

Early Maternal Influences on Stress Regulation in Late Adolescence

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Research Article

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ABSTRACT

Identifying the developmental roots of psychological stress regulation is important in supporting young individuals' ability to cope with academic, social, and emotional stress. The present study examined how maternal care and overprotection relate to perceived stress and emotion regulation difficulties in late adolescence. A cross-sectional correlational design was used, with 133 university students aged 18-25 completing self-report scales concerning early maternal experiences, current perceived stress, and emotion regulation ability/difficulty. Findings indicated that higher maternal care was associated with lower perceived stress and fewer emotion regulation difficulties, and emerged as the most consistent predictor of outcomes. On the other hand, maternal overprotection showed weaker and less consistent associations across the measured outcomes. Emotion regulation difficulties were strongly associated with perceived stress, suggesting a potential mechanism underlying these relationships. Overall, the current study's findings support attachment-based theories and highlight the importance of early caregiving environments in shaping stress regulation in late adolescence.

LITERATURE REVIEW

Parental caregiving experiences are widely agreed to be the foundation for emotion regulation and behavioural functioning development in childhood. Attachment theory, as proposed by Bowlby (1988), explains that the quality of early parent-child relationships shapes internal working models, which in turn shape emotion regulation and coping responses across the developmental period. Through consistent and responsive caregiving, children develop a sense of security and trust, which provides them with a safe base from which they explore their environment. This relationship enables children to develop stable emotion regulation responses, and allows them to navigate stressors more effectively (Ainsworth, 1979). Research consistently demonstrates that securely attached children have more favourable long-term outcomes (such as higher self-esteem), whereas insecurely attached children are more likely to face adverse outcomes (such as lower autonomy) developmentally (Cassidy et al., 2013). Disruptions in early attachment relationships have generally been associated with less adaptive emotion regulation and heightened stress reactivity (Eilert & Buchheim, 2023). Further

research suggests that attachment theory extends to the development of coping skills, lower emotional reactivity, and more adaptive emotional regulation across the lifespan. While these associations are largely well established, current findings are largely based on correlational data, limiting causal interpretations, and may vary across developmental stages. Late adolescence, typically defined as the period between 18 and 25 years old (Arnett, 2000), encompasses a critical developmental stage characterised by increased autonomy and exposure to both emotional and environmental stressors, making it a particularly relevant period for examining any potential associations between early caregiving experiences and stress regulation.

Building on the role of early caregiving, while general positive parental care is deemed vital, maternal care specifically has been highlighted as particularly influential as mothers are often primary caregivers in early development, providing more consistent and prolonged opportunities for co-regulation and emotion modelling (Bowlby, 1969). Maternal attachment, as defined by Ainsworth (1979), is the emotional bond between mother and child. Ainsworth categorised these attachment patterns into three main types – secure, insecure-avoidant, and insecure-resistant – through her Strange Situation experiment. She posits that a mother's ability to notice, interpret, and respond to her infant's needs (maternal sensitivity) is the primary determinant of the attachment style developed. This is particularly relevant to the present study, as higher maternal care and sensitivity may support the development of adaptive emotion regulation skills, which play a key role in shaping stress regulation outcomes in later development. Ainsworth's theory extends into late childhood and beyond, with attachment styles typically manifesting into predictable patterns of emotional regulation, self perception, and social interaction. This is further supported by Mikulincer and Shaver (2019), who found that attachment orientations developed in early childhood continued to shape emotional regulation and stress outcomes into adulthood, suggesting that the mechanisms proposed by Bowlby and Ainsworth remain relevant well beyond infancy. The underlying cognitive and neurological mechanisms surrounding attachment theory have also been extensively investigated in recent decades, with overall findings agreeing that attachment styles form internal working models that ultimately control and

aid emotion regulation development (Vritiča & Vuilleumier, 2012). It is widely accepted that such attachments help facilitate co-regulation processes in early childhood, whereby caregivers support children to navigate understanding and managing emotional experiences (Gee & Cohodes, 2023). Over time, these underlying processes may support the development of more adaptive emotion regulation skills and reduced stress reactivity. Supporting this, research has found that maternal warmth, consistency, and emotional availability predict lower stress reactivity in adolescence (Mikulincer & Shaver, 2019), whereas lower levels of perceived maternal care have been linked to greater emotion regulation difficulties and increased vulnerability to negative stress-related outcomes (Zitzmann et al., 2023). However, it is important to note that much of the existing literature has typically examined these constructs in isolation, focusing on either maternal care or overprotection independently. This may limit a more solid understanding of how different parenting behaviours interact and collectively influence emotional development and stress outcomes. Nevertheless, the literature broadly suggests that maternal influences do play a substantial role in shaping emotional regulation and points to a meaningful relationship between early maternal influences and stress-regulation abilities across adolescence and beyond.

In contrast with the benefits associated with maternal care, not all forms of maternal caregiving are considered beneficial. Maternal overprotection, characterised by controlling and/or intrusive parenting behaviours, is linked to reduced autonomy and independence, as well as low self-efficacy in late childhood. Further research by Gar & Hudson (2009) found that parental overprotection (“helicopter parenting”; Cline & Fay, 1990) may reduce a child’s independence and increase their vulnerability to stress, through controlling caregiving patterns. Such caregiving patterns may limit opportunities for children to develop independent coping skills, potentially increasing the child’s vulnerability to stress-related outcomes over time. Supporting studies have found further evidence linking the consequences of reduced autonomy (as a result of overprotection) to lower school grades (Guay & Vallerand, 1997), lower internalization of learning activities (Hadré & Reeve, 2003), and less self-soothing behaviours (Sirois et al., 2021). In later childhood and into adolescence, these behavioral and emotional outcomes

developed as a result from maternal overprotection may further manifest into poorer stress regulation overall. By late adolescence (age 18-25), poor stress regulation may even be accompanied by physiological and psychological stress effects (Gar & Hudson, 2009). This also aligns with autonomy-based frameworks such as the Self-Determination Theory (Deci & Ryan, 2000), which emphasizes the importance of supporting autonomy for adaptive psychological functioning. Generally, the current literature indicates the potential negative impact maternal overprotection may play in a child's ability to develop independent coping skills, which may lead to long-term difficulties in stress management. However, it is important to note that findings in this area are not entirely consistent, with some new research suggesting that the effects of overprotection may depend on broader caregiving contexts (Bruysters & Pilkington, 2022). The presence of mixed findings on this topic raises the potential idea that overprotective behaviours may not operate independently, or be as straightforward as initially assumed. As such, though general findings are indicative of overprotection being a potential risk factor for poorer stress regulation skills in late adolescence, a precise relationship between the two has not been defined and remains relatively uncertain.

The role of emotion regulation has been widely identified as a central factor in understanding how individuals respond to stress, and may act as a unique pathway through which early maternal caregiving experiences influence later stress outcomes. Emotion regulation, by definition, refers to the process by which individuals monitor, evaluate, and modify their emotional responses to a stressor (Gross, 1998). Difficulties in emotional regulation have been consistently associated with greater emotional reactivity and greater perceived stress in childhood, adolescence, and beyond (Aldao & Schweizer, 2010). Emerging research proposes that early parental care directly shapes the development of emotion regulation strategies (Paley et al., 2022), and it is believed that children rely on caregivers for co-regulation before gradually internalising these processes into independent coping skills (Akeren et al., 2025). As such, it is possible that differences in maternal care and overprotection may indirectly influence stress regulation through their role in aiding emotion regulation development. However, much

of the existing research remains cross-sectional, limiting the ability to establish the directionality of associations between maternal influences, emotion regulation, and perceived stress. Nonetheless, the role of emotion regulation provides a theoretically grounded understanding in researching how early maternal influences may contribute to differences in stress regulation in late adolescence.

Despite research linking early caregiving experiences to emotional development, several gaps remain in the current literature. While maternal care has been consistently associated with more adaptive emotion regulation and lower perceived stress, and overprotective parenting has been linked to reduced autonomy and poorer emotion regulation, relatively few studies have examined both dimensions simultaneously and analysed the outcomes. This is particularly important, as there is some indication from recent research that parenting behaviours may interact and overlap, suggesting that these behaviours may not operate in isolation. Furthermore, although emotion regulation is relatively well studied and understood in relation to both caregiving environments and stress outcomes, its potential role as an underlying mechanism linking early maternal influences to stress regulation in late adolescence remains largely unexplored. Similarly, although general perceived stress is commonly studied within a young adult population, few studies intertwine the dimension of maternal bonding into their analysis. As a result, the current field lacks a definitive understanding of whether, and to what extent, early maternal influences predict stress-regulation outcomes in late adolescence. The present study aims to address these gaps by examining the relationships between maternal care, overprotection, emotion regulation, and stress regulation in late adolescence.

RESEARCH AIMS

The current study draws on attachment theory (Ainsworth, 1979; Bowlby, 1988) which proposes that early caregiver responsiveness plays a central role in emotion regulation.

The existing research demonstrates that secure maternal attachment is associated with greater coping ability, confidence, and lower stress reactivity. Recent longitudinal evidence links secure maternal attachment to better emotion regulation and lower perceived stress in both adolescence and adulthood (Mikulincer & Shaver, 2019). On the other hand, research also shows evidence to suggest that overprotective parenting (“helicopter parenting”; Cline & Fay, 1990) restricts autonomy and self-efficacy, both of which are key for adaptive stress regulation (Deci & Ryan, 2000). Excessive parental control has consequently been linked to poorer coping skills and predicts higher physiological and psychological stress reactivity (Gar & Hudson, 2009).

The present study aimed to examine two main research questions; (1) how early maternal care experiences are associated with stress regulation in late adolescence, and (2) whether perceived maternal overprotection in early life relates to stress regulation difficulties in late adolescence.

Therefore, it was hypothesised that (1) higher reported maternal care would be associated with better stress regulation in late adolescence (lower perceived stress and higher adaptive emotional regulation) and that (2) higher perceived maternal overprotection during childhood would predict poorer stress regulation in late adolescence (higher perceived stress and greater emotional regulation difficulties).

RESEARCH METHODOLOGY

Participants

The sample consisted of university students aged 18-25. All participants were recruited through the university’s EPR system, and the self-report questionnaire was administered online through the JISC survey platform. A total of 150 participants were

recruited to ensure sufficient statistical power to detect medium-sized effects in correlational analyses.

The inclusion criteria required participants to fall within the late adolescent age range, and to have lived with a maternal figure consistently during the first 16 years of life. Data was excluded if it did not align with the above, or if participants failed the embedded attention checks. This sample was appropriate for examining the relationship between early maternal experiences and stress regulation, as late adolescence represents a key developmental period in which stress coping mechanisms are forming and solidifying, making it relevant for investigating associations.

Design

This study adopted a cross-sectional correlational design using self-report questionnaire measures. All variables were assessed on continuous scales. The key predictor variables were maternal care (perceived warmth or sensitivity) and maternal overprotection (perceived control or intrusion). The outcome variables were perceived stress level and emotion regulation ability/difficulties. All data was collected through an online survey platform (JISC), and no counterbalancing was required as no conditions were manipulated by the researcher. This design allowed analysis of any potential associations between early maternal influences and stress regulation outcomes in late adolescence.

Materials

This study utilised three standardised self-report measures alongside a general demographic questionnaire. The first scale (Appendix A), which assesses maternal perception during the first 16 years of life, was the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979). The original scale was modified from the original 50-item list to 25, to only include questions relevant to maternal influence, rather than

paternal. The PBI is answered on a 4-point Likert scale with participants being able to choose from options such as: 'Very likely', 'Moderately likely', 'Moderately unlikely', and 'Very unlikely'. An additional option of 'Would rather not say' was offered for those uncomfortable with answering sensitive maternal-related questions, though such responses were omitted from the dataset. The PBI consists of two subscales: maternal care (reflecting warmth and sensitivity) and maternal overprotection (reflecting control and intrusion). Higher scores on the care dimension reflect greater perceived maternal care, whereas higher overprotection scores indicated increased perceived control. The PBI has been found to have good reliability and validity based on several studies. It has also been found to possess good re-test reliability as well as good internal consistency (Xu et al., 2016).

The second scale (Appendix B) was the Perceived Stress Scale (PSS-10; Cohen, Kamarck, & Mermelstein, 1983). The PSS-10 measures participants' overall perceived stress in the past month, drawing on their personal perceptions. The PSS-10 is a 10-item questionnaire that is answered on a 5-point Likert scale. The options offered to participants were: 'Never', 'Almost never', 'Sometimes', 'Fairly often', and 'Very often'. Higher scores indicate greater perceived stress. This scale has been shown to measure invariantly across cultures (Makhubela, 2022) and has recently been confirmed to show good reliability and validity (Jatic, 2023).

The third scale (Appendix C) was the Difficulties in Emotion Regulation Scale (DERS-16). This scale was designed to measure and briefly assess clinically relevant difficulties in emotion regulation (Bjureberg et al., 2016). The DERS-16 was derived from the longer DERS-36 (Gratz & Roemer, 2004). The DERS-16 is a 16-item scale that is answered on a 5-point Likert scale. Participants could choose options such as: 'Almost never', 'Sometimes', 'About half the time', 'Most of the time', and 'Almost always'. The DERS-16 assesses multiple dimensions of emotion regulation difficulties, including emotion clarity, impulse control, and goal-directed behaviour. Higher scores reflect greater emotion regulation difficulties. An analysis of DERS-16 completed by

Bjureberg (2016) found results demonstrating excellent internal consistency, good test-retest reliability, and high validity.

Procedure

The study was conducted using an online survey platform (JISC) and was made available to University of Leicester psychology undergraduate students via the EPR website. Participation was voluntary, and participants could withdraw at any time without penalty. Participants were first presented with an information sheet outlining the aims of the study (Appendix D), and were prompted to provide informed consent (Appendix E) before proceeding. Upon completion of the consent form, the participants completed a general demographic form (Appendix F) and then proceeded to each of the scales in a fixed order. The average completion time was approximately 20 minutes, and participants were rewarded with 0.75 EPR credits upon completion. Items directly referencing sensitive maternal experiences (PBI) were optional, could be skipped, and were not penalized. All participants were fully debriefed (Appendix G) and were provided with information on support services. All data was anonymised and was stored securely on a password-protected system for participant privacy, in line with standard ethical procedure.

Data Analyses

Data was analysed using JASP. The dataset was initially screened for missing values and outliers, and assumptions of normality were assessed. Reliability analyses (Cronbach's alpha) were conducted for all the self-report scales to assess internal consistency. Descriptive statistics were computed for all variables. Pearson's correlation coefficients were calculated to examine the relationships between maternal care, maternal overprotection, perceived stress, and emotion regulation difficulties. All statistical analyses were conducted using two-tailed tests unless otherwise stated, with the alpha level set at .05.

Multiple linear regression was conducted to examine whether maternal care and maternal overprotection predicted perceived stress and emotion regulation outcomes in late adolescence. A hierarchical multiple regression was then performed to assess whether emotion regulation difficulties explained additional variance in perceived stress beyond maternal care and overprotection. Furthermore, an exploratory one-way ANOVA was conducted to examine differences in perceived stress and emotion regulation difficulties across maternal bonding quadrants (PBI subscales).

All assumptions for parametric analyses were checked and met, and effect sizes and significant values were reported throughout. Data from 133 participants were retained for analyses. However, of the total sample, 122 participants completed the Maternal Care subscale and 120 participants completed the Maternal Overprotection subscale, while 132 participants completed the DERS-16 scale. Reliability analyses and descriptive statistics involving these scales were conducted using listwise deletion. Pearson's correlational analyses were conducted using pairwise deletion to maximise available data. Due to incomplete responses on the PBI subscales, there were only 112 valid cases for quadrant classification.

RESULTS

The Parental Bonding Instrument (PBI) demonstrated strong internal consistency. The Maternal Care subscale showed excellent reliability ($\alpha = .92$), and the Maternal Overprotection subscale showed very good reliability ($\alpha = .89$). Descriptive statistics indicated that maternal care ($M = 25.20$, $SD = 8.12$) and maternal overprotection ($M = 15.18$, $SD = 8.62$) were approximately normally distributed. Further skewness (-0.74 and 0.67) and kurtosis (-0.05 and -0.37) values were within acceptable limits (± 1), indicating no substantial deviation from normality. Detailed JASP outputs for all PBI reliability and assumption analyses are provided in Appendix H.

The PSS-10 score was computed following reverse-coding of positively worded items. The PSS-10 demonstrated good internal consistency (Cronbach's $\alpha = .84$). The scores ranged from 8 to 39 ($M = 23.05$, $SD = 6.07$). The distribution showed normality (skewness = 0.10, kurtosis = -0.12), and visual inspection of histograms and boxplots indicated no extreme outliers. Assumptions of normality were therefore considered to be met. Detailed JASP outputs for all PSS-10 reliability and assumption analyses are provided in Appendix I.

The Difficulties in Emotion Regulation Scale (DERS-16) is scored such that higher scores demonstrate greater emotion regulation difficulties (range = 16-80). The scale demonstrated excellent internal consistency ($\alpha = .95$). Participants reported moderate levels of emotion regulation difficulties ($M = 46.39$, $SD = 15.39$, range = 19-80). The distribution was approximately normal, reporting low skewness (0.14) and slight negative kurtosis (-1.00), indicating no substantial deviations from normality. Assumptions were considered sufficiently met for further parametric analysis. Detailed JASP outputs for all DERS-16 reliability and assumption analyses are provided in Appendix J.

Pearson's correlational analyses reported that higher maternal care was significantly associated with lower perceived stress ($r(131) = -.36$, $p < .001$) and fewer emotion regulation difficulties ($r(131) = -.39$, $p < .001$). In contrast, higher maternal overprotection was significantly and positively associated with perceived stress ($r(131) = .26$, $p = .004$) and emotion regulation difficulties ($r(131) = .23$, $p = .011$). Perceived stress was strongly positively correlated with emotion regulation difficulties ($r(131) = .68$, $p < .001$). Maternal care and maternal overprotection were moderately negatively correlated ($r(131) = -.54$, $p < .001$). JASP outputs for the above correlational analyses can be found in Appendix K.

To examine whether maternal care and maternal overprotection uniquely predicted perceived stress, a multiple linear regression was conducted. The overall model was significant, $F(2, 109) = 7.52$, $p < .001$, explaining 12.1% of the variance found in

perceived stress ($R^2 = .12$). Maternal care was reported as a significant negative predictor of stress ($\beta = -.26$, $p = .018$), whereas maternal overprotection did not significantly predict stress when controlling for maternal care ($\beta = .13$, $p = .211$). Detailed outputs for the above linear regression can be found in Appendix L.

A second multiple linear regression analysis was conducted to examine whether maternal care and maternal overprotection predicted emotion regulation difficulties. The overall model was significant, $F(2, 108) = 8.09$, $p < .001$, accounting for 13% of the variance found in DERS-16 scores ($R^2 = .13$). Maternal care was a significant negative predictor of emotion regulation difficulties ($\beta = -.35$, $p = .001$), whereas maternal overprotection was not a significant predictor when controlling for care ($\beta = .02$, $p = .869$). Detailed outputs for the second linear regression can be found in Appendix M.

A hierarchical multiple regression was then conducted to examine whether emotion regulation difficulties explained additional variance in perceived stress beyond maternal care and maternal overprotection. As reported above, Step 1 (maternal care and maternal overprotection; Appendix L) was significant, $F(2, 109) = 7.52$, $p < .001$, $R^2 = .12$.

Adding the dimension of emotion regulation in Step 2 significantly improved the model, $F(3, 107) = 28.63$, $p < .001$, increasing the explained variance to 44.5% ($R^2 = .445$), and representing an increase in explained variance of $\Delta R^2 = .324$. Emotion regulation difficulties emerged as a strong positive predictor of perceived stress ($\beta = .61$, $p < .001$), whereas maternal care and maternal overprotection no longer served as significant predictors. Detailed outputs for Step 2 analysis can be found in Appendix N.

Further exploratory analyses were conducted to examine differences in emotion regulation difficulties and perceived stress across maternal bonding quadrants established from PBI cut-offs (high vs. low care, high vs. low protection). These four quadrants consisted of: 'optimal parenting' (high care, low protection), 'affectionate constraint' (high care, high protection), 'affectionless control' (low care, high protection),

and 'neglectful parenting' (low care, low protection). A one-way ANOVA revealed a significant effect of quadrant type on DERS-16 scores, $F(3, 107) = 3.09$, $p = .030$, $\eta^2 = .08$. Descriptively, participants assigned in the affectionless control and neglectful quadrants showed higher mean DERS-16 scores compared to those in the affectionate constraint and optimal parenting quadrants. Detailed ANOVA and post-hoc outputs for the above can be found in Appendix O.

In contrast, no significant differences in perceived stress were observed across the quadrants, $F(3, 108) = 1.71$, $p = .169$. Although the 'affectionless control' quadrant demonstrated slightly higher mean stress scores (relative to other quadrants), these differences were not statistically significant. Descriptive statistics for each quadrant are presented in Table 1. Detailed ANOVA and post-hoc outputs for the PSS-10 can be found in Appendix P.

Table 1 <i>Means and Standard Deviations of DERS-16 and PSS-10 Scores Across PBI Quadrants</i>			
Quadrant	N	DERS M (SD)	PSS M (SD)
Affectionate Constraint	16	40.94 (12.66)	21.88 (5.71)
Affectionless Control	40	49.98 (13.40)	24.46 (5.45)
Neglectful	18	49.89 (17.39)	22.83 (7.85)
Optimal	37	41.70 (15.37)	21.68 (5.02)

DISCUSSION

The present study investigated how early maternal care and overprotection relates to perceived stress and emotion regulation difficulties in late adolescence. The results indicated that higher maternal care was associated with lower perceived stress and fewer emotion regulation difficulties, supporting Hypothesis 1. Maternal care also remained a significant predictor of outcomes in regression analyses. On the other hand, maternal overprotection was positively associated with both perceived stress and emotion regulation difficulties, supporting Hypothesis 2. However, when including maternal care as a factor in the regression model, overprotection was not a single significant predictor of either outcome. Analyses also found that emotion regulation difficulties were strongly associated with perceived stress scores, and explained a substantial amount of variance in the hierarchical regression model. Finally, further exploratory analyses indicated some differences in emotion regulation difficulties across maternal bonding quadrants (PBI), however, no significant differences in perceived stress scores were found.

Maternal care remained both the strongest and the most consistent predictor of perceived stress and emotion regulation difficulties. The present study found that high levels of care were linked to lower perceived stress and fewer difficulties in emotion regulation in this sample. When controlling for maternal overprotection in regression analyses, maternal care remained a significant predictor, indicating a unique predictive role to these outcomes. These results align with previous literature, strengthening the idea that higher parental warmth is associated with better emotion regulation skills and lower perceived stress in later life (Hawwa et al., 2025, Moran et al., 2018). This is also consistent with attachment theory (Ainsworth, 1979; Bowlby, 1988), which proposes that early caregiving experiences contribute to the development of internal working models that later shape emotional regulation and responses to stress. These results also support the notion that lower levels of parental warmth are linked to greater emotion regulation difficulties (Zitzmann et al., 2023). One possible explanation for this pattern lies in the central role of parental care fostering the development of emotion regulation

skills, including self-soothing behaviours (Cassidy et al., 2013). It is understood that perceived warmth and responsive caregiving creates an environment that supports the development of adaptive coping skills (e.g. co-regulation), which in turn can help manage and regulate emotional responses to stress (Gee & Cohodes, 2023). Over time, these regulatory skills may contribute to a reduced vulnerability to stress, as well as a more stable emotional state overall, in both late adolescence and general later life. Overall, this study's findings strongly suggest that maternal care plays a significant role in shaping emotional functioning and stress regulation, more so than overprotective parenting behaviours.

Building on this, the present study further highlights the role of emotion regulation as a potential mechanism underlying the relationship between maternal influences and perceived stress. The current study found that emotion regulation difficulties strongly associated with perceived stress, and accounted for a substantial amount of variance in the hierarchical regression analysis. As mentioned, when emotion regulation was included as a factor in the model, maternal care and overprotection were no longer significant predictors. These results suggest that emotion regulation may help explain the link between early maternal influences and stress regulation later on. This may be because individuals with poorer emotion regulation skills are more likely to experience heightened emotional reactivity, especially to negative affect, potentially leading to increased perceptions of stress. The present findings are also consistent with current literature, which propose that early parental care directly shapes the development of emotion regulation skills (Paley et al., 2022; Rutherford et al., 2015). Existing literature generally agrees that warm and responsive caregiving patterns provide the best environment and opportunity for co-regulation in childhood, where caregivers help children understand, manage, and react to their emotions. These interactions provide a strong basis for the development of independent self-regulation skills, which in turn can aid the individual to respond to stressors in a more controlled and adaptive manner (Akeren et al., 2025). In contrast, inconsistent or negative caregiving patterns can hinder the development of emotion regulation skills, leading to potential vulnerabilities in stress regulation, as individuals may struggle to effectively manage negative emotional

responses. Ultimately, this study suggests that higher maternal care supports the development of adaptive emotion regulation, which in turn reduces vulnerability to stress in late adolescence and beyond.

Surprisingly, the present study found maternal overprotection to be a weaker predictor, showing less consistent associations with the outcome variables. While high scores of perceived overprotection positively associated with perceived stress and emotion regulation difficulties, these associations did not remain significant when maternal care was accounted for. These findings suggest that the effects of overprotection may come secondary to the influence of maternal warmth. One potential explanation for this is that while overprotective parental behaviours may limit autonomy, their effects may not have the same negative impact on emotional development when they occur alongside high levels of maternal care. On the other hand, the partial or complete lack of parental warmth may have a more direct influence on emotional functioning and stress regulation skills. Previous literature on parental overprotection has generally been mixed, with some findings reporting a link to increased anxiety and reduced autonomy (Deci & Ryan, 2000), while others suggest it is highly dependent on the broader caregiving context (Bruysters & Pilkington, 2022). Such inconsistencies in previous literature may reflect a lack of standardisation in how overprotection is defined and measured, with many studies examining overprotection in isolation rather than alongside other parenting dimensions. The present findings builds on this limitation, and proposes the idea that maternal overprotection alone is not inherently detrimental, but instead interacts with other aspects of parenting, specifically levels of perceived care and warmth, which then influences how these maternal behaviours are both perceived and internalised. In this sample of university students, the findings suggest the notion that differences in maternal care may serve greater importance for stress regulation outcomes than perceived overprotective or 'helicopter' parenting behaviours.

Additionally, exploratory analyses examined differences between maternal bonding quadrants (PBI). The results showed some variation in emotion regulation difficulties, with individuals in lower care quadrants generally reporting higher levels of difficulties

when compared to those in higher care groups. This pattern is consistent with current literature, highlighting the importance of maternal care for the development of emotional functioning (Bowlby, 1988). However, it is important to note that these differences were not significant in post-hoc analyses, and no significant differences in perceived stress were found across PBI quadrants. This suggests that, although some observable trends were present, the combined effects of maternal care and overprotection may be complex and not fully captured by PBI quadrant groupings. Therefore, these findings are to be considered descriptive rather than conclusive of any meaningful associations.

Overall, the above findings highlight the importance of considering caregiving environments as multidimensional, rather than reducing them to single parenting behaviors. The current study's findings could have important implications for understanding the development of stress regulation in late adolescence. This study, alongside existing literature, highlights that strong and consistent maternal care is an important factor in shaping emotional functioning and resilience to stress. The present study also suggests that the potential adverse effects of maternal overprotection in early caregiving environments may be mitigated if accompanied by high levels of maternal care. This highlights the importance of early mother-child relationships in the development of adaptive emotion regulation skills, which may have lasting effects into late adolescence and beyond. These findings may be used to inform both early intervention practices, as well as parenting programmes, by emphasising the importance of fostering an emotionally supportive caregiving environment. Specifically, the promotion of maternal warmth and sensitivity in early childhood may support the development of effective emotion regulation skills, which would thereby reduce vulnerability to stress-related difficulties. This idea could further be used in both early education systems and psychological interventions, where supporting emotional development and strengthening emotion regulation skills could serve as a key target for reducing stress related outcomes across the developmental period.

Several limitations should be considered when interpreting the findings of the present study. This study used a cross-sectional design, limiting the ability to draw casual

conclusions between the relationships of maternal influences, emotion regulation, and perceived stress. Whilst the current study presents findings suggesting potential pathways, particularly regarding maternal care as a protective factor against the effects of maternal overprotection, these cannot be confirmed without concrete longitudinal data. Furthermore, the present study relied entirely on the use of self-report scales, which introduces the possibility of both self-report bias and shared method variance, potentially skewing and inflating the observed associations between the variables. Specifically, this study's use of the Parental Bonding Instrument (PBI) required retrospective recall, which may have been skewed by recall bias as participants may not have accurately described their early experiences of maternal care. Additionally, a notable number of participants selected 'Would rather not say' on PBI items, resulting in a reduced sample size for analyses. This may have limited this study's overall statistical power and potentially impacted the reliability of findings related to maternal influences. It is also worth noting that both the DERS-16 and PSS-10 only assess relatively recent functioning, with the PSS-10 explicitly focusing on perceived stress over the most recent month. As such, these measures may not capture the individuals' broader and more general patterns of emotion regulation and stress over time. Finally, due to the sample consisting entirely of university students, the findings may not be generalisable to the broader population, including late adolescents not in higher education, or individuals from different cultural or minority groups. Overall, these limitations highlight the need for caution when interpreting the present findings.

Future research should aim to refine and build upon the present study by using a longitudinal study design to better grasp how the associations between maternal care, emotion regulation, and stress regulation develop over time. Such data would allow for a clearer understanding of potential pathways, particularly the role of emotion regulation skills as a mechanism underlying stress regulation. Future research could further also explore maternal warmth and sensitivity, and its potential role as a protective factor against the outcomes of maternal overprotection. Furthermore, future research may benefit from incorporating multi-informant approaches, such as including primary reports from mothers alongside child self-report measures, which may provide a more

comprehensive outlook into understanding any associations. Future research should also expand the sample group beyond university students to improve the generalisability of findings, as well as allow for the exploration of both socioeconomic and cultural differences in parenting styles and their subsequent impact on emotional development and stress regulation. Finally, future research should further investigate the relationship and interaction between maternal care and overprotection, to better understand how different parenting dimensions overlap and operate together in shaping emotional functioning and stress outcomes in late adolescence and across development.

To conclude, the present study contributes to the growing literature examining parental influences on stress regulation. This study specifically examined the role of early maternal care and its subsequent impact on stress regulation in late adolescence. By simultaneously considering both maternal care and overprotection, this study offers insight into how different parenting dimensions interact and highlights the particularly important role of maternal care in the development of emotional development and resilience to stress. The present study further emphasises emotion regulation as a key mechanism underlying stress regulation, which provides a potential explanation for how early caregiving experiences translate into emotional outcomes in late adolescence and beyond. These findings provide a new perspective by proposing that maternal warmth and sensitivity may act as protective factors against maternal overprotection outcomes in stress regulation, and alludes to the idea that negative effects may be mitigated by high levels of maternal care. While further research is encouraged to confirm these associations and pathways, particularly through longitudinal and multi-informant study designs, the present study highlights the strong potential for future research to build upon these findings to further clarify the developmental mechanisms underlying stress regulation. Overall, this study highlights the importance of early caregiving environments in shaping stress regulation in late adolescence, while also emphasising the need to better understand the mechanisms through which these early experiences influence both stress and emotional outcomes across development.

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APPENDIX

Appendix A - Parental Bonding Instrument (PBI)

This questionnaire lists various attitudes and behaviours of parents. As you remember your MOTHER in your first 16 years would you place a tick in the most appropriate box next to each question.

0 - Very likely 1 - Moderately likely 2 - Moderately unlikely 3 - Very unlikely

1. Spoke to me in a warm and friendly voice
2. Did not help me as much as I needed
3. Let me do those things I liked doing
4. Seemed emotionally cold to me
5. Appeared to understand my problems and worries
6. Was affectionate to me
7. Liked me to make my own decisions
8. Did not want me to grow up
9. Tried to control everything I did
10. Invaded my privacy
11. Enjoyed talking things over with me
12. Frequently smiled at me
13. Tended to baby me
14. Did not seem to understand what I needed or wanted
15. Let me decide things for myself
16. Made me feel I wasn't wanted
17. Could make me feel better when I was upset
18. Did not talk with me very much
19. Tried to make me feel dependent on her/him
20. Felt I could not look after myself unless she/he was around
21. Gave me as much freedom as I wanted
22. Let me go out as often as I wanted
23. Was overprotective of me
24. Did not praise me
25. Let me dress in any way I pleased

Appendix B - Perceived Stress Scale (PSS-10)

For each question choose from the following alternatives:

0 - Never 1 - Almost never 2 - Sometimes 3 - Fairly often 4 - Very often

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and stressed?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that happened that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Appendix C - Difficulties in Emotional Regulation (DERS-16)

Please indicate how often the following statements apply to you by selecting the appropriate option for each item.

0 - Almost never 1 - Sometimes 2 - About half the time 3 - Most of the time 4 - Almost always

1. I have difficulty making sense out of my feelings
2. I am confused about how I feel
3. When I am upset, I have difficulty getting work done
4. When I am upset, I become out of control
5. When I am upset, I believe that I will remain that way for a long time
6. When I am upset, I believe that I'll end up feeling very depressed
7. When I am upset, I have difficulty focusing on other things
8. When I am upset, I feel out of control
9. When I am upset, I feel ashamed with myself for feeling that way
10. When I am upset, I feel like I am weak
11. When I am upset, I have difficulty controlling my behaviours
12. When I am upset, I believe that there is nothing I can do to make myself feel better
13. When I am upset, I become irritated with myself for feeling that way
14. When I am upset, I start to feel very bad about myself
15. When I am upset, I have difficulty thinking about anything else
16. When I am upset, my emotions feel overwhelming

Appendix D - Participant Information Sheet

Research Project title

Benevolent childhood experiences and wellbeing in adulthood.

Invitation paragraph

You are being invited to take part in a research project. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

This study aims to investigate the role of benevolent childhood experiences – twenty positive or protective aspects of childhood – in the positive mental health of adults. You have been chosen to take part in this study because you are above the age of 18 and a member of the general population. Should you consent to take part in this study, you will be asked some brief questions about yourself, followed by a series of scales which should take no longer than 15 minutes of your time. These scales are designed to measure the presence of benevolent childhood experiences, your perceived relationship with your mother prior to the age of 18, current emotion regulation strategies, current perceived levels of stress, and current levels of wellbeing. It is important to note that none of these scales serve as diagnostic tools, nor do they offer insight about clinical levels of psychopathology or wellbeing. By taking part in this study, you will be contributing to knowledge in this subject area and helping psychology students to complete their dissertation.

Please note that there are attention checks in the scales. If you fail to pass these checks you will not be able to continue your participation and will not receive your EPR credits.

Do I have to take part?

Participation in this research project is entirely voluntary. If you feel that answering surveys on these topics may impact you negatively in any way, please do not proceed with participation. If you are uncomfortable with responding to any items in the study, you are able to leave your response blank. If you do not respond to all items, your partial data may still be used in the study. If you would like to withdraw your consent midway through the study, you are able to simply leave the web page to ensure your responses are not submitted. However, as all participant data are anonymised, we are unable to withdraw data once submitted.

What will happen to any data/samples that I provide who will have access to my data?

All data collected will be anonymous and confidential and will not be used for any purpose beyond that of this study. Data will be stored securely and in accordance with the Data Protection Act 1988 on university managed computing systems, or password-protected personal devices (for students to analyse the data). Data will be destroyed subsequent to the submission of relevant dissertations.

Who has reviewed the research project?

The research project has been approved by the University Research Ethics Committee.

Contact for Further Information

If you have any complaints or concerns – either before participation or at any time subsequent – please contact the supervisor of this dissertation project, Dr George Hales at gkh6@leicester.ac.uk. If you have any concerns or queries about the way in which the research project has been conducted, please contact the Chair of the University Research Ethics Committee on ethics@le.ac.uk.

If you require more GDPR data protection information then you can access this via the University's Information Assurance Services:

*Information Assurance Services
University of Leicester
University Road
Leicester
LE1 7RH
T: +44 (0)116 229 7945
E: ias@le.ac.uk
W: <https://www2.le.ac.uk/offices/ias>*

Thank you for considering participation in this study. If you are happy to proceed, please continue to review the consent form.

Appendix E - Participant Consent Form

CONSENT FORM

Full title of Project: Benevolent childhood experiences and wellbeing in adulthood.

Name, position and contact details of Researchers: Esha Misra, Micaela Powell

**Name, position and contact details for Supervisor: Dr George Hales, Early Career Fellow,
gkh6@leicester.ac.uk**

1. I confirm that I have read and understand the participant information sheet (**Version 1.0, November 17 2025**) for the above study and have had the opportunity to ask questions.

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.

3. I understand that at all times this research project will comply with the *General Data Protection Regulations (GDPR, 2018)* approved by the EU parliament on 14 April 2016 and passing into UK law effective from 25 May 2018 and that if I have any concerns how I contact the University of Leicester to raise these.

4. I agree to take part in the above research project.

Appendix F - Demographic Form

Demographics

Please specify your age

Please specify your gender

Male " Female " Other (please specify)

Please indicate the ethnicity which best fits you

Asian, Asian British or Asian Welsh

Black, Black British, Black Welsh, Caribbean or African

Mixed or Multiple ethnic groups

White

Other ethnic group

What was your parent/guardian's main occupation when you were growing up?

Please select the option that best describes the main occupation of the parent/guardian who was the highest earner in your household when you were growing up.

Managerial or Professional (e.g., doctor, lawyer, teacher, engineer, senior manager)

Technical or Skilled Non-manual (e.g., technician, nurse, administrative officer)

Skilled Manual (e.g., electrician, plumber, mechanic)

Semi-skilled Manual (e.g., factory worker, driver, machine operator)

Unskilled Manual (e.g., labourer, cleaner)

Clerical or Sales (e.g., office clerk, shop assistant)

Self-employed (e.g., small business owner, freelancer)

Unemployed/never worked

Other (please specify)

Appendix G - Debrief information

Research Project title

Benevolent childhood experiences and wellbeing in adulthood.

Debrief

Thank you for your participation in this study. This research aims to investigate the role of benevolent childhood experiences – positive and protective aspects of childhood – in the positive mental health of adults. Investigating these relationships has important implications in developmental psychopathology, particularly in understanding risk and protective factors for psychopathology and factors promotive of flourishing (i.e., high wellbeing). This research will help to contribute to our understanding of this area. If you would like more information about the aims, hypotheses, or findings of this study, please contact the principal investigator at gkh6@leicester.ac.uk. Do note that as data are anonymised we will not comment on individual scores.

Some may find the surveys in this study distressing, personal, or worrying. It is important to remember that the surveys in this study are purely to understand normal levels of dark tetrad traits, and do not imply any clinical levels of these traits. These are not diagnostic tools.

Should you feel that you need support or advice following this study, please see the resources below.

University of Leicester students can find support from Spectrum.Life:

- Freephone UK at 0800 0318227
- Text 'Hi' via WhatsApp/SMS to +44 7418 360 780
- If international, call 00353 1 518 0277

For confidential mental health support:

- If based in Leicester, Leicestershire, or Rutland, call 0808 800 3302 (24/7)
- Call Samaritans on 116 123 to access a listening service (24/7)
- Text SHOUT to 85258 to access a free text-line service (24/7)

Alternatively, you could seek support from your GP, or access help via www.mind.org.uk

If you have any questions, please contact the supervisor of this dissertation project, Dr George Hales, at gkh6@leicester.ac.uk.

If you have any concerns or queries about the way in which the research project has been conducted, please contact the Chair of the University Research Ethics Committee on ethics@le.ac.uk.

Appendix H - PBI Reliability and Assumption Outputs

MCare Reliability*Frequentist Scale Reliability Statistics*

Coefficient	Estimate	Std. Error	95% CI	
			Lower	Upper
Coefficient α	0.918	0.013	0.894	0.943

Note. Of the observations, 122 complete cases were used.

MOverProtection Reliability*Frequentist Scale Reliability Statistics*

Coefficient	Estimate	Std. Error	95% CI	
			Lower	Upper
Coefficient α	0.891	0.015	0.863	0.920

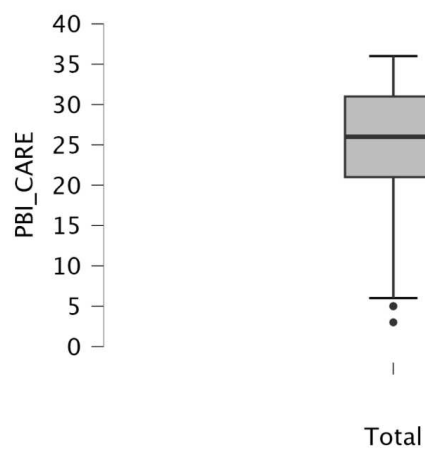
Note. Of the observations, 120 complete cases were used.

Descriptive Statistics*Descriptive Statistics*

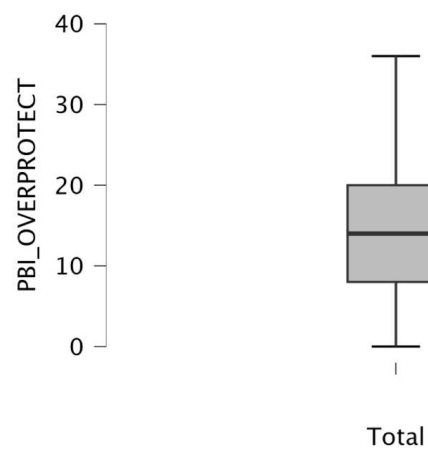
	PBI_CARE	PBI_OVERPROTECT
Valid	122	120
Missing	11	13
Mean	25.20	15.18
Std. Deviation	8.118	8.617
Skewness	-0.740	0.672
Std. Error of Skewness	0.219	0.221
Kurtosis	-0.049	-0.366
Std. Error of Kurtosis	0.435	0.438
Minimum	3.000	0.000
Maximum	36.00	36.00

Boxplots

PBI_CARE

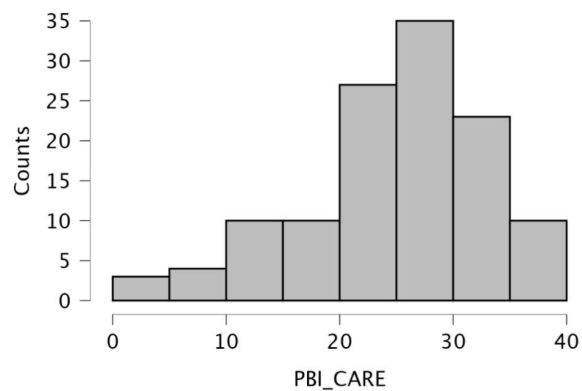


PBI_OVERPROTECT

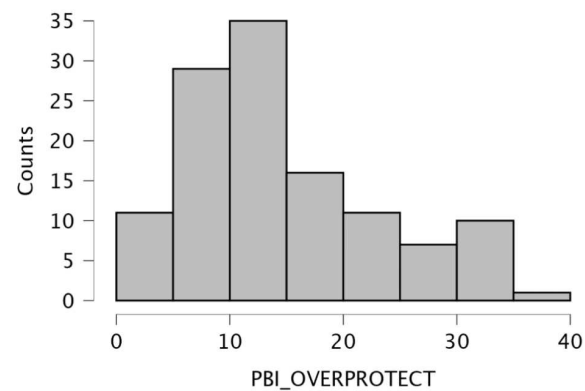


Frequency Plots

PBI_CARE



PBI_OVERPROTECT



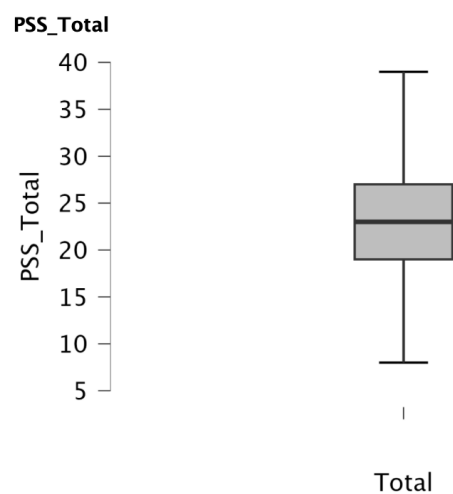
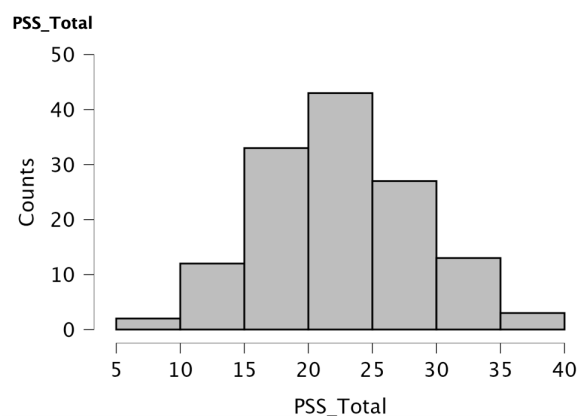
Appendix I - PSS-10 Reliability and Assumption Outputs

PSS-10 Reliability*Frequentist Scale Reliability Statistics*

Coefficient	Estimate	Std. Error	95% CI	
			Lower	Upper
Coefficient α	0.840	0.021	0.799	0.881

Descriptive Statistics*Descriptive Statistics*

	PSS_Total
Valid	133
Missing	0
Mean	23.05
Std. Deviation	6.071
Skewness	0.104
Std. Error of Skewness	0.210
Kurtosis	-0.117
Std. Error of Kurtosis	0.417
Minimum	8.000
Maximum	39.00

Boxplots**Frequency Plots**

Appendix J - DERS-16 Reliability and Assumption Outputs

DERS-16 Reliability

Frequentist Scale Reliability Statistics

Coefficient	Estimate	Std. Error	95% CI	
			Lower	Upper
Coefficient α	0.949	0.006	0.936	0.961

Note. Of the observations, 132 complete cases were used.

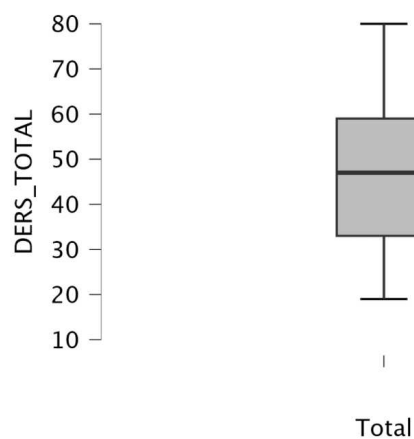
Descriptive Statistics

Descriptive Statistics

DERS_TOTAL	
Valid	132
Missing	1
Mean	46.39
Std. Deviation	15.39
Skewness	0.136
Std. Error of Skewness	0.211
Kurtosis	-0.998
Std. Error of Kurtosis	0.419
Minimum	19.00
Maximum	80.00

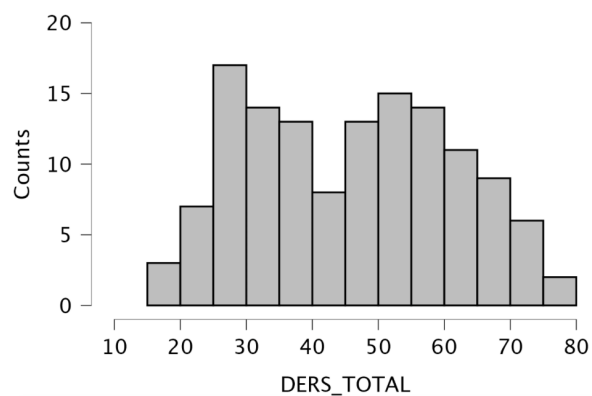
Boxplots

DERS_TOTAL



Frequency Plots

DERS_TOTAL



Appendix K - Pearson's Correlations Output

Correlation*Pearson's Correlations*

			Pearson's r	p
PSS_Total	-	PBI_CARE	-0.362	< .001
PSS_Total	-	PBI_OVERPROTECT	0.261	.004
PSS_Total	-	DERS_TOTAL	0.679	< .001
PBI_CARE	-	PBI_OVERPROTECT	-0.541	< .001
PBI_CARE	-	DERS_TOTAL	-0.387	< .001
PBI_OVERPROTECT	-	DERS_TOTAL	0.232	.011

Appendix L - Linear Regression Outputs (PBI & PSS-10)

Linear Regression*Model Summary – PSS_Total*

Model	R	R ²	Adjusted R ²	RMSE	R ² Change	df1	df2	p
M ₀	0.000	0.000	0.000	5.855	0.000	0	111	
M ₁	0.348	0.121	0.105	5.539	0.121	2	109	< .001

Note. M₁ includes PBI_CARE, PBI_OVERPROTECT

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
M ₁	Regression	461.3	2	230.65	7.519	< .001
	Residual	3343.8	109	30.68		
	Total	3805.1	111			

Note. M₁ includes PBI_CARE, PBI_OVERPROTECT

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p	95% CI	
							Lower	Upper
M ₀	(Intercept)	22.911	0.553		41.412	< .001	21.814	24.007
M ₁	(Intercept)	26.196	2.784		9.409	< .001	20.678	31.714
	PBI_CARE	-0.186	0.077	-0.257	-2.404	.018	-0.339	-0.033
	PBI_OVERPROTECT	0.093	0.074	0.134	1.258	.211	-0.054	0.240

Collinearity Diagnostics

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Intercept)	PBI_CARE	PBI_OVERPROTECT
M ₁	1	2.724	1.000	0.005	0.008	0.019
	2	0.254	3.277	0.003	0.094	0.4
	3	0.022	11.123	0.992	0.899	0.581

Note. The intercept model is omitted, as no meaningful information can be shown.

Appendix M - Linear Regression Outputs (PBI & DERS-16)

Linear Regression*Model Summary – DERS_TOTAL*

Model	R	R ²	Adjusted R ²	RMSE	R ² Change	df1	df2	p
M ₀	0.000	0.000	0.000	15.09	0.000	0	110	
M ₁	0.361	0.130	0.114	14.20	0.130	2	108	< .001

Note. M₁ includes PBI_CARE, PBI_OVERPROTECT

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
M ₁	Regression	3262	2	1631.2	8.087	< .001
	Residual	21785	108	201.7		
	Total	25048	110			

Note. M₁ includes PBI_CARE, PBI_OVERPROTECT

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p	95% CI	
							Lower	Upper
M ₀	(Intercept)	45.901	1.432		32.047	< .001	43.062	48.739
M ₁	(Intercept)	61.953	7.149		8.666	< .001	47.783	76.124
	PBI_CARE	-0.652	0.198	-0.351	-3.289	.001	-1.044	-0.259
	PBI_OVERPROTECT	0.032	0.190	0.018	0.166	.869	-0.346	0.409

Collinearity Diagnostics

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Intercept)	PBI_CARE	PBI_OVERPROTECT
M ₁	1	2.722	1.000	0.005	0.008	0.019
	2	0.255	3.265	0.003	0.093	0.401
	3	0.022	11.087	0.992	0.899	0.58

Note. The intercept model is omitted, as no meaningful information can be shown.

Appendix N - Hierarchical Regression Outputs (Step 2)

Linear Regression*Model Summary – PSS_Total*

Model	R	R ²	Adjusted R ²	RMSE
M ₀	0.000	0.000	0.000	5.844
M ₁	0.667	0.445	0.430	4.413

Note. M₁ includes PBI_OVERPROTECT, PBI_CARE, DERS_TOTAL

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
M ₁	Regression	1673	3	557.62	28.63	< .001
	Residual	2084	107	19.48		
	Total	3757	110			

Note. M₁ includes PBI_OVERPROTECT, PBI_CARE, DERS_TOTAL

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
M ₀	(Intercept)	22.973	0.555		41.415	< .001
M ₁	(Intercept)	11.849	2.892		4.097	< .001
	PBI_OVERPROTECT	0.085	0.059	0.122	1.429	.156
	PBI_CARE	-0.037	0.065	-0.051	-0.571	.569
	DERS_TOTAL	0.235	0.030	0.606	7.853	< .001

Appendix O - ANOVA and Post-Hoc Outputs (DERS-16)

DERS-16 ANOVA*ANOVA – DERS_TOTAL*

Cases	Sum of Squares	df	Mean Square	F	p
QUAD	1996	3	665.5	3.089	.030
Residuals	23051	107	215.4		

Note. Type III Sum of Squares

Descriptives*Descriptives – DERS_TOTAL*

QUAD	N	Mean	SD	SE	Coefficient of variation
AffectionateConstraint	16	40.94	12.66	3.166	0.309
AffectionlessControl	40	49.98	13.40	2.119	0.268
Neglectful	18	49.89	17.39	4.098	0.349
Optimal	37	41.70	15.37	2.526	0.369

Assumption Checks*Test for Equality of Variances (Levene's)*

F	df1	df2	p
0.841	3.000	107.0	.474

Post Hoc Tests**Standard (HSD)***Post Hoc Comparisons – QUAD*

		Mean Difference	SE	df	t	Cohen's d	Ptukey
AffectionateConstraint	AffectionlessControl	-9.038	4.342	107	-2.082	-0.616	.166
	Neglectful	-8.951	5.043	107	-1.775	-0.610	.291
	Optimal	-0.765	4.392	107	-0.174	-0.052	.998
AffectionlessControl	Neglectful	0.086	4.166	107	0.021	0.006	1.000
	Optimal	8.272	3.348	107	2.471	0.564	.070
Neglectful	Optimal	8.186	4.218	107	1.941	0.558	.217

Note. P-value adjusted for comparing a family of 4 estimates.

Appendix P - ANOVA and Post-Hoc Outputs (PSS-10)

PSS-10 ANOVA*ANOVA – PSS_Total*

Homogeneity Correction	Cases	Sum of Squares	df	Mean Square	F	p
None	QUAD	172.6	3.000	57.52	1.710	.169
	Residuals	3632.6	108.000	33.63		
Welch	QUAD	172.6	3.000	57.52	1.966	.134
	Residuals	3632.6	41.984	86.52		

Note. Type III Sum of Squares

Descriptives*Descriptives – PSS_Total*

QUAD	N	Mean	SD	SE	Coefficient of variation
AffectionateConstraint	16	21.88	5.714	1.429	0.261
AffectionlessControl	41	24.46	5.450	0.851	0.223
Neglectful	18	22.83	7.853	1.851	0.344
Optimal	37	21.68	5.017	0.825	0.231

Assumption Checks*Test for Equality of Variances (Levene's)*

F	df1	df2	p
2.179	3.000	108.0	.095

Post Hoc Tests**Standard (HSD)***Post Hoc Comparisons – QUAD*

		Mean Difference	SE	df	t	Cohen's d	P _{Tukey}
AffectionateConstraint	AffectionlessControl	-2.588	1.710	108	-1.514	-0.446	.433
	Neglectful	-0.958	1.993	108	-0.481	-0.165	.963
	Optimal	0.199	1.735	108	0.115	0.034	.999
AffectionlessControl	Neglectful	1.630	1.640	108	0.994	0.281	.753
	Optimal	2.788	1.315	108	2.120	0.481	.153
Neglectful	Optimal	1.158	1.667	108	0.695	0.200	.899

Note. P-value adjusted for comparing a family of 4 estimates.