a comparison of toddlers and mothers in the United States and Japan. Int J Behav Dev. 1992;15:19-42.
17. Lamb ME (ed.). The father's role: cross-cultural perspectives. London: Routledge; 1987.
18. Amodia-Bidakowska A, Laverty C, Ramchandani PG. Father-child play: a systematic review of its frequency, characteristics and potential impact on children's development. Dev Rev. 2020;57:100924.
19. Cerniglia L, Cimino S, Ballarotto G. Mother-child and father-child interaction with their 24-month-old children during feeding, considering paternal involvement and the child's temperament in a community sample. Infant Ment Health J. 2014;35:473-481.
20. Ainsworth MDS, Blehar MC, Waters E, Wall SN. Patterns of attachment: a psychological study of the strange situation. Hillsdale (NJ): Lawrence Erlbaum Associates; 1978.
21. Bakermans-Kranenburg MJ, van IJzendoorn MH, Juffer F. Less is more: meta-analyses of sensitivity and attachment interventions in early childhood. Psychol Bull. 2003;129:195-215.
22. Chatoor I, Sechi C, Vismara L, Lucarelli L. A cross-sectional study of father-daughter/son interactions from 1 month to 3 years of age with the feeding and play scales: exploring the psychometric properties. Appetite. 2022;168:105671.
23. Kerr ML, Rasmussen HF, Smiley PA, Buttitta KV, Borelli JL. The development of toddlers' emotion regulation within the family system: associations with observed parent-child synchrony and interparental relationship satisfaction. Early Child Res Q. 2021;57:215-227.
24. Brown GL, McBride BA, Bost KK, Shin N. Parental involvement, child temperament, and parents' work hours: differential relations for mothers and fathers. J Appl Dev Psychol. 2011;32:313-322.
25. Atzaba-Poria N, Cabrera NJ, Menashe A, Karberg E. The parental playfulness scale. Unpublished manuscript. Beersheba (Israel): Ben-Gurion University of the Negev; 2014.
26. Carlson MJ. Family structure, father involvement, and adolescent behavioral outcomes. J Marriage Fam. 2006;68:137-154.
27. Cimino S, Cerniglia L, Paciello M, Sinesi S. A six-year prospective study on children of mothers with eating disorders: the role of paternal psychological profiles. Eur Eat Disord Rev. 2013;21:238-246.
28. Cerniglia L, Cimino S, Ballarotto G, Monniello G. Parental loss during childhood and outcomes on adolescents' psychological profiles: a longitudinal study. Curr Psychol. 2014;33:545-556.
29. Pleck JH. Why could father involvement benefit children? Theoretical perspectives. Appl Dev Sci. 2007;11:196-202.
30. Feldman R. Infant-mother and infant-father synchrony: the coregulation of positive arousal. Infant Ment Health J. 2003;24:1-23.
31. Lamb ME, editor. The role of the father in child development. 5th ed. Hoboken (NJ): Wiley; 2010.
32. Stgeorge J, Freeman E. Measurement of father-child rough-and-tumble play and its relations to child behavior. Infant Ment Health J. 2017;38:709-725.
33. Fuertes M, Faria A, Beeghly M, Lopes-dos-Santos P. The effects of parental sensitivity and involvement in caregiving on mother-infant and father-infant attachment in a Portuguese sample. J Fam Psychol. 2016;30:147-156.
34. Anderson S, Roggman LA, Innocenti MS, Cook GA. Dads' parenting interactions with children: checklist of Observations Linked to Outcomes (PICCOLO-D). Infant Ment Health J. 2013;34:339-351.
35. Cabrera NJ, Shannon JD, Tamis-LeMonda C. Fathers' influence on their children's cognitive and emotional development: from toddlers to pre-K. Appl Dev Sci. 2007;11:208-213.
36. John A, Halliburton A, Humphrey J. Child–mother and child-father play interaction patterns with preschoolers. Early Child Dev Care. 2013;183:483-497.
37. Fletcher R, StGeorge J, Freeman E. Rough and tumble play quality: theoretical foundations for a new measure of father-child interaction. Early Child Dev Care. 2013;183:746-759.
38. Paquette D, Carbonneau R, Dubeau D, Bigras M, Tremblay RE. Prevalence of father-child rough-and-tumble play and physical aggression in preschool children. Eur J Psychol Educ. 2003;18:171-189.
39. Biringen Z, Robinson J, Emde RN. Emotional availability scales. Unpublished manual. International Center for Emotional Availability; 2008.
40. Barnard KE, Eyres SJ, editors. Child health assessment. Part 2: the first year of life. Washington (DC): U.S. Government Printing Office; 1979.
41. Calkins SD, Gill KL, Johnson MC, Smith CL. Emotional reactivity and emotional regulation strategies as predictors of social behavior with peers during toddlerhood. Soc Dev. 1999;8:310-334.
42. Chatoor I, Hommel S, Sechi C, Lucarelli L. Development of the parent-child play scale for use in children with feeding disorders. Infant Ment Health J. 2018;39:153-169.
43. Olofson EL, Schoppe-Sullivan SJ. Same behaviors, different outcomes: mothers' and fathers' observed challenging behaviors measured using a new coding system relate differentially to children's social-emotional development. Children (Basel). 2022;9:675.
44. Gardner F. Methodological issues in the direct observation of parent-child interaction: do observational findings reflect the natural behavior of participants? Clin Child Fam Psychol Rev. 2000;3:185-198.
45. Funamoto A, Rinaldi CM. Measuring parent-child mutuality: a review of current observational coding systems. Infant Ment Health J. 2015;36:3-11.
46. Dishion TJ, Mun CJ, Tein JY, Kim H, Shaw DS, Gardner F, Wilson MN, Peterson J. The validation of macro and micro observations of parent-child dynamics using the relationship affect coding system in early childhood. Prev Sci. 2017;18:268-280.
47. Lucarelli L, Ammaniti M, Porreca A, Simonelli A. Infantile anorexia and co-parenting: a pilot study on mother-father-child triadic interactions during feeding and play. Front Psychol. 2017;8:376.
48. Papousek M. Communication in early infancy: an arena of intersubjective learning. Infant Behav Dev. 2007;30:258-266.
49. Jones RA, Russell SB. Parent–child interaction and social development. In: Handbook of social development. New York (NY): Wiley; 2000.

50. Miron D, Lewis M, Zeanah CH. Clinical use of observational procedures in early childhood relationship assessment. In: Zeanah CH, editor. Handbook of infant mental health. New York (NY): Guilford Press; 2009. p. 252-265.
51. Karabekiroğlu K, Kuşçu-Orhan Ş, Babadağı Z, Yıldırım Z, Kuşçu K, Altuncu E, Akman İ. Anne-bebek etkileşimi çok eksenli değerlendirme (ABEÇED): geçerlilik ve güvenilirliği. Turk J Child Adolesc Ment Health. 2017;24:33-44.
52. Karabekiroğlu K, Cöngöloğlu A, Şahin B, Çıkılı-Uytun M, Yürümez E, Yalın-Sapmaz Ş, Öztop D, Gündüz-Çıtır B, Uzun-Çakır AD, Çakır B, Gülşen H, Akın-Sarı B, Taş-Torun Y, Yitik-Tonkaz G, Çobanoğlu-Osmanlı C, Önal BS, Ateş BÖ, Güleşen-Kapan O, Soyugür HS, Dinçer M, Ayraler-Taner H, Aksu H, Pekmezci-Yazgı E, Öğütlü H, Eyüboğlu D, Gümüş YY, Usta MB. Development, reliability, and validity of Father–Toddler Interaction Multiaxial Assessment Scale. J Fam Psychol. 2026;40:470-476.
53. Derogatis LR, Melisaratos N. The brief symptom inventory: an introductory report. Psychol Med. 1983;13:595-605.
54. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry. 1961;4:561-571.
55. Hisli N. Beck depresyon envanterinin üniversite öğrencileri için geçerliği güvenirliği. J Psychol. 1989;7:3-13.
56. Briggs-Gowan MJ, Carter AS, Irwin JR, Wachtel K, Cicchetti DV. The brief infant-toddler social and emotional assessment: screening for social-emotional problems and delays in competence. J Pediatr Psychol. 2004;29:143-155.
57. Karabekiroğlu K, Rodopman-Arman A, Ay P, Özkesen M, Akbaş S, Taşdemir GN, Böké O, Pekşen Y. The reliability and validity of the Turkish version of the brief infant-toddler social emotional assessment (BITSEA). Infant Behav Dev. 2009;32:291-297.
58. Karabekiroglu K, Briggs-Gowan MJ, Carter AS, Rodopman-Arman A, Akbas S. The clinical validity and reliability of the brief infant-toddler social and emotional assessment (BITSEA). Infant Behav Dev. 2010;33:503-509.
59. Aman MG, Singh NN, Stewart AW, Field CJ. The aberrant behavior checklist: a behavior rating scale for the assessment of treatment effects. Am J Ment Defic. 1985;89:485-491.
60. Karabekiroglu K, Aman MG. Validity of the aberrant behavior checklist in a clinical sample of toddlers. Child Psychiatry Hum Dev. 2009;40:99-110.
61. Volling BL, McElwain NL, Notaro PC, Herrera C. Parents' emotional availability and infant emotional competence: predictors of parent-infant attachment and emerging self-regulation. J Fam Psychol. 2002;16:447-465.
62. Kwon KA, Han S, Jeon HJ, Bingham GE. Mothers' and fathers' parenting challenges, strategies, and resources in toddlerhood. Early Child Dev Care. 2013;183:415-429.
63. Kochanska G, Aksan N. Development of mutual responsiveness between parents and their young children. Child Dev. 2004;75:1657-1676.
64. Wilson S, Durbin CE. Mother-child and father-child dyadic interaction: parental and child bids and responsiveness to each other during early childhood. Merrill Palmer Q. 2013;59:249-279.
65. Cabrera NJ, Fagan J, Wight V, Schadler C. Influence of mother, father, and child risk on parenting and children's cognitive and social behaviors. Child Dev. 2011;82:1985-2005.
66. Castillo J, Welch G, Sarver C. Fathering: the relationship between fathers' residence, fathers' sociodemographic characteristics, and father involvement. Matern Child Health J. 2011;15:1342-1349.
67. Emmott EH, Mace R. Why the son-bias in caregiving? Testing sex-differences in the associations between paternal caregiving and child outcomes in England. J Fam Issues. 2021;42:1354-1383.
68. Hewlett BS, editor. Father-child relations: cultural and biosocial contexts. 2nd ed. Abingdon (UK): Routledge; 2017.
69. Chaplin TM, Cole PM, Zahn-Waxler C. Parental socialization of emotion expression: gender differences and relations to child adjustment. Emotion. 2005;5:80-88.
70. Hastings PD, McShane KE, Parker R, Ladha F. Ready to make nice: parental socialization of young sons' and daughters' prosocial behaviors with peers. J Genet Psychol. 2007;168:177-200.
71. Diniz E, Brandão T, Monteiro L, Veríssimo M. Father involvement during early childhood: a systematic review of the literature. J Fam Theory Rev. 2021;13:77-99.
72. Diniz E, Brandão T, Veríssimo M. Father involvement during early childhood: a systematic review of qualitative studies. Fam Relat. 2023;72:2710-2730.
73. Karabekiroğlu K, Rodopman Arman A, Berkem M. Erken çocukluk dönemi psikiyatrik sorunları ile ebeveyn depresyonu arasındaki ilişki: cinsiyetin rolü. Turk J Child Adolesc Ment Health. 2008;15:75-86.
74. Boyd JH, Weissman MM. Epidemiology of affective disorders. A reexamination and future directions. Arch Gen Psychiatry. 1981;38:1039-1046.