

Measurement Invariance of the Positive Parenting Scale Across Child Gender and Parental Educational Attainment¹

Eda Biçener² Nilüfer Koçtürk³

Abstract

Positive parenting is widely recognized as a multidimensional and universal construct encompassing diverse caregiving practices that promote children's healthy development. Ensuring that parenting measures operate equivalently across different demographic groups is essential for making meaningful comparisons in family research. The present study examined the measurement invariance of the Positive Parenting Scale (PPS) across child gender and parental educational attainment among parents of children aged 4-6 years in Türkiye. Data were collected from parents using a convenience sampling approach, and responses were obtained through self-report measures. The participants consisted of a total of 473 parents, including 67.65% women ($n = 320$) and 32.35% men ($n = 153$). Multi-group confirmatory factor analysis was conducted to test configural, metric, scalar, and strict measurement invariance of the PPS across the specified groups. The findings supported measurement invariance across both child gender and parental educational attainment, indicating that the scale operates equivalently across these demographic groups. These results show that PPS scores can be meaningfully compared across parents of girls and boys as well as across different parental educational levels. Establishing measurement invariance provides further support for the use of the PPS in research and applied settings involving diverse parent populations in early childhood contexts.

Keywords: Positive parenting, preschool children, measurement invariance, child gender, parental educational attainment.

Introduction

In early childhood, parenting represents one of the most powerful proximal influences on children's developmental trajectories (Chazan-Cohen et al., 2009; Knauer et al., 2019). The focus in the parenting literature has evolved from identifying pathological outcomes in children and parenting behaviors that pose risks toward strengthening parenting practices that maximize children's developmental potential, as well as the protective factors that function within this process (Rodrigo et al., 2012). In this context, the Council of Europe (CoE, 2006) has defined positive parenting as parental behavior based on the best interests of the child, which nurtures, empowers, is non-violent, and ensures respect and guidance for the child, including setting boundaries to enable the full development of each child's potential. Rodrigo et al. (2014) explained which child needs are addressed by the positive parenting principles defined by the Council of Europe and their effects on children. Accordingly, the principle of nurturing supports

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² Sakarya University, edabicener@sakarya.edu.tr, ORCID: [0000-0002-9596-6486](https://orcid.org/0000-0002-9596-6486)

³ Hacettepe University, niluferkocturk@gmail.com, ORCID: [0000-0001-6124-1842](https://orcid.org/0000-0001-6124-1842)

responding sensitively to children's needs for love, safety, and acceptance, as well as the development of a secure parent-child bond. The principle of structure and guidance contributes to children's internalization of norms and their healthy expression of emotions through predictable routines and consistent boundaries. The principle of recognition is based on viewing the child as an individual and respecting their rights, thereby supporting the development of positive self-concept and self-esteem. The principle of empowerment promotes children's sense of competence and autonomy, fostering self-regulation and cooperation skills. Finally, the principle of non-violent upbringing aims to protect children's rights and dignity by rejecting disciplinary methods that cause physical or psychological harm. Positive parenting is widely recognized as a multidimensional construct, a perspective reflected in international policy frameworks and parenting education models that incorporate diverse parenting practices such as nurturing, guidance, emotional support, positive reinforcement, non-violent discipline, communication, and parental self-regulation (CoE, 2006; Smith et al., 1994; World Health Organization, 2022). Positive parenting has been consistently associated with adaptive socioemotional development, behavioral competence, and emerging self-regulatory capacities (Cui et al., 2018; Prime et al., 2023). A robust assessment framework for positive parenting is fundamental to identifying domain-specific parental strengths and needs, generating data-driven guidance for the development of targeted preventive and supportive programs in early childhood, tailoring family-based early intervention services, and systematically evaluating the effectiveness of parenting interventions.

Literature indicates that although several instruments have been developed internationally to assess positive parenting behaviors. The Alabama Parenting Questionnaire was developed for parents of children aged 6–18 years (Frick, 1991). The scale consists of the subscales parental involvement, positive parenting, poor monitoring, inconsistent discipline, and corporal punishment. In the Turkish adaptation study, item factor loadings were reported to range between .07 and .80, and the internal consistency coefficients of four subscales were found to be below .70 (Çekiç et al., 2018). The Parenting Styles and Dimensions Questionnaire–Short Form was developed for parents of children aged 4–12 years (Robinson et al., 2001). The scale consists of the subscales authoritative parenting, authoritarian parenting, and permissive parenting. In the Turkish adaptation studies, the reliability coefficients of the subfactors were found to range between .38 and .84 (Önder & Gülay, 2009), and the test-retest reliability coefficient was reported as .64 (Kapçı & Erdinç, 2009). The Parenting and Family Adjustment Scales, developed to evaluate the effectiveness of the Triple P Positive Parenting Program, consists of a parenting scale with the subscales parental consistency, positive encouragement, coercive parenting, and parent-child relationship, as well as a family adjustment scale with the subscales parental adjustment, family relationships, and parental teamwork (Sanders et al., 2014). The Turkish adaptation study was conducted with parents of children aged 2–12 years (Güller et al., 2020). It was reported that the Turkish version had a factor structure and item content different from the original scale. In conclusion, adaptation studies of existing scales frequently report relatively low reliability coefficients, weak or suboptimal item factor loadings, inconsistencies in factor structures, and measurement tools that either target parents across broad child age ranges or are limited in capturing the multidimensional nature of positive parenting.

Positive parenting is understood to evolve in response to the child's developmental stage and emerging needs (Kaniušonytė et al., 2021) and to vary across cultural contexts (Deater-Deckard et al., 2011). These considerations highlight the need for assessment instruments that are developmentally and culturally responsive, practical and cost-efficient in application, and supported by strong psychometric evidence, particularly for parents of preschool-aged children. In response to this need, the Positive Parenting Scale (PPS; Author, 2026) was developed, comprising 15 items that assess the subdimensions of positive relationship, problem-solving, coercive discipline, self-care, and support for the child's emotion regulation. Within the scope of the psychometric analyses, the scale demonstrated satisfactory model fit and good internal consistency (Author, 2026). Additionally, a multi-group confirmatory factor analysis provided evidence for measurement invariance across parental gender. Establishing that the scale captures the same construct with equivalent meaning for both mothers and fathers indicates that the resulting scores can be interpreted and compared across groups in a fair, valid, and unbiased manner. Furthermore, given that gender roles, cultural expectations, and parental perceptions may shape differential parenting practices toward girls and boys (Chaplin et al., 2005; Lansford, 2022; Lansford et al., 2010), establishing measurement invariance across child gender constitutes a critical prerequisite for the valid use and interpretation of parenting scales (Ahemaitijiang et al., 2021; Florean et al., 2023; Holas et al., 2024). Moreover, higher levels of parental educational attainment have been consistently associated with more authoritative parenting practices, including greater parental warmth, responsiveness, and autonomy support, whereas lower levels of educational attainment have been linked to harsher, more coercive, and punitive disciplinary approaches (Ayoub & Bachir, 2025; Wang et al., 2020; Ward et al., 2021; Zhang, 2021). Nevertheless, empirical evidence concerning measurement invariance across levels of parental educational attainment remains limited (Klímová Chaloupková & Pospíšilová, 2023). Therefore, examining whether measurement instruments function equivalently across different socio-demographic groups is essential for ensuring the validity of cross-group comparisons. In this context, the present study evaluates configural, metric, scalar and strict invariance of the PPS across child gender and parental educational attainment to determine whether the scale functions equivalently across these groups. Accordingly, the research questions of the present study are as follows:

1. Does the PPS demonstrate measurement invariance across child gender?
2. Does the PPS demonstrate measurement invariance across levels of parental educational attainment?

Method

The present study employed a correlational research design. Relational research designs aim to examine relationships among two or more variables without manipulating them, allowing researchers to identify patterns of association within naturally occurring conditions. Such designs are commonly used to examine how variables relate and to determine whether differences or associations exist across groups (Creswell, 2017). In the present study, convenience sampling was employed to select the participants. Convenience sampling is a nonprobability sampling technique in which participants are selected based on their accessibility and willingness to participate in the study (Fraenkel et al., 2016).

Participants

The study group for this research consisted of parents of children aged 4 to 6 years, selected using a convenience sampling method, from those readily accessible to the researchers and who voluntarily agreed to participate in the study (Fraenkel et al., 2016). Participant characteristics are presented in Table 1.

Table 1

Participant Characteristics

Characteristics		<i>n</i>	%
Gender	Female	320	67.65
	Male	153	32.35
Educational attainment	Below a bachelor's degree	238	50.32
	Bachelor's degree or higher	235	49.68
Perceived socioeconomic status	Low	44	9.30
	Middle	364	76.96
	High	65	13.74
Marital status	Single	43	9.09
	Married	430	90.91
Gender of child	Girl	257	54.33
	Boy	216	45.67
Total number of children	1	215	45.45
	2	186	39.32
	3	51	10.78
	4	13	2.75

	5	8	1.70
Total (N)		473	1003

Table 1 shows that 67.65% of the participants were female ($n = 320$), whereas 32.35% were male ($n = 153$). In terms of educational attainment, 50.32% of the participants had an educational level below a bachelor's degree ($n = 238$), while 49.68% held a bachelor's degree or higher ($n = 235$). With regard to perceived socioeconomic status, the majority of the participants reported having a middle socioeconomic status, accounting for 76.96% ($n = 364$). In addition, 13.74% reported a high socioeconomic status ($n = 65$), whereas 9.30% reported a low socioeconomic status ($n = 44$). Regarding marital status, 90.91% of the participants were married ($n = 430$), while 9.09% were single ($n = 43$). Findings related to the gender of the children indicated that 54.33% of the participants had daughters ($n = 257$), whereas 45.67% had sons ($n = 216$). In terms of the total number of children, 45.45% of the participants had one child ($n = 215$), and 39.32% had two children ($n = 186$). Smaller proportions of the participants had three children, accounting for 10.78% ($n = 51$), four children, accounting for 2.75% ($n = 13$), and five children, accounting for 1.70% ($n = 8$).

Instruments

Positive Parenting Scale (PPS): The PPS was developed to assess parents' self-perceptions of their positive parenting practices (Author, 2026). The instrument comprises 15 self-report items organized into five subdimensions: positive relationship, problem-solving, coercive discipline, self-care, and support for the child's emotion regulation. Items are rated on a five-point Likert-type scale ranging from 1 = "Does not describe me at all." to 5 = "Describes me completely.", with items 7, 8, and 9 reverse-coded. Total scores range from 15 to 75, with higher scores reflecting greater engagement in positive parenting behaviors. Exploratory factor analytic findings indicated that the scale accounted for 60% of the total variance. Confirmatory factor analysis supported the proposed five-factor structure, yielding acceptable model fit indices ($\chi^2/df = 2.275$, $p < .001$, CFI = .91, RMSEA = .06 (90% CI [.05, .07]), GFI = .93, SRMR = .05.). Internal consistency coefficients were satisfactory across subscales: positive relationship ($\omega = .71$; $\alpha = .71$), problem-solving ($\omega = .70$; $\alpha = .70$), coercive discipline ($\omega = .80$; $\alpha = .79$), self-care ($\omega = .75$; $\alpha = .75$), and support for the child's emotion regulation ($\omega = .74$; $\alpha = .74$), with adequate reliability for the total scale ($\omega = .79$; $\alpha = .78$). Multi-group confirmatory factor analysis supported measurement invariance across parental gender (Author, 2026).

Procedure

Prior to data collection, the necessary permissions were obtained from the Hacettepe University Ethics Committee (Approval Date: 16.05.2023; Approval Document No: E-35853172-300-00002847595). Subsequently, the study was announced on social media platforms. Data were collected online via Google Forms. Before accessing the scale forms, participants were required to review and approve the Informed Consent Form presented on the first page. Accordingly, participants were informed about the purpose of the study, the confidentiality and anonymity of the data, and that the collected data would be analyzed and reported only in aggregate form. They were also informed that participation in the study was voluntary and that they could withdraw at any time without any negative consequences. In

addition, the researchers' contact information was provided in case participants had any questions regarding the study. Completing the forms took approximately 15 minutes. The data collection process was carried out between May 2025 and June 2025.

Data Analysis

Measurement invariance of the PPS was examined across child gender (girls vs. boys) and parental educational attainment (below bachelor's degree vs. bachelor's degree or higher) using multi-group confirmatory factor analysis. All analyses were conducted using JASP (version 0.19.3). Although the PPS employed a 5-point Likert-type response format, robust maximum likelihood estimation was used because the literature suggests that Likert-type variables with five or more categories can be treated as approximately continuous and that robust maximum likelihood estimation can be appropriately applied under such conditions (Rhemtulla et al., 2012). Following established guidelines (Chen, 2007), a hierarchical sequence of increasingly restrictive models was tested: configural, metric, scalar, and strict invariance. First, configural invariance was evaluated to determine whether the same factor structure held across groups without imposing equality constraints. Second, metric invariance was tested by constraining factor loadings to equality across groups. Third, scalar invariance was examined by additionally constraining item intercepts. Finally, strict invariance was evaluated by constraining residual variances across groups. Measurement invariance was supported when changes between nested models did not exceed the following thresholds: $\Delta CFI \leq .010$ and $\Delta RMSEA \leq .015$ across all invariance levels. For metric invariance, $\Delta SRMR \leq .030$ was used as the criterion, whereas for scalar and strict invariance, the more stringent criterion of $\Delta SRMR \leq .010$ was applied (Chen, 2007).

Findings

Results of Measurement Invariance Based on the Child's Gender

The item factor loadings from the multi-group CFA, performed by child gender, are summarized in Table 2. In the configural model, standardized factor loadings were above .42 among parents of girls and above .49 among parents of boys.

Table 2

Standardized Item Factor Loadings According to Child Gender

PPS Items	Girl	Boy
Positive relationship		
m1	.765	.793
m2	.802	.708
m3	.693	.679
Problem-solving		

m4	.787	.652
m5	.544	.494
m6	.730	.772
Coercive discipline		
m7	.697	.751
m8	.680	.768
m9	.612	.793
Self-care		
m10	.677	.820
m11	.741	.645
m12	.424	.547
Supporting the child's emotion regulation		
m13	.798	.797
m14	.789	.616
m15	.463	.544

Configural measurement invariance across child gender groups was supported by the findings, χ^2 (160) = 271.956; $p < .001$; $\chi^2/df = 1.69$; CFI = .932; RMSEA = .054; SRMR = .056. For metric measurement invariance, the changes in CFI, RMSEA, and SRMR values were observed to fall within the specified threshold criteria ($\Delta CFI < .010$, $\Delta RMSEA < .015$, $\Delta SRMR < .030$; Chen, 2007). Subsequently, scalar measurement invariance was examined, and the results indicated that both parents of girls and boys responded similarly to the scale items. Finally, changes in fit indices were evaluated for strict invariance, and these changes were found to fall within acceptable threshold values. The imposition of equal item error variances revealed that the scale demonstrated measurement invariance throughout all four stages. Measurement invariance findings are summarized in Table 3.

Table 3

Measurement Invariance Results from Multi-group CFA by Child Gender

Measurement Invariance	CFI	ΔCFI	RMSEA	$\Delta RMSEA$	RMSEA [90% CI]	SRMR	$\Delta SRMR$
Child's Gender: Girl vs Boy							
Configural	.932		.054		.043-.065	.056	

Metric	.935	.003	.051	.003	.040-.062	.059	.003
Scalar	.938	.003	.049	.002	.038-.059	.056	.003
Strict	.936	.002	.048	.001	.037-.058	.057	.001

Note. CI = Confidence Interval; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Results of Measurement Invariance Based on Educational Attainment of Parents

The item factor loadings from the multi-group CFA, performed by the educational attainment of parents, are summarized in Table 4. In the configural model, standardized factor loadings exceeded .38 in the below bachelor's degree group and .45 in the bachelor's degree or higher group.

Table 4

Standardized Item Factor Loadings According to Educational Attainment of Parents

PPS Items	Below bachelor's degree	Bachelor's degree or higher
Positive Relationship		
m1	.798	.755
m2	.795	.728
m3	.706	.675
Problem-solving		
m4	.765	.677
m5	.579	.459
m6	.752	.761
Coercive discipline		
m7	.708	.726
m8	.696	.762
m9	.731	.680
Self-care		
m10	.695	.792
m11	.707	.676
m12	.486	.515
Supporting the child's emotion regulation		

m13	.786	.855
m14	.688	.696
m15	.383	.588

Configural measurement invariance across educational attainment of parents was supported by the findings, $\chi^2 (160) = 293.543$; $p < .001$; $\chi^2/df = 1.83$; CFI = .920; RMSEA = .059; SRMR = .056. For metric measurement invariance, the changes in CFI, RMSEA, and SRMR values were observed to fall within the specified threshold criteria ($\Delta CFI < .010$, $\Delta RMSEA < .015$, $\Delta SRMR < .015$; Chen, 2007). Subsequently, scalar measurement invariance across parental educational attainment (Bachelor's degree or higher vs. below bachelor's degree) was supported, indicating that parents with and without a bachelor's degree interpreted and responded to the scale items in a comparable manner. Finally, changes in fit indices were evaluated for strict invariance, and these changes were found to fall within acceptable threshold values. The imposition of equal item error variances revealed that the scale demonstrated measurement invariance throughout all four stages. Measurement invariance findings are summarized in Table 5.

Table 5

Measurement Invariance Results from Multi-group CFA by Educational Attainment of Parents

Measurement Invariance	CFI	ΔCFI	RMSEA	$\Delta RMSEA$	RMSEA [90% CI]	SRMR	$\Delta SRMR$
Educational Attainment of Parents: Below bachelor's degree vs Bachelor's degree or higher							
Configural	.920		.059		.049-.070	.056	
Metric	.925	.005	.056	.003	.045-.066	.058	.002
Scalar	.919	.006	.056	< .001	.046-.066	.056	.002
Strict	.919	< .001	.054	.002	.044-.064	.059	.003

Note. CI = Confidence Interval; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Discussion

The results of this study indicate that the PPS demonstrates measurement invariance across child gender, suggesting that the construct of positive parenting is conceptualized and interpreted in a similar way by parents of both girls and boys. The establishment of configural invariance confirms that the underlying factor structure remains stable across groups, while metric and scalar invariance indicate that item loadings and intercepts function similarly across groups. These results suggest that comparisons between parents of daughters and sons can be interpreted with confidence, as the scale appears to measure the same construct across groups. In addition, establishing scalar invariance allows comparison of latent mean scores across child gender, suggesting that observed differences are more likely to reflect true differences in parenting practices rather than measurement bias.

This result is particularly relevant given that parenting behaviors are often influenced by gender-related expectations embedded in broader social and cultural norms (Dittman et al., 2023; Eccles et al., 1990; Mesman & Groeneveld, 2018). One possible interpretation is that the PPS focuses on relational aspects of parenting that support children's development regardless of gender (Endendijk et al., 2016; Spruijt et al., 2019). From this perspective, positive parenting may represent a set of caregiving practices that are not strongly tied to gender-specific expectations. The results, therefore, support the use of the PPS in studies comparing parenting practices across families with children of different genders.

The analyses also showed that the PPS functions similarly across different levels of parental education. This suggests that parents with lower and higher levels of educational attainment interpret the items similarly. Although educational attainment is often associated with differences in parenting knowledge and resources (Bornstein & Bradley, 2014; Davis-Kean, 2005), the relational components of positive parenting assessed by the PPS appear to be understood similarly across educational groups. This finding suggests that the scale's wording and structure do not favor any particular educational group, supporting the validity of comparisons between parents with different educational backgrounds.

The establishment of scalar invariance further indicates that item responses operate in a comparable way across educational groups. As a result, differences observed in positive parenting scores across educational levels are more likely to reflect substantive differences rather than measurement artifacts. This supports the use of the PPS in comparative studies and multi-group analyses involving parents with diverse educational backgrounds. It may also be useful for evaluating parenting interventions for populations with varying educational attainment.

Implications

The findings of this study have several implications for both research and practice in the field of early childhood and parenting. First, the evidence supporting measurement invariance across child gender and parental educational attainment suggests that the PPS can be used to examine parenting practices across these demographic groups without introducing systematic measurement bias. Establishing invariance across key background variables is particularly important for research that aims to compare parenting behaviors across families, as it ensures that the construct being measured carries the same meaning for different groups of respondents. In this respect, the present findings provide a

methodological foundation for future studies investigating how demographic, social, and contextual factors are associated with positive parenting practices. The results also contribute to the broader literature on positive parenting by suggesting that the relational dimensions captured by the PPS may be understood in a relatively similar way across families with different educational backgrounds and children of different genders. This finding may indicate that certain core aspects of supportive parenting, such as warmth, responsiveness, and constructive guidance, are recognized by parents as central components of caregiving regardless of demographic differences. As a result, the scale may serve as a useful tool for studies examining parenting processes across diverse family contexts. From a practical standpoint, the PPS may also provide a useful assessment tool for professionals working in early childhood education settings and family support services. Practitioners often need reliable instruments to understand parenting practices better and identify areas where families may benefit from additional support. In this regard, the PPS may assist educators, counselors, and family support professionals in assessing parenting behaviors and monitoring changes that occur during the implementation of parenting programs. The availability of a scale that functions consistently across parents with different educational backgrounds may be particularly valuable in community-based interventions where participant groups are often heterogeneous. Finally, the scale may also support the evaluation of parenting interventions implemented in early childhood contexts. Because the PPS appears to measure positive parenting practices comparably across demographic groups, it may facilitate the assessment of program outcomes across diverse parent populations. This feature may be especially relevant for large-scale family support initiatives that aim to promote positive parenting practices within communities with varying levels of educational attainment and diverse family structures.

Limitations and Future Directions

Several limitations should be considered when interpreting the findings of the present study. First, the analyses focused on measurement invariance across child gender and parental educational attainment. Although these variables represent important demographic characteristics, other family and contextual factors may also influence how parenting constructs are understood and reported. Future research could therefore examine whether the PPS demonstrates similar measurement properties across additional groups, such as different socioeconomic backgrounds, family structures, or cultural contexts. Such work would provide further evidence of the scale's broader applicability. Second, the study relied on cross-sectional data, which limits conclusions about the stability of the measurement structure over time. Parenting practices and family dynamics may change as children grow and family circumstances evolve. Longitudinal research would allow examination of whether the factor structure and measurement properties of the PPS remain stable across developmental periods. Testing longitudinal measurement invariance would also help determine whether the scale can reliably capture changes in parenting practices over time. Finally, the data were based on parental self-reports, which may be influenced by social desirability or parents' own interpretations of their parenting behaviors. Although self-report measures are widely used in parenting research, future studies may benefit from incorporating multiple data sources, such as observational measures or reports from other caregivers.

Combining different types of data could provide a more comprehensive understanding of parenting practices and further strengthen the validity of research using the PPS.

Declarations

Ethics approval and consent to participate

All procedures followed were in accordance with ethical standards of responsible communities on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from the participants via online form. The study was approved by the [Hacettepe University Ethics Committee]. Participants provided informed consent and were informed of their right to withdraw at any time.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. The data are not publicly available due to privacy or ethical restrictions.

Competing interests

The authors declare that they have no competing interests.

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