



Reliability of the Fathering Role Perception Scale in a Turkish Sample: A Meta-Analysis

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Abstract

Background: The Father Role Perception Scale (FRPS) is a widely used tool to assess fathers' perceptions of their parenting roles. Understanding the consistency of its measurement across different studies is crucial for reliable interpretation of research findings.

Methods: A comprehensive literature search identified 317 studies on fathering roles. Applying inclusion criteria, 32 studies with 9,987 participants were selected for meta-analysis. Cronbach's alpha coefficients, an indicator of internal consistency reliability, were extracted from each study and analyzed to determine the overall reliability of the FRPS.

Results: The meta-analysis revealed an average Cronbach's alpha value of 0.80 for the FRPS, indicating generally acceptable reliability. However, variability in reliability was observed across studies, potentially attributable to sample characteristics, data collection methods, or cultural differences.

Conclusion: While the FRPS demonstrates acceptable reliability for assessing fathers' perceptions of their parenting roles, researchers should conduct reliability analyses within their specific study groups and consider potential influencing factors when interpreting results. This meta-analysis contributes valuable information for researchers and practitioners in family and child health, aiding in the understanding of fatherhood experiences and the development of supportive programs.

Keywords: Father role perception; Father role perception scale (FRPS); Reliability; Meta-analysis; Reliability generalization

Introduction

As family structures evolve, interest in the role and importance of the father in child development increases. In addition to traditional social roles, fathers play crucial roles in children's cognitive, social, and emotional development (1, 2). When fathers are responsive and actively involved, they positively affect children's self-confidence, academic success, and social adjustment (3, 4). In this

context, how fathers perceive their role and how they fulfill this role, "Fatherhood role perception" is an important factor that deeply affects the quality of interaction with children and the child's development process (5-8).

Perceptions of fatherhood are shaped by various factors, such as cultural norms, social expectations, personal experiences, and family dynamics



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(9-13). This complex web of interactions suggests that the role of fatherhood may be perceived differently in different cultures and contexts (14). For example, in collectivist cultures, the role of fatherhood focuses more on authority and discipline, whereas in individualistic cultures, emotional bonding and support are at the forefront. Furthermore, fathers' childhood experiences, education levels, and socioeconomic statuses can significantly influence these perceptions. Modern communication technologies and media are transforming widespread beliefs and expectations about fatherhood roles, leading to the continuous evolution of these perceptions. The impact of these differences on children's development is an important research focus (15). Therefore, accurately assessing perceptions of fatherhood roles forms the basis of research in this field.

A widely used tool in Türkiye to assess perceptions of fatherhood roles is the Father Role Perception Scale (FRPS), created by Kuzucu in 1999. The FRPS, a five-point Likert-type scale, aims to assess fathers' perceptions of their fathering roles in a multidimensional way with 25 items. In the first study of the scale, the Cronbach's alpha reliability coefficient was 0.75 (16). The FRPS is an important tool designed to assess the perception of fatherhood, especially in Turkish culture, by covering various dimensions. This scale assesses fathers' views on different aspects of parenting, such as their responsibilities toward their children, encouraging emotional bonding, providing discipline, and being role models. However, it is crucial to understand the FRPS's culturally specific structure within an international context. Father role perception scales used in Western cultures often emphasize individual autonomy, emotional expression, and shared responsibility in parenting. These differences reflect the diversity of cultural values and expectations related to parenting roles. Comparing the FRPS with international scales can enhance our understanding of how fatherhood perception is shaped within a cultural context and provide a perspective on the scale's universal validity.

This study comprehensively examined the reliability of the FRPS through meta-analysis, providing

a comprehensive overview of the scale's psychometric properties. Meta-analysis enables more robust and generalizable conclusions by effectively combining findings from multiple studies (17). Reliability coefficients obtained from various studies provide important information about the consistency of the measurement tool across different samples and conditions (18,19). Comparing reliability across different measures is an important step in assessing the consistency of an instrument. Reliability generalization (RG) studies make this comparison effective (17). Unlike traditional reliability analyses, RG studies emphasize the consistency of measurements across various studies and sample groups rather than relying on a single measure (20). This approach clarifies how the FRPS performs across studies, what factors affect its reliability, and its overall reliability (21). Furthermore, by exploring the impact of different characteristics of studies (such as sample groups and data collection methods) on the reliability of the FRPS through moderator analysis, we can gain more detailed insights into how the scale can be applied in various contexts. This information can enhance the effective and accurate use of the FRPS.

This study is expected to make significant contributions to the literature. Providing a comprehensive and up-to-date assessment of the reliability of the FRPS will be an important resource for future research on the use of the scale and perceptions of the fathering role. Furthermore, revealing the impact of different study characteristics (e.g., publication type, participant characteristics, year of data collection) on the reliability of the FRPS will highlight important factors that researchers should consider when designing and interpreting their studies. This study aims to provide a solid foundation for future research by developing a detailed database on perceptions of the fathering role in Türkiye. This study contributes to the international literature by illuminating the role of fatherhood in different cultures and facilitating comparative analyses. Furthermore, the findings provide a reference point for constructing and evaluating perception scales of fathering roles in different cultures.

The main purpose of this study was to examine the meta-analytic RG of the FRPS and to investigate how moderator variables such as publication type, participant characteristics, and year of data collection affect reliability coefficients.

Methods

We used meta-analysis to examine the reliability of the FRPS, a well-established instrument used to measure fatherhood perception in Türkiye. The aim was to assess the consistency of the FRPS across various studies and to identify factors affecting this consistency. Data from various FRPS studies were collected and analyzed to achieve this goal. Meta-analysis is a powerful statistical method that combines the results of multiple studies to reach an overall conclusion. With this method, the overall reliability of the FRPS was determined, and the impact of different study characteristics (e.g., type of publication, participants, and year of data collection) on reliability was examined. One of the most important contributions of this study is that it shows how reliable the FRPS is under different conditions. This information will help researchers interpret the FRPS results more accurately and understand the scale's limitations. In addition, this study followed meta-analysis reporting standards. We used general guidelines for meta-analysis (PRISMA) and specific guidelines for reliability generalization studies (REGEMA) to increase the transparency and accuracy of the study. These findings support the reliability and validity of the findings.

Selection criteria, search strategies, and data extraction

This meta-analysis comprehensively examines the reliability of the FRPS, a widely used instrument in Türkiye to assess father role perception. We aimed to assess the consistency of the FRPS across various studies and to identify factors affecting this consistency. For this purpose, a comprehensive

literature review was conducted to assess publications related to FRPS in Türkiye. Using academic databases such as Google Scholar, DergiPark, YÖK National Thesis Center and ULAKBIM and using keywords such as “Father Role Perception Scale”, “FRPS”, “Father role”, “Scale reliability” and “Cronbach's alpha”, 317 studies on FRPS were identified.

Thirty-two studies were selected according to specific criteria and included in the meta-analysis. All the selected studies were published in Turkish between 2007 and 2024. The Cronbach's alpha reliability coefficient of the FRPS was also considered in the inclusion criteria. Although the results of the meta-analysis revealed that the FRPS has generally acceptable reliability, it also revealed differences in reliability across different studies. The relationships between study characteristics (e.g., publication type, sample group, data collection method) and reliability were examined to understand the reasons for these differences. This study provides valuable insights into how FRPS performs in different contexts and what factors influence its reliability. The findings guide what researchers should consider when using FRPS.

Coding

This meta-analysis on the FRPS prioritized transparent data collection and analysis. A comprehensive literature review identified 32 FRPS studies meeting pre-defined criteria. Two independent researchers coded each study for publication type, date, sample characteristics, size, and number of scale items. Disagreements were resolved via expert consultation and discussion until a consensus was reached. High interrater reliability (95%) demonstrated consistent coding. Ultimately, 32 Cronbach's alpha values, derived from 317 studies, were analyzed. A workflow diagram (Fig. 1) illustrates this process.

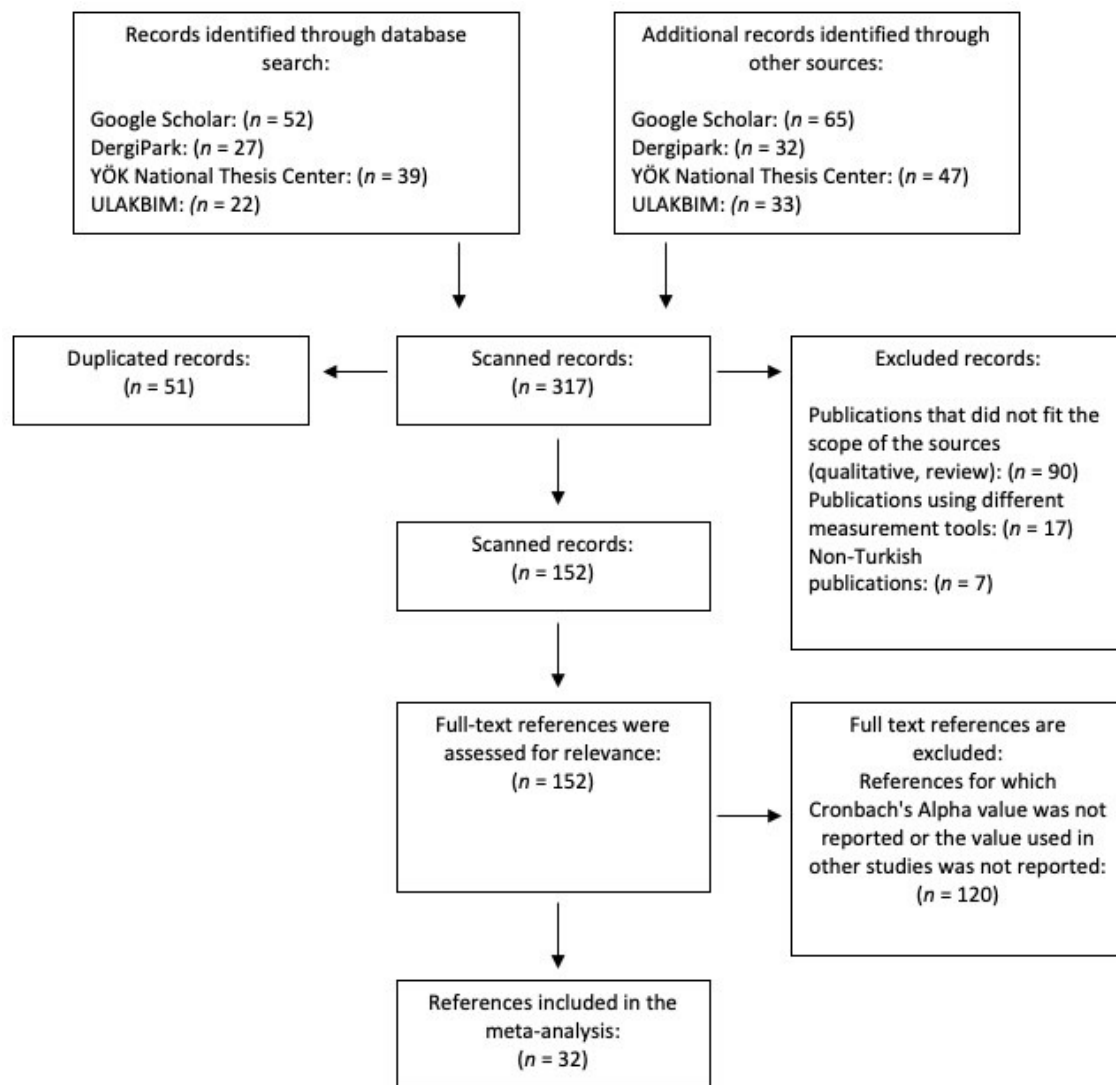


Fig. 1: Workflow Chart of the Review and Evaluation Process of the Selected Studies

Data analysis

RG studies explore the variability of reliability coefficients across studies. This study focuses on Cronbach's alpha, a standard measure of internal consistency. Using a random effects model (REM), the research aggregates data from multiple studies to estimate overall reliability. Several methods were employed to assess heterogeneity, including Hunter-Schmidt, Hedges, and DerSimonian-Laird, along with maximum likelihood estimation (ML and REML). The I^2 index, based on the Q statistic, quantified the degree of heterogeneity. Average effect sizes were calculated and compared

to established reliability thresholds. Publication bias was investigated using Fail-Safe N tests, Egger's regression, and Kendall's Tau tests. A mixed effects model with categorical variables was used for RG assessment. All statistical analyses were conducted using the MAJOR package in Jamovi.

Ethical Approval and Informed Consent

Ethical approval was not sought for this study as it involved a meta-analysis of previously published research.

Results

We examined the reliability of the FRPS coefficients in different research settings. For the RG analysis, 32 studies were conducted between 2007

and 2024, each reporting an alpha value, and were selected. All studies in the sample are from Türkiye. Table 1 shows the characteristics of the included studies.

Table 1: Frequencies of Studies According to Study Characteristics

Author (S)	Publication type	Participant features	Cronbach's alpha	Number of items	Sample size
Sahin, et al., (30)	Article	Father	0.90	25	650
Ozkan, (31)	Article	Child and Father	0.75	25	100
Poyraz, (32)	Master's Degree	Father	0.75	25	389
Kurucirak, (33)	Master's Degree	Father	0.90	25	260
Uzun, (34)	Master's Degree	Father	0.75	25	659
Salci, (4)	Master's Degree	Father	0.75	25	40
Ugur, (23)	Master's Degree	Father	0.73	25	306
Gul, (25)	Master's Degree	Parents	0.90	25	800
Beyazit et al., (35)	Article	Child	0.75	25	74
Telli et al., (6)	Article	Father	0.75	25	482
Deles et al., (8)	Article	Father	0.78	25	200
Aksoy et al., (7)	Article	Father	0.75	25	321
Turkoglu et al., (5)	Article	Child and Father	0.75	25	533
Dogan et al., (24)	Article	Father	0.91	25	200
Semiz et al., (36)	Article	Father	0.75	21	504
Tarsuslu et al., (26)	Article	Father	0.83	25	15
Tarsuslu2 et al., (37)	Article	Father	0.89	25	320
Gonul, (38)	Master's Degree	Father	0.75	25	161
Unlu, (39)	Master's Degree	Child and Father	0.75	25	123
Demir, (40)	Specialization Thesis	Father	0.90	25	175
Kutluana, (41)	Master's Degree	Father	0.75	25	393
Aksoy, (42)	Master's Degree	Child and Father	0.75	25	413
Gokpinar, (43)	Master's Degree	Father	0.75	25	305
Semiz, (44)	PhD	Father	0.75	25	504
Bolat, (45)	Master's Degree	Father	0.75	25	286
Sahin, (46)	Master's Degree	Father	0.75	25	376
Avcibasi, (47)	PhD	Father	0.90	25	80
Dogan, (24)	Master's Degree	Father	0.91	25	200
Kose, (48)	Master's Degree	Father	0.90	25	315
Aksungur, (28)	Article	Father	0.85	25	120
Celik et al., (29)	Article	Father	0.75	25	443
Pekkaras, (27)	Master's Degree	Father	0.84	30	240

When Table 1 is examined, the study sample sizes vary between 40 and 800 participants, including 9,987 participants. Finally, the Cronbach's alpha values range between 0.73 and 0.91.

Heterogeneity

This research investigated the heterogeneity of Cronbach's alpha values, which is crucial for understanding reliability differences across studies. The Q test ($Q(31) = 856.2536, P < .001$) and I^2 index (96.56%) revealed significant heterogeneity, indicating substantial variability in reliability coefficients. The between-study variance (τ^2) was 0.06. These findings underscore the importance of considering this variability for FRPS validity. The Cochran Q test showed statistically significant differences in FRPS reliability values across studies, indicating varying effect sizes. The high I^2 value reflects substantial variability in FRPS reliability. The average effect size and 95% confidence interval further highlight these differences. As noted in (22), the minimal overlap in confidence intervals across studies further emphasizes this heterogeneity. The significant Q statistic, high I^2 , and the confidence interval's relationship to the estimation interval width all support the conclusion of substantial FRPS reliability heterogeneity, warranting further investigation.

Conclusions on Publication Bias

A meta-analysis, a powerful tool for synthesizing research, faces challenges from “publication bias,” where positive results are favored, potentially skewing conclusions. This bias, arising from the preferential publication of positive findings over negative or inconclusive ones, distorts the

representation of included studies. Visual tools like funnel plots are used to mitigate this, which plots effect size against study sensitivity. Asymmetry in these plots may indicate bias, though they primarily serve as a visual aid. Statistical methods like trim-and-fill and Egger regression are employed for more objective assessment. Trim-and-fill corrects funnel plot asymmetry by estimating missing studies, while Egger regression analyzes the correlation between effect size and study sensitivity. Effectively managing publication bias is crucial for ensuring the reliability and validity of meta-analyses. Researchers can enhance objectivity and strengthen the conclusions drawn from pooled study data by utilizing techniques like funnel plots, trim-and-fill, and Egger regression.

In this study, several methods were used to determine objectively the presence of publication bias. Egger's regression test is a popular method used to detect publication bias. It examines bias by analyzing the correlation between effect size and standard error. The results show that Egger's regression test was not statistically significant (Egger value = -0.997, $P = 0.31 > 0.05$). This suggests that the studies included in the meta-analysis did not provide evidence of publication bias.

In addition, we analyzed Fail-Safe-N, which represents one of the quantitative outputs of the meta-analysis. The Fail-Safe-N metric estimates the number of unpublished studies needed to change the overall conclusion of the meta-analysis. The high Fail-Safe-N value obtained ($FSN = 269160.00, P < 0.001$) suggests that the findings of the meta-analysis are robust to publication bias; thus, the conclusions drawn are reliable (Fig. 2).

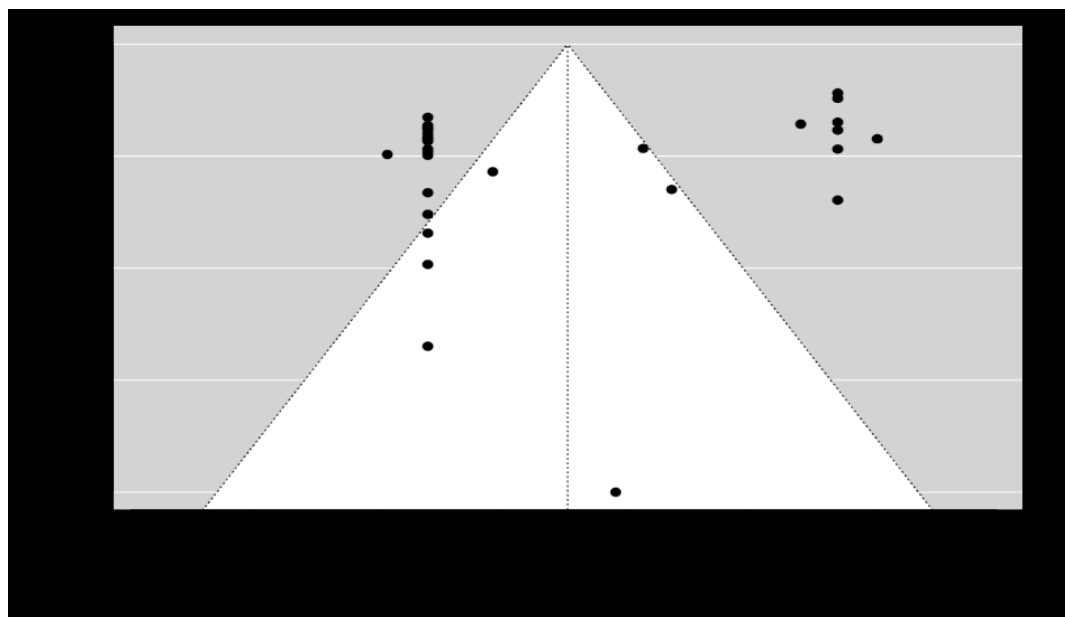


Fig. 2: Funnel Plot for the Transformed Alpha Coefficients

Results on the Generalized Effect Size of FRPS Scale Reliability

A meta-analysis is a research approach designed to draw general conclusions about a particular topic by synthesizing data from various studies. A significant output of this method is a graphical tool called a “Forest Plot.” This graph visually depicts the overall effect size of each study, including the effect size and confidence intervals.

The forest plot in Fig. 3 shows the results of a meta-analysis to assess the reliability of the FRPS scale. This graph presents the Cronbach's alpha coefficients of 32 studies involving 9,987 participants. A dot represents the Cronbach's alpha of each study, and the horizontal lines represent confidence intervals. The vertical line represents the overall effect size. The meta-analysis revealed that the mean Cronbach's alpha of the FRPS was 0.80 (95% CI (confidence interval) = 0.78–0.83). This finding suggests that the FRPS demonstrates overall high reliability. A high Cronbach's alpha value indicates that the items in the scale are consistent with each other and effectively measure the same construct or trait. As a result, the scale can be used reliably.

Meta-analysis aims to provide robust conclusions by synthesizing diverse studies, but “publication bias” poses a significant challenge. This bias, where positive results are favored, can distort findings by obscuring negative or inconclusive results. Therefore, assessing included studies for publication bias is crucial. Once addressed, a “generalized effect size” should be calculated using a statistical model that accounts for study variability, such as the REM. This analysis employed REM to compute the generalized effect size and confidence intervals. While the examined scale demonstrated acceptable overall reliability, the confidence intervals revealed variability in reliability across individual studies.

In this study, the generalized effect size for the reliability of the FRPS was 0.80, with a 95% confidence interval (CI) ranging from 0.77-0.82. These findings suggest that the FRPS has a high level of overall reliability. The generalized effect size value of 0.80 reveals that the scale's internal consistency is significant and that items developed to assess the same construct or trait are compatible. This shows that the scale provides consistent and reliable results in various studies.

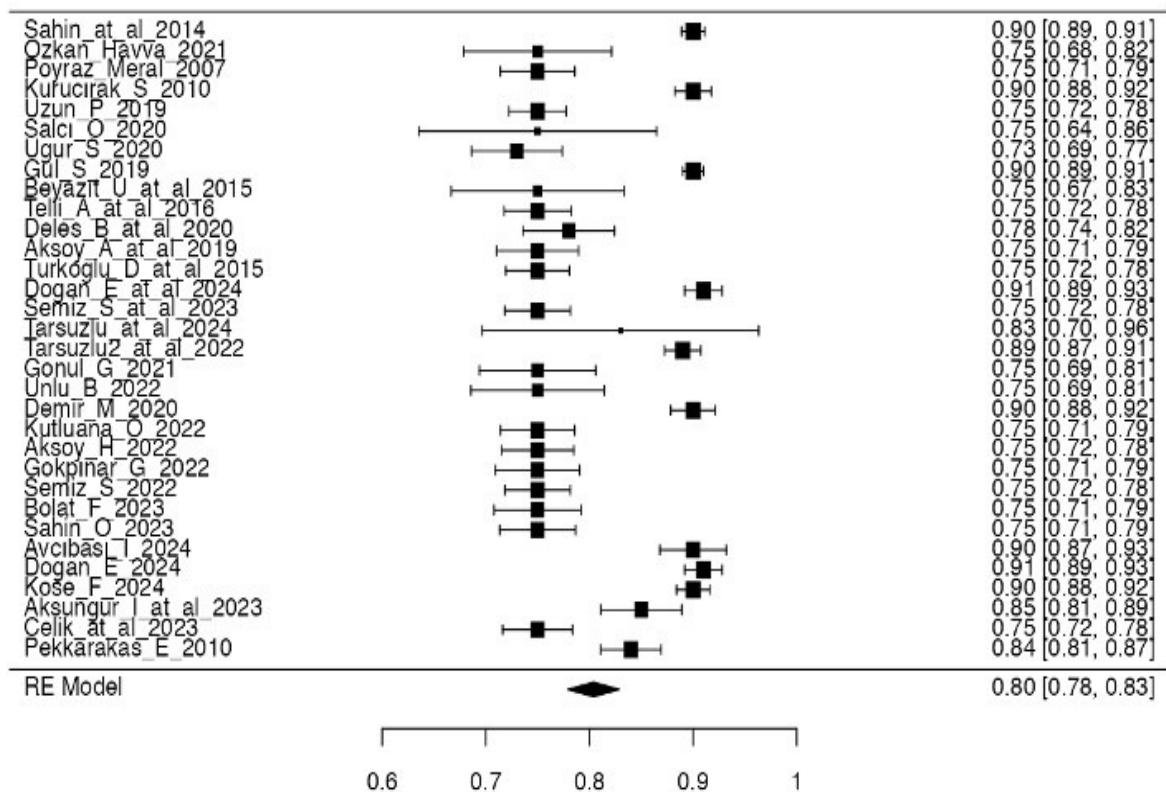


Fig. 3: Forest Plot for Raw Alpha Coefficients

The reliability values obtained from the studies included in the meta-analysis provide essential information about the overall reliability of the scale. These values range between 0.73 (23) and 0.91 (24). This range is generally considered acceptable for reliability coefficients.

The fact that the reliability values obtained from all studies exceeded the acceptable threshold is encouraging in terms of showing the reliability of the meta-analysis results. This consistency indicates that the various studies yielded similar results and confirms the scale's reliability. Furthermore, the weights of the studies were assessed via forest plot analysis. In the forest plot, the square dimensions of each study reflect their contribution or weight to the meta-analysis. This weight usually depends on factors such as sample size and study reliability. The analysis revealed that the study by Gul (25) carried the greatest weight and had a more significant impact on the meta-analysis results than other studies did.

Analysis of Moderator Variables

Understanding whether reliability values vary across different factors provides essential information about the overall validity of a measurement tool and its use in different contexts. This study used moderator analyses with the mixed effects model to assess reliability values across categorical variables.

Moderator analysis is a statistical method used to examine how one variable affects the relationship between two variables. In this study, categorical variables such as publication type (thesis, article), participants (mother and father, father, child and father, child), and year of data collection (2007-2024) were used as moderators to examine possible effects on reliability.

The analysis revealed that reliability remained consistent across publication type ($P = .36$), participant group ($P = .63$), and data collection period

during the study year ($P = .90$). These findings suggest that the reliability of the FRPS is consistent across different types of publications, different groups of participants, and different periods. This finding indicates that the scale can be used reliably in different contexts.

Discussion, Conclusion and Recommendations

This meta-analysis examined the reliability of the FRPS by analyzing 32 studies, aiming to determine how consistently the scale performs across various research. Meta-analysis, a robust method for combining study findings, was used to understand the FRPS's overall reliability comprehensively. Since publication bias, where positive results are favored, can distort meta-analytic results, statistical and graphical methods were employed to assess its presence. Fortunately, the analysis found no evidence of publication bias within the included studies.

The average reliability coefficient from 32 studies was 0.80. This figure indicates that the overall estimate of the Cronbach's alpha coefficient is adequate and that the FRPS is a reliable measurement tool. However, statistically significant heterogeneity was observed across studies on reliability. This observation implies that the reliability coefficients of the FRPS may vary across different samples, and caution should be exercised when generalizing the findings. Future research efforts could further investigate the factors contributing to this heterogeneity and provide additional insights into applying FRPS in different contexts.

Several studies have evaluated the reliability of the FRPS. Tarsuslu et al. (26) examined fathers' views on fatherhood during the COVID-19 pandemic and reported a Cronbach's alpha value of 0.83, indicating acceptable reliability for the FRPS. Similarly, Pekkaras (27) reported a reliability score of 0.84 in a sample of 240 fathers with children in private and public schools. Aksungur and Aksungur (28) studied fathers with children aged 3-15 years during the pandemic and reported a reliability coefficient of 0.85 for the FRPS in a group of 120 fathers. These three studies suggest that the FRPS has consistently demonstrated acceptable

reliability across different sample groups and conditions, strengthening its effectiveness in measuring perceptions of the father role.

We aimed to investigate the reliability of the FRPS in various research contexts and to highlight any differences. The analysis revealed that the reliability coefficients of the FRPS varied significantly across studies, indicating considerable statistical heterogeneity. This suggests that the FRPS does not have consistent reliability across all studies and that various factors may contribute to this inconsistency. The impact of different variables on FRPS reliability was assessed to identify the reasons for this heterogeneity. Variables such as publication type (e.g., articles, dissertations), participant role (e.g., fathers, mothers), and years of study were investigated as potential moderators. However, the results showed that these factors did not significantly affect the reliability of the FRPS. This suggests that variability in FRPS reliability may be due to other underlying factors. Future research could investigate the effects of additional variables such as scale structure, item analysis, and sample characteristics on FRPS reliability.

Given the high degree of heterogeneity ($I^2 = 96.56\%$), it is crucial to distinguish the most influential factors contributing to this variability. We hypothesize that the age range of the samples may significantly affect the reliability of the FRPS. For example, studies that include fathers of infants may produce different reliability coefficients than studies that include fathers of adolescents due to various developmental stages and parenting demands. Similarly, socioeconomic status (SES) may be a significant moderator. Fathers from different SES backgrounds may interpret and respond to FRPS items differently, reflecting diverse cultural and economic contexts. The timing of data collection, particularly around significant life events or societal changes, may also affect reliability. For example, data collected during economic instability or social upheaval periods may reflect increased stress or changing perceptions of fatherhood. Future research could specifically examine these potential moderators to elucidate sources of heterogeneity and improve the applicability of the FRPS across diverse populations.

This study highlights the importance of RG studies. RG studies provide insight into the overall reliability of a measurement tool by assessing its reliability across several studies. In this study, the Cronbach's α coefficients of the FRPS were analyzed. Future studies may consider examining alternative forms of reliability, such as test-retest reliability of the FRPS, or investigating other measurement tools beyond the FRPS. Research has revealed a need to improve the reliability of instruments measuring perceptions of fathers' role in the literature.

The present study focused on the reliability of the FRPS across various subgroups and obtained interesting results. Our findings reveal that the reliability values of the FRPS do not differ significantly across subgroups. The scale shows comparable levels of reliability for both fathers and mothers. In particular, the FRPS showed higher reliability in studies involving fathers, suggesting that the scale effectively measures fathers' perceptions of their roles. On the other hand, reliability values were lower in studies focusing on children, suggesting that different assessment tools are needed to assess children's perceptions of the fathering role. In support of this, Çelik et al. (29) reported a low Cronbach's alpha value in their study involving children.

Conclusion

FRPS is generally recognized as a reliable measurement tool. However, different samples may yield different reliability values. When the FRPS is used, researchers can evaluate the scale's reliability within the target sample group. In this context, future research could examine the validity and reliability of the FRPS in different cultural and socio-economic groups in more detail. In particular, testing the developmental appropriateness and validity of new scales developed to measure children's perceptions of the fathering role in various contexts is essential. In addition, longitudinal studies examining the change in perceptions of the fathering role over time and its impact on children's development contribute significantly to the body of

knowledge in this field. Such studies help to understand the perception of fathering roles more comprehensively and to develop appropriate intervention programs. In addition, examining the reliability of other measurement tools used to assess perceptions of fathering roles will similarly make essential contributions to the literature.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Funding Declaration

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest Declaration

The authors declare no conflicts of interest.

Data Availability Statement

The data supporting this study's findings are available from the corresponding author upon reasonable request.

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