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RESEARCH

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Investigating moderators of daily marital to parent–child spillover: Individual and family systems approaches

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Abstract

Objective: We tested whether cognitive reappraisal and coparenting quality moderate marital to parent–child spillover in mothers and fathers.

Background: The influence of marital relationship quality on parent–child relationships, referred to as the spillover effect, is well documented. Factors that may attenuate the occurrence of spillover, however, remain unclear. Cognitive reappraisal, an emotion regulation strategy that promotes the reframing of emotional situations as neutral or positive, and coparenting—the intermediate subsystem between the marital and parent–child relationships—may buffer the effects of marital to parent–child spillover.

Method: Using daily diary data from mother–father couples ($N = 96$) of young children ($M_{age} = 3.22$ years), we investigated coparenting quality and cognitive reappraisal as moderators of marital and parent–child spillover within and between days.

Results: Dyadic multilevel models revealed within-day spillover of marital emotional climate and parent–child emotional climate for both mothers and fathers. Whereas cognitive reappraisal moderated spillover for fathers, no significant moderators emerged for mothers. Fathers also experienced next-day associations between marital emotional climate and parent–child emotional climate the following day, whereas mothers did not. Coparenting quality accounted for next-day associations between fathers' marital emotional climate and parent–child climate.

Author note: We are grateful to the families for their participation, and to Cheryl Lee and Heidi Miller for their assistance in recruitment.

Conclusion: Overall, our results evince that although spillover can be attenuated by both cognitive reappraisal and coparenting quality for fathers, the same is not true for mothers.
Implications: These results signify the importance of considering mother and father differences in empirical investigations of spillover effects and processes within the family system, and the clinical implications recommended to marriage and family therapists.

KEYWORDS
cognitive reappraisal, coparenting, fathers, mothers, spillover

The marital relationship serves as the basis of adaptive or maladaptive family functioning (Bowen, 1978; Cox & Paley, 2003). According to family systems theory (Bowen, 1978; Cox & Paley, 2003), all other relationships within the family (e.g., parent–child) are organized around the marital relationship such that disturbances within the marriage often affect parent–child relationships (Almeida et al., 1999; Erel & Burman, 1995; Lee et al., 2020; Sears et al., 2016). This phenomenon, known as the spillover effect, is commonly observed among families with young children (Almeida et al., 1999; Erel & Burman, 1995; Gao et al., 2019; Lee et al., 2020; Sears et al., 2016) and plays a key role in overall family well-being (Cox & Paley, 2003). The spillover effect has far-reaching impacts on families and child outcomes (Cummings & Davies, 2002) and has been studied across differing timescales through cross-sectional associations, longitudinal associations across months or years, or within and between days (e.g., Erel & Burman, 1995; Gao & Cummings, 2019; Katz & Gottman, 1996; Stroud et al., 2015).

Although the spillover effect is a robust finding within the literature, research investigating modifiable factors that would attenuate spillover lags behind (Coiro & Emery, 1998; Cummings & Davies, 2002; Erel & Burman, 1995; Krishnakumar & Buehler, 2000), with some exceptions (Merrifield & Gamble, 2013). In this paper, we investigated whether individual- and couple-level factors could moderate spillover within and between days and specifically focused on the spillover in emotional climate of the marital relationship to the parent–child relationship. Emotional climate is intended to broadly capture the emotional quality of each relationship (Brophy-Herb et al., 2013), rather than specific aspects of a relationship (e.g., conflict, cooperation) or how the relationship functions within specific contexts (e.g., disciplinary situations, routine household activities).

Spillover processes within the family system

A critical first step in mitigating potential spillover is to understand spillover as both an intra- and interpersonal process (Stroud et al., 2015). Whereas the *causes and effects* of spillover are interpersonal—relational behaviors with one partner (i.e., spouse) alter relational behaviors with another partner (i.e., child)—the affective *experience* of spillover is intrapersonal (Bradbury et al., 2000; Stroud et al., 2015). Given that spillover is both an affective and behavioral process, potential moderators are likely to exist at both the individual and couple levels (Belsky, 1984; Bowen, 1978; Cox & Paley, 2003; Feinberg, 2003). The individual-level factor that likely mitigates the affective experience of spillover is emotion regulation (Gross & John, 2003; Kuo & Johnson, 2021) or, more specifically, cognitive reappraisal—a tactic where negative feelings arising from the marital relationship are reframed and not transferred to the

parent–child relationship. The couple-level factor most likely to moderate the behavioral experience of spillover is coparenting quality, as the coparenting relationship is considered the intermediate subsystem between the marital and parenting relationships according to family systems theory (Cox & Paley, 2003).

Possibly operating in contrast to, or in tandem with, the spillover effect is the compensatory effect in which marital conflict is associated with improved parent–child relationships (Belsky et al., 1991). Put another way, whereas the spillover effect captures a positive association between marital and parent–child relationships, the compensatory effect captures a negative association between marital and parent–child relationships. For example, one parent may attempt to compensate for marital conflict by giving more attention or support to their child (Katz & Gottman, 1996). Although Erel and Burman's (1995) landmark meta-analysis supported the spillover effect over the compensatory effect, some recent evidence has found compensatory effects (negative associations) between marital quality and parent–child relationships alongside spillover effects (positive associations), particularly when examining within-family associations over consecutive days (e.g., Gao & Cummings, 2019; Kouros et al., 2014). Although evidence for the compensatory effect is still nascent, the between-day time frame may offer a regulatory or cooling off period for spouses by engaging more with their children.

Cognitive reappraisal as an intrapersonal moderator of spillover

Emotion regulation is effective in improving both marital and parent–child relationships (Barros et al., 2015; Carreras et al., 2019; Shaffer & Obradović, 2017) and has been shown in both observational studies and cross-sectional reports to reduce spillover (Low et al., 2019; Kuo & Johnson, 2021). Although there are a variety of emotion regulation strategies that may influence relationships within the family system, the strategy of cognitive reappraisal has been shown to be particularly effective in reducing negative mood and improving interpersonal interactions (d'Arbeloff et al., 2018; Gross & John, 2003; Nolen-Hoeksema, 2012). When people engage in cognitive reappraisal, they reframe an emotional situation as neutral or positive, which ultimately reduces negative affect (Gross & John, 2003; Marroquín & Nolen-Hoeksema, 2015; Nolen-Hoeksema, 2012). Because women tend to use cognitive reappraisal as an emotion regulation strategy more than men (Nolen-Hoeksema, 2012), one may hypothesize that gender differences would also emerge in the moderating effect of cognitive reappraisal on spillover. However, based on our recent data, we found there were no significant gender differences within couples on cognitive reappraisal (Kuo & Johnson, 2021).

Previous research has advocated for the integration of parental cognitive reappraisal into family process models (Bariola et al., 2011) due to the reported association between cognitive reappraisal and positive parental behavior. Cognitive reappraisal has been associated with observed labeled praise (Kohlhoff et al., 2016), encouraging emotion (Meyer et al., 2014), and supportive reactions (Gunzenhauser et al., 2014). Cognitive reappraisal skills may also promote a positive parent–child relationship by allowing parents to compartmentalize more effectively, by reframing emotion-eliciting situations within their marital relationship as neutral or positive, and thus preventing any negativity from spilling over into the parent–child relationship.

Our recent data show that cognitive reappraisal moderates associations between marital dissatisfaction and parenting stress in mothers and fathers (Kuo & Johnson, 2021). Specifically, cognitive reappraisal weakened the association between marital dissatisfaction and parenting stress for mothers; and among fathers with greater marital dissatisfaction, having high cognitive reappraisal was associated with lower parenting distress (Kuo & Johnson, 2021). However, in that paper, all measures were taken from the baseline time point, which reflects global levels of functioning. In this manuscript, we investigate whether reported general use of cognitive reappraisal moderates marital-to-parenting spillover on a daily basis. Daily diary data offers an

advantage over relying on cross-sectional data by providing information on intraindividual variability and episodic knowledge of each day's experiences (Lischetzke & Könen, 2020). Thus, daily diary data may capture more ecologically valid data on family life than conducting structured observations of couples or asking participants to self-report global assessments of their family's emotional climate.

Coparenting as an interpersonal moderator of spillover

Although coparenting and marital relationships are interwoven in two-parent families, there are important distinctions that dictate how they operate within the family system. In both coparenting and marital relationships, parents are the critical actors; however, the coparenting relationship is different than the marital relationship due to distinct goals and foci that drive specific interactions. Whereas the goals and focus in the marital relationship may include individual and couple aspects (e.g., romantic, sexual, financial), the goal and focus within the coparenting relationship is centered around the child/children and is shaped by the partner's parenting support and coordination (Feinberg, 2003; Margolin et al., 2001). Because the coparenting relationship incorporates the interest (and sometimes involvement) of the child, it is considered a family-level system compared to the marital relationship, which is a dyad-level system (Margolin et al., 2001).

Within family systems theory, the coparenting relationship is viewed as the intermediary subsystem between the marital relationship and the parent–child relationship within intact families (Cox & Paley, 2003; Feinberg, 2003; Pedro et al., 2012). A growing body of literature supports this view, as coparenting quality has been shown to be related to both marital quality and parent–child relationships (Adler-Baeder et al., 2018; Kuo et al., 2017; Pedro et al., 2012), and coparenting conflict has been identified as the central link between bidirectional associations of marital discord and child problems (Cui et al., 2007; Zemp et al., 2018). High quality coparenting relationships are evidenced by mutual support and a strong alliance between parents—in essence, how well parents work together as a team in raising their children (Baril et al., 2007; Margolin et al., 2001). Thus, positive interactions within the marriage likely bolster effective teamwork between parents regarding their child, which supports positive parent–child relationships.

Although family systems theorists agree that the coparenting relationship is the critical link between the marital and parent–child relationships, the ways in which coparenting links the two systems is up for debate. Whereas some may consider coparenting as a mediator between marital and parent–child relationships—in which marital relationships affect the coparenting relationship, which in turn shapes the parent–child relationship (Feinberg, 2003; Peltz et al., 2018)—there may be an alternative mechanism in which coparenting relationships actually *moderate* associations between the marital and parent–child relationships (Merrifield & Gamble, 2013). For example, a couple with low marital satisfaction may try to put aside their marital differences for the sake of their children, and thus still have a high-quality coparenting relationship despite a low-quality marital relationship (Margolin et al., 2001). Indeed, high quality coparenting relationships can exist independently of marital relationships—as seen in divorced couples (Braver et al., 2018). In this report, we investigated coparenting quality as a moderator of daily associations between marital and parenting emotional climate.

Spillover processes for fathers and mothers: Similarities or differences?

Some scholars have argued that fathers are more vulnerable to spillover than mothers are within opposite-sex couples (Cummings et al., 2004; Cummings et al., 2010), but evidence on this matter is mixed (Coiro & Emery, 1998; Erel & Burman, 1995; Gao et al., 2019; Kuo & Johnson, 2021). The mixed findings may result from overlooking potential moderators

(e.g., coparenting) that differentially affect spillover in fathers and mothers. For instance, it has been proposed that fathers are more vulnerable to spillover from the marriage through maternal gatekeeping given that mothers have greater power in shaping parent–child relationships than fathers do (Allen & Hawkins, 1999).

Specifically, gatekeeping is more likely to occur when mothers perceive themselves to be a more competent and engaged caregiver than the father and in cases in which the mother–father relationship is strained (Fagan, 2020). When mothers restrict or reduce shared parenting while preserving her own bond with the child, these restrictions can then undermine the father–child relationship through reduced father involvement and fathers' lower sensitivity and pleasure during father–child interactions (Fagan, 2020). Thus, the perception of coparenting quality may be a more influential moderator of fathers' spillover compared to mothers' spillover. For example, one study reported that coparenting moderates the association between marital quality and parenting self-efficacy more so for fathers than mothers (Merrifield & Gamble, 2013). However, given limited evidence, we did not make directional hypotheses about coparenting as a moderator for fathers compared to mothers.

Current study

The goals of the current study were to investigate daily spillover in marital emotional climate and parent–child emotional climate from an inter- and intrapersonal perspective. Examining moderators of spillover from a daily standpoint, as opposed to a single time point, lends greater validity to the findings and provides insight into the daily fluctuations that influence the family system over time. For instance, prior research has demonstrated that parent–child relationships are vulnerable to marital relationship quality on a day-to-day basis (Gao et al., 2019) and that the quality of daily emotional interactions between family members accumulate over time, contributing to relationship well-being (Walsh et al., 2017).

In this context of daily data, we tested whether coparenting quality (interpersonal) and cognitive reappraisal (intrapersonal) moderated spillover and explored whether coparenting more strongly moderated fathers' spillover than mothers' spillover. We hypothesized that there would be positive associations between marital emotional climate and parent–child emotional climate within and between days. Based on previous findings regarding the compensatory hypothesis (Gao et al., 2019; Kouros et al., 2014), we expected that if it were to emerge, then it would be between-days only. We also hypothesized that both cognitive reappraisal and coparenting quality would weaken links between marital emotional climate and parent–child emotional climate. Finally, we explored whether differences in significant moderators emerged between fathers and mothers.

METHOD

Data come from a larger online study about parenting stress with young children. All participants were members of cohabitating opposite-sex couples who had at least one child aged 6 years or younger and resided in the United States. The study included baseline surveys and 10 days of daily diary reports from each parent collected over a 2-week period and received ethical approval from University of Notre Dame's Institutional Review Board. A 10-day diary was chosen to gather enough daily data while minimizing participant burden (Iida et al., 2012). The current report uses data from both the baseline survey and daily diary reports. Data were collected in 2019.

Following informed consent, 202 participants were enrolled into the study as a couple (101 couples). All participants were then sent a baseline survey, and 198 participants completed the baseline survey. However, participants were only allowed to progress to the daily diary

portion if both members of the couple completed the baseline survey, after which, participants chose their 2-week period to complete 10 daily diaries. Thus, 194 participants (97 couples) were invited to progress to the daily diary portion, and we were able to obtain diary reports from 96 couples (192 participants).

Participants

The majority of participants were married (89.7%) with an average of 9.89 years ($SD = 4.87$ years) in the relationship. Participants reported having a range of 1 to 7 children living at home ($M = 2.24$, $SD = 1.31$), and the mean age of children in these families was 3.22 years ($SD = 2.33$ years). There were 114 male and 110 female children. Children were biological, adopted, or stepchildren of the parents in the study. Nearly all mothers in the sample (98%) reported having at least one biological child, whereas two mothers reported having zero biological children. Two mothers reported having adopted children, and seven mothers reported having stepchildren. All fathers reported having at least one biological child, seven fathers reported having at least one stepchild, and two fathers reported having adopted children.

Participants lived in all areas of the United States: 13% were from the Northeast, 65% from the Midwest, 16% from the South, and 6% from the West. Mothers and fathers were highly educated, as most parents reported earning a bachelor's degree or higher (76% of mothers; 70.4% of fathers). The sample was largely racially homogenous: 87.1% of mothers and 89.1% of fathers were White. The remaining racial categories represented were Asian (three mothers; four fathers), Black/African-American (seven mothers; three fathers), and other (two mothers; one father). Five mothers and two fathers identified as Hispanic. Participants' household income ranged from <$19,999 to >$120,000, and the median reported income category was $70,000–$79,000. As is commonly represented among families with young children (U.S. Bureau of Labor Statistics, n.d.), disparities in fathers' and mothers' work status existed in the participating couples. Whereas 84.7% of fathers worked full-time, 36.4% of mothers worked full-time. Within these participants, 43.4% of mothers, but only 3.1% of fathers, reported not being employed outside the home. Part-time work was also unevenly distributed between mothers and fathers with 15.2% of mothers and 4.1% of fathers reporting working part-time.

Measures

Daily marital and parent–child emotional climate

Daily diary measures were adapted from previous studies (Gao & Cummings, 2019; Kouros et al., 2014). To assess daily marital and parent–child emotional climate, participants were asked the following question: "Rate the emotional quality of your relationship with your spouse TODAY." Similarly, to assess parent–child relationship climate, participants were asked the following: "Rate the emotional quality of your relationship with your children TODAY." Response options for both questions ranged from 1 (*extremely positive*) to 7 (*extremely negative*). Thus, higher scores reflected greater negativity. Daily ranges for mothers' marital and parent–child emotional climate spanned the full scale (1–7), whereas daily ranges for fathers spanned 1–6.

Coparenting quality

Coparenting quality was assessed using the Parental Alliance Measure (PAM; Abidin & Konold, 1999). This measure captures the perceived partnership and teamwork a parent feels

with their parenting partner (e.g., "My child's other parent believes I am a good parent," "My child's other parent and I have the same goals for our child"). Fathers and mothers completed the 20-item scale using a 5-point Likert rating (1 = *strongly disagree* to 5 = *strongly agree*) and the mean of all responses was used for the composite score, with higher scores indicating higher coparenting quality ($\alpha = .95$ mothers, $\alpha = .92$ fathers). There were no significant gender differences within couples in coparenting quality, $t(93) = .64$, $p = .52$.

Cognitive reappraisal

Mothers and fathers completed the Cognitive Reappraisal subscale of the Emotion Regulation Questionnaire (Gross & John, 2003) to measure their use of cognitive reappraisal as an emotion regulation strategy (e.g., "When I want to feel less negative emotion, I change the way I'm thinking about the situation"). The Cognitive Reappraisal subscale consists of six items rated on a Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). The mean of all six items was used to create a composite, with higher scores indicating more cognitive reappraisal ($\alpha = .77$ mothers, $\alpha = .80$ fathers). There were no significant gender differences within couples in cognitive reappraisal, $t(95) = 1.51$, $p = .13$.

Procedure

Potentially interested participants contacted the first author through a website submission form that was distributed via targeted social media ads to users that matched our key demographics (18+ years of age, parents of young children, coupled), word of mouth, or snowball methods. Then, after receiving more information via email, interested participants were invited to complete a screening survey. Screening criteria included age 18 years or older, in a cohabitating opposite-sex relationship, parent of at least one child age 6 years and under, and residing in the United States.

If they met the screening inclusion criteria, the parent would be shown the consent form and asked to provide contact information for themselves and their partner. Partners were then invited to complete the same screening and consent. After both partners consented, they were enrolled as a couple into the study and sent individual baseline surveys. Each participant was then compensated with a $5 gift card after survey completion.

Following completion of the baseline survey by both members of the couple, participants selected a start date for their daily diaries in which they would both would be at home with their child/children for a 2-week period. Each participant was then sent a daily survey for 10 days. Participants were asked when they wanted to receive reminder links to complete the daily survey, 7 p.m. or 9 p.m. local time and the method of notification (email or text message). Checks on daily completion were performed at the end of the 10-day period. If participants did not complete 10 surveys within the 10-day period, additional surveys were sent until either the 2-week period was over or 10 surveys were completed, whichever came first. Each participant was compensated with a $1 gift card per survey completed at the end of the diary period, and if both members of the couple had full completion on baseline and diary surveys, then they were eligible to enter into a drawing for a $100 gift card.

Data analysis plan

To determine whether cognitive reappraisal or coparenting quality moderated daily spillover between marital and parent–child emotional climates, we conducted a series of dyadic

multilevel (two-level) models or dyadic two random-intercept models (Kenny & Kashy, 2011; Raudenbush et al., 1995) using nlme R package (Pinheiro et al., 2020) in R statistical software (R Core Team, 2020). More specifically, we employed two random-intercept models to examine daily spillover between marital and parent–child emotional climates for both mothers and fathers. This means that two dummy-coded variables indicating mothers (e.g., $M_i = 1$ indicates mother) and fathers (e.g., $F_i = 1$ indicates father) were included into the models. Two random intercepts were incorporated simultaneously to estimate intercept and slope coefficients for each mother and father.

We specified Level 1 in our dyadic multilevel models as the daily level or within-couple level and Level 2 in our models as the individual level or between-couple level. Level 1 predictors (e.g., daily marital emotional climate) were group-mean centered. This means that each individual's daily marital emotional climate score was centered using the individual's averaged marital emotional climate score across 10 days. We also included a Level 1 covariate called *Time* to account for potential systematic fluctuation in parent–child emotional climate scores (Gao & Cummings, 2019). Additionally, Level 2 variables (e.g., coparenting quality, cognitive reappraisal) were grand-mean centered, meaning that father's or mother's coparenting quality and cognitive reappraisal scores were centered using the average of means across fathers' and mothers' scores (Gao & Cummings, 2019).

The first set of models tested for within-day and between-day spillover. Based on the results of these models, we built the moderating models, which included coparenting quality and cognitive reappraisal as moderators of associations between marital emotional climate and parent–child emotional climate. We were guided by multiple determinants of parenting approaches (Belsky, 1984) that presume that intrapersonal variables (e.g., parent's use of cognitive reappraisal as an emotion regulation strategy) exert more influence than interpersonal variables (e.g., relationship quality between mother and father) and that these variables should be entered in order of proximal to distal influence. Thus, we included cognitive reappraisal first and then expanded the model to include coparenting quality in the final model. We fitted the within-day model and the between-day model to our data using nlme R package (Pinheiro et al., 2020). Finally, we probed any significant interactions using the Johnson-Neyman region of significance technique (Preacher et al., 2006) to determine the direction of the moderating effects. Analyses were conducted on the total sample; missing data were handled using restricted information maximum likelihood (REML). REML works similarly to the full information maximum likelihood (FIML) estimation method in terms of treating missing data. These types of the maximum likelihood estimation methods are known to handle missing data following missing completely at random or missing at random mechanisms (Enders, 2010), meaning that data do not need to be missing completely at random as the most conservative missing pattern in order for REML to be used.

Nakagawa and Schielzeth (2013) suggested using marginal R^2 and conditional R^2 for the mixed-effects regression models. Thus, we employed Nakagawa and Schielzeth's (2013) marginal R^2 and conditional R^2 to provide the extent to the proportion of variance explained in the outcome. The marginal R^2 is the proportion of variance in a dependent variable explained by fixed effects, whereas the conditional R^2 is the proportion of variance in a dependent variable explained by both fixed effects and random effects. Note that the interpretation of the R^2 values in our models are not the same as R^2 in linear regression.

RESULTS

Preliminary analyses

See Table 1 for correlation matrix, means, and standard deviations of main study variables.

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TABLE 1 Zero-order correlations and descriptive statistics for main study variables

Variable	1	2	3	4
1. Coparenting quality	—	−.004	−.20	.01
2. Cognitive reappraisal	.24*	—	−.03	−.11
3. Day 1 marital emotional climate	−.20	−.20	—	.32**
4. Day 1 parent–child emotional climate	−.002	−.06	.27**	—
Father mean (*SD*)	4.32 (.48)	5.07 (.89)	1.99 (.85)	1.87 (1.05)
Mother mean (*SD*)	4.37 (.57)	5.26 (.81)	2.09 (1.01)	1.85 (.88)

Note. Correlations for fathers are presented below the diagonal ($n = 93$–97); correlations for mothers are presented above the diagonal ($n = 93$–100).
*$p < .05$. **$p < .01$.

We first conducted preliminary testing of potential covariates that would explain variance in our outcome, parent–child emotional climate. We prescreened for demographic covariates of parent–child emotional climate using the first day's reports. The following demographic variables were tested and none were significantly related to parent–child emotional climate: parent age, household income, relationship length, number of children, average age of children, parent race and ethnicity, parent work status, parent education, parent marital status, and geographic location. Thus, none of the demographic variables were included as covariates in our models.

Within- and between-day tests of spillover

The first set of dyadic multilevel models examined within-day and between-day spillover. Specifically, we tested whether there were concurrent associations between marital emotional climate and parent–child emotional climate (within-day model) and whether marital emotional climate predicted parent–child emotional climate the following day (between-day model). Positive associations would support the spillover effect, whereas negative associations would support the compensatory effect.

Regarding the within-day analysis, individuals' daily observed parent–child emotional climate (PCR) outcome within each dyad were predicted by the group-mean centered daily marital emotional climate scores at Level 1 (see Equation S1 in the supplemental material for more details). Regarding the between-day analysis, an individual's PCR score was a function of the autoregressive effect of the individual's previous day's PCR score and the effect of marital emotional climate (see Equation S2 in the supplemental material for more details).

Within-day model results

Results showed significant concurrent positive associations between marital emotional climate and parent–child emotional climate in the within-day model for fathers ($b = .23$, standard error [*SE*] $= .03$, $t = 7.42$, $p < .001$) and mothers ($b = .25$, $SE = .03$, $t = 9.54$, $p < .001$). Put another way, there was evidence of spillover between marital and parent–child emotional climate, supporting our hypothesis. In terms of random effects, the variation around mother's and father's daily parent–child emotional climate (intercept) was .20 and .32, respectively. This means that there was a slightly larger variability around father's initial parent–child emotional climate compared with those initial levels for mothers. Based on the marginal R^2 value of the within-day model, this model explained 5.2% of parent–child emotional climate and the fixed effects and random effects together explained 37.5% of parent–child emotional climate.

Between-day model results

Marital emotional climate significantly predicted between-day parent–child emotional climate for fathers ($b = -.09$, $SE = .03$, $t = -2.74$, $p < .01$), but not mothers ($b = .03$, $SE = .03$, $t = -1.03$, $p = .30$) in the between-day model. This significant negative association between marital emotional climate and next-day parent–child climate shows evidence of the compensatory effect instead of the spillover effect. The variability around mothers' and fathers' parent–child emotional climate (intercept) was .21 and .33, respectively. Again, there was a slightly larger variability around fathers' initial parent–child emotional climate when compared with those initial levels from mothers. The fixed effects of the between-day model, which represents the overall constant effects across individuals from the between-day model, explained .06% of parent–child emotional climate, whereas the combined fixed effects and random effects explained 33.5% of parent–child emotional climate. Based on these findings, we proceeded to incorporate our moderators (cognitive reappraisal and coparenting) for both mothers and fathers in the within-day moderator models, and for fathers only in the between-day moderator models.

Testing moderators of spillover: Within-day models

We constructed a series of dyad multilevel (two-level) models to test (a) whether cognitive reappraisal and coparenting quality would moderate marital to parent–child spillover/compensation, and (b) whether moderators of spillover/compensation may differ between fathers and mothers. Moderators (cognitive reappraisal, coparenting quality) were grand-mean centered, as they were predictors at the Level 2 or between-couple level in our models (Kenny & Kashy, 2011) and marital emotional climate was group-mean centered (Kenny & Kashy, 2011) because marital emotional climate is a Level 1 or daily level predictor. Guided by ecological models of parenting (Belsky, 1984; Cabrera et al., 2014; Feinberg, 2003) that create hierarchies of influence from proximal (i.e., personal–cognitive reappraisal) to distal (i.e., relational–coparenting) influences, our first model included cognitive reappraisal as a moderator only (see Equation S3). Our second moderating model included both cognitive reappraisal and coparenting quality as moderators (see Equation S4 in the supplemental material for details).

Moderator analyses with within-day model results

Results showed that when including cognitive reappraisal (Emotion Regulation Questionnaire) into the models (see Equation S3), cognitive reappraisal significantly moderated associations between marital emotional climate and parent–child climate for fathers ($b = -.09$, $SE = .04$, $t = -2.34$, $p < .05$), but not mothers ($p = .99$). When both cognitive reappraisal and coparenting quality moderators were included into the models (see Equation S4), only cognitive reappraisal moderated associations between marital emotional climate and parent–child climate for fathers ($b = -.09$, $SE = .04$, $t = -2.34$, $p < .05$), but not mothers ($p = .70$). Coparenting quality did not statistically significantly moderate associations between marital emotional climate and parent–child climate for either fathers ($p = .99$) or mothers ($p = .42$). Regarding the random effects associated with the intercept and daily marital emotional climate, the variation around mother's and father's daily parent–child emotional climate (intercept) was .20 and .32, respectively. The variation around mother's and father's daily marital emotional climate was .05 and .03, respectively. The marginal R^2 of the cognitive reappraisal within-day model was .072, whereas the marginal R^2 of the model with combined cognitive reappraisal and coparenting moderators was .099. See Table 2 for parameter estimates.

TABLE 2 Parameter estimates from within-day model of marital to parenting spillover moderated by cognitive reappraisal and coparenting quality

	Fathers		Mothers	
Regression coefficient	***b***	***SE***	***b***	***SE***
Intercept	1.85***	.07	1.78***	.06
Time (day)	−0.01	.01	−0.01	.01
Marital emotional climate	0.23***	.04	0.26***	.04
Cognitive reappraisal	−0.05	.07	−0.15*	.06
Coparenting quality	−0.45***	.12	−0.13	.09
Marital Emotional Climate × Cognitive Reappraisal	−0.09*	.04	0.02	.04
Marital Emotional Climate × Coparenting Quality	−0.001	.08	0.06	.07

Note. b = regression coefficient estimate; SE = standard error. Higher scores on emotional climate indicate greater negativity.
*$p < .05$.
**$p < .01$.
***$p < .001$.

Within this combined model, cognitive reappraisal continued to significantly moderate associations between marital and parent–child emotional climate for fathers only. We probed this significant interaction using post hoc regions of significance analyses using the Johnson-Neyman technique (Preacher et al., 2006). See Figure 1 for regions of significance.

The regions of significance analyses show that as cognitive reappraisal increases, the association between marital and parent–child emotional climate decreases—consistent with our hypothesis that cognitive reappraisal would attenuate spillover. The confidence bands show that cognitive reappraisal significantly moderated marital and parent–child climate at the full possible range of cognitive reappraisal values, except at the highest levels (above centered values of 1.2175). Put another way, having nearly maximum levels (6.28 out of 7 max score) of cognitive reappraisal does not significantly moderate marital to parenting spillover.

Coparenting quality did not significantly moderate marital and parent–child emotional climate for either parent. Interestingly, coparenting quality made independent contributions to parent–child emotional climate for fathers, but not mothers. Higher coparenting quality reduced daily father–child emotional negativity. Cognitive reappraisal made independent contributions toward parent–child emotional climate for mothers but not fathers in this final model. Increased cognitive reappraisal reduced daily mother–child emotional negativity.

Moderators of next-day compensation effects

Because marital emotional climate predicted next-day parent–child emotional climate for fathers only, we achieved more parsimonious between-day moderating models by removing the fixed and random effects from mothers' variables and excluding the mother data from the analysis. Following the within-day moderator model building approach, we first included only cognitive reappraisal as a moderator in our between-day multilevel model, and then both cognitive reappraisal and coparenting quality as moderators in the combined between-day moderator model (see Equation S5 in the supplemental material for more details).

Moderator analyses with between-day model results

Results showed that neither cognitive reappraisal ($p = .82$) nor coparenting quality ($p = .60$) interaction terms were significant. In this model, only fathers' coparenting quality significantly

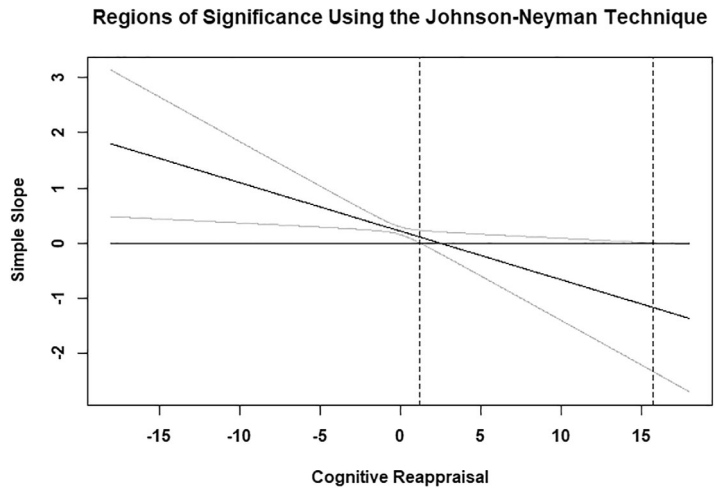

FIGURE 1 Region of significance for the interaction between cognitive reappraisal (centered values shown) and marital emotional climate for fathers
Note. The interaction is significant outside the dotted lines.

TABLE 3 Parameter estimates from between-day model of marital to parenting spillover moderated by cognitive reappraisal and coparenting quality for fathers only

	Fathers	
Regression coefficient	***b***	***SE***
Intercept	1.84***	.07
Time (day)	−0.01	.01
Marital emotional climate	−0.06	.04
Cognitive reappraisal	−0.03	.07
Coparenting quality	−0.54***	.13
Marital Emotional Climate × Cognitive Reappraisal	−0.01	.04
Marital Emotional Climate × Coparenting Quality	0.05	.08

Note. b = regression coefficient estimate; SE = standard error. Higher scores on emotional climate indicate greater negativity.
*$p < .05$. **$p < .01$.
***$p < .001$.

predicted parent–child emotional climate, showing that coparenting quality accounted for the initial significant negative associations between marital emotional climate and next-day parent–child climate ($b = -.54$, $SE = .07$, $t = -4.22$, $p < .001$). See Table 3 for parameter estimates of the between-day moderator model. Regarding the random effects associated with the intercept and daily marital emotional climate, the variation around father's daily parent–child emotional climate (intercept) was .28. The variation around father's daily marital emotional climate was .04.

DISCUSSION

The overall purpose of the study was to investigate cognitive reappraisal and coparenting quality as moderators of marital and parent–child spillover within and between days in mothers and

fathers using a dyadic, within-couple approach. As expected, we found evidence of spillover for mothers and fathers in our within-day models. However, the similarities in findings between mothers and fathers end there. Cognitive reappraisal significantly attenuated within-day spillover for fathers, reflecting the influence of effective emotion regulation in reducing the affective experience of spillover. In contrast, neither cognitive reappraisal nor coparenting quality significantly moderated spillover for mothers. In the between-day models, there were significant negative associations between fathers' marital emotional climate and next-day parent–child climate, evincing compensatory effects; whereas there were no significant associations for mothers. This compensation effect found for fathers' next-day parent–child emotional climate disappeared when accounting for coparenting quality. The remainder of the discussion contextualizes these contrasting results (mother vs. father; within vs. between day) in family science literature and addresses implications for therapists, practitioners, and couples with young children.

Although the spillover effect is a more robust finding within the literature than the compensatory effect (Erel & Burman, 1995; Krishnakumar & Buehler, 2000), compensatory effects can be found in tandem with spillover effects specifically when time-lagged associations are considered (Gao et al., 2019; Kouros et al., 2014). For example, similar to our results, Kouros et al. (2014) found positive associations between marital emotional quality and parent–child emotional quality within days (spillover) and negative associations between marital and parent–child emotional quality between days (compensatory) in their sample of parents of 8–16-year-olds. The appearance of both effects may be explained by how both spillover and compensatory processes unfold. Both processes capture affective and behavioral dimensions and involve intra- and interpersonal components. Compensatory effects are motivated specifically by unsatisfactory spousal relationships—in which parents experiencing a lack of support and connection with one's spouse seek that connection and support from their child instead (Erel & Burman, 1995; Gao et al., 2019; Kouros et al., 2014). With the compensatory effect, several conditions need to be met in order for it to manifest. First, there needs to be negativity within the marital relationship, and second, there needs to be a conscious choice to invest more into the parent–child relationship as a means of compensating for a poor marital relationship. When compared to the spillover effect, which presumes that the emotional valence in one relationship (whether positive or negative) breeds that same emotional valence in another relationship, we contend there are much fewer conditions to be met for spillover to manifest. Given that families are connected systems (Cox & Paley, 2003), we hypothesize that spillover between relationships is quite effortless in families, whereas compensation for relationships is rather effortful because compensation involves purposeful disconnection between family systems. This hypothesized contrast in effort—with spillover requiring almost none, and compensatory requiring quite a lot—likely explains why the compensatory effect found in our study was tenuous and why overall support for the compensatory effect in the literature remains limited (Erel & Burman, 1995; Krishnakumar & Buehler, 2000). Future research investigating the compensatory effect would likely need to study the phenomenon under more specific conditions—that is, among couples with higher levels of negativity and dissatisfaction in their marriage, and across time.

Although we found evidence of both spillover and compensatory effects, the spillover effect appeared more robust—the within-day spillover effect remained for both mothers and fathers despite accounting for main and interactive effects of cognitive reappraisal and coparenting quality. There were apparent gender differences in interactive effects—cognitive reappraisal significantly moderated within-day associations between marital and parent–child emotional climates for fathers, but no significant moderators emerged for mothers. The appearance of gender differences in spillover is not uncommon (Coiro & Emery, 1998; Cummings et al., 2004; Cummings et al., 2010; Gao et al., 2019; Kuo & Johnson, 2021). Here, we contend that spillover was weaker for fathers than mothers, given that cognitive reappraisal reduced spillover for men, and nothing reduced spillover for women. Although it is possible that mothers' spillover may be moderated by other variables that we overlooked in the current report, others have

similarly found moderating effects for fathers' spillover, but not mothers', when investigating parental depression (Kouros et al., 2014) and coparenting quality (Merrifield & Gamble, 2013). Because the spillover effect in mothers is resistant to intra- and interpersonal factors, marital and parent–child relationships may be more interconnected for mothers than fathers on a day-to-day basis. Perhaps mothers experience higher levels of cohesion between marital and parent–child systems than fathers do. According to the circumplex model of family systems (Olson, 2000), having particularly high levels of cohesion between systems is considered enmeshment and generally problematic in the long term, whereas having moderate levels of cohesion is considered optimal for family functioning. Individual therapy for mothers may need to focus on slight decoupling of the marital and parent–child relationships. Within family therapy contexts, it appears that addressing issues in the marriage is critically important for mothers experiencing significant spillover. For fathers, however, addressing either issues in the marriage or individual emotion regulation via cognitive reappraisal can reduce spillover.

The typical argument about gender differences in spillover is that fathers experience stronger spillover than mothers because his parenting is more likely to be controlled, at least in part, by the mother (Allen & Hawkins, 1999). This argument is why we expected coparenting quality to moderate spillover, but we only found main effects of coparenting on fathers' parent–child emotional climate in both the within- and between-day models. When fathers perceived better coparenting quality, they also reported less negativity in their parent–child relationships. Notably, including coparenting quality into the between-day model also accounted for the initial compensation effect found with fathers. These results potentially hint at coparenting as a mediator between marital and father–child relationships, though our data do not meet the temporal requirements to test a mediation model (Selig & Preacher, 2009) because coparenting quality was collected during the baseline surveys prior to the daily assessments of marital and parent–child emotional climate. Coparenting quality was unrelated to mothers' parent–child emotional climate. We believe that this null result can be explained by common patterns seen in families with young children in which mothers are often much more involved than fathers are in childcare (Katz-Wise et al., 2010; Kuo et al., 2018). Coparental support is likely far more important for improving parent–child relationships with secondary-caregiving fathers than with primary-caregiving mothers in families with young children (Brown et al., 2010; Holland & McElwain, 2013).

Although it is discouraging to find that neither coparenting quality nor cognitive reappraisal attenuated spillover for mothers, these findings point to opportunities for future research into the emotional experience of mothering young children (Erickson, 1993, 2005). This study cannot explain *why* these intra- and interpersonal factors were not helpful for mothers in preventing negative emotional climate in the marriage from spilling over into the parent–child relationship, but this strong coupling between the marriage and parent–child relationship may be reflective of the mother's dependence on the marriage relationship for emotional support (Munch et al., 1997; Stevens et al., 2006). Although it has garnered less attention in family literature (Erickson, 2005), spousal emotion support plays a key role in maternal experiences that influence family systems and functioning (e.g., Erickson, 1993; Nelson et al., 2014; Stevens et al., 2006; Uysal Irak et al., 2020). For example, another study found that mothers of young children had fewer positive and collaborative interactions with their child when they experienced challenges with emotion regulation, but that these difficulties with emotion regulation were strongly predicted by social support (Shaffer & Obradović, 2017). Likewise, Gao et al. (2019) found that mothers reported better relationships with their children on days when they experienced improved emotional quality with their spouse. Our findings highlight the importance of examining fathers' provision of emotional support, particularly for mothers of young children, to support maternal well-being and positive family functioning.

As with all research, our study included limitations. Of note, the sample—though geographically diverse across the United States—is not racially or ethnically diverse. Thus, our study

likely has limited generalizability outside of our sample's characteristics (opposite-sex couples, mostly White and middle to high socioeconomic status in the United States), and it is important to note that we were unable to distinguish between biological and stepparent status in our mother–father dyads. We also relied on self-report data, as is common with daily diary designs. Inclusion of observational data could potentially shed light on more behavioral aspects of spillover and compensation processes. Finally, the emotional quality question was a single-item measure intended to capture daily variation in positive to negative emotional quality on one scale. Although single-item measures are often included in daily diary research to increase participant retention by minimizing burden (Bolger et al., 2003), we acknowledge that reliability and validity of these single-item measures may be questioned. The emotional quality items have been previously used to detect within-person daily variations in a sample of parents with older children (Kouros et al., 2014), lending some additional validity to this single-item measure of emotional quality. The dynamic nature of relationships and interactions within the family posits that a measure of emotional quality with one's partner would invariably include coparenting interactions as one of many interactions between spouses. However, we do not find this to be in conflict with our study as the variable for emotional climate (and the item used to measure it) is focused on the emotional connection between partners and not parenting cooperation.

Implications

In this paper, we uncovered that the spillover processes are differentiated between mothers and fathers within couples and that spillover is contained within each day. The findings are somewhat optimistic for healthy family functioning—people are generally not carrying over emotional negativity from their marriages into their parent–child relationships over subsequent days. However, this also means that emotional positivity from the marriage relationship may not carry over into parent–child relationships from one day to the next. Each day is a new day with opportunities for potential problems and/or positive connections. However, considering previous findings in terms of emotional capital—or the day-to-day positive interactions that enhance a partner's sense of feeling valued and connected—marital emotional quality may not contribute to next-day parent–child quality, but may still accumulate over time with protective or problematic potential for the family system (e.g., Walsh et al., 2017). Our research supported the spillover hypothesis, but perhaps *spillover* is a misleading term, empirically. In this data, we were able to identify concurrent associations between marital emotional climate with parent–child emotional climate. Future research using measurement burst designs could investigate the impact of day-to-day changes on overall family emotional climate. Although we examined two theoretically compelling possibilities—on both personal and couple levels—for reducing the impact of marital emotional negativity on parent–child relationships, spillover persisted. For fathers, reframing the situation helps, but there are no such shortcuts for mothers—the emotional energies in the marital relationship seep into the emotional energy within the parent–child relationship. Although this finding is somewhat disheartening, it offers a compelling view of the powerful emotional link between partner and parent–child relationships, pinpointing emotional marital bonds as a critical area for attention in overall family well-being. For parents of young children especially, negative parent–child interactions may be rooted in unmet emotional needs in the couple relationship—for both mothers *and* fathers.

Interestingly, our results revealed that fathers sought compensatory relationships with their children when they had experienced low emotional quality with their partner the day before. However, this next-day effect was completely accounted for by coparenting quality, or the father's perception of the teamwork alliance and partnership they felt with their parenting partner. Thus, in families where couple interactions are frequently focused on or inclusive of parenting interactions, as is common in couples with young children, coparenting involvement may be

an important area where fathers feel valued, included, and connected (or undermined, underappreciated, and disconnected) in their relationship with their spouse (see also Merrifield & Gamble, 2013).

Although coparenting and marital relationships tend to be studied as separate constructs within the literature, in a therapeutic context, it may be critical to address marital and coparenting issues concurrently. For family educators, service providers, and therapists, our results emphasize the impervious bond between marital emotional climate and parent–child emotional climate, and the value of cognitive reappraisal, or reframing the situation, for fathers in lessening the impact of marital negativity on their parent–child relationships. Practitioners working with couples who are experiencing negativity in the marriage relationship might emphasize how these negative interactions influence the entire family system, including each parent's relationship with their child. In particular, focusing on the *emotional climate* of the partners' daily interactions to identify areas of need and potential support can improve daily family experiences and strengthen relationship bonds not only between spouses but between parents and children. Considering the results identified here, working specifically with fathers to improve cognitive reappraisal skills and to identify opportunities for improving the father's perception of coparenting quality can also contribute to reducing spillover of negative marital interactions to the father–child relationship.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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Supplementary Document

S1. Let PCR_{ti} be an observed parent-child emotional climate outcome for the *i*th dyad at the time point *t* (*t* = 0, 1, 2,…, 9), where *t* = 0 indicates the first daily diary. We included $Time_t$ as a level-1 covariate to control for potential systematic fluctuation in PCR (Gao & Cummings, 2019; Wang & Maxwell, 2015). Let M_i and F_i variables be dummy-coded variables indicating mothers (e.g., M_i =1 indicates mothers) and fathers (e.g., F_i =1 indicates fathers), respectively. With the within-day model, PCR_{ti} is represented as a function of time ($Time_t$) and group-mean centered daily marital emotional climate ($MQ_{ti} - \overline{MQ_{.i}}$) as follows:

Level-1:

$$PCR_{ti} = M_i\left[\beta_{0i} + \beta_{1i}(MQ_{ti} - \overline{MQ_{.i}}) + \beta_{2i}Time_t + e_{1,ti}\right] + F_i\left[\beta_{3i} + \beta_{4i}(MQ_{ti} - \overline{MQ_{.i}}) + \beta_{5i}Time_t + e_{2,ti}\right],$$

Level-2:

- $\beta_{0i} = \gamma_{00} + u_{0i}$,
- $\beta_{1i} = \gamma_{10}$,
- $\beta_{2i} = \gamma_{20}$,
- $\beta_{3i} = \gamma_{30} + u_{3i}$,
- $\beta_{4i} = \gamma_{40}$,
- $\beta_{5i} = \gamma_{50}$.

(S1)

S2. For the between-day model, let $PCR_{(t+1)ij}$ be a function of autoregressive effect of PCR_{tij}, time ($Time_{t+1}$), and group-mean centered daily marital emotional climate ($MQ_{(t+1)ij} - \overline{MQ_{.j}}$) as follows:

Level-1:

$$PCR_{(t+1)i} = M_i\left[\beta_{0i} + \beta_{1i}\left(MQ_{(t)i} - \overline{MQ_{.i}}\right) + \beta_{2i}Time_{t+1} + \beta_{3i}PCR_{ti} + e_{1,(t+1)i}\right] + F_i\left[\beta_{4i} + \beta_{5i}\left(MQ_{(t)i} - \overline{MQ_{.i}}\right) + \beta_{6i}Time_{t+1} + \beta_{7i}PCR_{ti} + e_{2,(t+1)i}\right],$$

Level-2:

- $\beta_{0i} = \gamma_{00} + u_{0i}$,
- $\beta_{1i} = \gamma_{10}$,
- $\beta_{2i} = \gamma_{20}$,
- $\beta_{3i} = \gamma_{30}$,
- $\beta_{4i} = \gamma_{40} + u_{4i}$,
- $\beta_{5i} = \gamma_{50}$.
- $\beta_{6i} = \gamma_{60}$.
- $\beta_{7i} = \gamma_{70}$.

(S2)

S3. Moderator Model 1: Cognitive reappraisal moderator (ERQ) only, within day.

Level-1:

$$PCR_{ti} = M_i\left[\beta_{0i} + \beta_{1i}(MQ_{ti} - \overline{MQ_{.i}}) + \beta_{2i}Time_t + e_{1,ti}\right] + F_i\left[\beta_{3i} + \beta_{4i}(MQ_{ti} - \overline{MQ_{.i}}) + \beta_{5i}Time_t + e_{2,ti}\right],$$

Level-2:

- $\beta_{0i} = \gamma_{00} + u_{0i}$,
- $\beta_{1i} = \gamma_{10} + \gamma_{11}(ERQ_i - \overline{ERQ_.}) + u_{1i}$,
- $\beta_{2i} = \gamma_{20}$, (S3)
- $\beta_{3i} = \gamma_{30} + u_{3i}$,
- $\beta_{4i} = \gamma_{40} + \gamma_{41}(ERQ_i - \overline{ERQ_.}) + u_{4i}$,
- $\beta_{5i} = \gamma_{50}$.

S4. Moderator Model 2: Cognitive reappraisal (ERQ) and coparenting quality (PAI) moderators of marital and parent-child emotional climate, within day.

Level-1:

$$PCR_{ti} = M_i\left[\beta_{0i} + \beta_{1i}(MQ_{ti} - \overline{MQ_{.i}}) + \beta_{2i}Time_t + e_{1,ti}\right] + F_i\left[\beta_{3i} + \beta_{4i}(MQ_{ti} - \overline{MQ_{.i}}) + \beta_{5i}Time_t + e_{2,ti}\right],$$

Level-2:

- $\beta_{0i} = \gamma_{00} + u_{0i}$,
- $\beta_{1i} = \gamma_{10} + \gamma_{11}(ERQ_i - \overline{ERQ_{.}}) + \gamma_{12}(PAI_i - \overline{PAI_{.}}) + u_{1i}$,
- $\beta_{2i} = \gamma_{20}$, (S4)
- $\beta_{3i} = \gamma_{30} + u_{3i}$,
- $\beta_{4i} = \gamma_{40} + \gamma_{41}(ERQ_i - \overline{ERQ_{.}}) + \gamma_{42}\left(PAI_i - \overline{PAI_{.}}\right) + u_{4i}$,
- $\beta_{5i} = \gamma_{50}$.

S5. Cognitive reappraisal and coparenting quality moderator model, between-day.

Level-1:

$$PCR_{(t+1)i} = \beta_{0i} + \beta_{1i}(MQ_{ti} - \overline{MQ_{.i}}) + \beta_{2i}Time_t + \beta_{3i}PCR_{ti} + e_{ti},$$

Level-2:

- $\beta_{0i} = \gamma_{00} + u_{0i},$ (S5)
- $\beta_{1i} = \gamma_{10} + \gamma_{11}(ERQ_i - \overline{ERQ_{.}}) + \gamma_{12}(PAI_i - \overline{PAI_{.}}) + u_{1i},$
- $\beta_{2i} = \gamma_{20},$
- $\beta_{3i} = \gamma_{30}.$