Family dynamics. An exploration of parental sensitivity and depressive symptoms among mothers and fathers of toddlers

Antonia Muzard, Marcia Olhaberry, Nina Immel, Javier Moran-Kneer

1School of Psychology, Pontifical Catholic University, Macul, Santiago, Chile; 2University of Witten/Herdecke, Witten, Germany; 3School of Psychology, University of Valparaíso, Valparaíso, Chile

ABSTRACT

In studies of maternal sensitivity, the influence of mothers’ depressive symptomatology has been consistently highlighted. Additionally, the relevance of both maternal and paternal sensitive responses to children’s development has been recognized. However, literature regarding the dynamics of the mother-father-toddler triad is scarce. This is particularly true when understanding how parental sensitivity may be bidirectionally shaped by both parents’ (i.e., mothers’ and fathers’ depressive symptomatology) and children’s characteristics (i.e., age). Hence, the present study aims to describe and analyse the associations between parental depression, paternal sensitivity and children’s socioemotional difficulties and age with mothers’ sensitive responses to highlight the appropriateness of considering fathers’ depressive symptoms and sensitivity to better understand the impact of maternal depressive symptomatology on mothers’ sensitivity. The participants included 80 Chilean mother-father-child triads in which all children were between 1 and 3 years of age and presented some degree of socioemotional difficulty. The results reveal no differences in maternal and paternal sensitivity or higher depressive symptomatology in mothers than in fathers. Additionally, while mothers’ depression was significantly associated with their sensitivity, this was not the case for fathers. Paternal depressive symptomatology was associated with the mother’s depression. Finally, paternal sensitivity emerged as a mediator between maternal depressive symptoms and sensitivity. This result calls attention to the use of paternal variables to understand how maternal depression impacts mothers’ sensitivity and to thus develop appropriate interventions that expand the scope of such impacts from the dyad to the triad.

Key words: Maternal sensitivity; paternal sensitivity; parental depression

Introduction

Parents constitute the main source of children’s relational experience, which in turn impacts their overall development (Barrows, 2004; Svetlova & Carpenter, 2017). In particular, parental sensitivity, defined as caregivers’ abilities to perceive and read their children’s signals, interpret them adequately and address them in a prompt and
suitable way, constitutes a crucial aspect of parenting that impacts children’s socioemotional development and mental health (Ainsworth, Bell & Stayton, 1974; Bouvette-Turcot, Bernier & Leblanc, 2017; DePasquale & Gunnar, 2020; Farkas, Valloton, Strasser, Santelices & Himmel, 2017; Manning, 2019; McMahon et al., 2019; Riera, 2016).

Although studies show that during children’s first five years, both mothers and fathers can sensibly interact with their offspring, the literature regarding parental sensitivity has mainly focused on mother-child interactions and is still inconclusive regarding similarities and differences between maternal and paternal parenting skills. Nonetheless, while some studies have found similar results regarding fathers’ and mothers’ parental sensitivity to their 4-month babies from evaluations of diverse contexts involving care routines, free play and the ‘still face’ procedure (Branger, Emmen, Woudstra, Alink & Mesman, 2019; Eickhorst, et al., 2010), others have reported differences such as less sensitivity and emotional availability in fathers (Fuertes, Faria, Beehly & Lopes-dos-Santos, 2016; Hallers-Haalboom, et al., 2014). Specifically, Fuertes et al. (2016) reported higher maternal sensitivity than paternal sensitivity over children’s first 9 and 15 months during free play interactions. Additionally, Hallers-Haalboom et al. (2014) found higher sensitivity and less intrusiveness in mothers than in fathers of 1- and 3-year-old children in free play interactions. Likewise, Parsons et al. (2017) found mothers to provide more positive ratings of happy expressions and more extreme ratings of intense emotions than fathers during a laboratory procedure involving the videorecording of 8-month-old infants. Hence, further research is needed to achieve a better understanding of maternal and paternal parenting skills within family processes.

Among the variables considered to influence parental sensitivity, caregivers’ depressive symptomatology has been widely studied and associated with a decrease in parental sensitive responses (Binda, Figueroa-Leigh & Olhaberry, 2019; Bernard, Nissim, Vaccaro, Harris & Lindheim, 2018; DePasquale & Gunnar, 2020; Gentile & Fusco, 2017; Koch et al., 2019; Muzik et al., 2016). Specifically, studies have identified that maternal depression negatively impacts the quality of mother-child interactions as well as the subjective experience of motherhood through the intensification of mothers’ negative affect and less positive maternal perceptions of their children and of themselves (Behrendt, Scharke, Herpertz-Dahlmann, Konrad, & Firk, 2019; Field, 2010; McAndrew, 2019; Lefkovics, et al., 2018; Muzik et al., 2016; Tronick & Reck, 2009). In addition, even mild depressive symptoms, which may not be even perceived as problematic, can significantly impact a mother’s perception of the quality of her bond with her child (Moehler et al., 2006). Nonetheless, other studies report that adequate maternal sensitivity could act as a protective factor that could reduce the negative effects of maternal depression on young children’s clinical symptomatology (Kaplan, Burgess, Sliter & Moreno, 2009; Seath, Murray, Netsi, Netsi, Psychogiu & Ramchandani, 2015; Sidor, Kunz, Schweyer, Eickhorst & Cierpka, 2011). Therefore, since mothers’ sensitivity plays an essential role in children’s development, the exploration of its predictors is fundamental to identifying families at risk of less sensitive parenting and thus to the development of children’s difficulties (Rahma Alsarhi, Prevo, Alink & Mesman, 2021).

On the other hand, depressive disorders are a public health concern that affects 18.4% of the general population, with a higher prevalence found in women of working age with less education (Brummelte & Galea, 2016; Dougherty et al., 2013; Markkula, Zito, Peña, Margozzini & Retamal, 2017; Rosenfield & Mouzon, 2013). Within family dynamics, the literature has reported associations between maternal and paternal depressive symptomatology (Kiviruusu, et al., 2020; Thiel, Pittelkow, Wittchen & Garthus-Niegel, 2020). Specifically, Chilean studies report prevalence rates of 38% and of between 10.5% and 18.5% for maternal and paternal depression, respectively (Perez et al., 2018; Hahn-Holbrook, Cornwell-Hinrichs & Anaya, 2018; Jadresic, 2010; Perez & Brahm, 2017).

Similarly, for children with a mother with maternal depression, studies have identified a higher risk of suffering from depression throughout their lives (Fox & Borelli, 2015; Pawlby, Hay, Sharp, Waters & O’Keane, 2009) from negative developmental consequences (Milgrom, Gemmill & Bilszt, 2008; Grace, Evidard & Stewart, 2003; Pearson et al., 2012), a negative effect on mother-baby dyadic adjustment (Vismara et al., 2016, Rolle et al., 2017), an intensification of negative affect and a reduction in maternal sensitive responses to infant signals and needs (Behrendt, Scharke, Herpertz-Dahlmann, Konrad, & Firk, 2019; Lefkovics, et al., 2018). All of the abovementioned consequences have been found in mothers who meet criteria for the diagnosis of major depression as well as in those with subclinical symptomatology (Tronick & Reck, 2009), highlighting the negative impact of depression on family interactions and mental health (Dougherty, Tolep, Smith & Rose, 2013; Olhaberry et al., 2013; Paulson & Bazemore, 2010).

Despite the above evidence of negative impacts of maternal depression on mothers’ sensitivity to their children and of a positive association between paternal and maternal depressive symptomatology, few studies have explored the relationship between sensitivity and depressive symptoms in parenting couples of toddlers. While studies acknowledge that both members of the parental dyad constitute a source of psychological and emotional support for all family members, most studies have historically focused on mother-child dyadic interactions (Gentile & Fusco, 2017; Fusco & Grych, 2013; Teubert & Pinquart, 2010). However, father-child relationship research has expanded (Sarkadi, Kristiansson, Oberklaid, & Bremberg, 2008; Wong et al., 2015), revealing its impact on dynam-
ics within the mother-father-child triad, both for parenting and children’s development (Sameroff, 2009; Sanson, Letcher, Havighurst, 2018; Woldarsky, Urzáa, Farkas & Valloton, 2019). Particularly, studies have identified an association between paternal emotional support and adequate maternal sensitivity (Olhaberry & Santelices, 2013) as well as an association between fathers’ involvement with mothers’ and offspring’s mental health (Fisher, 2017; Gere et al., 2013). Additionally, studies have found that the father’s acceptance reduces the impact of maternal depression on the mother’s sensitive responses, while his aggressiveness exacerbates the negative impact of the mother’s depression on her sensitivity towards their 6-month-old baby and that triadic interactions mediates the association between the mother’s parenting skills and socioemotional difficulties in children of between 1 and 3 years of age (Cockenberg & Leerkes, 2003; Leon & Olhaberry, 2020). However, even though there is evidence that fathers’ depressive symptomatology could predict mothers’ depression at a later point in time, studies of this relationship, particularly of the factors’ interdependence, are still scarce, particularly for the toddler raising years (Theil, 2020).

Another important aspect to consider when studying parental sensitivity is the possible influence of a child’s age and socioemotional difficulties. Development between 12 and 48 months is characterized by rapid, complex, simultaneous and interrelated cognitive, emotional and physical changes. In particular, socioemotional development refers to children’s development of capacities to form close and secure adult and peer relationships; explore and learn from the environment and experience, regulate and express emotions in socially and culturally appropriate ways (Yates, Ostrosky, Cheatham, Fetting, Haffer & Santo, 2008). Therefore, during the toddler years, children become capable of independent walking, coordination, paying attention to others, distinguishing the cooccurrence of different emotions, understanding that others’ internal states can differ from their own and developing mechanisms that allow for a better understanding and regulation of their own emotions and behaviours in accordance to cultural practices (Allen, 2017; Henderson, Burrows & Usher, 2017; Brownell & Knopp, 2007; Johansson, Marciszko, Brocki & Bohlin, 2015; Tomasello & Carpenter, 2007; Svetlova & Carpenter, 2017).

Notwithstanding, while children’s more developed socioemotional skills may facilitate caregivers’ sensitive responses, other age-appropriate developments, such as oppositional behaviour and the search for autonomy, as well as socioemotional difficulties, may increase demands on parental sensitivity (DePasquale & Gunnar, 2020; Dougherty et al., 2013). Specifically, among the unique challenges of raising toddlers, the literature has identified that parents’ perceptions of their children’s stubbornness, noncompliance, aggression, communication challenges, and need for autonomy emerge as the major challenges of parenting children of this age group (Known et al., 2013; McHale et al., 2000).

Based on the abovementioned findings, the literature shows that family subsystems do not function in isolation and that children’s development cannot be comprehended based on their interactions with each parent separately (Favez, Scaiola, Tissot, Darwiche & Frascaroli, 2011; Fosco & Grych, 2013). Thus, since each member of the mother-father-child triad plays a specific role in the family context, evidence stresses the relevance of studying maternal depressive symptomatology and sensitivity in relation to children’s development as well as how mothers’ sensitive responses may be affected by other family members’ characteristics.

Hence, the present study aims to analyse the relationships between parental depression, paternal sensitivity and children’s socioemotional difficulties and age with mothers’ sensitive responses in Chilean mother-father-child triads. The intention is to highlight the appropriateness of considering fathers’ depressive symptoms and sensitivity as well as children’s characteristics to understand the impact of maternal depression on her sensitivity within family dynamics. It is hypothesized that there is a negative association between parental depressive symptomatology and sensitivity as well as between children’s socioemotional difficulties and parental sensitivity. Additionally, higher levels of depression are expected in mothers, and paternal sensitivity is expected to act as a mediator between maternal depression and maternal sensitivity.

Materials and methods

Participants

The participants included 80 mother-father-child triads that resided in Santiago, Chile and were referred by family health care centres, JUNJI nursery/daycare centres (National Board of Daycare Centers of the Ministry of Education of the Government of Chile) or other participants due to children’s socioemotional difficulties. All participating toddlers were between 12 and 36 months of age (M=24.73, SD=7.35 months) and were the youngest of their family group. Of these toddlers, 60% were male, 71.3% were firstborn children and 58.1% were attending daycare. The mothers’ ages ranged from 20 to 43 years (M=32.26, SD=4.97), and the fathers’ ages ranged from 22 to 54 years (M=34.66, SD=6.34). Seventy-five percent of the mothers and 78.75% of the fathers had a technical or university degree, and 48.75% of the mothers and 93.75% of the fathers had a full-time paid job at the time of the study.

As our inclusion criteria, we studied parents of at least 18 years of age in a couple relationship at the time of the study and with at least one child between the ages of 12 and 36 months with difficulties in one or more of the following areas: sleeping, feeding, behavioural, emotional,
and relationship issues, as assessed by the *Ages & Stages Questionnaires: Social-emotional ASQ-SE* (Squires et al., 2002). Exclusion criteria included the presence of intellectual and/or sensory disability in children as well as the presence of parental psychosis and/or addictions as diagnosed by a health professional, by the referring institution, or at the first family interview.

**Procedure**

The population included in this study took part in a larger Fondecyt Start-up Project (Nº 11140230) that considered the implementation and evaluation of a video-feedback intervention and that was approved by the institutional Human Research Ethics Committees of the Catholic University of Chile and by the Chilean National Commission of Scientific and Technological Research (CONICYT).

Participants were contacted by phone by certified members of the research team who explained the study in detail and determined whether the participants’ families met the inclusion and/or exclusion criteria. For those who fulfilled the requirements and agreed to participate, the first assessment session was coordinated at the family’s household, where both parents signed an informed consent form that explained the study’s objective, benefits, risks, and data confidentiality safeguards and the voluntary nature of participation. Thereafter, parents completed surveys on sociodemographic and psychological characteristics and on their children’s socioemotional difficulties in the presence of a psychologist to address doubts that may emerge. Afterwards, maternal and paternal sensitivity were independently assessed for each caregiver with their child from the recording of a free play interaction according to the procedure defined by the Experimental Index of Child-Adult Relationships (CARE-Index, Crittenden, 2006, unpublished manuscript). At the end of the evaluation, trials participated in a brief video-feedback intervention.

**Results**

A detailed analysis of the differences in maternal and paternal sensitivity in a brief video-feedback intervention is provided in Table 1.

**Table 1. Differences in maternal and paternal sensitivity.**

| Group             | Mothers | Fathers |
|-------------------|---------|---------|
|                   | N       | Mean    | SD     | U   | P   | N       | Mean    | SD     | U   | P   |
| Child Gender      |         |         |        |     |     |         |         |        |     |     |
| Male              | 48      | 5.88    | 1.71   | 619 | 0.132 | 48      | 6.40    | 2.22   | 739 | 0.775 |
| Female            | 32      | 6.25    | 1.55   |     |       | 32      | 6.13    | 1.56   |     |       |
| Paid Job          |         |         |        |     |     |         |         |        |     |     |
| No                | 19      | 5.84    | 2.29   | 0.432 | 0.086 | 2       | 7.5     | 4.95   | 0.75 | 0.937 |
| Yes               | 61      | 6.08    | 1.41   |     |       | 78      | 6.26    | 1.91   |     |       |
| Child in Day-care |         |         |        |     |     |         |         |        |     |     |
| No                | 31      | 5.81    | 1.33   | 0.586 | 0.367 | 31      | 6.23    | 2      | 0.637 | 0.745 |
| Yes               | 43      | 6.30    | 1.87   |     |       | 43      | 6.3     | 1.9    |     |       |
| Nationality       |         |         |        |     |     |         |         |        |     |     |
| Chilean           | 75      | 6       | 1.58   | 0.184 | 0.951 | 76      | 6.28    | 1.93   | 0.171 | 0.804 |
| Other             | 5       | 6.4     | 2.7    |     |       | 4       | 6.5     | 3.11   |     |       |
| Current Treatment |         |         |        |     |     |         |         |        |     |     |
| No                | 70      | 6.21    | 1.66   | 0.131 | 0.001 *** | 76     | 6.32    | 2.01   | 0.138 | 0.761 |
| Yes               | 10      | 4.70    | 0.68   |     |       | 4       | 5.75    | 0.96   |     |       |
| Former Treatment  |         |         |        |     |     |         |         |        |     |     |
| No                | 41      | 5.88    | 1.42   | 0.736 | 0.533 | 55      | 6.42    | 2.05   | 0.593 | 0.3190 |
| Yes               | 39      | 6.18    | 0.86   |     |       | 25      | 6.00    | 1.8    |     |       |

U, U Mann-Whitney test; *P<0.05, **P<0.01, ***P<0.001.

**Instruments**

**Personal information questionnaire.** The following sociodemographic information was collected: each child’s age, gender, birth order and number of siblings and each parent’s age, years of education, employment status, and history of psychological/pharmacological treatment. An overview of sociodemographic information can be found in Table 1.

**Experimental Index of Child-Adult Relationships (CARE-Index, Crittenden, 2006, unpublished manuscript).** This instrument was used to evaluate the sensitive responses of mothers and fathers during dyadic interactions with their children. The index was used to assess caregiver-child interactions through 3 to 5 minutes of video recording of free play. Values were coded according to 7 aspects of interactive behaviour evaluated separately for each participant (facial and verbal expression, body positioning and contact, expressions of affect and turn taking, and the selection and control of activity) and with three descriptors for each adult (sensitive, controlling and nonresponsive) and four for each child (cooperative, difficult, compulsive and passive). Finally, coding was done based on two main dyadic constructs (the adult’s sensitivity to the child’s signals and the latter’s cooperation with the former) and a dyadic sensitivity scale of 0 to 14 points, with values of 0-4 signalling ‘risky’ parenting, values of 5-6 denoting ‘poor’ parenting, values of 7-10 denoting ‘adequate’ parenting, and values of 11-14 denoting ‘sensitive’ parenting. Scores of below 7 indicate a need for intervention. For the present study, coding was performed by psychologists trained by the author of the instrument without information about the families and reached an interjudge reliability value of ≥0.7.

**The Beck Depression Inventory (BDI-IA, Beck, et al., 1961).** We assessed depressive symptomatology through a 21-item self-report questionnaire. Each item was rated on a 0-3 scale, with higher scores denoting higher levels of depression.
of depressive symptomatology. Scores for instrument categories were set as follows: scores of 0-9 denoted minimal depression, scores of 10-18 denoted mild depression, scores of 19-29 denoted moderate depression and scores of 30-63 denoted severe depression, and the clinical cut-off point for the Chilean sample was set as 14. The Chilean adaptation of the BDI-IA reports high estimations of internal consistency $\alpha = 0.92$ (Valdés et al., 2017), and in the present study, an alpha value of .83 was calculated for both the fathers and mothers.

The Ages & Stages Questionnaire: Social-emotional (ASQ-SE, Squires et al., 2002). Children’s socioemotional development was assessed with a caregiver’s report questionnaire evaluating 7 areas of socioemotional development (autonomy, compliance, adaptive functioning, self-regulation, affect, interaction and social communication). The questionnaire was completed by both parents. To address potential doubts, the questionnaire was completed in the presence of a psychologist and scored according to the number of reported concerns. Higher total scores indicate problems, whereas low scores suggest that a child’s social and emotional behaviour was considered appropriate by his or her parents. The instrument has evidenced concurrent validity levels of 71%-90% with an overall agreement score of 84%, a test-retest reliability score of 89%, and intraclass correlations of 0.91 (Squires et al., 2002). The overall Cronbach alpha of the ASQ-SE is 0.82 (Squires et al., 2002). The instrument measures different forms depending on a child’s age, and the number of items measured varies by form. Since children included in our sample were between 1 and 3 years of age, different forms were used, and it was not possible to compare the direct scores obtained. Thus, the severity of the problems facing each child was calculated as a percentage relative to the maximum possible score for each child’s respective age.

Data analysis

First, normality and homoscedasticity assumptions were tested with a Shapiro Wilk test and scatterplot of residuals vs. predicted values, respectively. Since these assumptions were violated, the Mann-Whitney U test was used to compare mean differences in maternal and paternal sensitivity according to sociodemographic variables.

Preliminary analyses were run to confirm expected correlations between parental sensitivity and depression and between children’s age and socioemotional development.

A three-stage hierarchical multiple linear regression model was then calculated to estimate the association between maternal sensitivity (dependent variable) and both depression and paternal sensitivity (independent variables). Due to variability in the children’s ages (12 to 36 years) and the different levels of emotional difficulty for which they were referred, both variables were controlled. Additionally, given violations of normality and homoscedasticity assumptions in our data, a bootstrapping regression was used based on the observations and via error resampling. The bootstrap method allows for inference even when errors do not follow a normal distribution or constant error variance (Hosseini et al., 2017).

Finally, as a way of evaluating the mediating effect of paternal sensitivity on the relationship between maternal depressive symptomatology and sensitivity, a mediation model was employed. For this purpose, Model 4 of a process macro (Hayes, 2016) was used. Within this mediation model, maternal depression was introduced as an independent variable, paternal sensitivity was used as a mediator and maternal sensitivity was set as a dependent variable. As recommended by Hayes (2009), 5000 bootstrap samples for the construction of a 95% bias-corrected confidence interval (CI) for indirect effects were used. The null hypothesis was rejected once the CI did not include zero. The data analyses were managed using SPSS v.25 considering 95% confidence intervals (SPSS, 2017).

Results

Preliminary analyses

The results show no significant differences between mothers and fathers’ sensitivity ($U(79)=1.19, P=0.239$). Most parents showed less than 7 points on sensitivity, which was set as the cut-off point for requiring intervention ($M=6.03, SD=1.65$ and $M=6.29, SD=1.98$ for mothers and fathers, respectively). According to this threshold, 68.8% of the mothers and 66.3% of the fathers showed sensitivity levels for which intervention is recommended.

Regarding differences in parental sensitivity and sociodemographic variables for the mothers and fathers, such differences were only observed in mothers in current psychological treatment, who showed significantly lower levels of sensitivity than those who were not ($U(79)=5.199, P<0.001$) (see Table 1).

Regarding the participation of mothers and fathers in parenting activities, 100% of the mothers reported being involved in tasks associated with feeding, cleaning and playing with their children. For the fathers, 81.3% reported taking part in feeding and cleaning, while 93.8% stated that they played with their children.

Regarding the depressive symptomatology distributions of the mothers and fathers, 25% of the sample was composed of couples in which both the mother and father evidenced depressive symptomatology from the 9-point cut-off indicator. Additionally, for 32.5% and 6.3% of the couples, only the mother and father evidenced depressive symptoms, respectively. Furthermore, for 36% of the participating couples, no depression indicators were identified in either member of the parenting dyad.

Moreover, significant differences were found for parental depression ($U(79)=4.52, P=0.001$), where the average BDI score recorded as 10.28 ($SD=6.53$) for mothers and as 6.45 ($SD=5.40$) for fathers. Among the mothers,
10% exhibited moderate depression, 39% exhibited mild depression and 51% exhibited no or minimal depressive symptomatology. Among the fathers, 74% exhibited no or minimal depression, 23.5% had mild depression and 2.5% had moderate depressive symptoms.

Regarding the children’s socioemotional difficulties, 65% of the participating children scored above the cut-off point of the ASQ-SE. That is, 52 children presented clinically significant difficulties in their socioemotional development when participating in the study.

Moreover, the results show that the mothers’ and fathers’ sensitivity levels were significantly correlated \((r=0.414, P<0.001)\) and that the mothers’ depression was significantly correlated with maternal sensitivity \((r=–0.237, P=0.034)\). In addition, paternal sensitivity, although not correlated with paternal depression \((r=–0.112, P=0.323)\), was significantly associated with maternal depression \((r=–0.301, P=0.007)\). Additionally, while the child’s age was not related to maternal sensitivity \((r=0.064, P=0.571)\), it was associated with paternal sensitivity \((r=0.26, P=0.02)\), indicating that while the mothers were equally sensitive to all of their children, the fathers were more sensitive to their older toddlers. Finally, the children’s socioemotional difficulties were not significantly associated with either maternal \((r=–0.129, P=0.256)\) or paternal \((r=–0.057, P=0.614)\) sensitivity. The above correlations are illustrated in Table 2.

### Hierarchical regression analysis

To explore how paternal sensitivity and maternal depression are associated with maternal sensitivity, a hierarchical regression analysis was run while controlling for child age and social-emotional development. In stage one, neither a child’s age nor his or her socioemotional development contributed significantly to the regression model \((F(2,77)=1.11, P=0.333)\). Control variables accounted for only 2.8% of the variation in maternal sensitivity. In stage two, maternal depression significantly explained maternal sensitivity \((r=–0.028, P=0.031)\). With the introduction of maternal depression, the model explained an additional 5.79% of the variation in maternal sensitivity. The change in the R-square value of this step was significant \((F(1,76)=4.82, P=0.031)\). Finally, the inclusion of paternal sensitivity into the regression model explained an additional 11.3% of the variation in maternal sensitivity, and this change in the R-square value was significant \((F(1,75)=10.58, P=0.002)\). When all four independent variables were included in stage three, maternal depression was no longer significant \((β=–0.027, P=0.222)\) in explaining maternal sensitivity. The only remaining significant predictor of maternal sensitivity was paternal sensitivity \((r=–0.095, P=0.002)\). Together, the four independent variables accounted for 19.91% of the variance in maternal sensitivity (Table 3). Bootstrapped coefficients for the full model are shown in Table 4.

### Mediation analysis

As shown in Figure 1, maternal depression was negatively associated with paternal sensitivity (a) \((β=–0.301, 95% CI [–0.156, –0.026])\). In turn, the latter was positively associated with maternal sensitivity (b) \((β=0.377, 95% CI [0.135, 0.493])\). Once paternal sensitivity was included in the model, the direct effect (c’) of maternal de-

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### Table 2. Correlation matrix.

|       | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1. Child’s age |        |        |        |        |        |        |        |        |        |
| 2. Maternal Education | 0.038 |        |        |        |        |        |        |        |        |
| 3. Paternal Education | 0.091 |        | 0.701*** |        |        |        |        |        |        |
| 4. Child’s socio-emotional difficulties | 0.299** |        | 0.006 |        | –0.082 |        |        |        |        |
| 5. Maternal Sensitivity | 0.064 |        | 0.184 |        | 0.067 | –0.129 |        |        |        |
| 6. Paternal Sensitivity | 0.260* |        | –0.084 |        | –0.020 |        | –0.057 |        | 0.414*** |
| 7. Maternal Depression | –0.074 |        | 0.104 |        | –0.041 |        | –0.067 |        | –0.237* –0.301** |
| 8. Paternal Depression | –0.164 |        | 0.035 |        | –0.056 |        | –0.002 |        | –0.043 | –0.112 | 0.206 |
| 9. Couple’s number of children | 0.151 |        | –0.304** |        | –0.220 |        | –0.023 |        | –0.196 | 0.037 | –0.022 | 0.023 |

*P<0.05, **P<0.01, ***P<0.001.
pression on maternal sensitivity was no longer significant ($\beta = -0.124, 95\% \text{ CI } [-0.085, 0.023]$) due to a total mediation effect ($\beta = -0.114, 95\% \text{ CI } [-0.218, -0.020]$).

## Discussion and conclusions

This study provides evidence that contributes to the existing literature on parental sensitivity in highlighting the relevance of considering both mothers and fathers in research of this area.

Initially, the results revealed higher levels of depressive symptomatology in women than in men (Brummelte, *et al*., 2016; Dougherty *et al*., 2013). A possible explanation in line with the aforementioned literature is based in the multicausality and complexities of depression aetiology, for which the interplay between the roles of sex hormones, reproductive events and conflicts between parenting and professional interests could explain the higher levels of depressive symptomatology evidenced by mothers (Brummelte & Galea, 2010; Marchand *et al*., 2016; Markkula *et al*., 2017). This argument has gained momentum in explaining the higher incidence of depression found in Chilean women. In particular, Chilean sociodemographic data show that while 0.6% of men do not work because they are taking care of a family member, this percentage is 19.4% among women (Encuesta Casen, 2017). Additionally, female participation in the Chilean labour market is lower than in most OECD countries (Calderá, 2014), reflecting work-family conflicts that many Chilean women encounter, which may contribute to the development of depressive symptomatology as observed in the participants of the present study.

Furthermore, and according to previous studies, the results show that mothers and fathers do not differ significantly in their ability to sensitively respond to their children’s signals and needs (Branger *et al*., 2019). Additionally, even though the results show a negative association between maternal depression and sensitivity (Binda *et al*., 2019; Bernard *et al*., 2018; Muzik *et al*., 2016), the most important factor in explaining mothers’ sensitivity was found to be fathers’ sensitivity. Among these associations, the latter emerged as a risk factor that may intensify the negative impact of maternal depression by decreasing mothers’ sensitivity (Gere *et al*., 2013; Olshaberry & Santelices, 2013). Particularly, the negative re-

### Table 3. Hierarchical regression to predict maternal sensitivity.

| Predictor | B     | $\beta$   | t     | p         | 95% CI | Overall model test | $R^2$ | $\Delta R^2$ |
|-----------|-------|-----------|-------|-----------|--------|-------------------|-------|-------------|
| **Stage 1** |        |           |       |           |        |                   |       |             |
| Intercept | 5.865 | 0.664     | 8.829 | <0.001    |        | 1.11 (2, 77)      | 0.028 | 0.028       |
| Child Age | 0.025 | 0.026     | 0.958 | 0.341     | −0.397 | 0.072             |       |             |
| ASQ-SE    | −0.027| 0.019     | −1.379| 0.172     | −0.397 | 0.072             |       |             |
| **Stage 2** |        |           |       |           |        | 2.39 (3, 76)      | 0.086 | 0.058       |
| Intercept | 6.605 | 0.731     | 9.038 | <0.001    |        |                   |       |             |
| Child Age | 0.022 | 0.026     | 0.855 | 0.395     | −0.131 | 0.327             |       |             |
| ASQ-SE    | −0.029| 0.019     | −1.154| 0.134     | −0.403 | 0.055             |       |             |
| BDI_M     | −0.061| 0.028     | −2.195| 0.031     | −0.461 | 0.022             |       |             |
| **Stage 3** |        |           |       |           |        | 4.66 (4, 75)      | 0.199 | 0.113       |
| Intercept | 4.808 | 0.882     | 5.445 | <0.001    |        |                   |       |             |
| Child Age | −0.002| 0.025     | −0.0685| 0.946   | −0.233 | 0.2179            |       |             |
| ASQ-SE    | −0.019| 0.019     | −1.038| 0.303     | −0.333 | 0.1049            |       |             |
| BDI_M     | −0.034| 0.027     | −1.2326| 0.222   | −0.351 | 0.0827            |       |             |
| SENS_P    | 0.308 | 0.095     | 3.2528| 0.002     | 0.143  | 0.596             |       |             |

ASQ-SE, socio-emotional development; BDI_M, maternal depression; SENS_P, paternal sensitivity.

### Table 4. Bootstrap coefficients for the full model.

| Model       | Unstandardized | Bias   | Standard error | 95% bca CI | Overall model test | $R^2$ | $\Delta R^2$ |
|-------------|----------------|--------|----------------|------------|-------------------|-------|-------------|
| $H_1$ (Intercept) | 4.847 | 0.037 | 0.900          | 2.835      | 6.366             |       |             |
| Child age   | −0.002 | <0.000 | 0.023          | −0.046     | 0.043             |       |             |
| ASQ-SE      | −0.020 | <0.000 | 0.016          | −0.046     | 0.015             |       |             |
| BDI_M       | −0.035 | −0.001 | 0.022          | −0.073     | 0.018             |       |             |
| Paternal sensitivity | 0.309 | −0.003 | 0.119          | 0.090      | 0.565             |       |             |

bca, bias corrected accelerated; CI, confidence interval; ASQ-SE, socio-emotional development; BDI_M, maternal depression. Bootstrapping based on 1000 replicates. Coefficient estimate is based on the median of the bootstrap distribution.
relationship between maternal depressive symptomatology and paternal sensitivity and the total mediation effect observed for the indirect effect of paternal sensitivity on the relationship between maternal depression and maternal sensitivity call attention to the dynamics and relational transactions that occur within family systems. In light of these results, future interventions that address parental sensitivity should expand the scope of analysis from the dyad to the triad by considering both members of the parenting couple.

In this regard, the literature has highlighted the relationship between depression and partner satisfaction as well as its differences according to gender, where increments of parental conflict have been associated with decreased in support towards the partner, and where women’s depressive symptomatology has been identified as a predictor of men’s marital satisfaction (Faulkner, Davey & Davey, 2005; Gabriel, Beach & Bodenmann, 2010).

Particularly, in the present study, the foregoing findings could be reflected in greater paternal reactivity to maternal depression and in higher levels of maternal discomfort resulting from a lack of partner support as expressed in the failure to have sensitive responses towards one’s children’s signals and needs. As previously stated, Chile is a country in which traditional gender roles are reinforced, with women assuming the majority of housework and child-rearing tasks (Bush & Peterson, 2014). Therefore, since cultural values and perspectives impact parental sensitivity (DePasquale & Gunnar, 2020), maternal depression, with its concomitant interferences in daily functioning, and children’s increasing autonomy, which requires more parental coordination and limit setting, may increase paternal stress (American Psychiatric Association, 2013; Goodman, 2008; McHale et al., 2000). This could in turn impact fathers’ parental skills, such as their sensitivity, which would increase family stress and successively disturb maternal sensitivity even further. This hypothesis highlights the relevance of considering cultural perspectives to accurately interpret the associations between parenting and children’s development within the family system (DePasquale & Gunnar, 2020).

Moreover, even though children’s age was not found to explain maternal sensitivity, it was significantly associated with paternal sensitivity. This result suggests that while children’s socioemotional development over the years does not have an impact on maternal sensitivity, it facilitates fathers’ sensitive responses towards the needs of their children through their toddler years. Most likely, the development of cognitive, affective, motor, and interactional skills in children close to three years of age could facilitate exchanges and favour the quality of interactions and sensitivity in parents. Particularly, the fact that a mother evidences equal levels of sensitivity regardless of her child’s age could be attributable to mothers being responsible for childrearing during the first year of their children’s lives and carrying out less paid work. Thus, it could be speculated that these mothers have had more opportunities to interact with their children since birth, which in turn would favour nonverbal exchanges as well as the quality of interactions with younger children whose interactive skills are developing (Fuertes et al., 2016; Huston & Rosenkrants Aronson, 2005). Future studies should address this association to develop more understanding of which aspects of children’s development may have a stronger impact on paternal sensitivity. The result stresses the notion that the parent-child relationship is built not only on sociocultural factors but also throughout bidirectional processes that impact both children’s and parents’ characteristics (DePasquale & Gunnar, 2020).

Regarding the hierarchical regression analysis results, it is likely that the small percentage (19.9%) of variance explaining maternal sensitivity according to paternal sensitivity, maternal depression, childhood socioemotional difficulties and child age is due to other relevant variables not being considered in the present study. Bearing these limitations in mind, future studies on parental sensitivity should also include variables associated with couples’ relationship satisfaction, adjustment to parenting and other sociocultural elements that underline and impact parental practices (DePasquale & Gunnar, 2020; Rahma Alsarbi, Prevoo, Alink & Mesman, 2021).

Overall, the above results highlight the complexities of maternal sensitivity and its relations to other variables of the family system and help broaden diagnostic understanding of the relationship between maternal depression and sensitivity. This opens the way for preventive treatments and interventions that expand the scope of analysis from the dyad to the triad.

Notwithstanding its relevance, the present study presents various limitations, such as its use of self-report questionnaires to assess depression, the low variability in parental sensitivity and depression found, and the fact that the children studied had been referred for socioemotional difficulties. Additionally, we used a convenience sample and no control with respect to the presence and/or absence of depressive symptomatology among the members of the parenting dyad. Moreover, the low variability in parental depression, particularly for fathers, may have impeded the evaluation of the significance of this variable to mothers’ sensitive responses. The use of cross-sectional data that preclude causal interpretation encourages future studies to address such variables from a longitudinal perspective and use other methods and instruments. For example, it would be relevant to propose study designs that allow for an exploration of possible variations between caregivers’ sensitive responses, children’s ages and socioemotional difficulties, and methods that directly assess the mother-father-child triad in community-based samples.

Finally, although the value of parental sensitivity and family mental health has been well established among clinicians and researchers (O’Neill et al., 2021; Foster, O’Brien & Korhonen, 2011), their understanding within
the triadic dynamic has been less studied (Barrows, 2004; Favez et al., 2006; Sweeney & MacBeth, 2016). Thus, our study highlights the relevance of developing clinical screening and interventions that consider the mother-father-child triad in a dynamic way where every partner makes a significant contribution to family interactions (Favez, Figueroa-Leigh, & Olhaberry, 2019; Beccari, Frascarolo & Tissot, 2017; Fosco & Grych, 2013). Consequently, our results stress the importance of studying more associations between caregivers’ mental health and parenting skills within families, where health professionals should be active agents in promoting the screening of parents’ mental health and in the promotion and development of parenting skills in both mothers and fathers.

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