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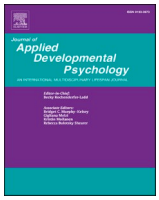

Parent-partner and parent-child attachment: Links to children's emotion regulation☆

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ABSTRACT

We investigate the interconnections between couple and parenting relationships and young children's emotion regulation across time. Our goals were to: (1) examine whether mothers' and fathers' attachment security towards their romantic partners relates to mothers- and fathers-child attachment quality; (2) investigate the bidirectional relations between mother- and father-child attachment quality, and children's emotion regulation. We followed 206 children (95 girls, *M*age = 4.01 years, *SD* = 0.57), their mothers, and fathers over 3-time points during the preschool period. Parents reported attachment security towards their romantic partner and the quality of their attachment relationships with the child. Teachers reported children's emotion regulation. Results from a dyadic cross-lagged panel model indicated a consistent negative association between mothers' and fathers' insecure attachment and parents-child attachment quality. Despite some variations according to children's sex and age, overall, findings suggest that a higher father- and mother-child attachment quality links to children's higher emotion regulation abilities.

Emotion regulation is a multidimensional construct that refers to the ability to manage distinct nuances of the emotional experience, such as emotional awareness, management, and expression (Gross & Thompson, 2007; Shields & Cicchetti, 1997). Developing emotion regulation abilities is a central goal of socialization during preschool. Prior works underscored the critical significance of the preschool years on emotion regulation development (Eisenberg, Spinrad, & Eggum, 2010; Matias et al., 2017; Sala, Pons, & Molina, 2014; Stegge & Terwogt, 2007). During this period, children undergo essential developmental processes in which they consolidate increasingly complex emotion regulation strategies (e.g., attention-shifting abilities and inhibitory control) and develop the capacity to employ them for emotional management in social interactions, namely with peers. Preschools are commonly the first socialization context outside the family circle, providing children the opportunities to increase their resources for understanding and managing their own emotional experience in socially oriented ways. Conversely, these regulatory skills are valuable for children to navigate social interactions and relationships with greater autonomy and efficacy (Bailey, Ondrusek, Curby, & Denham, 2022; Cole, Zahn-Waxler, Fox, Usher, & Welsh, 1996; Herndon, Bailey, Shewark, Denham, & Bassett, 2013). Furthermore, children's acquisition of emotion regulation abilities during these early ages predicts later adjustment and well-being (Cole, Dennis, Martin, & Hall, 2008; Denham et al., 2003).

There is convincing evidence that parenting quality predicts children's early socioemotional skills, including emotion regulation (Cassidy, 1994; Thompson & Meyer, 2014). Evidence from longitudinal studies indicates that the quality of early parent-child relationships in early childhood, namely children's security and parental warmth, predicts children's later regulatory skills (Boldt, Goffin, & Kochanska, 2020; Choe, Olson, & Sameroff, 2013). This literature highlights the crucial role of children's positive attachment relationships with primary caregivers in supporting the development of emotion regulation. Nevertheless, our knowledge about the reciprocal effects between children's emotion regulation abilities and parent-child attachment quality is still limited. Furthermore, we need more data to understand how the complex intertwining between distinct family subsystems might shape children's regulatory abilities. Human development has been conceptualized as the product of complex transactional, regulatory processes between children and their social context (Lerner, 2006; Sameroff & Mackenzie, 2003). Family is the primary socialization context for

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children at early ages and is viewed as a dynamic system composed of interdependent individuals and overlapping, intricate relationships (Cox & Paley, 1997, for a theoretical review on dynamic systems approaches). Subsystems like mother-child, father-child, and mother-father relationships interact with each other over time, affecting children's socioemotional development, including their ability to regulate emotions. The current study addresses these complex and multiple influences, investigating the interplay between couple, parent-child relationships, and children's emotion regulation over time.

Parent-child attachment and children's emotion regulation

Features of parent-child relationships, such as warmth, sensitivity, consistent caregiving, and contingent responsiveness, have been extensively associated with children's development of pivotal socioemotional skills, namely emotion regulation (Cassidy, 1994; Yagmurlu & Altan, 2010). A meta-analysis by Cooke, Kochendorfer, Stuart-parrigon, Koehn, and Kerns (2019), conducted over >70 empirical studies, indicated that securely attached children usually benefit from consistently sensitive and responsive parents that support the acquisition of increasingly adaptive regulatory skills. Traditionally, literature has given great attention to the contributions of the mother-child relationship to children's socioemotional development (Berlin & Cassidy, 2003; Brophy-Herb, Zajicek-Farber, Bocknek, McKelvey, & Stansbury, 2013). More recently, many studies have highlighted fathers' contributions to children's socioemotional abilities, namely emotion regulation (Boldt et al., 2020; Shewark & Blandon, 2015). So far, however, only a limited number of studies simultaneously examined mother- and father-child relationships' contributions, and very few investigated how the interplay between these two relational contexts can influence children's emotion regulation skills (Ferreira et al., 2018; Kerr, Rasmussen, Smiley, Buttitta, & Borelli, 2021). In a recent noteworthy dyadic study, Kerr et al. (2021) found support for a positive effect of father-child synchrony on children's emotion regulation, above and beyond the effect of mother-child synchrony. Still, additional research efforts are needed to fully understand the interdependent effects of mother- and father-child attachment on children's emotion regulation.

From a systemic perspective, the quality of one relationship can have ripple effects on other relationships within the family (Cox & Paley, 1997). This dynamic interplay is well-documented in prior studies that observed a set of spillover and crossover effects within the family system (Erel & Burman, 1995; Lau & Power, 2020; Peltz, Rogge, & Sturge-Apple, 2018). Spillover and crossover effects illustrate how, through within- and between-person processes, can behaviors, emotions, and attitudes be transferred over various relational subsystems (Bolger, DeLongis, Kessler, & Wethington, 1989). Prior studies found evidence for the reciprocal links between marital and parent-child relationships (Lau & Power, 2020; Peltz et al., 2018) and mother- and father-child relationships (Basili et al., 2021; Guay, Ratelle, Duchesne, & Dubois, 2018). For instance, Basili et al. (2021) found, in a longitudinal study using mother- and father-child dyads, reciprocal influences between mothers' and fathers' use of psychological control strategies with the child, indicating that mothers' use of psychological control relates to fathers' adoption of control strategies with the child. These findings highlight the interplay between mother- and father-child relationships and their potential influences on children's development. By acknowledging this systemic view, our study seeks to provide a more holistic understanding of the intricate dynamics within the family context, exploring the interconnections between parent-partner, and parent-child relationships. Furthermore, an increasing number of studies point out that children's characteristics influence the quality of their social contexts (Ferreira et al., 2022; Mackler et al., 2015). For instance, Mackler et al. (2015) followed children from 4 to 10 years of age and found that self-control difficulties relate to increased parental stress, which, in turn, contributes to intensifying children's behavioral issues. This idea that child and context affect each other across time is central to the transactional model of development (Sameroff & Mackenzie, 2003). The current study adopts this model, expanding the existing evidence by focusing specifically on children's development of emotion regulation abilities during the preschool period and addressing the reciprocal influences with mother- and father-child attachment quality.

Links between parent-partner attachment and parent-child attachment

Several researchers have explored the interconnections between the couple and parental relationships and their implications for children's socioemotional well-being (Cowan, Cowan, & Mehta, 2009; Cowan, Cowan, Pruett, & Pruett, 2019; Cummings, Schermerhorn, Davies, Goeke-morey, & Cummings, 2006; Neppl, Wedmore, Senia, Jeon, & Diggs, 2019). Attachment theorists have offered guidance to conceptualize these links, claiming that parents' own attachment representations might shape their caregiving behavior towards children (Bretherton & Munholland, 2008; Jones, Cassidy, & Shaver, 2015; Main, Kaplan, & Cassidy, 1985; Mehta, Cowan, & Cowan, 2009). The complementary nature between the caregiving and attachment behavioral systems offers important ground for understanding the implications of parents' own attachment security and parent-child attachment quality (Bowlby, 1999; Cassidy, 1994; Fonagy, Steele, Steele, Moran, & Higgitt, 1991; Grossmann, Grossmann, & Kindler, 2005; Main et al., 1985; Thompson & Meyer, 2014). In a well-functioning parent-child relationship, the attachment and caregiving behavioral systems interact, jointly working under the general principles of protection and proximity seeking (Jones et al., 2015). Adults' attachment security is frequently captured within the context of romantic relationships using two dimensions, avoidance and anxiety (Bartholomew, 1990; Bergin, Hudson, Heffernan, & Segal, 2015). Avoidance reflects the attachment system's suppression and is expressed through adults' discomfort with closeness and dependency on the romantic partner. Anxiety reflects the attachment system hyperactivation and can be manifested by fear of rejection/abandonment and concerns about the partner's availability, particularly in times of need (Brennan, Clark, & Shaver, 1998; Wei, Russell, Mallinckrodt, & Vogel, 2007). High levels of attachment-related anxiety and avoidance indicate an insecure adult attachment orientation, whereas low levels of anxiety and avoidance characterize a secure attachment style (Bartholomew, 1990; Fraley, Hudson, Heffernan, & Segal, 2015; Wei et al., 2007). Although attachment-related anxiety and avoidance are expected to be independent constructs, several studies showed that they are intercorrelated (Fraley, Heffernan, Brumbaugh, & Vicary, 2011; Wei et al., 2007). Prior evidence also suggests that, despite some circumstantial variations, adult attachment styles are relatively stable over time (Fraley, Vicary, Brumbaugh, & Roisman, 2011; Stern et al., 2018).

Several studies within different assessment traditions of attachment styles have addressed the links between parents' attachment and their caregiving and parenting behavior towards their children (Jones et al., 2015; van Ijzendoorn, 1995). Overall, findings suggest that parents' insecure attachment styles relate negatively to parent-child attachment quality. Low levels of anxiety and avoidance, which characterize a secure attachment orientation, have been linked to higher parental sensitivity, responsiveness, and support (Jones et al., 2015). However, to our knowledge, only two prior studies adopted a dyadic framework to account for the interdependence among family members while examining the effect of couple attachment on parenting relationships (Fonseca, Nazaré, & Canavarro, 2018; Millings, Walsh, Hepper, & O'Brien, 2013). Millings et al. (2013) found an association between parents' attachment security and higher levels of authoritarianism and permissiveness while controlling for between-partner correlations. Fonseca et al. (2018) showed that parents' with more secure attachment representations perceived themselves as more effective caregivers and displayed more positive caregiving representations of others as worthy of help. They also found a partner effect suggesting a connection between fathers' attachment representations and mothers' representations of

themselves as caregivers (Fonseca et al., 2018). Still, we need more evidence to understand the connection between parents' attachment and parent-child attachment quality as children grow older. Our study contributes to this goal by adopting a longitudinal design that allowed us to investigate the connections between mothers' and fathers' attachment security and the quality of their attachment relationships with the child over time. By offering a comprehensive approach to the processual dimensions of emotion regulation development, this study could produce knowledge on relational dynamics underlying child maladjustment, supporting the development of parenting evidence-based practices in the field.

The current study

The current study focuses on the links between couple attachment, parent-child attachment quality, and children's emotion regulation. Based on a family system, we explored the connections between couples' attachment insecurity and parent-child attachment and investigated the reciprocal associations between mother- and father-child attachment quality and children's emotion regulation over time. Two main goals were addressed. First, we analyzed the effects of both couple members' attachment (in)security respectively, on mother- and father-child attachment quality. Based on previous findings, we anticipated a negative association between a couple's attachment insecurity and the overall quality of parent-child attachment (Fonseca et al., 2018; Millings et al., 2013). Second, we investigated the reciprocal influences between mother- and father-child attachment and children's emotion regulation as reported by preschool teachers. We expected to observe positive feedback cycles involving children's emotion regulation and parent-child attachment quality (Ferreira et al., 2022; Mackler et al., 2015). Parent-child relationships characterized by high levels of parental feelings of closeness, understanding, awareness and responsiveness can boost children's emotion regulation skills (Boldt et al., 2020; Brophy-Herb et al., 2013; Kerr et al., 2021). On the other way around, children's emotion regulation might facilitate parent-child attachment quality (Ferreira et al., 2022; Mackler et al., 2015). To our knowledge, no prior study has investigated whether the links between couple attachment, parent-child attachment quality, and children's regulatory skills change over time and with parents' sex. The current study aims to fill this gap by exploring these dynamics, providing valuable insights into the nuanced interactions among parent attachment security, parent-child attachment quality, and children's emotion regulation skills across various time points, differentiating between both maternal and paternal influences.

Method

Participants

Participants were 206 children (95 girls; *M* age = 4.01 years, *SD* = 0.57), their mothers (*M* age = 34.84 years, *SD* = 4.20), fathers (*M* age = 37.02 years, *SD* = 4.77), and preschool teachers (*M* age = 39.39 years, *SD* = 9.30). Children and their families were recruited from 48 preschool classrooms from public and private preschool centers in the metropolitan area of Porto, Portugal. Most mothers had graduated from college, 63% ($n = 129$), and 35% ($n = 71$) completed high school. Most fathers had a college degree (44%, $n = 90$) or completed high school (51%, $n = 103$). A minority of mothers (2%, $n = 4$) and fathers (5%, $n = 11$) had 9 or fewer years of education. In adherence to the study's prerequisite, all the participating children were from households with mothers and fathers who were employed and living together. The sample was reflective of the Portuguese dual-earner population concerning family structure, parental age range, and working hours, encompassing a substantial proportion of parents with higher education levels (INE [Statistics Portugal], 2011).

Data were obtained at three assessment points. We conducted the baseline assessment (T1) during the children's first or second year of preschool. Children were assessed twice for the following two years (T2 and T3), with a time gap of approximately 1 year between each assessment. The percentage of missing data points was 23% for the full data set, <1% at T1, 44% at T2, and 32% at T3. The attrition rate was 33% ($n = 70$) at T2 and 13% ($n = 27$) at T3. Attrition at T2 and T3 mainly was because parents and/or teachers refused to participate in data collection. Missing data followed a monotone pattern, including a large proportion due to attrition (69%). To examine whether the pattern of missing data was consistent with the assumption of Missing Completely at Random (MCAR), we used Little's MCAR tests (Little, 1988) to assess means ($\chi^2(640) = 677.82$, $p = .146$) and the test proposed by Jamshidian & Jalal, 2010 to assess covariances ($\chi^2(18) = 27.06$, $p = .078$). These statistics converged, suggesting that the missing data were MCAR. In addition, we conducted a Poisson regression to determine the extent to which the absence of data was related to any of the demographic (e.g., child sex, age, and parents' education) or study variables (i.e., parents' anxiety, parenting relationships' quality, and children's emotion regulation) measured at T1. None of these variables significantly predicted the relative risk of missing data.

Procedure

This study was part of a broader research project aiming to understand the impact of work-family dynamics on parenting and children's development. This project was approved by the faculty's ethics committee and the schools' board. After these approvals, the research team explained teachers the study, who then invited the families to participate. Children were eligible for participation if they came from families with working and cohabiting parents and did not move to elementary school the year after the baseline assessment. Parents of eligible children who consented to participate were asked to fill out independently an individual questionnaire, focusing on their couple and parental relationships. Teachers also filled out a survey focusing on several indicators of the child's development, namely emotional regulation abilities. Assessments were conducted approximately 6 months after the beginning of each school year.

Measures

Mothers' and Fathers' attachment *Security* was self-reported by mothers and fathers from T1 to T3 using the Experiences in Close Relationship Scale – Short Form (Carvalho, Ávila, & Matos, 2012; Wei et al., 2007). This questionnaire includes 12 items rated through a 7-point Likert-type scale ranging from 1 (“*strongly disagree*”) to 7 (“*strongly agree*”). These items were designed to assess two well-known dimensions of attachment, namely *Attachment-Related Anxiety* and *Attachment-Related Avoidance*. The anxiety subscale evaluates individuals' attachment-related anxiety towards his/her romantic partner, whereas the avoidance subscale captures the fear of intimacy and dependence, and excessive need for self-reliance (Wei et al., 2007).

Although these two subscales comprised originally a total of 6 items each, item 5 from the *Attachment-Related Anxiety* subscale (e.g., “I do not often worry about being abandoned”) and item 11 from the *Attachment-Related Avoidance* subscale (e.g., “It helps to turn to my romantic partner in times of need”) were excluded from the analyses due to low reliability. For the *Anxiety* subscale's 5 remaining items (e.g., “I worry that romantic partners won't care about me as much as I care about them”), the median Cronbach's alpha coefficient for mothers' and fathers' assessments at T1, T2, and T3 was 0.69, ranging from 0.65 to 0.74. As for the 5 items from the *Avoidance* subscale (e.g., “I want to get close to my partner, but I keep pulling back.”) we used in the current study, the median Cronbach's alpha coefficient for mothers' and fathers' assessments at T1, T2, and T3 was 0.76, ranging from 0.64 to 0.79.

For mothers and fathers, we observed an average correlation between anxiety and avoidance scores at each time point of 0.41, ranging from 0.28 and 0.55 (all statistically significant, $p < .05$). Considering

these significant associations, we computed an (in)security composite score for each participant, averaging the scores from the Attachment-Related Anxiety and Avoidance scales at each time point. Averaging the attachment-related anxiety and avoidance scores allows obtaining a single score that taps overall (in)security, with smaller values (i.e., low anxiety and avoidance) indicating security and higher values (i.e., high anxiety and avoidance) indicating insecurity (Bartholomew, 1990; Fraley et al., 2015).

Parent-Child Attachment quality were independently reported by mothers and fathers using the Attachment sub-scale from the Parenting Relationship Questionnaire – Preschool Form (Kamphaus & Reynolds, 2006; Vieira, Cadima, Leal, & Matos, 2013). This subscale includes 11 items (e.g., "I know what to say to calm down my child") tapping parents' feelings of closeness, understanding, awareness, and responsiveness towards children's emotions, thoughts, and behaviors. Items were rated using a 4-point scale ranging from 1 ("never") to 4 ("always"). The median Cronbach's alpha for mothers' and fathers' assessments at T1, T2, and T3 was 0.80, ranging from 0.77 to 0.84.

Children's *Emotion Regulation* was assessed from T1 to T3 through teachers' reports using the Emotion Regulation subscale from the Emotion Regulation Checklist (Shields & Cicchetti, 1997). We used six items from this subscale (two items were excluded due to low reliability) that measure children's ability to express emotions in a socially adaptive way, to behave empathically, and to control emotions in social interactions (e.g., "can say when he/she is feeling sad, angry or mad, fearful or afraid"). Teachers were asked to rate on a 4-point scale (1 = "never" to 4 = "almost always") how characteristic each item was of a particular child, with higher scores indicating higher emotion regulation skills. Teachers' ratings had a Cronbach's alpha of 0.69, 0.68, and 0.69, respectively, at T1, T2, and T3.

Data analyses[1]

The analytical plan comprised three main steps. First, we evaluated the measures' factor structure through Confirmatory Factor Analysis (CFA) and tested for their Measurement Invariance (MI) across time and parent-child dyads (i.e., father-child and mother-child). Second, we use composite mean scores to inspect the descriptive statistics for parents' attachment (in)security, parent-child attachment' quality, and children emotion regulation. Finally, we use Structural Equation Modeling (SEM) to test our hypotheses. All analyses were conducted in R (R Core Team, 2020), using the *lavaan* (Rosseel, 2012) and *semTools* packages (Jorgensen, Pornprasertmanit, Schoemann, & Rosseel, 2021). We employed full-information maximum likelihood estimation to avoid excluding participants with missing data and achieve more precise models' estimation. As some children were sharing the same classrooms, we adopted a design-based estimation approach to correct standard errors for potential nonindependence of observations (Muthén & Satorra, 1995). Model fit was examined using the chi-square goodness-of-fit statistic, the root mean square error of approximation (RMSEA), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the standardized root mean square residual (SRMR). Values lower than 0.06 for RMSEA, >0.95 for CFI and TLI, and lower than 0.08 for SRMR indicate good model fit (Hu & Bentler, 1999).

We used item parceling in the CFA models to define latent variables measuring attachment-related anxiety and avoidance, parent-child attachment quality, and children's emotion regulation. Items were randomly assigned to parcels (Little, Rhemtulla, Gibson, & Schoemann, 2013). We tested longitudinal MI for each construct independently. MI was established by comparing CFA increasingly constrained models, representing configural, weak, and strong MI across time. CFA models with different MI levels are nested and can thus be directly compared using chi-square difference tests.

We used SEM to test the model displayed in Fig. 1. This model included a latent variable representing the stable underlying trait of parents' attachment security, specified using the observed mean anxiety and avoidance scores at T1, T2, and T3. Their loadings were set to 1 to give an equal contribution from each score of (in)security to the trait factor. This latent variable captures the stable variance of parents' attachment security over time, ignoring the state variance, representing individuals' consistent attachment security levels irrespective of temporary fluctuations. Using their observed mean scores, we included mother- and father-child attachment quality and children's emotion regulation measured from T1 to T3, as manifest variables in the model. As depicted in Fig. 1, the model provided estimates for the effects of parents' attachment security on parent-child attachment quality, as well as for the auto-regressive and cross-lagged effects involving children's emotion regulation, mother-, and father-child attachment quality. The baseline model assumed parameters' stationarity, that is, the invariance in the relationships among parents' attachment security, parent-child attachment quality, and children's emotion regulation over time. This baseline model also imposed equality constraints on all the corresponding parameters involving mother-child and father-child dyads (see Fig. 1, e.g., parameter $\beta_{5,1} = \beta_{9,5} = \beta_{7,3} = \beta_{11,7}$). Based on prior evidence, child sex (Herndon et al., 2013), age (Eisenberg et al., 2010), and the length of the couple's relationship (Freeman, Simons, & Benson, 2023) were included as control variables at all time points.

The preceding model was compared against alternative, less restrictive models, with parameters freely estimated across time and parent-child dyad. The best fitting and parsimonious model was achieved by releasing equality constraints and trimming nearly zero, non-significant effects. We evaluated the impact of these changes in model fit through nested model comparisons using the likelihood ratio test.

Results

Confirmatory factor analysis and measurement invariance

A CFA was performed independently for each one of the study's measures. We tested longitudinal MI for teachers' scores of children's emotion regulation at T1, T2, and T3. Also, we examined the invariance of parent-child attachment quality and parents' attachment-related anxiety and avoidance measurements across time and between mothers' and fathers' scores. The baseline model for testing MI (i.e., configural invariance model) included one latent variable for each measurement occasion and rater (i.e., mother and father), if applicable. The test of MI across time and rater was conducted by sequential imposing equality constraints on loadings (*weak MI)* and intercepts (*strong MI)*. Results from CFA and MI analyses for all the study's main variables are presented in Table 1.

As shown in Table 1, the configural MI model for emotion regulation (Model 1a) provided a good fit to children's data at T1, T2, and T3, $\chi^2(15) = 31.77$, $p = .007$, RMSEA = 0.07 (90% CI [0.04; 0.11]), CFI = 0.96, TLI, = 0.90, SRMR = 0.05. Results from the chi-square difference test and CFI difference suggested that weak (Model 1b), $\Delta\chi^2(4) = 3.38$, $p = .497$, and strong (Model 1c), $\Delta\chi^2(4) = 9.39$, $p = .052$, longitudinal MI could be assumed.

The configural invariance model for parent-child attachment quality (Model 2a) also provided an adequate fit for mothers' and fathers' reports across time, $\chi^2(93) = 121.03$, $p = .027$, RMSEA = 0.04 (90% CI [0.01; 0.06]), CFI = 0.98, TLI, = 0.96, SRMR = 0.05. We simultaneously tested dyadic and longitudinal MI by constraining corresponding factor loadings and measurement intercepts across different raters (i.e., from mothers and fathers) and time (i.e., longitudinal MI). The chi-square difference test showed no deterioration of fit when weak (Model 2b), $\Delta\chi^2(10) = 13.85$, $p = .179$, and strong (Model 2c), $\Delta\chi^2(10) = 12.29$, $p = .266$, MI was imposed. These results suggested that the factor structure

[1] The data and code that support the findings of this study are openly available in zenodo at https://zenodo.org/records/10357858, reference number https://doi.org/10.5281/zenodo.10357858.

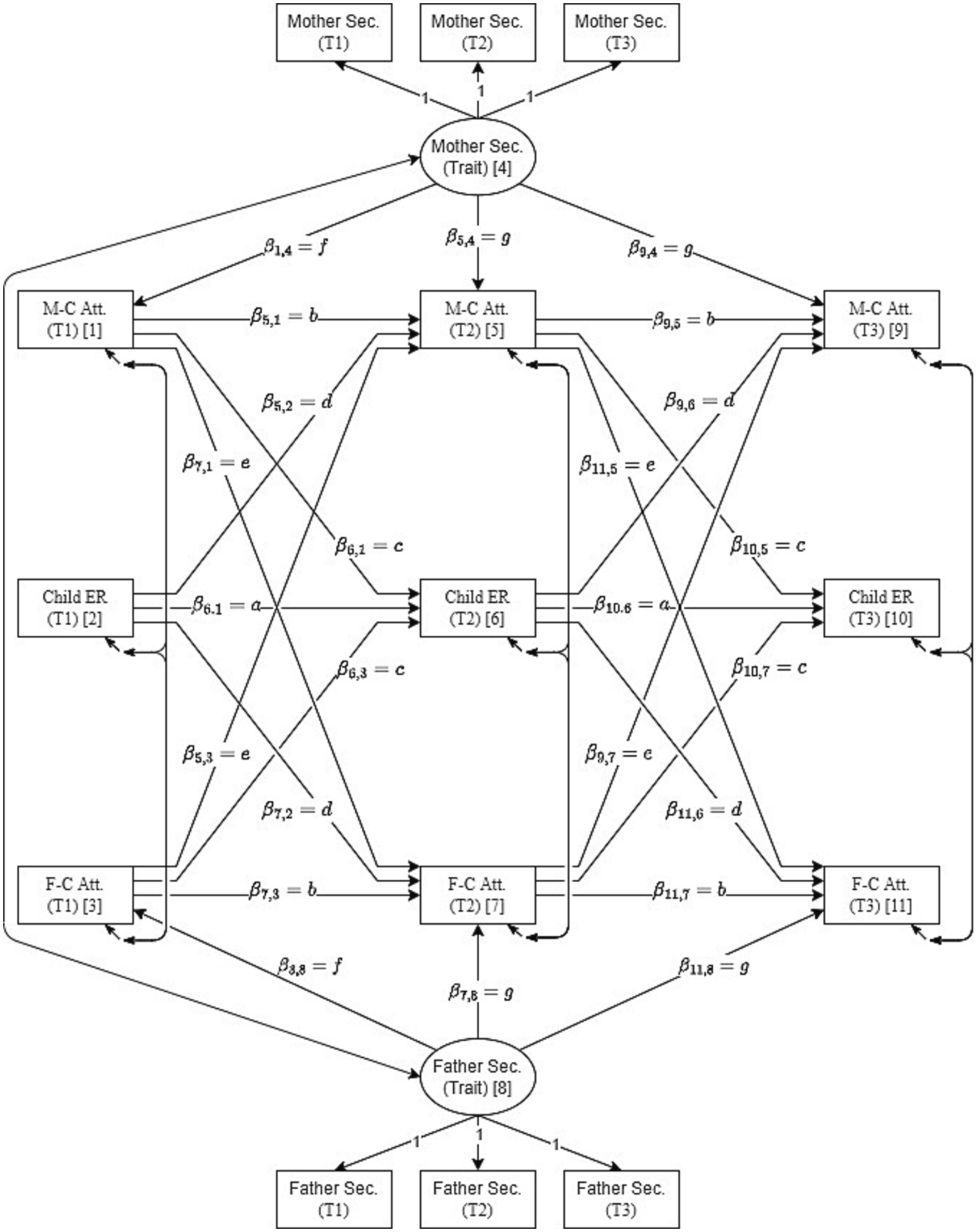

Fig. 1. Representation of the tested cross-lagged panel model; observed and latent variables are depicted as rectangles and ellipses, respectively; Sec. = Security; E.R. = Emotion Regulation; M-C Att. = Mother-Child Attachment; F-C Att. = Father-Child Attachment; T1 = Time 1; T2 = Time 2; T3 = Time 3; Variables are numbered from 1 to 11. Parameters equalized across time and dyads are denoted by letters (a – g).

Table 1
Goodness of fit statistics for the nested sequence in CFA and test for measurement invariance across time, mothers, and fathers.

Model tested		X^2(df)	RMSEA (90% CI)	CFI	TLI	SRMR	Compared Model	$\Delta X^2(\Delta df)$
Child emotion regulation (MI across: T1, T2, and T3)								
1a	Configural invariance	31.77 (15)*	0.07 (0.04; 0.11)	0.96	0.90	0.05	–	–
1b	Metric invariance	30.68 (19)*	0.06 (0.01; 0.10)	0.96	0.93	0.07	1a	3.38 (4)
1c	Scalar invariance	41.74 (23)*	**0.07** (0.04; 0.11)	0.93	0.89	0.07	1b	9.39 (4)
Parent-child attachment (MI across: Mothers and fathers; T1, T2, and T3)								
2a	Configural invariance	121.03 (93)*	0.04 (0.01; 0.06)	0.98	0.96	0.05	–	–
2b	Metric invariance	134.89 (103)*	0.04 (0.02; 0.06)	0.97	0.96	0.06	2a	13.85 (10)
2c	Scalar invariance	147.16 (113)*	0.04 (0.02; 0.05)	0.97	0.96	0.06	2b	12.29 (10)
Attachment-related anxiety (MI across: Mothers and fathers; T1, T2, and T3)								
3a	Configural invariance	132.36 (93)*	0.04 (0.03; 0.06)	0.95	0.92	0.06	–	–
3b	Metric invariance	139.41 (103)*	0.04 (0.02; 0.06)	0.95	0.93	0.07	3a	7.51 (10)
3c	Scalar invariance	199.86 (113)**	0.06 (0.05; 0.07)	0.89	0.85	0.08	3b	62.23 (10)**
3c	Partial scalar invariance[a]	149.07 (112)*	0.04 (0.02; 0.06)	0.95	0.93	0.07	3b	9.70 (9)
Attachment-related avoidance (MI across: Mothers and fathers; T1, T2, and T3)								
4[a]	Configural invariance	101.30 (93)	0.02 (0.00; 0.05)	0.98	0.99	0.06	–	–
4b	Metric invariance	117.60 (103)	0.03 (0.00; 0.05)	0.98	0.98	0.07	4a	15.02 (10)
4c	Scalar invariance	157.41 (113)*	0.05 (0.03; 0.06)	0.93	0.93	0.08	4b	47.84 (10)**
4c	Partial scalar invariance[b]	126.98 (110)	0.03 (0.00; 0.05)	0.97	0.97	0.08	4b	9.49 (7)

Note. MI = Measurement invariance; T1 = time 1; T2 = time 2; T3 = time 3; CI = confidence interval; preferred model in bold.
*$p < .05$, **$p < .01$.
[a] The constraints between mothers' and fathers' parcel 2 intercepts was removed.
[b] The constraints between all mothers' and fathers' corresponding parcels' intercepts were removed.

underlying the scores of parent-child attachment quality were equivalent (equal loadings and intercepts) over time and across mothers' and fathers' ratings.

The configural invariance models for parents' attachment-related anxiety (Model 3a) and attachment-related avoidance (Model 4a) showed acceptable overall fit to mothers' and fathers' reports from T1 to T3 (see Table 1). Weak metric invariance holds, both for the anxiety (Model 3b), $\Delta\chi^2(10) = 7.51$, $p = .677$, and avoidance scores (Model 4b), $\Delta\chi^2(10) = 15.02$, $p = .131$. The results did not support the assumption of strong MI both for the anxiety (Model 3c) and the avoidance scale (Model 4c). We were able to achieve strong partial MI for parents' anxiety (Model 3d), $\Delta\chi2(9) = 9.70$, $p = .376$, by removing the imposed equality constraint between mothers' and father's intercepts of the second parcel [item 6 ("I need a lot of reassurance that I am loved by my partner.") and item 10 ("I get frustrated if romantic partners are not available when I need them.")]. The difference between intercepts indicated that mothers more easily endorse these items than fathers. Strong Partial MI for parents' attachment-related avoidance was only possible after freeing the constraints between mothers' and fathers' corresponding parcels' intercepts (Model 4d), $\Delta\chi^2(7) = 9.49$, $p = .220$. This supports the invariance of items' intercepts across the different assessment points over time but not between mothers' and fathers' ratings.

Preliminary results

Table 2 presents descriptive statistics and zero-order correlations for the observed variables. Mothers and fathers reported low to moderate average levels of insecurity and moderate to high mother- and father-child attachment quality across all the assessment points. Overall, teachers reported high average scores of children's emotion regulation. We used SEM to estimate the change trajectories of mother- and father-child attachment security, and children's emotion regulation. We tested a growth curve model that demonstrated a good fit with the data, $\chi^2(18) = 25.05$, $p = .124$, RMSEA = 0.04 (90% CI [0.00; 0.08]), CFI = 0.98, TLI, = 0.95, SRMR = 0.05. Results indicate a significant increase in the estimated trajectories of mother-child attachment ($b = 0.05$, $p = .001$, 95% CI [0.02, 0.08]), father-child attachment ($b = 0.07$, $p < .001$, 95% CI [0.04, 0.10]), and children's emotion regulation ($b = 0.06$, $p = .014$, 95% CI [0.01, 0.12]) over the three-time points.

Correlations in Table 2 suggested high rank-order stability in mothers' and fathers' attachment (in)security and in mother- and father-child attachment quality over time. The stability in children's emotion regulation over time was moderate. Parents who display higher levels of insecurity tend to report lower parenting relationships quality. This seemed true regardless of the parent's sex. The correlations between mother-child attachment quality and emotion regulation were mainly positive, whereas those between father-child attachment quality and emotion regulation were non-significant and inconsistent, ranging from −0.15 to 0.20.

Cross-lagged panel model

To address our main hypothesis for this study, we tested a cross-lagged panel model, examining the concurrent and longitudinal associations between parents' average levels of attachment (in)security over time, mother- and father-child attachment quality, and children's emotion regulation, while controlling for child sex, age, and the length of the parents' romantic relationship (see Fig. 1). This model estimated the regression paths from mothers' and fathers' insecurity traits to the quality of their attachment relationship with the child at T1, T2, and T3. Additionally, it accounted for concurrent correlations between mother-child attachment, father-child attachment, and children's emotion regulation at T1, T2, and T3. Furthermore, it estimates lag 1 bidirectional associations among mother-child attachment, father-child attachment, and children's emotion regulation over time, all while controlling for the within-time correlations and autoregressive effects. Our baseline model was fully constrained, imposing parameters' invariance across time and type of parent-child dyad. This model included equality constraints on corresponding covariances, autoregressive, and cross-lagged paths at different time points and dyads (i.e., mother and father).

Results from model fit statistics presented in Table 3 indicated that the fully constrained model previously described (Model 1) did not fit the data well. We then tested a series of more complex models, specified by freeing the invariance constraints across time (Model 2) and mother/father dyads (Model 3). Model 2 relaxed the time stationarity assumption, enabling an investigation into whether the estimated paths varied based on the time lag (i.e., from T1 to T2 and from T2 to T3). In Model 3, different estimates were permitted for paths involving mother and father variables, allowing for a comprehensive exploration of the nuanced relationships within the parental dynamics and their impact on children's

Table 2
Means, standard deviations, and zero-order correlations for the observed variables.

Variable	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Mother Sec. (T1)	2.51 (0.90)	–																
2. Mother Sec. (T2)	2.41 (0.91)	0.57**	–															
3. Mother Sec. (T3)	2.61 (0.90)	0.53**	0.59**	–														
4. Father Sec. (T1)	2.56 (0.98)	0.36**	0.25**	0.29*	–													
5. Father Sec. (T2)	2.48 (0.81)	0.20*	0.21*	0.37**	0.60*	–												
6. Father Sec. (T3)	2.72 (0.86)	0.21*	0.28**	0.41**	0.56**	0.62**	–											
7. Child E.R. (T1)	3.36 (0.49)	−0.07	−0.11	0.02	−0.15	−0.13	−0.10	–										
8. Child E.R. (T2)	3.51 (0.42)	0.10	0.05	−0.04	−0.08	−0.20*	−0.08	0.25*	–									
9. Child E.R. (T3)	3.52 (0.44)	−0.01	0.04	−0.10	−0.09	−0.23*	−0.12	0.20*	0.40**	–								
10. M-C Att. (T1)	3.17 (0.35)	−0.20*	−0.31*	−0.19*	−0.20*	−0.08	−0.20*	0.20*	0.22*	0.10	–							
11. M-C Att. (T2)	3.21 (0.34)	−0.10	−0.36**	−0.30*	−0.13	−0.06	−0.06	0.06	0.19*	−0.02	0.57**	–						
12. M-C Att. (T3)	3.25 (0.38)	−0.18*	−0.35**	−0.31**	−0.05	0.00	−0.11	0.08	0.18	0.05	0.45**	0.55**	–					
13. F—C Att. (T1)	2.92 (0.39)	−0.11	−0.20*	−0.17*	−0.27**	−0.28*	−0.12	0.03	0.11	0.00	0.15*	0.15	0.06	–				
14. F—C Att. (T2)	2.97 (0.33)	−0.07	−0.16	−0.08	−0.11	−0.21*	−0.28*	−0.02	0.08	−0.15	0.07	0.22*	0.26*	0.56**	–			
15. F—C Att. (T3)	3.05 (0.33)	−0.05	−0.13	−0.22*	−0.15	−0.12	−0.33**	0.19	0.18	0.09	0.24*	0.25*	0.19*	0.49**	0.42**	–		
16. Length Par. Rel.	12.76 (4.43)	−0.04	−0.06	−0.02	0.07	0.08	0.02	−0.07	0.09	0.03	−0.10	0.05	0.02	−0.07	−0.04	−0.15	–	
17. Child age	4.01 (0.57)	0.06	0.10	−0.06	−0.07	−0.06	−0.09	0.10	0.08	−0.07	−0.03	0.13	−0.08	−0.02	−0.07	−0.01	0.00	–
18. Child sex (1 = girl)	0.45 (0.50)	0.07	−0.02	0.16	0.02	0.03	0.03	0.19*	0.19*	0.18*	0.02	0.03	0.05	−0.09	−0.07	−0.12	−0.02	−0.05

Note. Sec. = Security; E.R. = Emotion Regulation; M-C Att. = Mother-Child Attachment; F—C Att. = Father-Child Attachment; T1 = Time 1; T2 = Time 2; T3 = Time 3; M = Mean; SD = Standard Deviation.
$*p < .05$, $**p < .01$.

Table 3
Goodness of fit statistics for the nested models.

Model tested		X^2(df)	RMSEA (90% CI)	CFI	TLI	SRMR
Model 1:	Fully constrained model	184.87 (123)**	0.05 (0.03; 0.06)	0.88	0.86	0.07
Model 2:	Unconstrained time	149.56 (112)*	0.04 (0.02; 0.06)	0.93	0.90	0.06
Model 3:	Unconstrained mother/father	169.48 (111)**	0.05 (0.04; 0.07)	0.88	0.85	0.07
Model 4:	Final model	142.60 (113)*	0.04 (0.01; 0.05)	0.94	0.92	0.06
Model 5:	Final trimmed model	147.97 (123)	0.03 (0.00; 0.05)	0.95	0.94	0.07

$*p < .05$, $**p < .01$.

emotion regulation skills while imposing time stationarity. Table 3 includes model fit statistics for each one of these models. None of them reached optimal fit.

We followed a step-wise re-specification process based on the results from nested model comparisons, relaxing specific constraints among some of the cross-lagged parameters. The final model (see Fig. 2) imposed stationarity constraints on the autoregressive paths involving mother- and father-child attachment quality. Different estimates were provided for the autoregressive paths involving child emotion regulation and the cross-lagged paths of mother- and father-child attachment quality on children's emotion regulation across time. The stationarity constraints on the paths from child emotion regulation to mother, and father-child attachment quality were also dropped. Finally, we also set free the partner effects of the mother-child attachment on the father-child attachment and vice versa. Allowing these additional estimates resulted in a model with an acceptable fit to data (see fit statistics for model 4 in Table 3). Although more complex, this partially constrained model provided a significantly better fit to the data than the baseline, fully constrained model, $\Delta\chi^2(10) = 47.89$, $p < .001$. We proceeded by trimming the non-significant paths. This process resulted in a more parsimonious model without worsening the fit to the data, $\Delta\chi^2(10) = 6.37$, $p = .783$. The final, trimmed model provided an adequate fit to the data (see Model 5 fit statistics in Table 3).

Fig. 2 presents the final model's standardized estimates. We used subscripts in this figure to identify the equality constraints imposed among the autoregressive and cross-lagged effects. The model specified children's sex, age, and the length of couples' relationships as control variables. Results suggest that older children tend to show lower rates of mother-child attachment quality at T3 ($b = -0.11$, $p = .032$, 95% CI [−0.22, −0.01], $\beta = -0.18$). Compared to boys, girls were more likely to exhibit higher levels of emotion regulation at T1 ($b = -0.19$, $p = .006$, 95% CI [0.05, 0.32], $\beta = 0.19$), as well as at T2 and T3 ($b = 0.12$, $p = .039$, 95% CI [0.04, 0.20], $\beta = 0.13$). The length of couples' relationships was not associated with parents' attachment insecurity.

Although not displayed in the Fig. 2, the standardized factor loadings of the mothers' and fathers' attachment (in)security traits were reasonably high, ranging from 0.70 to 0.81. This suggests that a large proportion of these scores' variance was stable over time. There was a positive association between mothers' and fathers' insecurity ($r = 0.52$, $p < .001$) and between mother- and father-child attachment at T2 ($r = 0.23$, $p = .039$).

As represented in Fig. 2, all variables were relatively stable across time. From T1 to T2 and T2 to T3, the stability paths were significant both for children's child emotion regulation ($b_{1.1} = 0.21$ $p = .024$, 95% CI [0.02, 0.39]; $b_{1.2} = 0.46$, $p < .001$, 95% CI [0.26, 0.65]) and parent-child attachment quality ($b_2 = 0.46$, $p < .001$, 95% CI [0.37, 0.55]). The

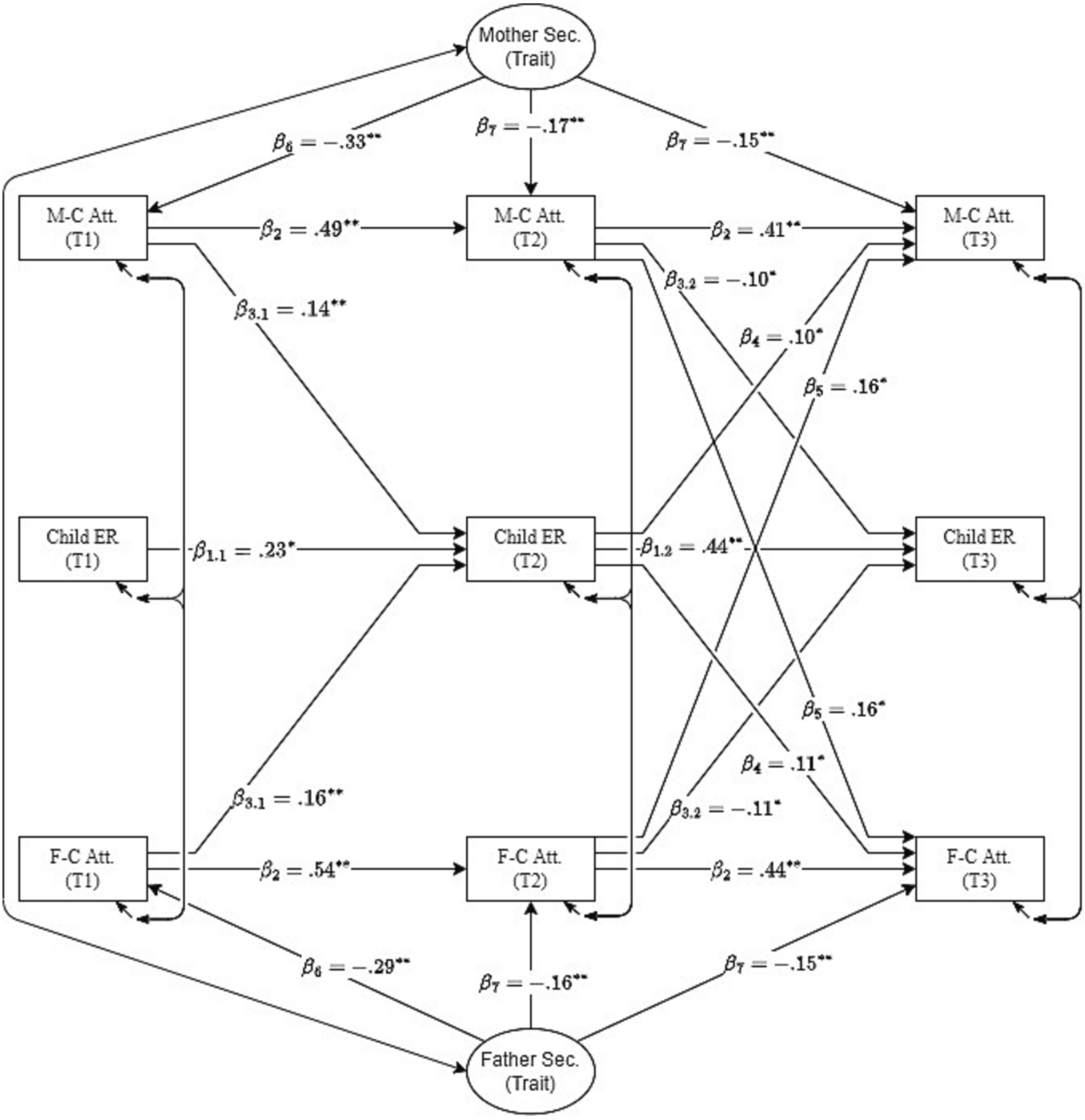

Fig. 2. Cross-lagged panel model examining associations between parents' attachment (in)security (Sec.), mother- and father-child attachment' quality (M-C Att. and F-C Att.), and children's Emotion Regulation (Child ER); T1 = Time 1; T2 = Time 2; T3 = Time 3. Numbers in subscripts are used to flag equality constraints; Child sex, age, and the length of the parents' romantic relationship were included as control variables; Lines representing non-significant paths are not displayed; *$p < .05$.; **$p < .01$.

autoregression parameters of parent-child attachment were invariant across dyad types (i.e., mother- and father-child).

Mothers' and fathers' attachment insecurity negatively predicted the quality of their attachment relationships with the child at T1 ($b_6 = -0.17, p < .001$, 95% CI [−0.23, −0.10]), as well as at T2 ($b_7 = -0.08, p < .001$, 95% CI [−0.18, −0.04]) and T3 ($b_7 = -0.08, p < .001$, 95% CI [−0.18, −0.04]), while controlling for the autoregressive effects. This means that, a more secure trait of attachment towards the romantic partner is linked to an increasing parent-child attachment quality, both for mothers and fathers. There was a positive association between mother- and father-child attachment quality at T1 and children's emotion regulation at T2 ($b_{3.1} = 0.17$, $p = .001$, 95% CI [0.07, 0.27]) while accounting for prior levels of emotion regulation. Nevertheless, higher mother- and father-child attachment quality at T2 were linked to children's lower scores of emotion regulation at T3 ($b_{3.2} = -0.14$, $p = .013$, 95% CI [−0.25, −0.03]). Children's higher emotion regulation abilities at T2 were associated with a higher quality of mother- and father-child attachment at T3 ($b_4 = 0.09$, $p = .04$, 95% CI [0.00, 0.17]) after controlling for prior attachment. Finally, the paths from mother-child attachment to father-child attachment, and vice versa, were

significant only from T2 to T3 ($b_5 = 0.17$, $p = .021$, 95% CI [0.03, 0.32]), suggesting a positive interdependence between these two relational contexts as children progress through their developmental stages.

Discussion

The current study adopts a family system approach to investigate how distinct family relationship subsystems interplay to influence children's emotion regulation abilities. We considered both mother- and father-child relationships and, guided by an attachment perspective (Bretherton & Munholland, 2008; Jones et al., 2015), investigated whether parents' attachment security shape the quality of parent-child attachment relationships. Furthermore, inspired by a transactional approach to human development (Sameroff & Mackenzie, 2003), we examined whether children's emotion regulation abilities influence and are influenced by mother- and father-child attachment quality.

Parents' attachment security and parent-child attachment quality

The current study focuses on the couple and parenting subsystems, adopting a longitudinal dyadic data analytical approach to disentangle how parent-partner attachment (in)security can interfere with the quality of parent-child attachment. We assumed that attachment representations are relatively stable over time and employed a trait-like analytical approach to couple attachment. Our results support this assumption, indicating that a large proportion of variance in mothers' and fathers' scores was explained by a latent construct representing the overall levels of attachment (in)security over time.

Prior evidence indicated that parents' own attachment representations could influence their relationships with the child (van Ijzendoorn, 1995). The current study adds to this research by investigating the extent to which parents' attachment insecurity towards the partner, characterized by higher levels of attachment-related anxiety and avoidance, relates to the parent-child attachment quality. Using a dyadic approach, we found a negative link between insecurity and parent-child attachment quality that was consistent for mothers and fathers over time. This finding can be interpreted considering the interaction between attachment and caregiving behavioral systems (Jones et al., 2015). Prior literature claims that these two behavioral systems work synchronously, and that parents' insecure attachment styles can undermine their caregiving behavior (Fonseca et al., 2018; Jones et al., 2015; Millings et al., 2013). Our findings support this claim, indicating that parents' insecurity towards their romantic partners, marked by high levels of attachment-related anxiety and avoidance, might undermine the quality of their relationship with the child.

Parent-child attachment quality and child emotion regulation

Considering the overwhelming evidence (Cooke et al., 2019), we hypothesized for the current study that mother- and father-child attachment quality would predict higher rates of children's emotion regulation throughout time. Results indicated that mother- and father-child attachment quality at T1 predicted higher levels of children's emotion regulation, later at T2, with similar size effects. These findings supported our expectation that children who benefit from higher parent-child attachment quality are more likely to display higher levels of children's emotion regulation. Surprisingly, we have not observed a positive effect of parent-child attachment quality at T2 on children's subsequent emotion regulation skills. Conversely, results suggested that higher rates of parent-child attachment at T2 predicted lower levels of children's emotion regulation at T3. Considering the distinct correlations among the study's main variables observed for boys and girls, we conducted a set of new analyses to investigate whether children's sex moderated the links between parent-child attachment quality and emotion regulation (see supplemental material for a detailed description of these results). Results from a multi-group SEM suggested that the positive effects of mother- and father-child attachment quality at T1 on children's emotion regulation at T2 were consistent for girls and boys. Nevertheless, at subsequent time points, these effects were moderated by parent and child sex. Higher levels of mother-child attachment at T2 were associated with boys' higher emotion regulation rates at T3. On the contrary, higher levels of father-child attachment at T2 were linked, at T3, to lower emotion regulation for boys and higher emotion regulation for girls.

These findings suggested that mother- and father-child attachment can predict young girls' and boys' emotion regulation differently, particularly at later ages, when differences in gender roles become more evident (Martin & Ruble, 2010). For instance, the association between father-child attachment quality and boys' emotion regulation abilities was found to be positive between T1 to T2 but negative between T2 to T3. For girls, however, father-child attachment quality seems to relate to more emotion regulation abilities consistently over time. These findings suggest that the link between paternal awareness and responsiveness and children's regulatory skills is dynamic, changing over the preschool period, depending on the children's sex. Some prior studies have found evidence for the moderating role of children's sex on the effects of parenting relationships' quality and children's emotion regulation (Chaplin, Cole, & Zahn-Waxler, 2005; Van Lissa, Keizer, Van Lier, Meeus, & Branje, 2019). For instance, Chaplin et al. (2005) found that boys' and girls' emotional responses, namely submissive and disharmonious emotions, receive, since early ages, differential attention and response, particularly by fathers. Furthermore, in a longitudinal study involving adolescents, Van Lissa et al. (2019) reported a positive effect of maternal support on girls', but not boys', emotion regulation. Despite these promising results, this line of research is still poorly explored, and more studies are needed to understand further the extent to which children's sex moderates the link between parenting quality and children's emotion regulation.

Child and partner effects on parent-child attachment quality

Prior research documented that parenting dimensions, such as responsiveness and engagement, are subject to significant changes over time. These changes are, at least partially, driven by children's characteristics (Ferreira et al., 2022; Mackler et al., 2015). The current study adds to these prior works, pointing out a connection between children's emotion regulation and parent-child attachment quality. Specifically, we found that children's ability to express and control emotions in social interactions, as reported by teachers, relates to greater levels of parental emotional awareness, responsiveness, closeness, and support. This link was particularly evident from T2 to T3 in our study. It is possible that, as children age, their regulatory difficulties might become more apparent to parents, more clearly influencing parent-child attachment quality. The current study uniquely focuses on the between-child effect of emotion regulation on parenting. We need additional research to clarify the effect of children's emotion regulation on parent-child attachment quality while controlling for emotion regulation developmental changes at the within-child level. Nonetheless, it seems that, from an early age, children's socioemotional abilities, such as emotion regulation, can shape important features of parent-child relationships.

Another interesting conclusion from the current study relates to the systemic notion of interconnection between different dyadic relationships within the family system (Cox & Paley, 1997). Relationships within the family system are interdependent, dynamically affecting each other over time (Cox & Paley, 1997). Indeed, results suggest that children who benefit from a parent's higher levels of closeness, support, and responsiveness will more likely experience these positive relational features in the context of the relationship with the other parent. This finding illustrates the close interconnection between family subsystems, highlighting the paths through which mothers' and fathers' caregiving behavioral and emotional styles are transmitted within the same family system, thereby affecting children's emotion regulation abilities.

Strengths, limitations, and future direction

The current study investigated the connections of two crucial relational contexts (i.e., parent-partner and parent-child relationships) to children's emotion regulation skills during preschool. Our results point out that mother- and father-child attachment quality consistently relates to children's emotion regulation. These relationships are interdependent and shaped by parents' own romantic attachment styles and children's regulatory abilities. Together, these results yielded important implications for informing interventions that address child emotion regulation abilities. The first one concerns the need to address relational dimensions from parents' or primary caregivers' relational experiences when developing parenting programs that target children's emotional and psychosocial adjustment outcomes. Comprehensive interventions have been developed in the field, showing that attachment-informed practices could be particularly effective in addressing attachment and caregiving dynamics, contributing for inducing changes in both child and caregiver behaviors (e.g., Byrne et al., 2019; Dozier, Bernard, & Roben, 2018; Woodhouse, Powell, Cooper, Hoffman, & Cassidy, 2018). The second result concerns the complex interaction found between parent-child relationship quality and child emotion regulation abilities, particularly addressing the father's role. This result highlights the need to pay further attention to differences that may result from cultural or gender expectations regarding parenting or child behaviors when evaluating parent and child relationships. Helping parents understanding that emotion regulation is a developmental acquisition that benefits from a caring and supportive environment throughout time could be important for dealing with challenges that may arise in parent-child relationships through the preschool years. The last implication regards the need to develop systemic interventions for addressing child emotion regulation as a dynamic and relational construct. The close link between parents' relational experiences and parent-child relationships supports a spillover effect of positive behaviors and dynamics in the family system (Neppl et al., 2019), which should be critical when developing interventions for children who exhibit emotion regulation difficulties.

This study has several strengths. We used data from multiple sources (i.e., mothers', fathers', and teachers' reports), employed appropriate statistical procedures to ensure measurement equivalence across time and informants, and adopted a longitudinal design for testing our hypotheses. However, some limitations must be acknowledged. The present study exclusively relies on reports from mothers, fathers, and teachers to assess parent-child attachment quality and children's emotion regulation. Future research can avoid this methodological limitation by adopting a multi-method approach, integrating self-report data with direct observations of attachment quality and objective assessments of children's emotion regulation. We used parcels to examine the factor structure and invariance of the measurement models. While this approach reduced the number of parameters in the models and helped prevent model convergence issues, parcels can potentially obscure the interpretation of indicator content and introduce bias, particularly when comparing latent means (Lee & Whittaker, 2021). Although we established strong measurement invariance for parent-child attachment and children's emotion regulation, the scores for parents' attachment-related anxiety and avoidance only reached partial strong invariance. Specifically, while we found longitudinal strong measurement variance for supporting the trait approach in this study, mothers' and fathers' scores were not invariant at the item's intercept level, preventing unbiased comparisons between mothers' and fathers' average scores of attachment-related anxiety and avoidance. Additionally, while our study leverages the advantages of a longitudinal design, it is crucial to recognize the constraints in definitively establishing causal relationships among the variables. To address this limitation, future research endeavors could explore our hypothesis through experimental designs. While we acknowledge that practical constraints and ethical considerations may limit the manipulation of certain variables, experimental investigations, such as randomized control trials, may offer opportunities to elucidate the impacts of attachment-based interventions that concentrate on couples and parenting relationships on children's emotion regulation. The results documented in this work were based on data from dual-earner families, including a relatively large proportion of highly educated parents. Generalizing the findings to children from other family configurations, low socioeconomic families, or minority groups should be made with caution. Finally, we acknowledge our modeling approach's inability to capture stable sources of within-person variation in children's emotion regulation, parent-child relationship quality, or father-child relationship quality, potentially resulting in biased estimates. There are more robust modeling strategies for tackling this issue that comprise the estimation of both within- and between-person parameters, namely the autoregressive latent trajectory model (Bianconcini & Bollen, 2018; Bollen & Curran, 2004; Hamaker, Kuiper, & Grasman, 2015). Unfortunately, these alternatives would imply a substantial increment in model complexity, which, given our sample size and study design, would result in inadequate levels of statistical power and model identification issues. Despite these limitations, the current study offers important insights to further understanding the paths through which mothers' and fathers' attachment can shape their caregiving quality, with implications for children's acquisition of essential regulatory abilities.

CRediT author statement

Tiago Ferreira: Study conception, data acquisition, design, data analysis, drafting and manuscript revision. **Marisa Matias:** Methodology, data acquisition, and manuscript revision. **Helena Carvalho:** Conceptualization and manuscript revision. **Paula Mena Matos:** Conceptualization, methodology, manuscript revision, funding acquisition, supervision, and project administration.

CRediT authorship contribution statement

Tiago Ferreira: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Marisa Matias:** Data curation, Methodology, Writing – review & editing. **Helena Carvalho:** Conceptualization, Writing – review & editing. **Paula Mena Matos:** Conceptualization, Funding acquisition, Methodology, Project administration, Writing – review & editing.

Data availability

The datasets and R syntax for data analyses are open access (https://doi.org/10.5281/zenodo.10357858), licensed under a Creative Commons Attribution 4.0 International license.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.appdev.2023.101617.

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