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RESEARCH ARTICLE

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Parental prenatal representations of the child are related to 18-month-old children's social-emotional competence

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ABSTRACT

Parental representations of the child are linked to positive developmental outcomes in children, but the impact of prenatal representations on early social-emotional development, particularly from fathers, is less understood. This study explores how fathers' and mothers' prenatal representations within two-parent families are associated with early social-emotional development. Prenatal representations of fathers (n = 88) and mothers (n = 92) were assessed between 28 and 32 weeks of gestation using the Working Model of the Child Interview, categorizing them as balanced or nonbalanced. The children's (n = 97; 49.5% girls) social-emotional and behavioral problems and competencies were measured at 18 months using the Brief Infant-Toddler Social and Emotional Assessment. Balanced prenatal representations of both parents were related to higher social-emotional competence in toddlers. However, prenatal representations were not related to social-emotional and behavioral problems. The results highlight the benefits of balanced prenatal representations in promoting early social-emotional competence in children.

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Pregnancy; prenatal representations; child development; social-emotional; The STEPS study

A child's social-emotional development is commonly defined in terms of their social-emotional and behavioral (SEB) problems and social-emotional competence (Briggs-Gowan, 2004). Favorable early social-emotional development is beneficial for subsequent psychological functioning and emotional well-being (Briggs-Gowan & Carter, 2008; Englund et al., 2011; Halligan et al., 2013; Treyvaud et al., 2012). However, approximately 10% to 15% of one- and two-year-old children have significant SEB problems, including various externalizing, internalizing, and dysregulation challenges (Briggs-Gowan et al., 2001; Briggs-Gowan & Carter, 2006; Roberts et al., 1998). Since early signs of SEB problems or delays in social-emotional competence are a risk for further social-emotional challenges, it is important to identify factors that affect early social-emotional development.

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Young children experience rapid growth and change, often accompanied by some challenging behaviors as part of their normal psychosocial development (Wakschlag & Danis, 2009). However, intense, widespread, and prolonged problem behaviors are clinically significant (Carter et al., 2003). Externalizing problems are characterized as difficulties with impulsivity, aggression, or activity (Briggs-Gowan & Carter, 2006), while internalizing problems include fearfulness, worry, nervousness, anxiety, withdrawal, and symptoms of depression (Briggs-Gowan & Carter, 2006; Groh et al., 2012). Typical dysregulation challenges include negative emotionality, problems with sleeping and eating, and sensory sensitivities (Briggs-Gowan & Carter, 2006). A child's social-emotional competence, in turn, refers to characteristics and skills that are important for developing and maintaining social relationships, such as compliance, attention skills, prosocial interactions, empathy, and mastery motivation (Briggs-Gowan & Carter, 2006). SEB problems and delays in social-emotional competence are often interrelated, particularly during early childhood (Briggs-Gowan, 2004). Age-appropriate competence skills increase the likelihood of continued competence and may also minimize the emergence of problem behaviors.

Extensive literature demonstrates that a child's social-emotional development is shaped by their experiences with caregivers (e.g. Belsky & Fearon, 2002; Fearon et al., 2010; Ramchandani et al., 2013; Sarkadi et al., 2008; Sroufe, 2005). For instance, a child's secure attachment to parents predicts positive social-emotional development (Belsky & Fearon, 2002; Sroufe, 2005). However, parent-child relationships begin to develop even before the child's birth, during pregnancy, through parental psychological reorganization and representations of the expected child (Slade et al., 2009; Vreeswijk et al., 2014). These representations, referred to as internal working models by Bowlby (1969/1982), include parent's expectations, ideas, and experiences related to the child, relationship with the child and self as a parent and prospective caregiver (Benoit, Parker, et al., 1997; Slade et al., 2009). Moreover, these representations guide early parenting practices and constitute the basis for the postnatal parent-child relationship (Dayton et al., 2010; Solomon & George, 1996). However, the associations between prenatal representations and children's early social-emotional development have been rarely studied, especially regarding fathers' prenatal representations.

Prenatal representations can be assessed through interviews, such as the Working Model of the Child Interview (WMCI; Benoit, Parker, et al., 1997; Zeanah et al., 1994), which categorizes representations into balanced, disengaged, and distorted representations based on the coherence and qualitative characteristics of parental narratives. Balanced representations describe a positive emotional connection with the child, openness, acceptance of the child's experiences and needs for dependency, and appreciation of the relationship. Disengaged representations are characterized by emotional distance, rigid or stereotyped descriptions of the child and the relationship, and rejection of the child's emotional needs and dependency. Distorted representations may indicate high emotional involvement but also demonstrate incoherence and confusion in the narrative of parental role. Representations of parents demonstrate, to some extent, stability from pregnancy to the postnatal period, particularly in balanced representations and maternal distorted representations (Benoit, Parker, et al., 1997; Vreeswijk et al., 2014). Furthermore, prenatal representations of first-time parents seem to be more frequently balanced compared to those of nonprimiparous mothers and fathers (Vreeswijk et al., 2015; Vreeswijk et al., 2014). Among fathers, the quality of prenatal representations is related

to prenatal attachment, which refers to parental self-reported behaviors, attitudes, thoughts, and feelings demonstrating emotional bond and commitment toward the fetus (Condon, 1993; Cranley, 1981). Fathers with balanced prenatal representations report a higher level of prenatal attachment compared to fathers with disengaged representations (Vreeswijk et al., 2014).

Pregnancy provides opportunities to recognize and address crucial prenatal factors affecting early parent-child relationships and subsequent child development (e.g. Davis & Narayan, 2020). To our knowledge, longitudinal associations between prenatal representations and children's social-emotional development have not been directly examined, with fathers often being excluded from studies (Branjerdporn et al., 2017). Nevertheless, previous research has demonstrated that balanced prenatal representations of mothers and fathers have a positive effect on the quality of postnatal parent-child interaction (Lindstedt et al., 2020; Theran et al., 2005). Balanced prenatal representations and higher prenatal attachment are associated with more optimal child outcomes, including secure parent-child attachment, which contributes to a child's higher social-emotional competence (Belsky & Fearon, 2002; Benoit, Parker, et al., 1997; Condon et al., 2013; Huth-Bocks et al., 2011; Tambelli et al., 2020; Trombetta et al., 2021). Furthermore, postnatal assessments have shown that fathers with balanced representations demonstrate higher sensitivity and lower withdrawal during interaction with their 2-year-old child, who, in turn, exhibits higher sociability and a larger vocabulary (Hall et al., 2014). Similarly, regarding mothers, their postnatal balanced representations are associated with higher-quality interaction behaviors of mothers and infants, such as higher quality play and attention skills (Korja et al., 2010). These findings together suggest that parent-child interaction quality and a child's secure attachment could serve as mechanisms through which representations influence a child's social-emotional development.

Although fathers, like mothers, build relationships with their children during pregnancy, and positive prenatal father-child relationships have positive effects on postnatal relationships (Lindstedt et al., 2020; Vreeswijk et al., 2014), the impact of paternal prenatal representations on children's social-emotional development remains unknown. Furthermore, contemporary models suggest that the combination of relationships may predict a child's developmental outcomes more strongly than either relationship alone (Dagan & Sagi-Schwartz, 2018; van Ijzendoorn et al., 1992). This also provides a more ecologically valid approach to understanding an individual's developmental trajectory (Belsky, 1981). As parent-child relationships begin to develop during pregnancy through parental prenatal representations of the child, both parents' representations should also be examined together to gain an understanding of the individual and interrelated effects of these representations.

To conclude, there is very limited longitudinal research on the long-term effects of prenatal representations on a child's social-emotional development. Despite the acknowledged significance of fathers, they have mainly been excluded from previous studies. To address this gap, the purpose of the present study is to examine whether prenatal representations of mothers, fathers, and both parents in two-parent families are associated with early SEB problems and social-emotional competence when their child is 18-months old. Specifically, we expect that children of parents with balanced prenatal representations of the child will demonstrate higher levels of competence and lower levels of SEB problems. Possible

confounding variables, i.e. prenatal symptoms of depression, marital satisfaction of both parents, and child temperament were selected based on prior findings indicating significant associations with either prenatal representations or a child's social-emotional development (Ahlqvist-Björkroth et al., 2016; Bridgett et al., 2015; Deave et al., 2008; Favez et al., 2006).

Method

Participants and procedure

The present study is a sub-study of the longitudinal multidisciplinary birth-cohort study, Steps to the healthy development and well-being of children (the STEPS study), conducted in the Hospital District of Southwest Finland (Lagström et al., 2013). The study was approved by the Ethical Committee of the Southwestern Finland Health Care District on 27 February 2007. Pregnant couples were invited to participate in the study during their first visit to the maternity health care clinic (between 10 and 15 gestational weeks). Information regarding parents' education, income, socioeconomic status, civil status, and parity was gathered during their inclusion in the study. The initial sample included 1,797 mothers, 1,658 fathers, and 1,827 children. The intensive follow-up of the families started after the recruitment stage in the first trimester, with parents completing several questionnaires. Both parents completed questionnaires assessing the symptoms of depression and the quality of their dyadic couple relationship at 20 weeks of gestation. Based on the Revised Dyadic Adjustment Scale (RDAS; Busby et al., 1995) scores, families were invited to participate in a substudy focusing on the psychological welfare of the family and child development. In approximately half of the families, one or both spouses scored 36 or higher on the RDAS, indicating distress in their relationship. In another half of the families, both spouses scored under 36 on the RDAS, indicating no distress in their relationship. The cut-off score of the RDAS was equal to the cut-off proposed by Crane et al. (2000). In total, 435 families were invited to participate, and eventually, 153 families agreed to take part in the substudy. Further, drop-out analyses indicated that nonparticipating couples had more often lower educational levels and were not married compared to participating couples; however, no other differences were found (Ahlqvist-Björkroth et al., 2016). The selection of the present study sample is illustrated in Figure 1.

Between 28 and 32 weeks of gestation, both parents were interviewed separately regarding their prenatal representations of the child. Information concerning child sex, length of gestation, birth weight, and Apgar score was collected from hospital records after the child was born. When the child reached 18 months of age, the parents completed a questionnaire measuring their child's social-emotional development. The final sample comprised 97 families with complete available WMCI, RDAS and social-emotional assessments. Further, families were categorized as "risk" families if marital distress was found ($n = 44$; 45%) or as "controls" ($n = 53$; 55%) if no marital distress was found. Drop-out analyses revealed that among the excluded families ($n = 56$), the mothers reported slightly more prenatal symptoms of depression ($M = 7.81$, $SD = 4.41$) compared to the mothers ($M = 5.81$, $SD = 4.40$) from the included families, $U = 1446.00$, $p = .007$. No other differences were found. The demographic sample characteristics are reported in Table 1.

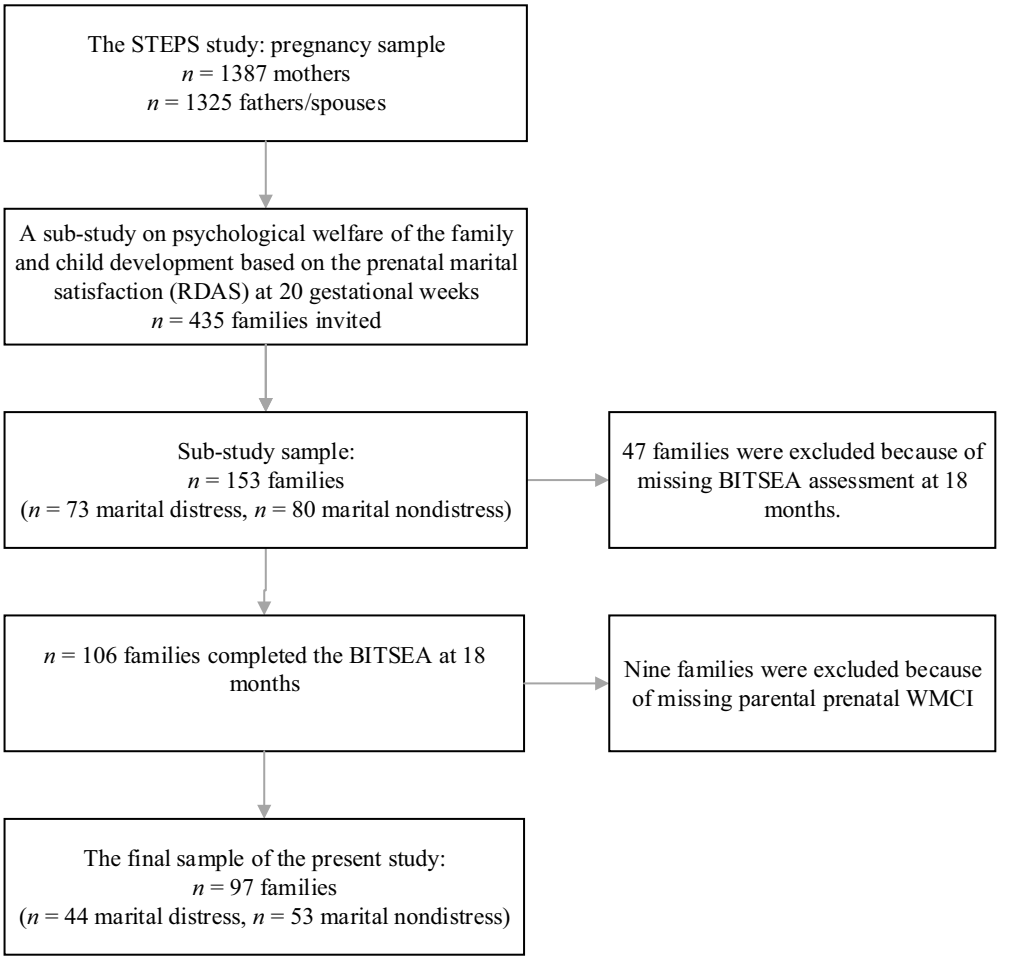

Figure 1. Flowchart of the sample selection.

Measures

Study variables

Parental prenatal representations. The prenatal version of the Working Models of the Child Interview (WMCI; Benoit, Parker, et al., 1997; Zeanah et al., 1994) was used to assess parents' thoughts, feelings, and perceptions about their expected baby and their relationship with the baby. The interviews were conducted by master's students in psychology who were trained for the procedure. The video recorded interviews were approximately one hour long and were rated by two trained researchers using the WMCI coding manual (Zeanah et al., 1996). The rating process had two stages. First, the quality and content of the parental narratives were evaluated based on eight subscales: richness of perceptions, openness to change, intensity of involvement, coherence, caregiving sensitivity, acceptance, infant difficulty, and fear for the infant's safety. These subscales were then used to classify parental representations into three categories: balanced, disengaged, and distorted. Balanced representations are coherent and flexible descriptions of perceptions and experiences. Parents

Table 1. Descriptive Statistics for the Participating Families ($n = 97$).

Variable	*n*	%	*M*	*SD*	Range
Child sex					
Male	49	50.5			
Female	48	49.5			
Apgar 5 min	96		9.07	.73	7–10
Birth weight (grams)	96		3542	465	1915–4460
Gestational age at birth (weeks)	96		40	1.48	34–42
Parental age					
Father	97		33.27	4.38	25–46
Mother	97		31.46	3.57	23–42
Civil status					
Married	72	74.2			
Cohabited	25	25.8			
Length of relationship (years)	97		7.77	4.08	1–18
Prenatal marital satisfaction (RDAS)					
Father	96		31.52	5.82	18–50
Mother	97		32.26	6.76	18–56
Prenatal marital satisfaction status					
Risk family	44	45			
Control family	53	55			
Prenatal symptoms of depression (EPDS)					
Father	97		3.37	3.20	0–14
Mother	97		5.81	4.40	0–19
Parity (first child)					
Father	53	54.6			
Mother	54	55.7			
Both parents	51	52.6			
Nuclear family structure					
Nuclear	88	92.6			
Professional socioeconomic status					
Father	50	61			
Mother	58	66			
Family income					
High	16	16.5			
Intermediate	67	69.1			
Low	14	14.4			

[a]Professional refers to managers but also intermediate level professionals, e.g. nurses; nonprofessionals refer to blue-collar and service workers. [b]High: over 4000 € total net income monthly; Intermediate: 2000–4000 €/month; Low: < 2000 €/month. *Note*. The exchange rate for U.S. dollar is 1.08 for one euro (€).

identify the child's individuality and express a valuing of their relationship with the child. Nonbalanced disengaged representations are described by a sense of emotional distance and detachment. Parents lack genuine interest in their child's experiences, and descriptions of their child can be restricted and intellectualized. Further, nonbalanced distorted representations are characterized by incoherent and inconsistent narratives, and they may be confused and distracted by other concerns. In the present study, we used balanced and nonbalanced (disengaged and distorted) representation categories. The main coder rated all the interviews and 25% of the interviews were double-scored for reliability. Interrater agreement for the three-way classification was 80% ($\kappa = .65$).

Child social-emotional and behavioral (SEB) problems and competencies. The Brief Infant – Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006) was used to assess children's SEB problems and competencies. We applied the Finnish translation (Haapsamo et al., 2009) of the BITSEA parent form. The questionnaire includes 42 items that measure the symptoms of SEB problems and social-emotional competence

present during the preceding month in children aged 12 to 35 months on a 3-point scale (0 = *not true/rarely*, 1 = *somewhat true/sometimes*, 2 = *very true/often*). Two of the items (19 and 27) include an additional alternative N for *no opportunity*. Individual items are combined into two scales that provide the total scores for problems (31 items) and competence (11 items).

Problem scale items assess externalizing and internalizing problems, dysregulation, and maladaptive and atypical behaviors. Total scores for SEB problems range from 0 to 62, and higher scores indicate SEB problems. Competence scale items, instead, assess areas of attention, compliancy, mastery motivation, pro-social peer relations, empathy, play skills, and social relatedness. Total scores for competence range from 0 to 22, and low scores indicate deficits or delays in competence. Further, total scores for SEB problems and social-emotional competence were used as continuous variables. The manual also offers clinical cut-offs for deficits or delays in competencies and possible social-emotional problems (Briggs-Gowan & Carter, 2006). Due to the lack of validity of these cut-scores in the Finnish population and the nonclinical nature of the study sample, they were not used. However, the proportion of clinically significant symptoms of SEB problems and deficits in competence is reported to describe the present sample.

Internal consistency (Cronbach's alpha) was .62 for the competence scale and .67 for the problem total scale. Previous studies using the Finnish version of the BITSEA have found similar levels of internal consistency: between .57 and .61 for the competence scale and between .66 and .75 for the problem total scale (Alakortes et al., 2017; Haapsamo et al., 2009). Further, the children were 16 to 19 months old when the BITSEA form was filled. Many of the children were 18 months old ($n = 58$), and 30 children were 17 months old during the assessment. The BITSEA was completed mainly by the mothers, and only three fathers completed the questionnaire.

Control variables

Marital satisfaction. Parental prenatal marital satisfaction was assessed with the 14-item Revised Dyadic Adjustment Scale (RDAS; Busby et al., 1995) at 20 weeks of gestation. The items were rated either from 1 to 5 or from 1 to 6. A total sum score was calculated separately for the fathers and mothers, ranging between 14 and 83. Higher scores indicate distress in the relationship. The internal consistency (Cronbach's alpha) for the RDAS in the present sample was .80 for the fathers and .81 for the mothers.

Prenatal symptoms of depression. Both parents completed the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987) at 20 weeks of gestation. The EPDS is a self-reported questionnaire with 10 items rated on a four-point scale (0 to three). The total sum score was calculated, ranging from 0 to 30. Higher scores indicate more severe symptoms of depression.

Child temperament. The Infant Behavior Questionnaire -Revised Short Form (IBQ-R SF; Gartstein & Rothbart, 2003; Putnam et al., 2014) was used to assess parental perceptions of their eight-month-old child's temperament. The questionnaire includes 91 items rated on a seven-point Likert scale from 1 (*never*) to 7 (*always*). The scale means were calculated for surgency/extraversion, negative affectivity, and orienting/regulation. Higher scores indicated a higher level of specific temperament features. The questionnaire was completed

by either the mothers (48%) or the parents together (52%). Further, data were available for 93 children, with missing information for five children (5%). Missing values at item level were imputed using the mean of each item. Children were rated higher in surgency/extraversion when the questionnaire was completed together compared to maternal reports, $t(91) = -4.61$, $p < .001$. The internal consistency (Cronbach's alpha) of the scale was .86 for negative affectivity, .77 for orienting/regulation, and .87 for surgency/extraversion.

Data analysis

Statistical analyses were completed using IBM SPSS Statistics (version 25.0). First, we provided descriptive statistics of the study variables. To identify crucial covariates, the associations between the study variables and background variables were examined using Spearman correlation analyses, chi-square tests, independent samples *t*-tests, Mann-Whitney *U*-tests, and Kruskal-Wallis tests. Associations between prenatal representations and children's social-emotional development were first examined using Mann-Whitney *U*-tests and Kruskal-Wallis tests. Finally, we conducted hierarchical regression models to 1) examine these associations and 2) include confounding variables in the models. Bonferroni-adjusted values are reported when required. No imputation was used for the missing values. A G*Power 3.1.9.7 (Faul et al., 2007) post hoc power analysis indicated that our sample of 97 families was sufficient to detect a medium-size effect, $f^2 = .15$, power = .86, $\alpha = .05$, in a multiple linear regression with four predictors.

Results

Parental prenatal representations

The distribution of prenatal representations of the child among all fathers and mothers is reported in Table 2, and representations within the family in Table 3. In the study sample ($n = 97$), the WMCI was available for both parents in 83 families. In 41 families (49%), both parents had balanced prenatal representations. In 24 families (29%), one parent had balanced representations and the other had nonbalanced representations. Finally, in 18 families (22%) both parents had nonbalanced representations. Within-family comparisons indicated a difference between parents in terms of the distribution of balanced and nonbalanced representations, $\chi^2(1) = 11.81$, $p = .001$ (Table 3). However, when all fathers and mothers ($n = 180$; 88 fathers and 92 mothers) were compared, no difference was

Table 2. Distribution of parental prenatal representations.

	Father	Mother	Total
	n (%)	*n* (%)	*n* (%)
Balanced	53 (60)	59 (64)	112 (62)
Nonbalanced	35 (40)	33 (36)	68 (38)
Disengaged	24 (27)	17 (19)	41 (23)
Distorted	11 (13)	16 (17)	27 (15)
	88	92	180

Table 3. Distribution of prenatal representations of fathers and mothers.

		Paternal representations		
		Balanced *n* (%)	Nonbalanced *n* (%)	Total *n*
Maternal representations	Balanced	41 (49)	14 (17)	55
	Nonbalanced	10 (12)	18 (22)	28
	Total	51	32	83

found in the distribution of balanced and nonbalanced representations (Table 2). Furthermore, parity, prenatal symptoms of depression, and marital satisfaction were not related to the quality of prenatal representations.

Social-emotional and behavioral problems and competence of 18-month-old children

Descriptive statistics of the BITSEA problem total and competence scores are reported in Table 4. In the present sample, 10.2% of the children (six girls and four boys) scored above the clinical cut-off for problem total scores. In addition, 13.3% of the children (five girls and eight boys) scored below the clinical cut-off for possible deficits or delays in the competence scale.

Following this, crucial confounding variables were identified. Child sex was not related to the problem or competence scores. Regarding marital satisfaction, children of nondistressed couples had lower scores in problem scale, $U = 809.00$, $p = .009$, and higher scores on the competence, $U = 836.00$, $p = .016$ compared to the children of distressed couples. We found no difference in the BITSEA scale scores related to parity, parental age, the socioeconomic status of the parents, or paternal prenatal depressive symptoms. However, maternal prenatal depressive symptoms indicated slightly higher problem scores, $r_s = .216$, $p = .033$. Concerning child temperament, a child's higher scores in surgency/extraversion and orienting/regulation

Table 4. Descriptives for the BITSEA Competence and Problem total scores.

	Competence			Problem total		
	M	*SD*	Range	*M*	*SD*	Range
Total ($n = 97$)	17.12	2.57	11–22	8.28	4.62	0–26
Girls ($n = 48$)	17.60	2.62	11–22	7.65	4.63	1–26
Marital satisfaction status						
Distressed couples ($n = 53$)	16.39	2.70	11–22	9.80	5.45	1–26
Nondistressed couples ($n = 44$)	17.74	2.31	13–22	7.02	3.35	0–14
Prenatal representations						
Fathers ($n = 88$)						
Balanced ($n = 53$)	17.92	2.31	12–22	8.58	3.96	2–21
Nonbalanced ($n = 35$)	16.46	2.65	12–22	8.09	5.61	0–26
Mothers ($n = 92$)						
Balanced ($n = 59$)	17.66	2.50	11–22	8.00	4.24	0–26
Nonbalanced ($n = 33$)	16.24	2.54	12–22	8.79	5.42	2–26
Family-level prenatal representations ($n = 83$)						
Both parents balanced ($n = 41$)	18.22	2.20	14–22	8.02	3.48	2–17
One parent balanced ($n = 24$)	16.92	2.62	12–21	9.13	5.91	0–26
Both parents nonbalanced ($n = 18$)	16.11	2.68	12–22	8.28	5.59	2–26

indicated higher competence score, $r_s = .348$, $p = .001$ and $r_s = .321$, $p = .002$. Instead, higher negative affectivity indicated higher problem scores, $r_s = .351$, $p = .001$.

Based on the demonstrated associations, maternal prenatal symptoms of depression, the marital satisfaction status of the family, and child temperament (surgency/extraversion and orienting/regulation) were included as covariates in the regression models.

Preliminary associations between parental prenatal representations and children's social-emotional and behavioral problems and competence

We found that children having a parent with balanced prenatal representations, $U_{father} = 627.50$, $p = .010$ and $U_{mother} = 669.00$, $p = .013$, had higher scores on the competence scale compared to children having a parent with nonbalanced representations (Table 4). No differences were found in the problem scores between children having a parent with balanced prenatal representations and children having a parent with nonbalanced prenatal representations.

We then included prenatal representations as a family-level variable (both parents balanced, one parent balanced and both parents nonbalanced) in the analyses and compared competence and problem scores between the families. The competence scores were significantly different between families, $H(2) = 8.88$, $p = .012$. In the pairwise Bonferroni-corrected comparisons, children having two parents with balanced prenatal representations had higher competence scores compared to those having two parents with nonbalanced prenatal representations ($p = .013$) (Table 4). No differences were found in the problem scores between children having no, one, or two parents with balanced prenatal representations.

Regression of parental prenatal representations on a child's social-emotional competence

Because significant associations were found only for parental prenatal representations and the social-emotional competence of the children, hierarchical regression models were calculated for these variables using standardized values (z-values). Categorical variables were dummy-coded, and balanced representations were used as a reference category. Control variables were entered in the first step, and dummy-coded parental prenatal representations in the second step.

Paternal prenatal representations and the child's social-emotional competence

After including all variables in the model, a statistically significant regression equation was found, $F(4, 83) = 7.18$, $p < .001$, accounting for 26% of the variance in the BITSEA competence scores, Model 1. The data showed a significant increase in the explained variance from 19.9% for the first step to 25.7% for the second step ($p = .013$). Regression analysis indicated that, after controlling for marital satisfaction status and child temperament, fathers' prenatal balanced representations were related to higher competence scores in children ($\beta = .48$, $p = .013$), accounting for 5.8% of the variance in the BITSEA competence scores (Table 5).

Maternal prenatal representations and the child's social-emotional competence

Similar regression analyses were performed for maternal representations and BITSEA competence scores, Model 2. After including all variables, the model was significant, $F(4, 87) = 11.30$, $p < .001$, accounting for 34% of the variance in the competence scores. The data showed a significant increase in the explained variance from 30.6% for the first step to 34.2% for the second step ($p = .033$). Regression analysis indicated that after controlling for marital satisfaction status and child temperament, mothers' prenatal balanced representations were associated with higher competence scores in children ($\beta = .39$, $p = .033$) accounting for 3.5% of the variance in the BITSEA competence scores (Table 5).

Family-level prenatal representations and a child's social-emotional competence

Finally, we conducted regression analyses for family-level representations and BITSEA competence scores, Model 3. After entering all variables, the model was significant, $F(5, 77) = 7.25$, $p < .001$, accounting for 32.0% of the variance in the competence scores (Table 5). The data showed a significant increase in the explained variance from 24.7% for the first step to 32.0% for the second step ($p = .020$). After controlling for marital

Table 5. Hierarchical regression for prenatal representations and BITSEA competence scale scores.

Variables	β	*SE*	95% CI *LL*	95% CI *UL*	*p*	R^2
Model 1 ($n = 88$)						
Step 1						.199
Marital satisfaction status[a]: marital distress	−.36	.19	−.74	.03	.069	
Child temperament: surgency/extraversion	.29	.11	.08	.51	.008	
Child temperament: orienting/regulation	.17	.10	−.03	.38	.094	
Step 2						.257
Marital satisfaction status[a]: marital distress	−.30	.19	−.67	.07	.113	
Child temperament: surgency/extraversion	.26	.10	.06	.47	.013	
Child temperament: orienting/regulation	.19	.10	−.01	.39	.064	
Paternal prenatal representations[b]: balanced	.48	.19	.10	.86	.013	
Model 2 ($n = 92$)						
Step 1						.306
Marital satisfaction status[a]: marital distress	−.44	.18	−.79	−.09	.015	
Child temperament: surgency/extraversion	.35	.10	.16	.54	<.001	
Child temperament: orienting/regulation	.21	.10	.01	.41	.042	
Step 2						.342
Marital satisfaction status[a]: marital distress	−.43	.17	−.77	−.08	.016	
Child temperament: surgency/extraversion	.33	.10	.14	.52	<.001	
Child temperament: orienting/regulation	.20	.10	.00	.39	.048	
Maternal prenatal representations[b]: balanced	.39	.18	.03	.75	.033	
Model 3 ($n = 83$)						
Step 1						.247
Marital satisfaction status[a]: marital distress	−.41	.19	−.79	−.03	.037	
Child temperament: surgency/extraversion	.31	.11	.09	.52	.006	
Child temperament: orienting/regulation	.21	.11	.00	.42	.053	
Step 2						.320
Marital satisfaction status[a]: marital distress	−.35	.19	−.72	.02	.060	
Child temperament: surgency/extraversion	.27	.11	.06	.48	.013	
Child temperament: orienting/regulation	.22	.11	.01	.43	.041	
Family-level prenatal representations[c]:						
one parent balanced	−.30	.22	−.73	.14	.177	
both parents nonbalanced	−.68	.24	−1.15	−.20	.006	

[a]Marital satisfaction status: 0 = no marital distress, 1 = marital distress.
[b]Prenatal representations: 0 = nonbalanced, 1 = balanced.
[c]Dummy-coded family-level prenatal representations: both parents balanced, one parent balanced, both parents nonbalanced. Both parents balanced were used as the reference category.

satisfaction status and child temperament, children of two parents with balanced prenatal representations had higher competence scores compared to children with no parents with balanced prenatal representations ($\beta = -.68$, $p = .006$) accounting for 7.3% of the variance in the BITSEA competence scores. However, no differences were found in the BITSEA Competence scores between children with one parent having balanced representations and children with either two or no parents having balanced representations.

Discussion

Recognizing pregnancy as a crucial transition period when early parent-infant relationships begin to form, this study explored how parental prenatal representations of the child are associated with toddlers' social-emotional and behavioral problems, and social-emotional competence. The results demonstrated that the balanced prenatal representations of both parents were significantly related to parental reports of children's higher social-emotional competence. However, the quality of prenatal representations was not related to parental reports of social-emotional and behavioral problems. Our findings suggest that in two-parent families, it is beneficial for the child's social-emotional development if both parents are capable of constructing balanced representations regarding the child and their relationship during pregnancy.

Our results, highlighting the positive impact of balanced prenatal representations, are consistent with previous findings. As previous studies have shown, balanced prenatal representations are typically stable from pregnancy to the postnatal period and predict higher quality in postnatal parent-infant relationships (Benoit, Parker, et al., 1997, Lindstedt et al., 2021; Tambelli et al., 2020; Vreeswijk et al., 2014). Furthermore, balanced prenatal representations have been linked to more optimal child outcomes, such as a child's secure attachment to both parents, which has a crucial impact on a child's favorable social-emotional development (Belsky & Fearon, 2002; Benoit, Parker, et al., 1997; Sroufe, 2005; Tambelli et al., 2020; Trombetta et al., 2021). Similarly, postnatal balanced representations are associated with a higher quality of parent-child interactions during the first postnatal year, as well as a child's secure attachment to parents (Benoit, Zeanah, et al., 1997; Hall et al., 2014; Korja et al., 2010; Sokolowski et al., 2007). Furthermore, children of fathers with balanced representations show higher sociability and larger vocabulary when reaching the age of two years, and the infants of mothers with balanced representations show lower levels of withdrawn mood and higher quality of play and attention skills during dyadic interaction (Hall et al., 2014; Korja et al., 2010).

Taken together, these findings suggest that prenatal balanced representations may positively influence the postnatal parent-child relationship through postnatal parental representations and the quality of caregiving relationship, which contributes to the development of secure attachment and social-emotional competence in young children. However, to our knowledge, the present study is the first to demonstrate associations between both parents' prenatal representations and a child's social-emotional competence. Furthermore, balanced prenatal representations indicated a unique contribution to young toddlers' social-emotional competence, beyond the other variables controlled in the models, such as marital satisfaction and child temperament.

Further, we examined the quality of prenatal parent-infant relationship using a semi-structured interview, the WMCI, to assess parental prenatal representations. In contrast,

many previous studies employing self-report questionnaires of prenatal attachment have demonstrated significant associations with various child outcomes. Parental prenatal attachment, psychological preparation, and emotional bond with the expected child have positive influences on children's social-emotional development among children aged 2 or 3 years (Branjerdporn et al., 2017; Hruschak et al., 2022; Trombetta et al., 2021). Higher prenatal attachment has been particularly associated with higher social-emotional competence in children. All these findings together, including the assessments of prenatal representations and prenatal attachment, provide considerable evidence demonstrating that the prenatal parent-infant relationship has a crucial impact on the development of a child's social-emotional competence.

A limited number of studies have included fathers and assessed their prenatal representations. Therefore, we lack information on whether the quality of prenatal representations differs between fathers and mothers. In the present study, when comparing all fathers and mothers, no difference was found in the distribution of prenatal representations. However, the distribution differed between parents within the same family. In the majority of families, both parents had balanced representations, consistent with previous studies (Vreeswijk et al., 2012, 2014). Nevertheless, in our sample, fathers had balanced representations more often (60%) compared to findings (44%) reported by Vreeswijk et al. (2014). They also reported that fathers had disengaged representations more often than women, which was not found in our sample. Furthermore, our results indicate that in two-parent families, children benefit when both parents construct balanced prenatal representations regarding the expected child. To our knowledge, the impact of parental prenatal representations as a family-level variable has not been previously examined. However, both mothers' and fathers' balanced prenatal representations have demonstrated similar individual associations, indicating that they result in higher-quality postnatal interaction behaviors (Lindstedt et al., 2020; Theran et al., 2005). Additionally, the risk of parenting problems and child maltreatment during pregnancy seems to be lower in families where both parents have balanced prenatal representations (Vreeswijk et al., 2015).

In the present study, parental representations of the child were assessed once prenatally, and the postnatal assessment was not available. Based on prior research, it seems that balanced representations are more stable during the perinatal transition (Benoit, Parker, et al., 1997; Theran et al., 2005; Vreeswijk et al., 2014). Instead, it has been suggested that nonbalanced representations may develop into balanced representations postnatally more often, at least among fathers (Vreeswijk et al., 2014). It is possible that in our sample, some of the nonbalanced prenatal representations have become balanced postnatally, further increasing the already substantially high proportion of balanced representations in the sample. This could be one explanation for why we found no association between prenatal representations and a child's SEB problems. Nevertheless, this is a positive aspect because it suggests that having nonbalanced representations prenatally does not necessarily indicate adverse child outcomes, such as SEB problems. Moreover, our previous results using the same cohort showed that it was beneficial for the early postnatal father-infant relationship if the father had balanced prenatal representations; however, the quality of the father-child relationship developed and showed positive changes during the first 18 months after birth (Lindstedt et al., 2020). In addition, the fact that limited research has concurrently examined the predictive value of both prenatal and

postnatal representations needs to be highlighted. In one such study, prenatal assessment of maternal representations indicated a predictive value above postnatal assessment in relation to a child's secure attachment relationship (Madigan et al., 2015). The postnatal assessment of maternal representations did not significantly add to the prediction of a child's security. Therefore, it is possible that the prenatal organization of parental representations is of special significance.

It also needs to be pointed out that our sample was nonclinical, and the overall level of SEB problems was low. Therefore, associations between prenatal representations and SEB problems may be evident in other clinical samples with a higher prevalence and severity of these problems. Furthermore, the fact that we combined disengaged and distorted representations into nonbalanced representations may partly explain why prenatal representations were not related to SEB problems in the present study. Previous postnatal studies have reported that distorted representations may be associated with less optimal outcomes regarding the quality of the parent-child relationship (Hall et al., 2014; Korja et al., 2010). Distorted representations appear less open to change postnatally, and among mothers they often coexist with symptoms of depression and anxiety (Benoit, Parker, et al., 1997; Korja et al., 2009; Theran et al., 2005; Vreeswijk et al., 2012). Therefore, the group of parents with distorted prenatal representations needs special attention in future studies. However, our results provide clear evidence that having parents with balanced prenatal representations is beneficial for a child's social-emotional competence, and the inclusion of fathers in the study is a clear strength. It is also interesting that, in our study, the BITSEA was almost exclusively completed by the mothers. This reduces the bias related to the association between fathers' representations and children's social-emotional competence, rendering our findings even stronger.

Limitations

Although our study found strong associations, there are some limitations that need attention. This study was based on a nonclinical, low-risk sample, and the generalizability of the results is, therefore, limited. In addition, the attrition rate for the BITSEA questionnaire was considerably high. Families participated in extensive data collection at the 18-month assessment, concurrently with the BITSEA assessment, which may have contributed to the attrition. Furthermore, due to the limited number of cases in these representation categories, we were unable to examine the individual effects of prenatal disengaged and distorted representations. This could be examined in future studies with larger samples, including a higher proportion of nonbalanced representations, and both disengaged and distorted representations, as well as with samples presenting a higher prevalence of SEB problems. Additionally, group sizes in family-level analyses were unbalanced and relatively small, demanding replication of these findings. However, the sample and design of this study are unique and valuable, including the assessment of both parents' prenatal representations.

In the present study, all except three, BITSEA questionnaires were completed by the mothers. Therefore, the assessment was based on one informant, and represented maternal perceptions about her child's social-emotional behavior and development. Particularly with young children, parents are valuable informants because they are familiar with the child's daily life and functioning across several contexts (Squires et al.,

2001). Maternal ratings and observed infant behavior have indicated high agreement, which suggests that mothers can provide accurate ratings of the children's behaviors even as early as 12 months of age (Carter et al., 1999). However, few previous studies have indicated that mothers report higher scores for both boys and girls in social-emotional competence compared to fathers (e.g. Alakortes et al., 2017). Moreover, maternal reports may be more negative than paternal reports regarding SEB problems, especially among boys (Alakortes et al., 2017).

Conclusion and clinical implications

In conclusion, these results highlight the significance of parents developing balanced representations during pregnancy. A child's early social-emotional competence skills seem to benefit when both parents form balanced representations toward their expected child. This may be particularly important, as early social-emotional competence is known to increase the likelihood of continued competence and may also prevent the emergence of problem behaviors. Thus, our findings suggest that the prenatal organization of parental representations is of special significance. Therefore, it is beneficial to support parent-infant relationships during this transition among first-time parents as well as families with children already. Increasing general awareness of pregnancy as a significant prenatal period for both parents and the expected child should be the focus of professionals working with pregnant families.

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Data availability statement

Participants of this study have not agreed for their data to be shared publicly during the data collection and therefore, the data supporting the findings of this study are not available.

References

Ahlqvist-Björkroth, S., Korja, R., Junttila, N., Savonlahti, E., Pajulo, M., Räihä, H., Aromaa, M., & Aromaa, M. (2016). Mothers' and fathers' prenatal representations in relation to marital distress and depressive symptoms. *Infant Mental Health Journal*, *37*(4), 388–400. https://doi.org/10.1002/imhj.21578

Alakortes, J., Kovaniemi, S., Carter, A. S., Bloigu, R., Moilanen, I. K., & Ebeling, H. E. (2017). Do child healthcare professionals and parents recognize social-emotional and behavioral problems in 1-year-old infants? *European Child & Adolescent Psychiatry*, *26*(4), 481–495. https://doi.org/10.1007/s00787-016-0909-3

Belsky, J. (1981). Early human experience: A family perspective. *Developmental Psychology*, *17*(1), 3–23. https://doi.org/10.1037/0012-1649.17.1.3

Belsky, J., & Fearon, R. M. P. (2002). Infant-mother attachment security, contextual risk, and early development: A moderational analysis. *Development & Psychopathology*, *14*(2), 293–310. https://doi.org/10.1017/s0954579402002067

Benoit, D., Parker, K. C. H., & Zeanah, C. H. (1997). Mothers' representations of their infants assessed prenatally: Stability and association with infants' attachment classifications. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *38*(3), 307–313. https://doi.org/10.1111/j.1469-7610.1997.tb01515.x

Benoit, D., Zeanah, C. H., Parker, K. C. H., Nicholson, E., & Coolbear, J. (1997). "Working model of the child interview": Infant clinical status related to maternal perceptions. *Infant Mental Health Journal*, *18*(1), 107–121. https://doi.org/10.1002/(SICI)1097-0355(199721)18:1<107:AID-IMHJ8>3.0.CO;2-N

Branjerdporn, G., Meredith, P., Strong, J., & Garcia, J. (2017). Associations between maternal-foetal attachment and infant developmental outcomes: A systematic review. *Maternal and Child Health Journal*, *21*(3), 540–553. https://doi.org/10.1007/s10995-016-2138-2

Bridgett, D. J., Burt, N. M., Edwards, E. S., & Deater-Deckard, K. (2015). Intergenerational transmission of self-regulation: A multidisciplinary review and integrative conceptual framework. *Psychological Bulletin*, *141*(3), 602–654. https://doi.org/10.1037/a0038662

Briggs-Gowan, M. J. (2004). The brief infant-toddler social and emotional assessment: Screening for social-emotional problems and delays in competence. *Journal of Pediatric Psychology*, *29*(2), 143–155. https://doi.org/10.1093/jpepsy/jsh017

Briggs-Gowan, M. J., & Carter, A. S. (2008). Social-emotional screening status in early childhood predicts elementary school outcomes. *Pediatrics*, *121*(5), 957–962. https://doi.org/10.1542/peds.2007-1948

Briggs-Gowan, M. J., Carter, A. S., Bosson-Heenan, J., Guyer, A. E., & Horwitz, S. M. (2006). Are infant-toddler social-emotional and behavioral problems transient? *Journal of the American Academy of Child and Adolescent Psychiatry*, *45*(7), 849–858. https://doi.org/10.1097/01.chi.0000220849.48650.59

Briggs-Gowan, M. J., Carter, A. S., Skuban, E. M., & Horwitz, S. M. (2001). Prevalence of social-emotional and behavioral problems in a community sample of 1- and 2-year-old children. *Journal of the American Academy of Child and Adolescent Psychiatry*, *40*(7), 811–819. https://doi.org/10.1097/00004583-200107000-00016

Busby, D., Christensen, C., Crane, D. R., & Larson, J. H. (1995). A revision of the dyadic adjustment scale for use with distressed and nondistressed couples: Construct hierarchy and multidimensional scales. *Journal of Marital & Family Therapy*, *21*(3), 289–308. https://doi.org/10.1111/j.1752-0606.1995.tb00163.x

Carter, A. S., Briggs-Gowan, M. J., Jones, S. M., & Little, T. D. (2003). The infant–toddler social and emotional assessment (ITSEA): Factor structure, reliability, and validity.

Carter, A. S., Little, C., Briggs-Gowan, M. J., & Kogan, N. (1999). The infant–toddler social and emotional assessment (ITSEA): Comparing parent ratings to laboratory observations of task mastery, emotion regulation, coping behaviors, and attachment status. *Infant Mental Health Journal*, *20*(4), 375–392. https://doi.org/10.1002/(SICI)1097-0355(199924)

Condon, J. (1993). The assessment of antenatal emotional attachment: Development of a questionnaire instrument. *The British Journal of Medical Psychology*, *66*, 167–183. https://doi.org/10.1111/j.2044-8341.1993.tb01739.x

Condon, J., Corkindale, C., Boyce, P., & Gamble, E. (2013). A longitudinal study of father-to-infant attachment: Antecedents and correlates. *Journal of Reproductive and Infant Psychology*, *31*(1), 15–30. https://doi.org/10.1080/02646838.2012.757694

Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression: development of the 10-item Edinburgh postnatal depression scale. *British Journal of Psychiatry*, *150*(6), 782–786. https://doi.org/10.1192/bjp.150.6.782

Crane, D., Middleton, K., & Bean, R. (2000). Establishing criterion scores for the Kansas marital satisfaction scale and the revised dyadic adjustment scale. *The American Journal of Family Therapy*, *28*, 53–60. http://dx.doi.org/10.1080/019261800261815

Cranley, M. (1981). Development of a tool for the measurement of maternal attachment during pregnancy. *Nursing Research*, *30*(5), 281–284.

Dagan, O., & Sagi-Schwartz, A. (2018). Early attachment network with mother and father: An unsettled issue. *Child Development Perspectives*, *12*(2), 115–121. https://doi.org/10.1111/cdep.12272

Davis, E. P., & Narayan, A. J. (2020). Pregnancy as a period of risk, adaptation, and resilience for mothers and infants. *Development & Psychopathology*, *32*(5), 1625–1639. https://doi.org/10.1017/S0954579420001121

Dayton, C., Levendosky, A., Davidson, W., & Bogat, G. (2010). The child as held in the mind of the mother: The influence of prenatal maternal representations on parenting behaviors. *Infant Mental Health Journal*, *31*(2), 220–241. https://doi.org/10.1002/imhj.20253

Deave, T., Heron, J., Evans, J., & Emond, A. (2008). The impact of maternal depression in pregnancy on early child development. *BJOG: An International Journal of Obstetrics & Gynaecology*, *115*(8), 1043–1051. https://doi.org/10.1111/j.1471-0528.2008.01752.x

Englund, M. M., Kuo, S. I.-C., Puig, J., & Collins, W. A. (2011). Early roots of adult competence: The significance of close relationships from infancy to early adulthood. *International Journal of Behavioral Development*, *35*(6), 490–496. https://doi.org/10.1177/0165025411422994

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/bf03193146

Favez, N., Frascarolo, F., Carneiro, C., Montfort, V., Corboz-Warnery, A., & Fivaz-Depeursinge, E. (2006). The development of the family alliance from pregnancy to toddlerhood and children outcomes at 18 months. *Infant and Child Development*, *15*(1), 59–73. https://doi.org/10.1002/icd.430

Fearon, R. P., Bakermans-Kranenburg, M. J., van Ijzendoorn, M. H., Lapsley, A.-M., & Roisman, G. I. (2010). The significance of insecure attachment and disorganization in the development of children's externalizing behavior: A meta-analytic study. *Child Development*, *81*(2), 435–456. https://doi.org/10.1111/j.1467-8624.2009.01405.x

Gartstein, M., & Rothbart, M. (2003). Studying infant temperament via the revised infant behavior questionnaire. *Infant Behavior and Development*, *26*(1), 64–86. https://doi.org/10.1016/S0163-6383(02)00169-8

Groh, A., Roisman, G., van IJzendoorn, M., Bakermans-Kranenburg, M., & Fearon, R. (2012). The significance of insecure and disorganized attachment for Children's internalizing symptoms: A meta-analytic study. *Child Development*, *83*(2), 591–610. https://doi.org/10.1111/j.1467-8624.2011.01711.x

Haapsamo, H., Ebeling, H., Soini, H., Joskitt, L., Larinen, K., Penninkilampi-Kerola, V., Carter, A., & Moilanen, I. (2009). Screening infants with social and emotional problems: A pilot study on the brief infant oddler social and emotional assessment (Bitsea) in northern Finland. *International Journal of Circumpolar Health*, *68*(4), 386–393. https://doi.org/10.3402/ijch.v68i4.17365

Hall, R. A. S., De Waard, I. E. M., Tooten, A., Hoffenkamp, H. N., Vingerhoets, A. J. J. M., & van Bakel, H. J. A. (2014). From the father's point of view: How father's representations of the infant

impact on father–infant interaction and infant development. *Early Human Development*, *90*(12), 877–883. https://doi.org/10.1016/J.EARLHUMDEV.2014.09.010

Halligan, S. L., Cooper, P. J., Fearon, P., Wheeler, S. L., Crosby, M., & Murray, L. (2013). The longitudinal development of emotion regulation capacities in children at risk for externalizing disorders. *Development & Psychopathology*, *25*(2), 391–406. https://doi.org/10.1017/S0954579412001137

Hruschak, J., Palopoli, A., Thomason, M., & Trentacosta, C. (2022). Maternal-fetal attachment, parenting stress during infancy, and child outcomes at age 3 years. *Infant Mental Health Journal*, *43*(5), 681–694. https://doi.org/10.1002/imhj.22004

Huth-Bocks, A. C., Theran, S. A., Levendosky, A. A., & Bogat, G. A. (2011). A social-contextual understanding of concordance and discordance between maternal prenatal representations of the infant and infant–mother attachment. *Infant Mental Health Journal*, *32*(4), 405–426. https://doi.org/10.1002/imhj.20304

Korja, R., Ahlqvist-Björkroth, S., Savonlahti, E., Stolt, S., Haataja, L., Lapinleimu, H., Piha, J., & Lehtonen, L. (2010). Relations between maternal attachment representations and the quality of mother-infant interaction in preterm and full-term infants. *Infant Behavior and Development*, *33*(3), 330–336. https://doi.org/10.1016/j.infbeh.2010.03.010

Korja, R., Savonlahti, E., Haataja, L., Lapinleimu, H., Manninen, H., Piha, J., & Lehtonen, L. (2009). Attachment representations in mothers of preterm infants. *Infant Behavior and Development*, *32*(3), 305–311. https://doi.org/10.1016/j.infbeh.2009.04.003

Lagström, H., Rautava, P., Kaljonen, A., Räihä, H., Pihlaja, P., Korpilahti, P., Peltola, V., Rautakoski, P., Österbacka, E., Simell, O., & Niemi, P. (2013). Cohort profile: Steps to the healthy development and well-being of children (the STEPS Study). *International Journal of Epidemiology*, *42*(5), 1273–1284. https://doi.org/10.1093/ije/dys150

Lindstedt, J., Korja, R., Vilja, S., & Ahlqvist-Björkroth, S. (2020). Fathers' prenatal attachment representations and the quality of father–child interaction in infancy and toddlerhood. *Journal of Family Psychology*, *35*(4), 478–488. https://doi.org/10.1037/fam0000813

Madigan, S., Hawkins, E., Plamondon, A., Moran, G., & Benoit, D. (2015). Maternal representations and infant attachment: An examination of the prototype hypothesis. *Infant Mental Health Journal*, *36*(5), 459–468. https://doi.org/10.1002/imhj.21527

Putnam, S. P., Helbig, A. L., Gartstein, M. A., Rothbart, M. K., & Leerkes, E. (2014). Development and assessment of short and very short forms of the infant behavior questionnaire–revised. *Journal of Personality Assessment*, *96*(4), 445–458. https://doi.org/10.1080/00223891.2013.841171

Ramchandani, P. G., Domoney, J., Sethna, V., Psychogiou, L., Vlachos, H., & Murray, L. (2013). Do early father-infant interactions predict the onset of externalising behaviours in young children? Findings from a longitudinal cohort study. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *54*(1), 56–64. https://doi.org/10.1111/j.1469-7610.2012.02583.x

Roberts, R., Attkinson, C., & Rosenblatt, A. (1998). Prevalence of psychopathology among children and adolescents. *The American Journal of Psychiatry*, *155*(6), 715–725.

Sarkadi, A., Kristiansson, R., Oberklaid, F., & Bremberg, S. (2008). Fathers' involvement and children's developmental outcomes: A systematic review of longitudinal studies. *Acta Paediatrica, International Journal of Paediatrics*, *97*(2), 153–158. https://doi.org/10.1111/j.1651-2227.2007.00572.x

Slade, A., Cohen, L. J., Sadler, L. S., & Miller, M. (2009). The psychology and psychopathology of pregnancy: Reorganization and transformation. In C. H. Zeanah (Ed.), *Handbook of infant mental health* (3rd ed., pp. 22–39). The Guilford Press.

Sokolowski, M. S., Hans, S. L., Bernstein, V. J., & Cox, S. M. (2007). Mothers' representations of their infants and parenting behavior: Associations with personal and social-contextual variables in a high-risk sample. *Infant Mental Health Journal*, *28*(3), 344–365. https://doi.org/10.1002/imhj.20140

Solomon, J., & George, C. (1996). Defining the caregiving system: Toward a theory of caregiving. *Infant Mental Health Journal*, *17*(3), 183–197. https://doi.org/10.1002/(SICI)1097-0355(199623)17:3<183:AID-IMHJ1>3.0.CO;2-Q

Squires, J., Bricker, D., Heo, K., & Twombly, E. (2001). Identification of social-emotional problems in young children using a parent-completed screening measure. *Early Childhood Research Quarterly*, *16*(4), 405–419. https://doi.org/10.1016/S0885-2006(01)00115-6

Sroufe, L. A. (2005). Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development*, *7*(4), 349–367. https://doi.org/10.1080/14616730500365928

Tambelli, R., Trentini, C., & Dentale, F. (2020). Predictive and incremental validity of parental representations during pregnancy on child attachment. *Frontiers in Public Health*, *8*, 8. https://doi.org/10.3389/fpubh.2020.439449

Theran, S. A., Levendosky, A. A., Bogat, G. A., & Huth-Bocks, A. C. (2005). Stability and change in mothers' internal representations of their infants over time. *Attachment & Human Development*, *7*(3), 253–268. https://doi.org/10.1080/14616730500245609

Treyvaud, K., Doyle, L. W., Lee, K. J., Roberts, G., Lim, J., Inder, T. E., & Anderson, P. J. (2012). Social–emotional difficulties in very preterm and term 2 year olds predict specific social–emotional problems at the age of 5 Years. *Journal of Pediatric Psychology*, *37*(7), 779–785. https://doi.org/10.1093/jpepsy/jss042

Trombetta, T., Giordano, M., Santoniccolo, F., Vismara, L., Della Vedova, A. M., & Rollè, L. (2021). Prenatal attachment and parent-to-infant attachment: A systematic review. *Frontiers in Psychology*, *12*, 620942. https://doi.org/10.3389/fpsyg.2021.620942

van Ijzendoorn, M. H., Sagi, A., & Lambermon, M. W. E. (1992). The multiple caretaker paradox: Data from Holland and Israel. *New Directions for Child and Adolescent Development*, *1992*(57), 5–24. https://doi.org/10.1002/cd.23219925703

Vreeswijk, C. M. J. M., Maas, A. J. B. M., Rijk, C. H. A. M., & Van Bakel, H. J. A. (2014). Fathers' experiences during pregnancy: Paternal prenatal attachment and representations of the fetus. *Psychology of Men & Masculinity*, *15*(2), 129–137. https://doi.org/10.1037/a0033070

Vreeswijk, C. M. J. M., Maas, A. J. B. M., & van Bakel, H. J. A. (2012). Parental representations: A systematic review of the working model of the child interview. *Infant Mental Health Journal*, *33*(3), 314–328. https://doi.org/10.1002/imhj.20337

Vreeswijk, C., Rijk, C., Maas, A., & van Bakel, H. (2015). Fathers' and mothers' representations of the infant: Associations with prenatal risk factors. *Infant Mental Health Journal*, *36*(6), 599–612. https://doi.org/10.1002/imhj.21541

Wakschlag, L., & Danis, B. (2009). Characterizing early childhood disruptive behavior: Enhancing developmental sensitivity. In C. H. Zeanah (Ed.), *Handbook of Infant Mental Health* (3rd ed., pp. 392–408). The Guilford Press.

Zeanah, C., Benoit, D., Hirshberg, L., Barton, M., & Regan, C. (1994). Mothers' representations of their infant are concordant with infant attachment classification. *Developmental Issues in Psychiatry and Psychology*, *1*.

Zeanah, C. H., Benoit, D., Barton, M., & Hirshberg, L. (1996). Working model of the child interview coding manual. In *Unpublished instrument*. School of Medicine, Louisiana State University.