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The mediating role of parental embodied mentalizing in the longitudinal association between prenatal spousal support and toddler emotion recognition

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Abstract

Emotion recognition is an important developmental achievement in early childhood. Grounded in theoretical concepts of family systems theory and the spillover effect, the goal of the current study was to examine whether prenatal spousal support predicts toddler emotion recognition at 24 months, and whether this association is mediated by parental embodied mentalizing (PEM) at 6 months. PEM refers to the parent's capacity to understand the infant's mental states from his or her whole-body kinesthetic expressions and adjust their own kinesthetic patterns accordingly. One hundred and five families expecting their first child were included in the study. Results indicated that maternal PEM mediated the relationship between prenatal dyadic positive and overall support and toddler emotion recognition. Paternal PEM was not found to be related to either dyadic support or to toddler emotion recognition, and it did not mediate the relationship between the two. The findings of the current study support the importance of including both parents' embodied mentalizing and a systemic approach to illuminate child development. A significant clinical implication from this study is the

usefulness of prenatal couple interventions to improve mutual support and communication as it can promote parents' parental mentalizing and ultimately the child's emotion recognition capacity.

1 | INTRODUCTION

One of the most significant developmental milestones young children undergo is learning to recognize and understand emotions in themselves and others. Emotion recognition of young children is an important predictor of their social and academic abilities at older ages (Bassett et al., 2012; Denham & Kochanoff, 2002). As such, it is important to examine possible predictors of emotion recognition in early development. An important parental capacity that was identified as related to child's emotional recognition is parental mentalizing—the parent's ability to perceive the child's behavior in terms of internal mental states (i.e., thoughts, emotions, and desires) (Fonagy et al., 2002; Slade, 2005). As most of the child's communication at this age is nonverbal, implicit aspects of mentalizing should be considered, namely parental embodied mentalizing (PEM; Shai & Belsky, 2011a). PEM captures the parent's capacity to understand the child's inner experience based on the child's whole-body kinesthetic expressions and adjust their own kinesthetic patterns accordingly (Shai & Belsky, 2011a). The first goal of the current study was to examine the relationships between maternal and paternal PEM at 6 months old and children's emotion recognition at 24 months.

A second goal of the current study was to broaden the scope of research on emotional development in early childhood and examine not only parental or parent–child relationship factors but also those related to the larger family system. Our research model was based on the family systems theory (Minuchin, 1985; O'Brien, 2005; White & Klein, 2002) and the "spillover hypothesis theory" (Stroud et al., 2011)—which suggests the family is a dynamic whole composed of subsystems having positive and negative mutually influences on each other. Specifically, Belsky (1990) argued that spousal support is associated with enhanced parenting and more harmonious parent–infant relationship, as it contributes to reduce stress (Lionetti et al., 2015). Considering this, the current study examined whether parents who receive stronger spousal support prenatally will demonstrate higher PEM when infants are 6 months old. This hypothesis was based on the premise that parents with stronger spousal support during the likely stressful transition to parenthood will be more emotionally available to attune and adjust to their children's mental states. The third goal of the current study was to examine whether prenatal spousal support is related to toddler emotion recognition at 24 months either directly or indirectly through the mediation of maternal and paternal PEM as measured at 6 months.

1.1 | Background

1.1.1 | Children's emotion recognition

Emotional interactions between babies and caregivers are a central feature of the relationships between them (Denham, 1998). Infants younger than 10 months are able to differentiate between

parents' positive and negative facial expressions. By about 10 months of age, infants start to be able to find emotional meaning in facial expressions and voices, which allows them to use this information and caregiver cues in order to learn which experiences to approach and which to avoid (Moses et al., 2001). Early in their second year, infants begin to show interest in the feelings of other people (Dunn, 1988). Older infants and toddlers (10–24 months old) can adjust their behaviors according to adults' emotional displays, thus demonstrate their emotion understanding. Children 18–20 months old begin using emotion labels (i.e., sad and happy) as they become more verbal (Widen & Russell, 2008). By the end of the second year, they can exchange verbal information about their own and other people's mental states and emotions, as well as dolls or imaginary friends (Wellman et al., 1995). Two-year-old toddlers are frequently curious about what causes the feelings of those around them. At this stage, their emotional understanding is mostly intuitive and not one they can reflect on (Dunn, 1988).

During the first 2 years of life, infants learn about the emotional world of themselves and others through their relationships with their parents and other caring adults (Hoemann et al., 2019; Rochat, 2012). Different theories have been offered regarding the process of emotional socialization. One that has been researched extensively relates to how parents' mentalizing contributes to the child's emotion recognition ability.

1.1.2 | Parental mentalizing

When mentalizing, the parent demonstrates a nonintrusive attitude (Fonagy et al., 2007), nonjudgmental acceptance of the infant's mental states (Fonagy et al., 1991), and overwhelming emotions and a capacity to organize them into coherent realistic narratives the child can understand. Parental appropriate mentalizing helps children develop a reflective ability themselves—through gaining a better understanding of their own and thus other people's mental states and feeling more secure (Benbassat & Priel, 2012; Ensink et al., 2015; Fonagy et al., 1991). Parental mentalizing can be expressed verbally or nonverbally. Most previous studies used explicit measures to examine parent's verbal expressions reflecting awareness and understanding of the child's mental states (Meins et al., 2012; Sharp & Fonagy, 2008; Slade: mind-mindedness—the parent's appropriate attuned comments reflecting the infant's current mental state (Meins et al., 2012); insightfulness—the parent's ability to understand the motives underlying the infant's behaviors by seeing the world through his or her eyes (Oppenheim & Koren-Karie, 2002); and reflective functioning—the parent's capacity to reflect their own mental states, those of their child, and the complex interactions between mental states and behavior within the context of the parent–infant relationship (Slade et al., 2005).

Several studies found that in comparison with mothers, fathers expressed lower reflective functioning and mind-mindedness (Arnott, & Meins, 2007; Esbjørn et al., 2013; Luyten et al., 2017). One study following fathers from the prenatal stage to 5 months postpartum found that only 53% of them were able to reflect on their infant's state of mind (Madsen et al., 2007). These findings were attributed to the lesser time fathers spend with their children in comparison with mothers and to their focus on play activities and not on emotional state (Miller et al., 2019).

Cross-sectional and longitudinal studies have repeatedly found that parental mentalizing, measured by mind-mindedness or reflective functioning, is associated with children's internalizing (Esbjørn et al., 2013) and externalizing problems (Ensink et al., 2015; Smaling et al., 2017), emotional and social development (Arnott & Meins, 2007; Hughes et al., 2018; Sharp et al., 2006), and attachment security (Fonagy & Target, 2005; Shai & Meins, 2018; Slade et al.,

2005). These findings were explained as stemming from the children of mothers with high mentalizing abilities trusting their mothers' responsivity in times of need (Heron-Delaney et al., 2016). In addition, maternal mind-mindedness was found to be related to infant emotional understanding (Centifanti et al., 2016) and low maternal reflective functioning was related to children's impairment in emotion regulation (Heron-Delaney et al., 2016). These findings were explained as a result of the infant developing a mentalizing capacity after gradually recognizing and understanding the meaning of his or her affective states following the parent's reflections of his or her mental states (Ensink et al., 2015; Goldberg, 2011; Rosso et al., 2015).

1.1.3 | Parental embodied mentalizing

A qualitatively different approach to parental mentalizing concept is based on the parent's *implicit* capacity to consider and understand the child's *nonverbal* signals. Parental embodied mentalizing (PEM; Shai & Belsky, 2011a) is based on the body of knowledge demonstrating that infants have limited verbal ability in early childhood and that most of the parent–child communication at this age takes place on a nonverbal level (Beebe et al., 2016; Stern, 1985; Tortora, 2013). Infants are able from a young age to take part in a nonverbal "conversation" with a caregiver—taking turns, turning their gaze toward him or her, waving, and responding vocally to his or her behaviors (Reddy & Trevarthen, 2004). Through these behaviors, infants can express a whole range of mental states (Beebe, 2000). Parents can be very attentive to their infant's nonverbal communication signals and use them to engage and relate to him or her (Beebe et al., 2010; Kim et al., 2014). As a result, the parent–child relationship at this age is mostly dependent on the parent's ability to be sensitive to the child's nonverbal behaviors (i.e., movements and gaze) and interpret them correctly (Tortora, 2013).

PEM is an implicit construct and measure that examines nonverbal behavioral indicators of parental mentalizing and examines the embodied dialog of both the infant and the parent to discern the parent's mentalizing capacities. A central element in the measurement of PEM is that the actions of the parent or the infant are not considered individually, but rather, the *dynamics* of the interactions between them and the degree the parent is able to respond kinesthetically to the infant's signals (expressed in his or her movements) in an appropriate and coordinated way (Shai & Belsky, 2011a, 2017). A parent with high PEM will be more likely to recognize, regulate and quickly adapt his or her behavior according to the infant's expressions of both positive and negative mental states. Low PEM parents will be manifested in a parent that either interprets his or her child's movements incorrectly or responds to them inappropriately (Shai & Belsky, 2017; Shai & Fonagy, 2014).

Few studies examined the effects of PEM on child outcomes (Gagné et al., 2021; Shai & Belsky, 2017; Shai & Meins, 2018). In their study, Shai and Meins (2018) assessed maternal PEM and mind-mindedness at 8 months old and infant attachment when they were 15 months old. It was found that higher maternal PEM distinguished between secure versus insecure avoidant infants—over and above the effects of mind-mindedness comments (Shai & Meins, 2018). Shai and Belsky's (2017) found that PEM in mother–infant interaction at 6 months old predicted security of attachment at 15 and 36 months, as well as better socioemotional wellbeing, social competence, cognitive abilities, and fewer behavioral problems at 54 months (Shai & Belsky, 2017). Noteworthy is that previous studies focused only on maternal PEM and its relationships with infants' outcomes, while fathers' PEM remained outside of the scope of empirical investigations.

We now examine the potential differences between fathers' and mothers' PEM. One factor that might differentiate between parents' PEM is their stress level. Studies have shown that parents who experience more stress tend to be less responsive (Belsky et al., 1996), sensitive, and supportive toward their children (Newland et al., 2013). In addition, they tend to exhibit reduced mentalizing ability (McMahon & Meins, 2012). Social support—particularly spousal support that is adapted to the needs of each partner (Simon et al., 1993 cited in Tanaka & Lowry, 2013)—can be especially helpful to reduce parent's stress.

1.1.4 | Broadening the scope–from the parent–child dyad to the family system

According to the family systems theory (Cox & Paley, 2003; Minuchin, 1985), the mother–father relationship is often perceived as the central subsystem influencing all aspects of family functioning (Easterbrooks & Emde, 1988). Specifically, parents' effective communication, emotional closeness, and support impact their children's wellbeing and development (Goldberg & Carlson, 2014). The research model examined in the current study was based on the family systems theory and the "spillover hypothesis theory". According to this theory, which was supported extensively, positive or negative affects transfer from one subsystem to others (Erel & Burman, 1995; Stroud et al., 2011)—i.e., between the marital relationship, parenting behaviors (Planalp et al., 2013; Rhoades et al., 2011), and the parent–child relationship (Kouros et al., 2014; Pedro et al., 2012).

1.1.5 | Contribution of marital quality to parental mentalizing

A longitudinal study of first-time parents found a bidirectional relationship between marital relationship satisfaction and parental reflective functioning. Higher relationship satisfaction when infants were 3 months old predicted higher PRF levels at 12 months, and higher PRF at 3 months predicted increased relationship satisfaction at 12 months (Salo et al., 2021). These findings were explained in accordance with the spillover hypothesis as a result of the stress and negative emotions the parent experience with their partner, which reduce their emotional availability and make it harder for them to accurately recognize their child's mental state (Fonagy et al., 2015; Salo et al., 2021).

Another indication of the significant of spousal support during the transition to parenting is found in a study that examined the effectiveness of an intervention designed to improve the mentalizing skills of first-time parents. In addition to helping both parents learn more about their babies and their mental states and getting support from other parents—especially for the women, the program helped them understand better what their partner is experiencing during this time, which made them closer. Following the intervention, both parents experienced a stronger bond, which, in turn, improved their mentalizing abilities—above and beyond the skills they learnt in the program (Sourander et al., 2021).

1.1.6 | Marital relationship quality and children development

Parents' relationship quality might impact children directly by modeling behaviors or indirectly via the parent–child relationship and parenting behaviors, such as by positive associations

between support, positive affect, and good communication between parent's and children's well-being (see review in Goldberg & Carlson, 2014). Studies have found that the quality of parents' relationship (degree of support, positive affect, satisfaction, and communication) is associated with children's cognitive and socioemotional development (Berger & McLanahan, 2015) and different outcomes as internalizing and externalizing problems (Goldberg & Carlson, 2014) and school achievements (Chen et al., 2017). The current study went a step further in examining this issue by testing the degree that the quality (or degree of support) of the marital relationship before the child is born—can predict their emotional development (emotion recognition) at 24 months.

1.1.7 | The current study

The first goal of the current longitudinal study was to examine whether maternal and paternal PEM when infants are 6 months old predict children's emotional recognition at 24 months of age. The second goal of the current study was to broaden the scope of research on emotional development in early childhood and examine the ability of the prenatal marital relationship quality—as part of the larger family system—to predict parental mentalizing (maternal and paternal PEM) as well as toddlers' emotional development at 24 months—either directly or through the mediation of PEM.

The study is unique in several aspects. First, this study is the first to look at the effects of spousal support measured *prenatally* on child emotional development at 24 months. One previous study found a bidirectional association between parental reflective functioning and relationship satisfaction among new parents and a relationship of both to infant's social competence at 1 year (Salo et al., 2021). The current study is also unique in testing whether spousal support measured prenatally predicts the level of parental embodied mentalizing (PEM) when the infants are 6 months old. Third, the study is distinctive in comparing between mothers and fathers in their parental mentalizing and the degree that PEM mediates the relationship between prenatal spousal support and toddler emotional development at 24 months. The study, cited above (Salo et al., 2021), found associations between relationship satisfaction and emotional availability through PRF (as detailed above) for both mothers and fathers. The current study examined these associations during the earlier family stage and using an implicit measure. Lastly, this is also the first time that the indirect relationship between prenatal spousal support and emotional development (or emotion recognition) at 24 months, with the mediation of PEM at 6 months is examined.

Specifically, the following hypotheses were made:

H1.1: A positive relationship will be found between prenatal positive spousal support and toddler emotion recognition at 24 months.

H1.2: A positive relationship will be found between prenatal overall spousal support and toddler emotion recognition at 24 months.

H1.3: A negative relationship will be found between prenatal negative support behaviors and toddler emotion recognition at 24 months.

H2.1: A positive relationship will be found between prenatal positive spousal support and maternal or paternal PEM measured at 6 months.

H2.2: A positive relationship will be found between prenatal overall spousal support and maternal or paternal PEM measured at 6 months.

H2.3: A negative relationship will be found between prenatal negative spousal support and maternal or paternal PEM measured at 6 months.

H3: A positive relationship will be found between maternal or paternal PEM measured at 6 months and toddler emotion recognition at 24 months.

H4: Maternal or paternal PEM measured at 6 months will mediate the association between prenatal spousal support and toddler emotion recognition (at 24 months).

2 | METHOD

2.1 | Participants

This research is part of a larger longitudinal study following 105 community-based families of co-living heterosexual couples, expecting their first child. The present study was conducted according to guidelines laid down in the Declaration of Helsinki, with written informed consent obtained from a parent or guardian for each child before any assessment or data collection. All procedures involving human subjects in this study were approved by the IDC institutional review board, Israel.

Data were collected in the prenatal phase (T1), at 6 months (T2) and 24 months (T3). Participating families were recruited through internet advertisements, flyers, and medical centers. Each couple was paid 250 Israeli Shekels for their participation in the prenatal phase. All parents were fluent in writing and speaking Hebrew and lived in central Israel. The ages of both parents ranged from 23 to 42 years (mothers $M = 30.82$, $SD = 3.63$; fathers $M = 32.41$, $SD = 4.01$). Eighty nine percent of the mothers and 76% of the fathers had an academic education. About half of the mothers had below average salary while 35% of the mothers and 59% of the fathers had above average salary. All families were Jewish, and most of them were secular (72% of the mothers and 78% of the fathers).

In T2, 95 fathers, 100 mothers, and 100 infants participated. Out of the participating infants, 51 (53%) were boys and their ages ranged from 5.05 to 9.84 months ($M = 6.43$, $SD = 0.84$). Eight fathers and five mothers dropped out of the research at this point due to time constraints, and additional two fathers did not complete the task. In T3, 66 children completed the relevant task evaluating the outcome variable, 34 (52%) of which were boys in ages ranging from 23.44 to 28.93 months ($M = 24.59$, $SD = 0.79$). Thirty-nine children did not take part in this measurement: 16 families withdrew from the study before this point and 23 children did not complete the task.

2.2 | Procedure and instruments

At T1, after completing consent forms, couples were invited to the laboratory and participated in the marital discussion laboratory paradigm of Collins and Feeney (2000). Couples were informed that they will be asked to have a discussion that will be video recorded. One of them (randomly assigned), defined as "care seeker," was taken by the experimenter to a separate room in the

laboratory and was asked to write about a personal problem (that does not involve a conflict with his or her spouse) he or she is willing to discuss with their spouse (defined here as the "caregiver"). Following that, he or she were asked to disclose the problem with his or her partner and to discuss it for 10 min. Both partners were free to interact with each other in any way they wanted to.

The purpose of the procedure is to place the couple in a problem-oriented context and assess the degree of supportive and conflictual behaviors in the interaction. Couple discussions were video recorded, and their support seeking and giving behaviors in each interaction were coded according to a version of the coding scheme developed by Barbee and Cunningham (1995) and modified by Collins and Feeney (2000). Coding was performed by two independent trained undergraduate psychology students. Interrater reliability (ICC) was assessed using 20% of the sample and is mentioned below per subscale.

When coding the *care-seeker* behaviors, the following behaviors were rated: (a) emotional disclosure (ICC = .89) and (b) descriptive disclosure (ICC = .95), both rated on a scale ranging from 1 (no disclosure at all) to 7 (full disclosure). (c) Ask—strategy that includes behaviors such as asking directly for help and providing details of the problem (ICC = .9); (d) hint—complain—strategy that involves complaining about a situation or hinting that a problem exists without directly expressing that help is needed (ICC = .91); and (e) sulk—fidget—strategy that involves subtly showing negative affect through nonverbal expressions in the form of sighing, sulking, or fidgeting (ICC = .94). On the basis of these ratings, two indexes of "support-seeker" behaviors were computed: (a) support-seeker positive strategies—the average of emotional disclosure, descriptive disclosure, and ask; and (b) support-seeker negative strategies—the average of hint and sulk.

When coding the caregiver behaviors, four global aspects of caregivers' behaviors were rated on a scale ranging from 1 ("not at all") to 7 ("extremely") the extent to which he or she (a) appeared to be listening attentively (ICC = .85); (b) communicated understanding, including such things as clarifying the problem, reframing it, and showing empathy(clarified the problem, showed empathy) (ICC = .95); (c) blamed the support seeker for his or her problem or criticized the support-seeker feelings or actions (ICC = .85); and (d) overall support effort—the extent to which the caregiver was actively engaged in the interaction (ICC = .91). Next, observers rated the extent to which caregivers used four identified types of support-giving strategies on a scale ranging from 1 (not at all) to 7 (extremely): (a) solve—approaching the problem and offering instrumental aid (ICC = .85); (b) solace—attempting to deal directly with the emotional aspects of the stressful situation by providing reassurance and being empathic (ICC = .87); (c) dismiss—minimizing the importance of the problem or avoiding it by changing the subject (ICC = .80); and (d) escape—avoiding the emotional aspects of the stressful situation by appearing to be distracted or ignoring the "support-seeker" emotional cues (ICC = .89). Two indexes of caregivers' behaviors were computed: (a) caregiver positive support strategies—the average of listening, understanding, support effort, solve, and solace; and (b) caregiver negative support strategies—the average of dismiss, escape, and blame.

Lastly, since this research considers spousal support as a dyadic process that involves one partner's care seeking efforts and the other partner's caregiving responses, three dyadic variables were computed: (a) dyadic negative strategies—the average of caregiver and support-seeker negative support strategies; (b) dyadic positive strategies—the average of caregiver and support-seeker positive support strategies; and (c) dyadic overall support was computed by subtracting the negative strategies from the positive strategies. These three variables were used in the data analysis.

At T2 parents were invited to the laboratory with their infants. Each of them (separately) was given a set of age-appropriate toys and instructed to "be with your baby as you normally would" for 10 min. The parent–infant interactions were video recorded and assessed using the parental embodied mentalizing coding scheme (Shai, 2013). While coding, observers turn the videos on "mute" mode to avoid the potential interference of verbal input to the coding process. The video runs on normal speed. Coders were trained to focus on the participants' whole-body movements rather than focusing on specific elements as parent's or infant's facial expression or gaze patterns (Shai & Belsky, 2011b, 2017). Coding PEM proceeded in four stages: First, coders identified embodied circles of communication (ECC)—kinesthetic communicative exchanges of mental states taking place between the parent and the infant. Second, the coder described each step, in terms of the qualities of their movements: directionality—movement toward (suggesting desire, interest, and attraction) or away (suggesting repulsion or saturation); tempo—slow (reflecting calmness) or fast (reflecting excitement or agitation) movement; space (close or far); pathways (linear or rounded movement); pacing (gradual or abrupt movement); and tension flow—muscle tone involved in the movement (highly contracted muscles are associated with restraint and control, which might reflect distress and discomfort while relaxed muscles are associated with pleasure but also might reflect helplessness) (Shai & Belsky, 2011a, 2017). Third, once an ECC has been identified, the coder classified it into one of four types: embodied support, body ownership, transitions, and promoting exploration. The ECC events were then further classified into subtypes (i.e., embodied support). Next, the coder rated a PEM score based on an anchor rating scale ranging from "very low" (1) to "very high" (7). After assessing all of the ECC events, a global rating was calculated by averaging PEM ratings. The final rating reflected the degree the parent demonstrated a kinesthetic appreciation of the infant's emotional states and implicitly used this appreciation to modify his or her kinesthetic movement qualities accordingly. For a more detailed description of the coding process, please see Shai and Belsky (2017). Coding was performed by four trained postgraduate students. The coders were blind to all other aspects of the study. PEM interrater reliability was assessed using 20% of the parent–infant recorded interactions and was ICC = .85.

At T3, participants were invited to the laboratory and the toddlers participated in a modified version of the emotion recognition task (Denham, 1986; Ruffman et al., 2002). The experimenter asked the toddler to sit in a low chair and sat next to him or her. She then placed in front of him or her four different emotion faces (happy, sad, angry, and scared) and told the toddler: "Now we are going to play a nice game with these faces. Let's begin! Where is the happy/scared/sad/angry face? Show it to me." The toddler could point to or pick up the correct facial expression as well as identify it verbally. The order of identification questions was counterbalanced, and the experimenter asked all questions neutrally to prevent vocal clues for identification. If the toddler pointed to the wrong face (e.g., pointed on the happy face when shown the sad face), the experimenter corrected him or her by telling the toddler which one is the correct face. At the end of the first step, she went back to the faces he or she identified incorrectly and asked the same question again. Children's responses in this task were recorded and then coded by a postgraduate student. Scoring was done according to the following guidelines: A score of four was given for correct identification of the emotion on the first round, three points were given for identifying the proper valence on the first round and the proper emotion on the second round, two points for identifying the proper valence on both rounds and for identifying valence on the first round and the proper emotion on the second round, and one point for identifying improper valence on the first round and the correct valence on the second round. Zero points were given for identifying the improper

emotion and/or valance on both rounds. The global result was calculated by summing the scores of the first and second rounds from all faces.

2.3 | Data analysis

As this was a longitudinal study, there was some acceptable attrition of participation between measurement points. In addition, in each of the tasks, some of the participants did not complete the required tasks, so their data had to be removed. As a result, 22% of the data were missing. In order to make sure remaining participants were not substantially different than those that dropped out, Little's Missing Completely At Random (MCAR) test was conducted. It has indicated that the data were missing completely at random, $\chi^2_{(1153)} = 1025.53$, $p = .1$. This allowed handling the missing data using multiple imputation (Rubin, 2009) with 20 imputed datasets. Prior to the main analyses, we examined normal distribution of all main study measures using a series of Shapiro–Wilk normality tests, the presence of univariate outliers using the robust median absolute deviation (MAD) and of multivariate outliers using the minimum covariance determinant (MCD) approach (latter two by the *Routliers* R package). Next, Pearson correlations were calculated between main study measures. After the associations between main measures were assessed, we conducted a multiple regression to predict whether maternal and paternal PEM at 6 months predict the child's emotion recognition at 24 months. We also examined in this regression whether maternal and paternal interact in predicting the child's emotion recognition at 24 months. To do so, maternal PEM, paternal PEM (both centered around the sample mean to avoid multicollinearity and facilitate interpretation of results), and their interaction served as predictors. The presence of influential points (observations which are both outliers and have high leverage score) that might bias the results of the model was assessed using the *olsrr* R package. Because the MAD and MCD analyses detected a sum of four outliers (and although no influential points were detected), we corroborated the results of the multiple regression, with a robust multiple regression based on the MM estimator using the *MASS* R package. Finally, in order to test PEM as a mediator, we conducted multipath mediation model using MPlus 8.4 (Muthén & Muthén, 1998–2010) Structural Equation Modeling (SEM) software. Significance level was estimated using bias-corrected bootstrap analysis with 5000 resampling cycles. In this model, positive and negative prenatal spousal support served as the predictors, PEM (maternal and paternal) as the mediators, and child's emotional recognition as the outcome measure. The model is a saturated path model, and so, no fit indices are available.

3 | RESULTS

3.1 | Pearson correlations

Descriptive statistics and zero-order correlations are presented in Table 1. As can be seen, significant positive relationships were found between prenatal overall and positive (marginal significance) dyadic support and maternal PEM (H2.1 and H2.2). In contrast, the negative relationship between prenatal negative dyadic support and maternal PEM (H2.3) was not significant as were not any of the prenatal dyadic support measures (negative, positive, and overall) to paternal PEM (H2.1, H2.2, and H2.3). In addition, maternal PEM—but not paternal

TABLE 1 Mean values, standard deviations, and zero-order correlation matrix between study variables

Variable	1	2	3	4	5	6
1. Dyadic negative support		−.67**	−.02	.09	−.14	−.12
2. Dyadic global support			.75**	.03	.14	.23*
3. Dyadic positive support				.10	.07	.21*
4. Emotion recognition					.15	.27*
5. Paternal PEM						.22*
6. Maternal PEM						
Mean	1.88	4.58	2.69	3.52	3.61	11.16
Range	1–4.83	0.6–5.57	2.67–6.73	2–16	2–6	1–6
SD	0.75	1.15	0.85	0.99	0.96	3.53
N	90	90	90	100	95	66

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

PEM—was significantly associated with child's emotion recognition at 24 months (H3). These relationships between PEM and child's emotion recognition were similarly found in a multiple regression analysis—in which maternal PEM, paternal PEM, and their interaction served as predictors and child's emotion recognition at 24 months as the outcome measure—maternal PEM was significantly associated with higher child's emotion recognition ($\beta = .24$, $p = .016$) but paternal PEM was not ($\beta = .09$, $p = .37$). The interaction between maternal and paternal PEM was also not significant ($\beta = .07$, $p = .38$). Maternal and paternal PEM explained 7.1% of the variance of the child's emotion recognition (the interaction added 0.7% to the explained variance), $F_{(3,104)} = 2.94$, $p = .036$. As expected, the robust multiple regression corroborated the results of the multiple regression, and thus, the results are valid beyond possible biases because of outliers.

The first three subhypotheses (H1.1, H1.2, and H1.3) regarding the relationship between prenatal dyadic support (negative, positive, or overall) and toddler's emotion recognition at 24 months were not supported.

3.2 | Mediation analysis

In order to test PEM as a mediator, we conducted multipath mediation model using MPlus 8.4 (Muthén & Muthén, 1998–2010) Structural Equation Modeling (SEM) software. The final model is presented in Figure 1 (presented in standardized coefficients). It shows that maternal PEM significantly mediated the link between prenatal positive dyadic support and child's emotion recognition (H4), *indirect* = 0.24 ($\beta = .18$), bias-corrected 95% bootstrap confidence interval, 0.01, 0.46 (β .03, .41). Prenatal negative dyadic support was not found as related to maternal PEM and thus was not related to emotion recognition through the mediation of maternal PEM. Paternal PEM was not predicted by either positive or negative prenatal dyadic support and was not related to emotion recognition. As such, it did not mediate the relationship between prenatal dyadic support and emotion recognition.

Coefficients of the mediation analysis are presented in Table 2.

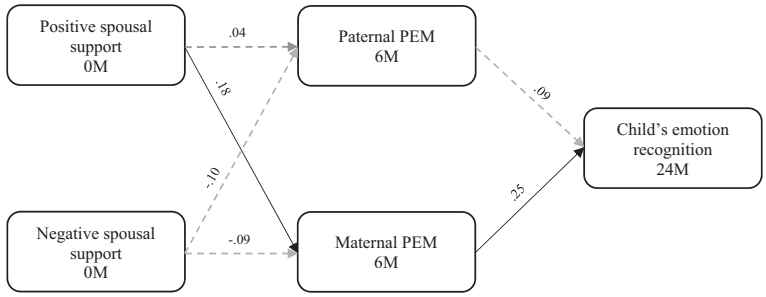

FIGURE 1 Multipath mediation model linking prenatal dyadic support and child's emotion recognition via maternal and paternal PEM. *Significant ratings are marked in bold paths, nonsignificant in gray, dashed paths

4 | DISCUSSION

The first goal of the current study was to examine whether maternal and paternal PEM at 6 months old predict children's emotion recognition at 24 months of age. The findings supported our hypothesis showing a positive relationship between maternal PEM and child's emotion recognition. This is the first study examining this relationship. This result is in line with previous findings showing that maternal PEM at 6 months old was related to infant attachment security at 12, 15, and 36 months (Shai & Belsky, 2017; Shai & Meins, 2018), as well as to better socioemotional wellbeing, social competence, and cognitive abilities and fewer behavioral problems at 54 months (Shai & Belsky, 2017). Maternal PEM was also found related to maternal mind-mindedness (Shai & Meins, 2018), which was found as related to emotional understanding (Centifanti et al., 2016).

This finding can be explained by the way children's emotional abilities are developed. Infants need their parents' to mentalize about their mental states to develop their own mentalizing capacity and understand their emotional experiences (Fonagy et al., 2002; Goldberg, 2011). Parents' mentalizing stance enables children to develop a representation of their mind and understand their mental states (Fonagy et al., 2002; Shai & Fonagy, 2014). Mothers with high levels of PEM are better able to recognize, regulate, and quickly adapt their behaviors to the infant's expressions of both positive and negative mental states (Shai & Fonagy, 2014). The more the mother's behaviors are congruent with her infant's mental states, the easier it will be for him or her to recognize and understand his or her own different affective experiences and mental states (Gergely & Watson, 1996; Sharp et al., 2006) and develop secondary representations of specific emotions (Fonagy et al., 2002), such as identifying and differentiating between emotions, as examined in the current work.

In contrast to the mothers, the relationship between paternal PEM and a child's emotion recognition did not reach significance. Only few previous studies examined the link between paternal mentalizing and children emotional development. Two studies that examined the relationship between an explicit mentalizing measure of mind-mindedness (Zeegers et al., 2017) or reflective functioning (Buttitta et al., 2019) and infants' emotion regulation found only indirect relationships between them—through sensitive behaviors. These findings were in contrast with those of mothers who exhibited both direct and indirect relationships between mentalizing and infant's emotion regulation (Buttitta et al., 2019; Zeegers et al., 2017).

These findings suggest that fathers and mothers each have a unique role in the prediction of children's emotional development. These differences can be explained as stemming from the differences between the amount of time and nature of the relationship each parent has with

TABLE 2 Coefficients of the mediation analysis

	Maternal PEM			Paternal PEM			Child's emotional recognition		
	***b* (95% CI)**	***β***	***t***	***b* (95% CI)**	***β***	***t***	***b* (95% CI)**	***β***	***t***
Positive spousal support	0.21* (0.01, 0.44)	.18	1.96	0.04 (−0.20, 0.29)	.04	0.34	−0.18 (−1.07, 0.71)	−.05	0.67
Negative spousal support	−0.12 (−0.44, 0.21)	−.09	−0.74	−0.15 (−0.39, 0.12)	−.11	−1.16	0.29 (−0.58, 1.05)	.06	0.48
Maternal PEM							0.83** (0.17, 1.44)	.25	2.58
Paternal PEM							0.30 (−0.40, 0.94)	.09	0.89

Note: b, unstandardized coefficients; 95% CI, bias-corrected 95% bootstrap confidence interval.

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

their infant at this age. In many cases, when they are 6 months old, infants still breastfeed and at times mothers are just going back to work after maternity leave. As such, it stands to reason that they are the ones who are spending more time with the infants and thus are better able to recognize their mental states and have more of an influence on their emotional socialization process. However, in this study, we did not examine the time spent with the infant for mothers nor for fathers. Future studies may include the examination of time spent with the infant (Mangialavori et al., 2019).

The second goal of the current study was to broaden the scope of research on emotional development in early childhood and assess the degree that prenatal dyad support can predict maternal and paternal PEM as well as toddler's emotion recognition at 24 months—either directly or through the mediation of PEM. As predicted, positive and overall prenatal dyad support behaviors predicted maternal PEM. These findings are supported by previous studies showing relationships between marital quality and support and responsive and sensitive parenting (Carlson et al., 2011; Planalp et al., 2013). Similarly, higher marital quality predicted stronger parental engagement a year or 2 years later (Carlson et al., 2011). These findings can be explained by the "spillover hypothesis," according to which the effects in one family subsystem affects the others (Nelson et al., 2009).

Current findings add to the literature by showing that even *prenatal* dyad support is related to maternal mentalizing at 6 months postpartum. A possible way to explain these findings is that dyad support during pregnancy reduces mothers' anxiety (Biehle & Mickelson, 2011; Rini et al., 2006)—which allows them to be emotionally available for their child after birth. However, mothers' anxiety was not tested in the current study, so this model should be tested in future studies.

The hypothesized negative relationship between negative prenatal dyad support and maternal PEM was not significantly found. On the surface, this could seem to contradict previous findings that showed that the spillover effect of negative marital relationship on parenting is usually stronger than the positive aspects (Kouros et al., 2014). The differences in our findings might have been a result of a methodological limitation in the choice of research tool to measure couple's interactive behaviors. The paradigm used was focused on measuring spousal support and thus might be less prone to trigger negative conflictual participant behaviors.

Among fathers, none of the prenatal dyadic support measures (positive, negative, and overall) were found to be related to PEM. Similar findings were found in study showing that fathers' relationship satisfaction when infants are 3 months old did not predict level of PRF when they were 12 months old. This in contrast to the mothers where this was found (Salo et al., 2021). These findings is that for fathers, the baby and their fathering role only becomes real after birth (Biehle & Mickelson, 2011; Deave & Johnson, 2008). This is in contrast to women who can prepare for motherhood during pregnancy. Supporting this explanation is the finding that first-time fathers, who participated in an intervention to improve parental mentalizing, reported that the most beneficial aspect of the program was understanding their baby (Sourander et al., 2021).

Another possible explanation for the differences in findings between the parents is that the maternal and paternal PEM in early parenthood is affected by other factors. Mothers, who spend more time taking care of the infant, might be more dependent on their partners' support in order to be emotionally attuned to their babies. This was evidenced in previous studies showing relationships between prenatal spousal support and coparenting interactions (Favez et al., 2013; Heinicke & Guthrie, 1996). In contrast, fathers might rely on other support sources to improve their parental mentalizing capabilities.

In regard to the relationship between prenatal dyadic support (negative, positive, or overall) and child emotional development at 24 months, direct relationships were not significantly

found. The premise underlying this hypothesis was that when the mother–father relationship is emotionally close and supportive, it will have positive effects on children's wellbeing and emotional development through modeling behaviors or indirectly via the parent–child relationship and parenting behaviors (see literature review, Goldberg & Carlson, 2014). However, indirect effect emerged between positive spousal support and toddler emotion recognition through maternal PEM. One possible explanation for these findings is that when mothers experience their marital relationship as more supportive during pregnancy, they are able to transition into their new role with less anxiety and be more emotionally available to their children (also similarly seen in Biehle & Mickelson, 2011). As a result, they are better able to interpret their infant's nonverbal kinesthetic cues as manifestations of their mind and respond to them appropriately—behaviors which contribute to their emotional recognition capacity. However, mothers' anxiety was not measured in the current study, so future studies will need to examine this model. In contrast to the findings regarding positive dyadic support, negative dyadic support was not indirectly related to toddler emotion recognition through maternal PEM. In addition, paternal PEM was not found to significantly mediate between any of the dyadic support variables and toddler emotion recognition. The explanations for this finding have been described in detail in the previous sections.

4.1 | Clinical implications

The current study's findings can be used to inform practitioners working with young couples at the early stages of building a family. First, it is important to work with couples, even before the birth of their first child, on improving their communication, mutual support, avoiding criticism, coping with stress, and problem-solving. Such a preventative intervention might reduce parents' stress, improve their parental mentalizing capabilities, and create a family environment that will contribute to their relationships with their child and their child's emotional development.

Second, in light of the relation found between maternal PEM and emotion recognition, it seems important to provide mothers with guidance that can help recognize their infants' nonverbal cues and adjust their own kinesthetic patterns accordingly.

4.2 | Methodological limitations and suggestions for future studies

The current study had several methodological limitations that should be taken into consideration. First, spousal support was only measured prenatally and not postpartum. As the quality of and the mutual support in a marital relationship during early childhood can affect the child's emotional development (see review Goldberg & Carlson, 2014), it would have been helpful to know if level of spousal support was reduced after birth. Future studies should examine this question by conducting several measurements of spousal support.

Second, parental mentalizing was only measured postpartum (at 6 months) and not prenatally. In order to take into account the initial level of parental mentalizing capabilities and understand how it changes during transition to parenthood, it is important to measure it at both times.

Several additional directions of future studies can be offered. First, it might be interesting to examine more thoroughly the dynamics and changes couples go through during the pregnancy of their first child. Getting a better understanding of the prenatal environment will help in broadening the family system model to this initial stage.

Second, a future study may examine the manifestations and influences of the interaction between maternal and paternal PEM in triadic interactions in different child ages. Third, another significant direction could be to take a closer look at the relationship between PEM and the development of emotion recognition capacity in order to understand its changes over time. Fourth, as stress was described in the literature as affecting PEM levels and improved by spousal support, it is recommended that future studies include direct measurements of stress.

5 | CONCLUSIONS

This longitudinal study has demonstrated an indirect effect between positive spousal support and toddler emotion recognition (at 24 months) through maternal PEM. The warm supportive environment that the couple had established prior the child's birth enabled mothers to be more emotionally available and demonstrate an embodied mentalizing stance toward the new baby. This mentalizing stance, in turn, contributed to the child's emotional recognition at 24 months. Fathers' PEM was not found to be related to either prenatal dyad support or to toddler's emotion recognition, and it did not mediate the relationship between the two. As such, it appears that fathers' contribution to their children's emotional development might follow different paths from the ones examined in the current investigation. This study supported the importance of using implicit measures to examine parental mentalizing with young children and especially the use of parental embodied mentalizing. In addition, it showed the significance of a broader family system point of view in studying the relations between parental mentalizing and child outcomes.

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CONFLICT OF INTEREST

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