

Original Research

Evolution of Maternal Ambivalence: Long-Term Stability, Suppression, and the Need for Targeted Support

Magdalena B. Martín-Sánchez¹, Juana Bretón-López^{2,3}, Carlos Suso-Ribera^{4,5,*}

¹Rumbos Psychological Clinic, Mairena de Aljarafe, 41297 Sevilla, Spain

²Department of Basic and Clinical Psychology and Psychobiology, Universitat Jaume I, 12006 Castellon de la Plana, Spain

³CIBER Fisiopatología Obesidad y Nutrición (CIBEROBn), Instituto Salud Carlos III, 28029 Madrid, Spain

⁴Psychology Department, Universidad Europea, 38300 Canarias, Spain

⁵Rheumatology Service, Vall d'Hebron University Hospital, 08035 Barcelona, Spain

*Correspondence: carlos.suso@universidadeuropea.es (Carlos Suso-Ribera)

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Abstract

Background: Maternal ambivalence—conflicting emotions toward motherhood—can affect psychological well-being; however, the longitudinal course of maternal ambivalence remains poorly understood. **Methods:** A three-wave study included 1242 Spanish women who completed the Maternal Ambivalence Scale at baseline (T1), with follow-ups at 3 months (T2, $n = 182$) and ~3 years (T3, $n = 23$). Doubts, rejection, and suppression comprised the assessed dimensions. Linear mixed-effects models (LMMs), adjusted for age, parity, education, and perinatal status, were used to examine changes over time, complemented by repeated-measures analysis of variance (RM-ANOVA). Attrition bias was evaluated via Little's Missing Completely at Random (MCAR) test, logistic regression, and inverse-probability weighting. **Results:** Short-term changes (T1–T2) were negligible across subscales ($|\beta| \leq 0.07$; $g = -0.03$ to 0.09 ; partial $\eta^2 = 0.003$ – 0.015). Rank-order stability was high for doubts ($r = 0.78$) and rejection ($r = 0.83$), moderate for suppression ($r = 0.67$). Long-term trajectories suggested stable doubts and rejection, whereas suppression increased moderately [$\beta = 0.16$, 95% CI (0.14, 0.19); $p < 0.001$]. Given the extremely low T3 retention ($n = 23$), these findings are exploratory; negative rank-order correlations suggest potential reversals or selective retention. **Conclusions:** Findings underscore the importance of longitudinal assessment and interventions promoting adaptive emotional expression.

Keywords: maternal ambivalence; perinatal mental health; longitudinal study; emotional suppression

1. Introduction

The perinatal period, spanning pregnancy to two years postpartum, involves extensive physical, psychological, and social changes, with heightened risks for mental health challenges [1]. Motherhood, frequently idealized by society, can intensify maternal anxiety and complicate the experience of maternal ambivalence [2]. Recently, narratives challenging this idealization have emphasized the complex realities of motherhood, including ambivalence, which can significantly impact maternal well-being [3].

Maternal ambivalence, characterized by conflicting emotions, thoughts, and attitudes toward motherhood, generates stress, guilt, and role conflict [4]. Importantly, maternal ambivalence is considered an inevitable and even healthy feature of motherhood, reflecting the dynamic process of negotiating autonomy and attachment in the maternal role [5]. Indeed, only when ambivalence becomes excessive, chronic, or suppressed may this state contribute to psychological distress or hinder mother-infant bonding [6].

While the associations between maternal ambivalence and poor mental health are increasingly well-documented [7], the longitudinal trajectory of these feelings throughout the perinatal period remains underexplored. Existing

research has primarily provided cross-sectional insights, thereby failing to capture the evolution of maternal ambivalence. Thus, understanding these longitudinal changes is crucial, as the intensity and expression of ambivalence may fluctuate depending on the perinatal stage, shaped by both internal emotions and external societal pressures. For instance, pregnant women may experience heightened doubts about their ability to transition into motherhood, likely driven by anticipatory anxieties. In contrast, postpartum mothers are more likely to suppress ambivalence due to increased external expectations and pressures, such as societal ideals of motherhood [8]. This shifting nature of ambivalence underscores the need for longitudinal research to improve understanding of the representative evolution and potential impact on maternal mental health.

Therefore, this study aimed to explore the longitudinal progression of maternal ambivalence. Hence, building on previous findings [8], we hypothesize that mean-level changes will show a decrease in doubts and an increase in suppression during the postpartum period, reflecting the evolving challenges and expectations that mothers face. We anticipate less pronounced rank-order changes, suggesting that while the intensity of ambivalence may shift, individual differences remain relatively stable over time. Ultimately,



these insights will deepen our understanding of maternal ambivalence and inform whether mental health interventions addressing this ambivalence should be tailored to critical moments in the perinatal period.

2. Materials and Methods

2.1 Participants and Procedure

Participants included pregnant women and mothers of children aged 0–2 years residing in Spain. Recruitment combined paid online advertisements with outreach through midwifery and breastfeeding associations. The first wave (T1) was conducted in April 2021, with 1242 eligible women completing the baseline survey. The second wave (T2) occurred three months later and included 182 participants (14.6% retention), while the final wave (T3) occurred approximately three years after T2 and included 23 participants (1.9% retention). The extended follow-up interval was intended to capture long-term changes in parenting experiences, child development, and family dynamics.

Inclusion criteria were identical across waves: participants had to be aged 18 years or older, reside in Spain, be fluent in Spanish, and have internet access to complete the online questionnaires. Both pregnant women and mothers of children born within the two years preceding participation were eligible. Information on ethnicity and socioeconomic status (SES) was not collected, which consequently limits generalizability; however, given that Spain is predominantly a White European population, substantial ethnic variability was unlikely. Recruitment through online and community channels may also have resulted in a self-selected sample of women who were more motivated or health-conscious than average, potentially narrowing variability in ambivalence scores.

Each participant received a unique alphanumeric code to link responses across waves while preserving anonymity. Electronic informed consent was obtained via the survey platform before participation, and consent records were automatically archived. Procedures adhered to the Declaration of Helsinki and the General Data Protection Regulation (GDPR; EU 2016/679). The study protocol was approved by the Ethics Committee of Universitat Jaume I (CD/22/2021; 15 April 2021). Participants could withdraw at any time by closing the survey, and all data were stored securely on encrypted university servers.

2.2 Measures

Maternal ambivalence was assessed using the 14-item Maternal Ambivalence Scale [8], which captures three dimensions: doubts about oneself or motherhood, rejection of motherhood, and suppression of ambivalent feelings. Items are rated on a 4-point Likert scale (1 = completely disagree–4 = completely agree), with higher scores indicating greater ambivalence. The instrument has demonstrated satisfactory internal consistency ($\alpha = 0.70$ – 0.83) and convergent valid-

ity with measures of anxiety, depression, and life satisfaction in Spanish samples [8].

2.3 Data Analysis

All analyses were conducted in R (v4.5.1., R Core Team, R Foundation for Statistical Computing, Vienna, Austria, <https://www.r-project.org>) and IBM SPSS Statistics 26 (IBM, Armonk, New York, USA, <https://www.ibm.com/products/spss-statistics>). Descriptive statistics summarized sociodemographic characteristics and ambivalence scores at each time point (T1, T2, T3). All tests were two-tailed with a significance level of $\alpha = 0.05$.

The primary analyses employed linear mixed-effects models (LMMs) to examine changes in maternal ambivalence across time while accounting for unequal intervals between waves (~3 months between T1–T2; ~36 months between T2–T3) and missing data due to attrition. Time was coded continuously in months since baseline (0, 3, 36). Each model included random intercepts for participants and fixed effects for time, maternal age, parity (primiparous vs. multiparous), perinatal status (pregnant vs. mother; time-varying), and education. Time \times perinatal status interactions were estimated to explore differential trajectories between pregnant and postpartum participants. Parameters were obtained using restricted maximum likelihood (REML) with Satterthwaite's approximation for denominator degrees of freedom, assuming an unstructured residual covariance matrix. Model assumptions were evaluated by inspecting residuals and random-effect distributions. Sensitivity analyses using inverse-probability weighting (IPW) and the T1–T2 completer subsample were performed to assess the robustness of the results.

To triangulate findings, repeated-measures general linear models (RM-GLMs) were conducted as a complementary analytic strategy. RM-GLMs were fitted with time (T1, T2, T3) as a within-subjects factor treated categorically, allowing direct pairwise comparisons despite unequal time intervals. When Mauchly's test indicated violations of sphericity, Greenhouse–Geisser corrections were applied. Partial η^2 with 95% CIs was reported as an effect-size measure, and Bonferroni-adjusted pairwise contrasts identified specific wave-to-wave differences. Perinatal status was entered as a time-varying covariate, and maternal age and parity were included as between-subjects covariates.

Rank-order (relative) stability of ambivalence dimensions was assessed using Pearson correlations across waves, with 95% CIs computed via Fisher's z transformation.

Attrition bias was examined by comparing baseline characteristics of completers and dropouts (T1–T2) using independent-samples t tests for continuous variables and χ^2 tests for categorical variables. Standardized mean differences (Hedges' g) and risk differences (RDs) with 95% CIs were calculated to quantify group differences. Little's Missing Completely at Random (MCAR) test indicated that missingness was consistent with a missing-at-random

(MAR) mechanism. Additionally, logistic regression models predicting retention from baseline age, parity, perinatal status, education, and ambivalence scores were used to generate IPW values, which were applied in all sensitivity analyses.

3. Results

3.1 Attrition, Sample Characteristics, and Sensitivity Analyses

At baseline (T1), 1242 women completed the survey. At the 3-month follow-up (T2), 182 participants (14.6%) provided data, and 23 participants (1.9%) remained at the 36-month follow-up (T3). Attrition was entirely passive, with no withdrawals of consent. At T1, 33.2% of participants were pregnant, and 66.8% were mothers of children under two years [Mean (M)_{age} = 34.70, SD = 4.87, range 18–50]. At T2, 23% were pregnant (M _{age} = 36.12, SD = 4.51), and at T3, all participants were mothers (M _{age} = 35.83, SD = 3.93), with 81.6% being multiparous.

Baseline comparisons between T2 completers and drop-outs are presented in **Supplementary Table 1**. T2 completers were slightly older than drop-outs [Hedges' g = -0.35, 95% CI (-0.50, -0.19)], but no significant differences were observed for parity, perinatal status, or T1 ambivalence subscale scores (all $|g| \leq 0.03$, p values ≥ 0.63). Education differed modestly between groups [Cramer's V = 0.15, 95% CI (0.10, 0.21)]. Logistic regression indicated that age predicted T2 retention [odds ratio (OR) = 1.07, 95% CI (1.03, 1.11); $p < 0.001$], whereas parity, perinatal status, subscale scores, and education were not significant predictors. Little's MCAR test was non-significant ($p = 0.21$), suggesting that missing data were largely at random.

To address potential attrition bias, IPW was applied to T1–T2 analyses. Weighted LMMs yielded results highly consistent with complete-case analyses (**Supplementary Tables 2,3**), confirming that differential attrition did not meaningfully bias short-term inferences. T1–T3 findings were interpreted cautiously due to the extremely small T3 sample ($n = 23$), and the post hoc power analyses indicated that only medium-to-large effects (Cohen's $d \approx 0.50$ – 0.55) could be reliably detected, meaning smaller effects may have remained undetected.

3.2 Measurement Reliability, Stability, and Reporting

Internal consistency across waves was acceptable to good: doubts ($\alpha = 0.86/0.87/0.85$), rejection ($\alpha = 0.83/0.84/0.84$), and emotional suppression ($\alpha = 0.79/0.80/0.81$). Rank-order stability from T1 to T2 was high for doubts [$r = 0.78$, 95% CI (0.71, 0.84)] and rejection [$r = 0.83$, 95% CI (0.76, 0.88)], and moderate for suppression [$r = 0.67$, 95% CI (0.58, 0.75)]. Stability decreased at T3, with suppression showing negative T1–T3 and T2–T3 correlations [$r = -0.60$, 95% CI (-0.82, -0.24); $r = -0.56$, 95% CI (-0.78, -0.21)], suggesting potential inversions in relative suppression scores over time. This pattern may re-

flect true individual differences, selective retention of participants, or measurement variability due to the very small T3 sample, and should be interpreted as exploratory.

Descriptive statistics, rank-order correlations, and LMM estimates for all waves are summarized in **Table 1** and **Supplementary Tables**. Effect sizes were consistently reported: Hedges' g for pairwise contrasts, partial η^2 for analyses of variance (ANOVAs), and β (95% CI) for LMMs. Covariates contributed minimally to observed changes over time, and residual confounding from unmeasured variables (e.g., broader SES or partner support) is unlikely to account for the null T1–T2 effects.

3.3 Short-Term Trajectories (T1–T2)

LMMs with random intercepts for participants (1|ID) were fit, adjusting for age, parity, education, and perinatal status at T1. Time was coded in months since T1 (~3 months), and time \times perinatal status interactions were included to test for differential trajectories between pregnant and postpartum women. Residual diagnostics indicated acceptable normality and homoscedasticity.

Across subscales, mean-level change from T1 to T2 was negligible (**Table 1**):

- Doubts: $\beta = 0.07$, 95% CI (-0.71, 0.85); $p = 0.859$
- Rejection: $\beta = 0.02$, 95% CI (-0.43, 0.47); $p = 0.929$
- Suppression: $\beta = -0.03$, 95% CI (-0.69, 0.64); $p = 0.940$

Time \times perinatal status interactions were also non-significant:

- Doubts: $\beta = -0.05$, 95% CI (-0.23, 0.13); $p = 0.591$
- Rejection: $\beta = 0.04$, 95% CI (-0.07, 0.15); $p = 0.454$
- Suppression: $\beta = 0.06$, 95% CI (-0.10, 0.21); $p = 0.482$

Effect sizes for T1–T2 paired comparisons were small (Hedges' $g = -0.03$ to 0.09), and marginal R^2 indicated that fixed effects explained 1–2% of variance. In contrast, conditional R^2 , including random intercepts, ranged from 0.67 to 0.84, reflecting substantial between-subject variability. RM-ANOVA triangulation confirmed negligible mean-level changes across subscales (doubts: $\Delta M = 0.11$, $t(180) = 0.62$; $p = 0.536$; rejection: $\Delta M = -0.18$, $t(180) = -1.77$; $p = 0.078$; suppression: $\Delta M = -0.22$, $t(180) = -1.44$; $p = 0.152$; partial $\eta^2 = 0.003$ – 0.015). Any potential masking of short-term changes by selective attrition was minimal, given the very small effect sizes.

3.4 IPW-Weighted Sensitivity Analyses (T1–T2)

Weighted LMMs mirrored complete-case models (**Supplementary Table 3**).

- Doubts: No significant change was observed over time ($\beta_{\text{time}} < 0.01$; $p = 0.932$). Primiparous participants reported higher baseline doubts compared to non-primiparous participants ($\beta = 1.02$; $p = 0.003$). Higher education (University or Master/PhD) was associated

Table 1. Maternal ambivalence: descriptive statistics, stability, and LMM estimates (T1–T2–T3).

Subscale	T1 mean (SD)	T2 mean (SD)	T3 mean (SD)	T1–T2 <i>r</i> (95% CI)	T1–T3/T2–T3 <i>r</i> (95% CI)	LMM T1–T2–T3: β (time) (95% CI); <i>p</i>	LMM T1–T2–T3: β (time \times status) (95% CI); <i>p</i>	LMM T1–T2: β (time) (95% CI); <i>p</i>	LMM T1–T2: β (time \times status) (95% CI); <i>p</i>	Hedges' <i>g</i> T1–T2 (95% CI)
Doubts	10.83 (3.53)	11.30 (3.75)	11.26 (3.60)	0.78 (0.71, 0.84)	0.64 (0.45, 0.79)/0.53 (0.20, 0.82)	<0.01 (–0.02, 0.03); 0.932	0.15 (–0.42, 0.72); 0.613	0.07 (–0.71, 0.85); 0.859	–0.05 (–0.23, 0.13); 0.591	–0.03 (–0.13, 0.07)
Rejection	6.74 (2.35)	7.26 (2.33)	7.13 (2.33)	0.83 (0.76, 0.88)	0.65 (0.41, 0.84)/0.68 (0.44, 0.84)	0.01 (–0.01, 0.02); 0.330	–0.22 (–0.59, 0.16); 0.252	0.02 (–0.43, 0.47); 0.929	0.04 (–0.07, 0.15); 0.454	0.08 (–0.01, 0.16)
Suppression	7.43 (2.51)	7.53 (2.57)	12.83 (2.80)	0.67 (0.58, 0.75)	–0.60 (–0.82, –0.24)/–0.56 (–0.78, –0.21)	0.16 (0.14, 0.19); <0.001	0.07 (–0.34, 0.48); 0.728	–0.03 (–0.69, 0.64); 0.940	0.06 (–0.10, 0.21); 0.482	0.09 (–0.03, 0.21)

Note: Mean and SD values for the maternal ambivalence subscales across waves. LMM estimates (β , 95% CI; *p*) adjusted for age, parity, education, and perinatal status at T1. time \times status = interaction with perinatal status (pregnant vs. postpartum). ICC, intraclass correlation; LMM, linear mixed-effects model. T1–T2 estimates are primary; T3 findings are exploratory due to small N. Hedges' *g* reflects T1–T2 paired contrasts.

with lower doubts ($\beta_{\text{university}} = -0.71$; $p = 0.042$; $\beta_{\text{Master/PhD}} = -0.73$; $p = 0.044$). No significant associations were observed for the other covariates.

- Rejection: Time did not significantly predict rejection ($\beta_{\text{time}} = 0.01$; $p = 0.330$). Older age was associated with higher rejection scores ($\beta = 0.07$; $p < 0.001$). No significant associations were observed for the other predictors, including parity and education.
- Suppression: Suppression increased significantly over time ($\beta_{\text{time}} = 0.16$; $p < 0.001$). Primiparous participants showed lower baseline suppression ($\beta = -0.49$; $p = 0.046$). No significant associations were observed for the other covariates.

Random effects suggested moderate between-person variability for doubts ($\text{ICC} \approx 0.35$) and lower variability for rejection and suppression, indicating that attrition was unlikely to bias the observed short-term trajectories.

3.5 Long-Term Trajectories (T1–T2–T3)

Weighted LMMs including all available data from T1 to T3, adjusted for age, parity, education, and perinatal status at T1, indicated the following:

- Doubts: There was no significant change over time [$\beta_{\text{time}} < 0.01$, 95% CI $(-0.02, 0.03)$; $p = 0.932$], and the trajectory did not differ between pregnant and postpartum women [$\text{time} \times \text{perinatal status} = 0.15$, 95% CI $(-0.42, 0.72)$; $p = 0.613$].
- Rejection: Scores remained stable [$\beta_{\text{time}} = 0.01$, 95% CI $(-0.01, 0.02)$; $p = 0.330$], with no significant time \times perinatal status interaction [-0.22 , 95% CI $(-0.59, 0.16)$; $p = 0.252$].
- Suppression: There was a moderate, statistically significant increase over time [$\beta_{\text{time}} = 0.16$, 95% CI $(0.14, 0.19)$; $p < 0.001$], which did not differ by perinatal status [$\text{time} \times \text{perinatal status} = 0.07$, 95% CI $(-0.34, 0.48)$; $p = 0.728$].

Primiparity predicted higher baseline doubts and lower baseline suppression; older age predicted slightly higher rejection. Triangulation with RM-ANOVA showed similar patterns: negligible changes in doubts and rejection, and a moderate increase in suppression (partial $\eta^2 = 0.622$). However, the effect size was likely inflated due to the very small T3 sample.

Given the extremely limited T3 sample ($n = 23$), negative rank-order correlations for suppression (T1–T3 $r = -0.60$, T2–T3 $r = -0.56$) should be interpreted with caution. These may reflect true reversals in relative suppression scores, selective retention of participants, or measurement variability. Therefore, the T3 results are exploratory, and small changes may have gone undetected.

4. Discussion

This study examined short-term (3 months) and long-term (3 years) trajectories of maternal ambivalence, focus-

ing on the subscales of doubts, rejection, and suppression. In the short-term interval (T1–T2), all subscales remained largely stable. Weighted LMMs and RM-ANOVA indicated negligible mean-level changes, with small effect sizes (Hedges' $g = -0.03$ to 0.09 ; partial $\eta^2 = 0.003$ – 0.015). Sensitivity analyses using inverse probability weighting confirmed that differential attrition did not meaningfully bias these results, supporting the conclusion that psychological changes were minimal over the first three months. While selective attrition may have slightly influenced mean-level estimates for rejection and suppression, any masking effects were likely minimal given the very small effect sizes, and should not be overinterpreted.

Over the long term (T1–T3), trajectories diverged across subscales. Doubts and rejection remained largely stable, with no significant mean-level change and non-significant time \times perinatal status interactions in LMMs ($\beta_{\text{time}} \approx 0.001$ – 0.007 ; $p > 0.33$). In contrast, suppression increased over three years [$\beta_{\text{time}} = 0.16$, 95% CI $(0.14, 0.19)$; $p < 0.001$], independent of perinatal status. RM-ANOVA confirmed this pattern (partial $\eta^2 = 0.622$), although it is important to note that the T3 sample was extremely small ($n = 23$), which likely inflates effect size estimates and reduces statistical reliability.

Interestingly, rank-order stability for suppression was negative over the long term (T1–T3 $r = -0.60$; T2–T3 $r = -0.56$). This inversion suggests that women who initially reported higher suppression tended to report lower suppression at T3, and vice versa. Given the very small sample size, this pattern may reflect substantial variability in individual trajectories, selective retention of participants, or potential measurement artifacts. While this pattern could also indicate genuine reversals in relative suppression scores, these interpretations remain highly tentative and underscore the exploratory nature of the long-term findings.

The stability of doubts and rejection aligns with prior evidence that evaluative dimensions of maternal ambivalence are enduring across the perinatal period. Women experiencing doubts or feelings of rejection before childbirth did not report substantial relief postpartum, consistent with research linking early maternal worries and low self-confidence to sustained depressive symptoms after delivery [9,10]. Similarly, persistent emotional challenges during pregnancy may contribute to ongoing postpartum dissatisfaction [11]. These findings suggest that negative emotional states are not easily alleviated by changes in perinatal status alone, consistent with evidence that psychosocial risks, such as pregnancy-related worries, locus of control, and neuroticism, predict postpartum depression even among breastfeeding mothers [12]. Early assessment of maternal ambivalence may provide nuanced insight into the emotional challenges of mothers and guide timely interventions to support maternal well-being [13].

The observed increase in suppression over the long term indicates that mothers may rely more on emotional

control strategies, potentially as a coping mechanism in response to societal pressures, professional responsibilities, or internalized ideals of motherhood [14–16]. While some women with initially high suppression reported slight decreases at T3, these patterns are difficult to interpret given the very small sample size and potential selective retention bias. These findings underscore the possible relevance of interventions that address suppressed ambivalence, promote adaptive emotional expression, and support emotion regulation. Integrating such support into perinatal care, including partner involvement, may mitigate the negative consequences of persistent suppression on maternal mental health [17–19]. These recommendations are consistent with Spanish consensus guidelines advocating routine screening, preventive programs, and specialized perinatal psychological support [20].

Limitations

Despite the notable strengths of this research, this study also has several limitations. Attrition across waves was substantial, particularly at T3 (1.9% retention), severely limiting statistical power and rendering long-term findings exploratory. Recruitment via community and online channels may have favored women already engaged in psychological well-being, potentially underrepresenting those experiencing greater distress or limited access to resources. Negative rank-order correlations for suppression suggest variability or potential measurement issues in the very small T3 sample, which may reflect either true reversals in relative scores or artifacts of coding and selective retention.

The absence of detailed SES and partner support data constrains interpretation, as both factors can influence perinatal mental health and maternal ambivalence [20]. Higher SES and stronger partner support are generally protective, so observed trajectories may underestimate risk among women with lower SES or less support. Education was included as a proxy in LMMs and IPW sensitivity analyses, and results were largely unchanged, suggesting that primary inferences are robust. Overall, missing data were largely random (Little's MCAR; $p = 0.21$), and complete-case and weighted analyses converged. Thus, future research should replicate these findings in larger, more diverse samples and incorporate multimethod assessments, including behavioral and partner-reported measures, to improve ecological validity [20]. Finally, T3 participants were all postpartum, so time \times perinatal status interactions are effectively limited to T1–T2, and interpretations regarding perinatal status at T3 should be made cautiously.

5. Conclusions

Maternal ambivalence appears relatively stable over the perinatal period, particularly in evaluative dimensions (doubts and rejection), which show minimal change from three months to three years postpartum. Emotional sup-

pression appears to increase over the long term; however, given the very small T3 sample, negative rank-order correlations, and potential selective retention bias, these findings are exploratory and should be interpreted with caution. Nonetheless, these results highlight the clinical relevance of assessing maternal ambivalence longitudinally. Interventions that validate conflicting emotions and encourage adaptive emotional expression may support maternal well-being and healthier transitions into parenthood.

Availability of Data and Materials

De-identified datasets and analysis syntax are available from the corresponding author upon reasonable request for research purposes only. Data sharing will require the signing of a data-sharing agreement ensuring compliance with GDPR (EU 2016/679) and institutional data protection policies. Data cannot be deposited in public repositories due to ethical restrictions related to participant consent and privacy.

Author Contributions

Conceptualization: CS-R, MBM-S, JB-L. Methodology: CS-R, MBM-S. Formal analysis: CS-R, MBM-S. Data curation: CS-R, MBM-S. Investigation: JB-L. Supervision: JB-L. Project administration: JB-L. All authors contributed to critical revision of the manuscript for important intellectual content. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

The study was conducted in accordance with the Declaration of Helsinki (2013 revision) and the General Data Protection Regulation (GDPR; EU 2016/679). Ethical approval was granted by the Ethics Committee of Universitat Jaume I (CD/22/2021; 15 April 2021). Participants provided electronic informed consent directly within the secure online survey interface before participation. The consent form explicitly described the study purpose, voluntary participation, data anonymity, and right to withdraw at any time without penalty. Consent records were automatically logged and securely stored in encrypted format on university servers. All data were pseudonymized using alphanumeric identifiers prior to analysis.

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Conflict of Interest

The authors declare no conflict of interest.

Declaration of AI and AI-Assisted Technologies in the Writing Process

During the preparation of this manuscript, the authors utilized ChatGPT-3.5 solely for grammar and language polishing. The authors thoroughly reviewed, edited, and revised the manuscript and take full responsibility for its content.

Supplementary Material

Supplementary material associated with this article can be found, in the online version, at <https://doi.org/10.31083/CEOG46910>.

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