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Parental and Peer Attachment Patterns and Their Relationship with Self-Esteem among Middle School Pupils: A Latent Profile Analysis

Patrones de apego parental con los pares y su relación con la autoestima en alumnos de educación secundaria: un análisis de perfiles latentes

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Resumen

The present investigation sought to identify hidden configurations of parental and peer emotional bonding among middle school students and examine how these emerging groups are related to self-esteem through logistic regression. The sample comprised 285 pupils (mean age = 14.65 years; 166 girls), all of whom completed the Inventory of Parent and Peer Attachment (IPPA) alongside the Rosenberg Self-Esteem Scale (RSES). Latent profile analysis uncovered four distinct membership groups: a secure bonding pattern, an anxious parental pattern, an avoidant peer pattern, and a mixed high-risk pattern.

Keywords: parental attachment, peer attachment, self-esteem, latent profile analysis

Abstract

El presente estudio tuvo como objetivo identificar configuraciones ocultas de apego emocional hacia los padres y los compañeros entre estudiantes de secundaria, y examinar cómo estos grupos emergentes se relacionan con la autoestima mediante regresión logística. La muestra estuvo compuesta por 285 alumnos (edad promedio = 14,65 años; 166 niñas), quienes completaron el Inventario de Apego hacia los Padres y los Compañeros (IPPA) junto con la Escala de Autoestima de Rosenberg (RSES). El análisis de perfiles latentes reveló cuatro grupos de pertenencia distintos: un patrón de apego seguro, un patrón de apego parental ansioso, un patrón de apego evitativo con los compañeros y un patrón mixto de alto riesgo.

Palabras clave: apego parental, apego entre pares, autoestima, análisis de perfiles latentes

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Introduction

Parenting is one of the most important responsibilities in human development, given that caregivers endeavor to nurture offspring who are psychologically sound, content, and autonomous (Bowlby, 1988). The psychological well-being of adolescents is greatly influenced by family upbringing; warmth and care promote adaptation and self- esteem as well as trust in others, while indifference, punitive discipline, and overprotection may contribute to the development of insecure attachment styles and have negative effects on behavior (Hanini, 2020).

Attachment is a psychological phenomenon involving both behavioral and affective components, originally formulated by Bowlby (1988) to account for the dyadic connection between offspring and caregivers. Grounded in psychoanalytic thought, which stresses the formative influence of early experiences on personality development and later life, Bowlby (1973, 1988) construed attachment as an intense affective tie emerging between the child and the principal caregiver, laying the groundwork for subsequent socio-emotional connections. The significance of this bond lies in the child's construction of self- esteem via the caregiver, influencing children's perceptions of whether they are worthy of affection and care, and generating anticipations concerning the conduct of others (Bowlby, 1989).

Bowlby (1969, 1973, 1988), the founding figure of attachment theory, advanced the view that attachment reflects an inborn behavioral system that modulates the tension between the child's need for exploration and safety. He maintained that play and environmental exploration cannot occur unless the child senses the availability of a safe haven to which they can retreat when alarmed or in need of defense, stressing that attachment is a basic biological imperative comparable in significance to nutritional sustenance (Abdul Rahman, 2015). Empirical work indicates that secure bonding during adolescence augments social competencies and favorably shapes interactions with peers; furthermore, secure parental bonds furnish essential interpersonal support and reinforce self-confidence and self-esteem, while insecure bonding impedes the crystallization of identity and the establishment of enduring relationships (Abdul Rahman, 2015). Scholars have delineated four relational styles: secure, avoidant, anxious, and disorganized; moreover, the link between attachment and personality traits, as well as affective disturbances, differs, given that individuals with clinical depression may fail to display a clear avoidant relational pattern (Setzer, 1999).

Investigations by Al-Qudsi and Ramadan (2017) documented a meaningful association between secure bonding and self-esteem during middle childhood, whereas no meaningful link emerged between insecure bonding (avoidant and anxious) and self-esteem. Likewise, Al-Maliki (2010) found that both secure and anxious bonding predicted self-efficacy, yet avoidant bonding did not; moreover, secure and avoidant styles were connected to social competencies, with the secure pattern yielding stronger prediction, and the secure pattern proved most frequent in the sample. Additionally, Abu Ghazal and Jaradat (2009) reported that both secure and anxious bonding correlated with self-esteem and contributed to forecasting self-esteem and loneliness, with the secure pattern being most common among respondents.

Moreover, Passanisi et al. (2015) observed that the secure attachment style predominated among students, while insecure patterns corresponded to diminished self-esteem; similarly, Doinita (2015) found that secure bonding correlated positively with self-esteem in adults, whereas both avoidant and anxious patterns showed inverse associations with self-esteem. Beigi et al. (2022) showed that adolescent self-esteem is positively linked to trust and open communication with caregivers and peers, and negatively linked to alienation from them; notably, maternal trust and peer-related variables ranked among the strongest predictors of self-esteem, with maternal trust exerting the greatest impact. Additionally, Karunarathne (2023) demonstrated that the intensity of bonding to both caregivers and peers jointly elevates adolescent self-esteem, although stylistic congruence between these bonds does not directly predict self-esteem, with parental bonding wielding stronger influence than peer bonding in the

cultivation of self-esteem. A meta-analytic synthesis by Gorrese et al. (2013) established that peer attachment, both globally and across its dimensions (trust, communication, alienation), relates to self-esteem in adolescents and emerging adults, yet cross-study heterogeneity calls for deeper inquiry into moderating variables, emphasizing the need to scrutinize more closely the contribution of peer bonding to self-esteem; conversely, Lim (2020) found that suboptimal parenting diminishes adolescent self-esteem, whereas peer bonding enhances it, an effect that remains stable over time; moreover, self-esteem fully mediates this pathway in males and partially mediates it in females; meanwhile, Anggelia et al. (2023) showed that self-esteem substantially improves the caliber of peer bonding among adolescents from divorced households, with a statistically robust association between the two constructs; finally, Shen et al. (2021) disclosed that both self-esteem and adult bonding mediate the effect of childhood bonding on psychological distress.

Abu Ghazal and Jaradat (2009) showed that strengthening self-esteem and relational security attenuates the harmful consequences of insecure bonding on psychological health across developmental phases. In addition, Hanini (2020) found that secure bonding accompanies elevated self-regard, whereas anxious bonding corresponds to reduced self-esteem. With respect to investigations applying Latent Profile Analysis (LPA), He et al. (2018) used this analytical framework to demonstrate that adolescents manifest unique arrangements of parental and peer bonding; similarly, Russotti et al. (2023) showed that bonding patterns with mothers, fathers, and peers shape the impact of maltreatment on depressed adolescents; specifically, weaker maternal bonding was tied to heightened depressive manifestations, underscoring the value of fortifying the mother–adolescent bond as a protective element in clinical treatment. Furthermore, Withers (2020) found that latent profile modeling distinguished four adolescent–parent bonding patterns (secure, avoidant, anxious, and disengaged), with disengaged and avoidant patterns linked to elevated deviant conduct, while caregiver depression was more common in the avoidant pattern, though no variations in adolescent depression appeared across remaining patterns. Additionally, Qu et al. (2025) revealed that latent profile and transition modeling identified three bonding patterns among Chinese adolescents (weak, moderate, and strong), with movement toward the moderate pattern being most frequent; these patterns showed significant ties to depression and anxiety, pointing to the necessity of tailored interventions for adolescents exhibiting moderate bonding styles.

In view of the theoretical and empirical literature reviewed above, the literature suggests that parental and peer attachment profiles are important factors associated with individual differences in individual variation in adolescent self-esteem; nevertheless, most prior work has depended on a variable-centered orientation, which may neglect individual differences. This state of affairs highlights an urgent necessity to adopt a more contemporary, person-centered analytical strategy through Latent Profile Analysis (LPA), which permits the detection of hidden bonding patterns with caregivers and friends within the sample, thereby uncovering diverse arrangements that conventional approaches might miss; accordingly, the present investigation aims to identify these latent configurations of parental and peer bonding among middle school pupils and to apply logistic regression to assess the influence of these profiles on self-esteem.

Methodology

Research Design

The investigation adopted a quantitative approach, employing a descriptive-analytical framework using Latent Profile Analysis (LPA) to discern patterns of emotional bonding and self-esteem among respondents.

Participants and Procedures

The sample comprised 285 middle school pupils (166 females, 58.2%; 119 males, 41.8%) drawn from a single school in Tébessa province, Algeria, with a mean age of 14.65 years (SD = 1.017). A convenience sampling strategy was adopted due to its feasibility and suitability for the study aims. Respondents completed the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) and the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). Data gathering took place during March and April 2024, after obtaining authorization from the provincial Directorate of Education and informing all respondents of the study's purpose.

Instruments

Inventory of Parent and Peer Attachment (IPPA)

The IPPA (Armsden & Greenberg, 1987) is a widely recognized instrument developed to assess the quality of adolescents' affective bonds with mothers, fathers, and peers. The measure includes three autonomous forms, each assessing bonding with one target figure: mother, father, or peers. The instrument is organized around three core dimensions: Trust, capturing feelings of safety and reciprocal reliance; Communication, gauging openness and the exchange of ideas and emotions; and Alienation, reflecting anger, loneliness, and relational misunderstandings. Moreover, the IPPA can categorize classical bonding patterns (secure versus insecure), differentiating secure and insecure bonding with mothers, fathers, and friends. The instrument has received validation for classifying bonding patterns as outlined by Armsden and Greenberg (1987), supporting its reliability and widespread use in research on adolescent relationships and psychological health. In the present investigation, the Arabic adaptation of the IPPA displayed acceptable psychometric properties, with Cronbach's alpha coefficients of 0.85 for secure maternal bonding and 0.60 for insecure maternal bonding; 0.90 for secure paternal bonding and 0.69 for insecure paternal bonding; and 0.89 for secure peer bonding and 0.61 for insecure peer bonding.

Rosenberg Self-Esteem Scale (RSES)

The RSES (Rosenberg, 1965) is a broadly employed instrument for assessing levels of self-esteem, especially among adolescents and young adults; it contains ten items scored on a Likert continuum from "strongly agree" to "strongly disagree," tapping two principal facets—positive and negative self-esteem —while also permitting classification of respondents into high, medium, or low self-esteem categories. A substantial body of research has confirmed the instrument's strong reliability and robust internal consistency, cementing its applicability in psychological, educational, and clinical settings; for the present investigation, the Arabic adaptation demonstrated satisfactory psychometric quality, with a Cronbach's alpha of 0.694, approaching the conventional 0.70 threshold.

Data Analysis

After data acquisition, information was entered and analyzed using SPSS version 25 for descriptive summaries (frequencies, means, and standard deviations) to portray the sample's general characteristics. Thereafter, R version 4.5.0 was utilized to estimate the Latent Profile Analysis (LPA) model, with the goal of identifying hidden patterns in emotional bonding—encompassing secure and insecure bonding with mother, secure and insecure bonding with father, and secure and insecure bonding with peers. The optimal latent profile solution was chosen on the basis of the following fit criteria: Entropy, BIC, AIC, LL, ICL, SABIC, and the BLRT (p-value); To examine whether attachment profiles predicted the probability of high self-esteem, a binary logistic regression was performed. Because the self-esteem measure comprised 10 items, with item scores ranging from 1 to 4, total scores ranged from 10 to 40. For the logistic regression, self-esteem was treated as a dichotomous criterion; scores of 10–25 were labeled low self-esteem (coded 0), whereas scores of 26–40 were labeled high self-esteem (coded 1). The bonding profile

was entered as a categorical predictor, with one profile designated as the reference group. The model yields odds of high self-esteem as a function of bonding profile, with findings reported as odds ratios (ORs) and 95% confidence intervals.

Results

A Latent Profile Analysis (LPA) was performed to investigate configurations of parental and peer bonding within the middle school sample. Comparisons of latent class solutions (spanning one to five classes) indicated progressive improvement in fit metrics; specifically, AIC, BIC, and SABIC values declined steadily from the single-class to the multi-class solutions, signaling improved data–model correspondence. Notably, the minimum BIC value (13060) appeared for the four-class solution, pointing to its optimal fit under this criterion, which is broadly valued for balancing parsimony and fit. Moreover, lower ICL values for the three- and four-class solutions reinforced this tendency. Concerning classification precision, entropy values attained 0.830 for the three-class solution and 0.801 for the four-class solution, both surpassing the 0.80 benchmark and indicating adequate separation between profiles. Additionally, the Bootstrap Likelihood Ratio Test (BLRT) was used to confirm the superiority of the k-class over the (k−1)-class solution; however, non-significant p-values for supplementary classes in the BLRT supported the adequacy of the four-class solution.

Table 1 presents the fit and classification indices for the competing latent class solutions. Taken together, these findings indicate that the four-class solution provided the best overall representation of the data, combining the lowest BIC value with adequate classification accuracy. Accordingly, the four-class model was retained for subsequent analyses.

Table 1

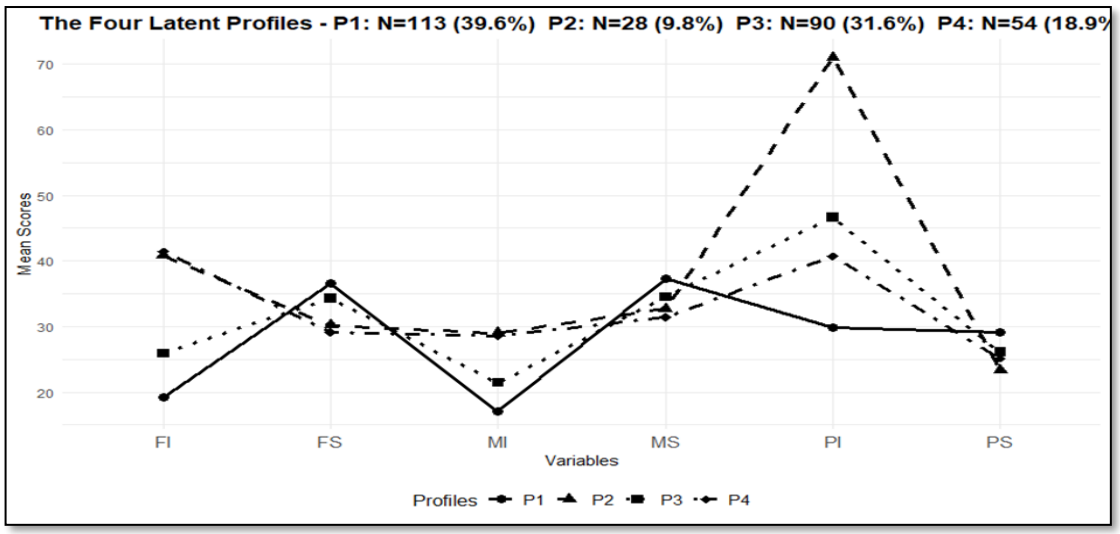
Fit Indices for Latent Profile Analysis

Model	LL	AIC	BIC	ICL	SABIC	Entropy	BLRT(*p*)
1-Profile	-6710	13448	13499	-13499	13455	1	1
2-Profile	-6533	13110	13190	-13233	13120	0.783	0.924
3-Profile	-6460	12979	13089	-13143	12994	0.830	0.913
4-Profile	**-6423**	**12921**	**13060**	**-13138**	**12939**	**0.801**	**0.800**
5-Profile	-6419	12930	13098	-13251	12953	0.696	0.583

Note. Akaike information criterion (AIC; Akaike, 1974), Bayesian information criterion (BIC; Schwarz, 1978), and sample-size adjusted BIC (SABIC; Sclove, 1987) are relative fit statistics wherein lower values denote superior fit relative to higher values. These criteria are derived from the log likelihood (LL), the logarithm of the likelihood ratio, which quantifies how much more probable the data are under a k-profile model than under a (k−1)-profile model. The p-value corresponds to the bootstrapped likelihood ratio test (BLRT; Tekle et al., 2016). Entropy quantifies classification certainty on a 0-to-1 scale (Compiani et al., 1998); higher values signify clearer separation between profiles. An entropy value of .80 indicates adequate profile separation (Ferguson et al., 2020). ICL = Integrated Classification Likelihood (Biernacki et al., 2000).

Figure 1

Mean values of latent profiles of emotional attachment styles



Note. MS = Mother Secure, MI = Mother Insecure, FS = Father Secure, FI = Father Insecure, PS = Peers Secure, PI = Peers Insecure.

Figure 1 illustrates that the latent profile solution—which extracted four distinct bonding profiles among middle school students—diverged with respect to attachment indicators for caregivers and peers. The first profile encompassed 113 students (39.6% of the sample), classified as "relatively secure," displaying moderate secure bonding to caregivers alongside low insecure bonding indicators. The second profile contained 28 students (9.8%), classified as "distressed in peer relationships," distinguished by comparatively elevated insecure bonding indicators toward peers relative to caregiver bonding levels. The third profile comprised 90 students (31.6%), classified as "mixed," showing comparatively elevated secure bonding to both caregivers and peers, together with some indications of anxious bonding in peer relationships. Finally, the fourth profile included 54 students (18.9%), classified as the "Low-communication/withdrawn" profile, exhibiting diminished levels of both secure and insecure bonding indicators across caregiver and peer domains compared with the other profiles. Overall, Figure 1 reveals heterogeneity across the four profiles in bonding indicator levels with caregivers and peers, with evident variation in profile size within the sample.

Table 2.

Logistic Regression Results for High Self-Esteem According to Attachment Profiles

Predictor: Attachment Profile	*OR*	*95% CI*	*p*
Profile 3 (Reference)	1.00	—	—
Profile 1 vs. Profile 3	2.43	[1.38–4.32]	.002
Profile 2 vs. Profile 3	0.471	[0.160–1.22]	.140
Profile 4 vs. Profile 3	0.938	[0.459–1.89]	.858

Note. OR = odds ratio; CI = confidence interval.

The findings in Table 2 indicate that members of Profile 1 were statistically significantly more prone to exhibit high self-esteem than members of Profile 3, with an odds ratio (OR) of 2.43 and a 95% confidence interval of [1.38–4.32], and the effect was statistically significant (p = .002). This signifies that

the odds of high self-esteem among Profile 1 members were roughly 2.43 times those of Profile 3 members. Regarding the comparison between Profile 2 and Profile 3, the OR was 0.471, with a 95% confidence interval of [0.160–1.22], which did not reach significance (p = .140). For Profile 4 versus Profile 3, the OR was 0.938, with a 95% confidence interval of [0.459–1.89], and the difference was not statistically significant (p = .858). Collectively, the logistic regression findings indicate that Profile 1 was the sole profile displaying a statistically significant association with the likelihood of high self-esteem relative to Profile 3, whereas no significant differences emerged for Profile 2 or Profile 4.

Discussion

The latent profile findings demonstrate the presence of four differentiated emotional bonding patterns among middle school students, suggesting that bonding to caregivers and peers is heterogeneous, reflecting diverse relational arrangements. This outcome carries theoretical weight because it bolsters the conceptualization of attachment as a multidimensional construct in which an individual's experiences with caregivers and age-mates may interplay in diverse ways, rather than collapsing into a simple secure/insecure dichotomy. From this vantage point, the profiles identified in the study do not simply mirror quantitative gradations in bonding intensity, but rather constitute qualitatively distinct relational arrangements that may connect differentially to how individuals form self-esteem and engage with their social milieu.

It seems that the first profile—marked by relative relational stability—represents the configuration most aligned with attachment-theoretic assumptions; it integrates comparatively secure caregiver bonding with low levels of insecure peer bonding. Such a relational arrangement may supply recurrent experiences of acceptance, responsiveness, and backing, thereby fostering more favorable internal working models of the self and others. Thus, the linkage of this profile to a higher probability of high self-esteem relative to the third profile in the logistic regression can be interpreted through the lens of secure relationships furnishing a relational scaffold that assists adolescents in cultivating a more stable sense of personal worth. This interpretation is consistent with previous research documenting connections between secure bonding and self-esteem and social competence, as reflected in studies by Al-Qudsi and Ramadan (2017), Al-Maliki (2010), and Abu Ghazal and Jaradat (2009). Nonetheless, this finding ought to be treated as a probabilistic association rather than a causal one, since the cross-sectional character of the data precludes inferring that bonding style directly produces elevated self-esteem.

By contrast, the second profile—comprising individuals with strained peer relationships marked by pronounced insecure bonding to peers—spotlights the importance of the interpersonal context within which attachment unfolds during adolescence. As the peer collective grows in salience as a source of acceptance, belonging, and social backing, the caliber of friendships can become a notable source of information that adolescents draw upon in self-evaluation. From this angle, stable and supportive peer ties may help consolidate self-esteem, whereas strained or insecure ties may be accompanied by heightened uncertainty about personal value and heightened sensitivity to social rebuff. This reading coheres with findings reported by Passanisi et al. (2015) and Doinita (2015), as well as Beigi et al. (2022) and Karunarathne (2023), concerning the significance of peer bonding quality for psychological adjustment and self-esteem in adolescence. However, the lack of a statistically significant association between this profile and the reference profile concerning the probability of high self-esteem implies that insecurity in peer relationships does not invariably and uniformly translate into diminished self-esteem, underscoring the necessity of conceptualizing attachment in its multifaceted complexity rather than through a unidimensional lens.

The findings for the third profile—the "mixed" type, which merges comparatively elevated secure bonding in some relationships with certain signs of anxiety in friendships—provide further evidence of this complexity. Although individuals in this profile displayed a comparatively elevated level of self-

esteem, logistic regression uncovered no significant differences between it and Profiles 2 and 4 regarding the likelihood of high self-esteem; a significant contrast surfaced only in relation to Profile 1. This pattern suggests that self-esteem is not linearly or simplistically tied to a single bonding level, but may be shaped by the overall constellation of relationships with caregivers and peers. This aligns with the perspective that adolescents can draw upon multiple relational resources, and that peer ties may assume growing significance as they move through adolescence. This is corroborated by the findings of Gorrese and Ruggieri (2013), as well as Lim (2020), who underscored the relevance of peer bonding and its connection to self-esteem across diverse developmental and social contexts.

As for the fourth profile—that of Low-communication/withdrawn, reflecting greater detachment or attenuated secure bonding with both caregivers and peers—it signals a relational pattern that may be less conducive to the development of a stable sense of self-esteem. This may be explained by the fact that restricted secure bonds curtail opportunities for affirmative feedback and social backing, which may render the construction of a positive self-esteem more arduous. This account is consistent with investigations that have tied insecure bonding styles to low self-esteem, including those by Passanisi et al. (2015) and Doinita (2015). However, the absence of a statistically significant difference between Profile 4 and Profile 3 in the current analysis suggests that withdrawal or low relational security by itself is insufficient to account for self-esteem levels, and that additional personal, familial, and social elements may contribute to shaping this association.

When the four profiles are considered integrally, the findings appear more compatible with the conceptualization of attachment as a multi-source relational system, in which an individual's experiences with caregivers and peers overlap rather than functioning as isolated domains. Furthermore, the divergent associations between profiles and self-esteem suggest that combining indicators of caregiver and peer bonding can yield a more precise understanding of individual differences than dependence on a simplistic binary attachment classification. This outcome is consistent with recent investigations that have applied latent profile analysis to identify multiple bonding patterns and their links to adjustment and mental health in adolescence, such as He et al. (2018), Gao et al. (2024), Russotti et al. (2023), and Withers (2020). These findings also raise the possibility that the salience of attachment figures may shift across developmental stages, particularly as the psychological and social significance of peers intensifies during adolescence.

Theoretically, these findings advance a more integrated comprehension of the attachment–self-esteem nexus by proposing that the impact of the relational context should not be examined in isolation from the overall structure of an individual's interpersonal relationships. Although a secure caregiver bond may constitute a valuable resource, the character of peer relationships can either amplify this resource or constrain its influence on psychological adjustment. Hence, the present findings underscore the utility of a profile-based approach in exposing differences among adolescents who may be comparable on a single attachment dimension yet diverge in the global makeup of their emotional and social ties.

These findings also carry noteworthy applied implications for psychological and school-based intervention. They suggest that programs targeting the enhancement of adolescent self-esteem may benefit from broadening their focus beyond the individual to encompass their proximal social ecology, particularly ties with caregivers and peers. Counseling initiatives might incorporate promoting caregiver–child communication and support, building skills for establishing stable and supportive friendships, and assisting adolescents in managing rejection and interpersonal conflict more adaptively. Early detection of relationship patterns marked by instability or detachment may likewise aid in designing interventions better matched to the heterogeneous needs of adolescents. However, these implications should be regarded as potential extensions of the findings rather than evidence for the efficacy of specific treatments.

Finally, these findings should be appraised in light of certain methodological constraints. The study depended on a convenience sample, which may circumscribe the generalizability of the findings to the broader population of middle school students. Moreover, the cross-sectional design does not permit the identification of causal directionality between bonding and self-esteem; the association between them could be modified by other developmental, familial, or social variables. Therefore, the present findings require replication in future research employing more representative samples and longitudinal designs that permit the tracking of changes in bonding and self-esteem profiles over time, along with cross-cultural comparisons. Such investigations would help establish whether the profiles identified here remain relatively stable or fluctuate in response to the developmental and relational transitions characteristic of adolescence.

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