

Running Head: ATTACHMENT AND ADJUSTMENT WHEN PARENTING AN INFANT
WITH A CONGENITAL ANOMALY

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Parental psychological distress and confidence after an infant's birth: The role of attachment representations in parents of infants with congenital anomalies and parents of healthy infants

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Abstract

The present study aimed to examine parental psychological distress and confidence after the infant's birth, when parenting an infant with a diagnosis of a congenital anomaly, and to understand the role of attachment representations on parental adjustment. Parents of infants with a congenital anomaly (44 couples) and parents of healthy infants (46 couples) completed measures of adult attachment representations and of psychological distress and parental confidence (one month after the infant's birth). Results showed no group differences in psychological distress. Mothers in the clinical group presented lower confidence than mothers in the comparison group, while for fathers the inverse pattern was found, showing their involvement in the caretaking of the infant. Insecure attachment representations predicted parental psychological distress, and a moderator role of group was found only for fathers; these results highlight the role of secure attachment representations as an individual resource in stress-inducing situations.

Keywords: attachment representations; parental confidence; parents of infants with a congenital anomaly; psychological distress.

In accordance to the family systems theory (Cox & Paley, 2003), the birth of an infant adds complexity to the family system and implies a set of changes and reorganizations in the existing familial context, which may be stressful and demanding for parents (Cowan & Cowan, 1992). Both parents must adapt to their new roles (e.g., being a mother/father) and learn how to effectively care for their infants (Mendes, 2007). In addition, the birth of an infant is a time in which parents experience several interpersonal changes, especially in their relationships with their partner and their new child (Monk, Leight, & Fang, 2008). For these reasons, parents' attachment representations become activated and begin to play a role in parental adjustment during this period (Feeney, Alexander, Noller, & Hohaus, 2003).

A pre- or postnatally diagnosed congenital anomaly (CA) in the infant affects the entire family system (Seligman & Darling, 2007). CAs include structural or functional anomalies that arise during intrauterine development and are present at birth (Crowley, 2010). Beyond dealing with the changes brought by the transition to parenthood, parents of infants who possess a CA also have to cope with their disrupted expectations of a healthy and perfect baby (e.g., Lalor, Begley, & Galavan, 2009) and with the CA requirements (Messias, Gilliss, Sparacino, Tong, & Foote, 1995). Caring for an infant with a CA in the early postpartum period may require extensive care and monitoring associated with the CA (Carnevale, Alexander, Davis, Rennick, & Troini, 2006; Mazer et al., 2008), in addition to the typical parental tasks. Therefore, when compared to parenting a healthy infant, raising an infant with a CA may be a more stressful experience (Messias et al., 1995) that impacts a parent's levels of psychological distress (Fonseca, Nazaré, & Canavarro, 2012) and may constrain the development of parental confidence (Freeman, 2006). This study aimed to compare parental adjustment (operationalized as psychological distress and confidence) in parents of infants

with a CA and parents of healthy infants and to examine whether parental adjustment was influenced by attachment representations.

Gender specificities should also be considered, as it has been well recognized that mothers and fathers experience the transition to parenthood in different ways. In response to the additional tasks of childcare after the infant's birth, mothers and fathers tend to adopt more traditional gender roles regarding work and family: while mothers assume the role of main caregivers (i.e., infant care and household), fathers assume the role of providers (i.e., managing family finances; Belsky, Lang, & Huston, 1986; Katz-Wise, Priess, & Hyde, 2010). Consistently, mothers usually report a greater investment in the parental role than their partners, and fathers mention an increased investment in the worker role, while mothers' investment tends to decrease (Cowan & Cowan, 1988). This may be related with women's main biological role in childbearing (e.g., pregnancy, lactation), cultural expectations regarding motherhood, and social constraints (e.g., maternity leave, gender differences in income; Katz-Wise et al., 2010). Therefore, for mothers, becoming a parent may be a more life-changing transition than for fathers, which may lead to more adjustment difficulties (e.g., Demo & Cox, 2000). In couples whose infant has a CA, mothers also tend to assume the role of main caregivers when compared to fathers (e.g., Hunfeld, Tempels, Passchier, Hazebroeck, & Tibboel, 1999).

Parental adjustment

Psychological distress

A diagnosis of a CA can be a stress-inducing event for the family that only increases the stress created by the transition to parenthood (Fonseca et al., 2012). However, few studies have compared parental adjustment to the birth of an infant with a CA with the adjustment of parents of a healthy infant. Skari et al. (2006) found that six weeks after birth, parents of infants with a surgically correctable CA had higher levels of psychological distress than

parents of healthy infants. Comparing their data to normative data, Brosig, Whitstone, Frommelt, Frisbee, and Leuthner (2007) found that parents of children with congenital heart disease had higher levels of psychological distress at the time of their child's birth. Aite et al. (2003) also found higher levels of anxiety in parents of infants with a surgically correctable CA. Finally, another study without a comparison group found that 65% of mothers and 45% of fathers with sick newborns who had been admitted to a Newborn Intensive Care Unit (NICU) had clinical levels of depression that significantly decreased three months after the infant's birth to 16% and 22%, respectively (Pinelli et al., 2008).

The majority of studies of both mothers and fathers of infants born with a CA found that mothers presented higher levels of psychological distress than fathers (e.g., Pinelli et al., 2008; Skari et al., 2006) after the infant's birth, which may be explained by the mothers' primary role as caregivers (Hunfeld et al., 1999). However, other studies did not find gender differences in levels of psychological distress (Brosig et al., 2007).

Parental confidence

Parental confidence has been defined as the perceived level of competence in one's parenting skills (also known as parental competence or parental self-efficacy; Crnec, Barnett, & Matthey, 2010), including the ability to take care of the child, to recognize and respond to the infant's needs, and to feel satisfied in the parenting role (Hess, Teti, & Hussey-Gardner, 2004; Mercer & Ferketich, 1994; Teti & Gelfand, 1991; Zahr, 1993).

Parental confidence may be influenced by the infant's characteristics, such as health problems or disabilities (Cutrona & Troutman, 1986; Freeman, 2006; Salonen et al., 2009). In a study comparing mothers of premature infants with mothers of full term infants, Zahr (1993) found that the number of medical complications the infants experienced predicted maternal confidence, with more medical problems corresponding to lower levels of maternal confidence. Studies also found that parents of infants with health problems (ranging from

minor complications to severe illnesses requiring intensive care) reported lower levels of parental confidence than parents of healthy infants (Freeman, 2006; Salonen et al., 2009). In a study of mothers with medically fragile infants, confidence levels were lower when the infant was classified as being less alert and when mothers displayed higher illness-related distress (Miles, Holditch-Davis, Burchinal, & Brunssen, 2011).

Regarding gender differences, studies of parents with healthy infants suggest that mothers have more confidence in their parenting skills than fathers, perhaps because mothers often have more opportunities to engage in infant care (Hudson, Elek, & Fleck, 2001; Reece & Harkless, 1998). However, few of the studies on this topic have examined parents of infants with a CA, and there is insufficient information concerning gender differences and similarities in this population. This topic, therefore, should be further explored.

The role of adult attachment in parental adjustment

Attachment representations and stress-inducing conditions

Attachment theory (Bowlby, 1969) maintains that attachment representations (i.e., internal working models of the self and of others) are particularly pronounced under stress-inducing conditions. Two orthogonal dimensions have been considered when assessing adult attachment representations: *Anxiety* and *Avoidance*. *Anxiety* refers to the degree of doubt regarding one's ability to form and maintain close relationships, fear of abandonment, and worry that others might be unsupportive when needed (characteristics associated with representations of the self). *Avoidance* refers to the degree to which individuals maintain psychological and emotional independence from significant others and desire to limit intimacy, characteristics associated with representations of others. While individuals who score low in both dimensions have secure working models (i.e., they consider themselves to be worthy of support and love and believe others to be trustworthy and supportive), individuals who score high in one or both of these dimensions present insecure working

models of the self (i.e., they believe they are unworthy of support) and/or of others (i.e., they believe other people are unsupportive of them; Griffin & Bartholomew, 1994; Simpson, Rholes, Campbell, Tran, & Wilson, 2003).

Attachment security may be conceptualized as an inner resource. Individuals with secure working models tend to adjust better to stress-inducing events than individuals with insecure working models, who have been found to display greater psychological distress. Individuals with secure working models tend to appraise stressful events as less threatening, to view themselves as more capable to cope with these events and to seek emotional and instrumental support (Mikulincer & Florian, 1995, 1998). Conversely, individuals with high scores in the Anxiety dimension tend to be excessively concerned (e.g., mental rumination, hypersensitivity) with their own distress and to overreact to their negative feelings to elicit support from others. Individuals with high scores in the Avoidance dimension seek distance (at the cognitive and behavioral levels) from the stress-inducing event, appear less sensitive to the stressor, and avoid seeking emotional or instrumental support from others (Lopez & Brennan, 2000; Mikulincer & Florian, 1995, 1998).

The role of attachment in parental adjustment to the infant's birth

Attachment representations play an important role in adjustment to parenthood, which is a time of increased stress. Insecure working models, particularly in individuals with higher scores in the Anxiety dimension, have been linked with increased prenatal and postnatal depression (Bifulco et al., 2004; Feeney et al., 2003; McMahon, Barnett, Kowalenko, & Tennant, 2005). Additionally, one study found that individuals with insecure working models generally feel less confident in their ability to relate to their children, when compared with individuals with secure working models (Rholes, Simpson, Blakely, Lanigan, & Allen, 1997).

To our knowledge, only one study has investigated the role of adult attachment representations in the psychological distress of mothers of healthy infants and mothers of

infants with a CA (specifically, infants diagnosed with mild or severe congenital heart disease in the first year of life; Berant, Mikulincer, & Florian, 2001). The results of the study showed that, regardless of the group (mild diagnosis, severe diagnosis, or healthy infants), mothers with Anxious or Avoidant working models displayed more psychological distress than mothers with secure working models. An interaction effect between group and attachment representations was also found, such that for mothers with avoidant working models, the levels of psychological distress varied according to the group: distress levels were significantly higher for mother of infants diagnosed with severe congenital heart disease. As the authors had hypothesized, mothers of healthy infants with Avoidant working models were better able to use their distancing strategies (e.g., cognitive and behavioral distance from the stressor event) to cope. However, the demands associated with raising an infant with a severe diagnosis may compromise the mother's ability to distance herself, thus leading to increased difficulty in coping with the infant's CA. Additionally, mothers with insecure working models (Anxious or Avoidant) were less able to cope with tasks related to motherhood (i.e., lower maternal confidence) in the severe diagnosis group. This association was not found in mothers of healthy infants. These findings suggest that secure working models can act as a protective resource during maternal adjustment to their infant's CA. However, this study was restricted to only one type of CA and the sample only comprised mothers, so the knowledge about this topic is limited and should be further explored.

Aims and hypotheses

The first goal of this study was to characterize parental adjustment (i.e., psychological distress and parental confidence) one month after an infant's birth by comparing a group of parents of infants diagnosed with a CA (clinical group) with a group of parents of healthy infants (comparison group). Gender and interaction effects were also explored. The second goal was to examine the role of attachment representations in parents' adjustment to their new

role and to determine whether there was a moderating effect of group (clinical vs. comparison). The following hypotheses were established: 1) the clinical group will present significantly higher levels of psychological distress and significantly lower parental confidence than the comparison group; 2) mothers will display significantly higher levels of psychological distress and parental confidence than fathers; and 3) individuals with higher scores in the Anxiety and/or Avoidance attachment dimensions will experience higher levels of psychological distress and lower parental confidence in both groups. Given the scarce literature, we established no predictions regarding interaction effects (gender x group) on parental adjustment or regarding the moderating effect of group in the relationship between attachment representations and parental adjustment.

Methods

Participants and procedure

This study was approved by the Ethics Committees of two urban Portuguese referral hospitals: the Hospitais da Universidade de Coimbra and the Centro Hospitalar de Coimbra. Inclusion criteria for the clinical group were having an infant with a pre- or postnatally identified CA that had not experienced perinatal death. A group of parents of healthy infants (infants without pre- or postnatally identified CAs or other medical problems) similar to the clinical group in terms of socio-demographic and clinical characteristics was constituted for comparison purposes (comparison group). Parents in both groups had to be at least 18 years of age and have a level of literacy that allowed them to comprehend the assessment protocol.

The data collection took place between September 2009 and September 2011. All parents in the clinical group were informed by the medical team about this study at the end of a medical appointment, approximately one month after the disclosure of a diagnosis of a CA (e.g., during pregnancy if the diagnoses were prenatal or one month after the birth if the diagnoses were postnatal). In this appointment, they were asked for permission to be

contacted by the researchers. The researchers approached participants in the comparison group prior to their obstetric appointments. The research goals were presented to all contacted parents, and those who decided to participate signed an informed consent form. Participants were given the questionnaires (Time 1 - assessment of adult attachment) and were told to return them to the researchers during the next medical appointment. With the exception of parents of infants with a postnatally diagnosed CA (assessed one month after the diagnosis/birth; questionnaires for this group assessed both adult attachment and parental adjustment), researchers contacted the participants (parents of infants with a prenatally diagnosed CA and parents in the comparison group) again one month after the infant's birth. At this time, researchers mailed participants the questionnaires and a pre-stamped envelope in which to return the completed questionnaires (Time 2 – assessment of parental adjustment).

The researchers initially contacted 82 couples from the clinical group and 100 couples from the comparison group. Thirty-eight couples refused to participate or did not return the questionnaires at Time 1 (participation rate: 73.2% in the clinical group and 84.0% in the comparison group) and 29 couples did not return the questionnaires at Time 2 (attrition rate: 14.6% in the clinical group and 27.4% in the comparison group). The researchers excluded 10 questionnaires from the clinical group and 16 questionnaires from the comparison group because they had been completed only by the female partner in each couple.

The final sample was composed of 44 couples in the clinical group and 46 couples in the comparison group. The sample characteristics are presented in Table 1. Participants in the two groups had similar characteristics, with the exception of maternal age and the number of gestational weeks at the infant's birth, which were significantly different between groups (see Table 1).

(Insert Table 1 about here)

In the clinical group, 59.1% ($n = 26$) of the diagnoses occurred in the prenatal period. The most frequent diagnoses were congenital heart disease ($n = 16$, 17.8%) and urinary system anomalies ($n = 11$, 12.2%). Less frequent diagnoses were nervous system anomalies ($n = 5$, 5.6%), orofacial clefts ($n = 5$, 5.6%), digestive system anomalies ($n = 4$, 4.4%) and limb anomalies ($n = 3$, 3.3%). After birth, 25.0% of cases ($n = 11$) required hospitalization in the NICU and 13.6% of cases ($n = 6$) needed surgery during the first month of the infant's life.

Measures

Socio-demographic and clinical information. Socio-demographic (e.g., gender, age, marital status, educational level and professional status) and clinical information (e.g., obstetric history, including parity, history of pregnancy loss and infertility; the infant's data, including gender, gestational age at birth and weight at birth; and CA information, including type of CA, timing of diagnosis, hospitalization in NICU and need for surgery) were obtained using a questionnaire.

Psychological distress. Psychological distress was assessed using the Portuguese version of the Brief Symptom Inventory 18 (BSI-18; Derogatis, 2000), a 5-point Likert scale (from 0 = *Not at all* to 4 = *Extremely*) composed of three dimensions (Anxiety, Depression, and Somatization). Higher values indicate the presence of more intense psychopathological symptoms. In accordance with the study goals, only the Anxiety and Depression dimensions were used. The Cronbach's alpha values in our sample ranged from .78 (Anxiety, comparison group) to .90 (Anxiety, clinical group).

Parental confidence: Confidence was assessed using the Portuguese version of the Maternal Confidence Questionnaire (Nazaré, Fonseca, & Canavarro, 2011). This 13-item questionnaire assesses responses on a 5-point frequency scale (from 1 = *Never* to 5 = *Always*), and is organized into three dimensions: Knowledge of the Infant (perceived knowledge of the infant's needs and motivations), Caretaking Tasks (perceived competence in the caretaking

tasks), and Evaluation of the Parenting Experience (perceived confidence and satisfaction associated with the parental role). In our study, the dimension Evaluation of the Parenting Experience was excluded, because its Cronbach's alpha was only .56 for the comparison group. For the remaining dimensions, Cronbach's alphas ranged from .75 (Caretaking Tasks, clinical group) to .84 (Knowledge of the Infant, comparison group).

Attachment representations: The Portuguese version of the Adult Attachment Scale – Revised (Canavarro, Dias, & Lima, 2006) was used in this study. This scale consists of 18 items that are rated on a 5-point Likert scale (from 1 = *Not at all characteristic of me* to 5 = *Extremely characteristic of me*) and organized in two dimensions (Anxiety and Avoidance, as described above; Collins, 2008). Higher scores indicate more Anxious and/or Avoidant working models (i.e., insecure working models). In our sample, Cronbach's alpha values ranged from .64 (Avoidance, comparison group) to .85 (Anxiety, clinical group).

Statistical Analyses

Analyses were conducted using IBM SPSS, version 19.0. Descriptive statistics and comparison tests (*t*-tests and chi-squared tests) were used for sample characterization.

Regarding the first goal, repeated-measures MANOVAs were used. To account for the interdependency of a couple's observations (as both members share the experience of parenting the same infant and may influence each other) and to allow for the investigation of gender differences within the couple, these analyses were performed on the couple as a unit (the database was restructured to consider each couple as the subject of the analysis and each partner's score as a different variable). Group (clinical vs. comparison) was considered the between-subjects factor and gender (mothers vs. fathers) the within-subjects factor. ANOVAs were used when the multivariate effects were significant. The post-hoc power calculations conducted for all comparison analyses performed with a significance level of .05 and power \geq .80 indicated that medium to large effects could be detected (Faul, Erdfelder, Lang, &

Buchner, 2007). Effect-size measures were presented for the comparison analyses (small: $\eta^2 \geq .01$, $d \geq .20$, medium: $\eta^2 \geq .06$, $d \geq .50$, large: $\eta^2 \geq .14$, $d \geq .80$).

Regarding the second goal, several multiple linear regressions were performed to analyze moderation effects, in accordance with the procedures recommended by Aiken and West (1991). Multiple linear regressions were performed separately for mothers and fathers (due to the interdependence of a couple's observations) and for each of the dependent variables (i.e., Depressive Symptoms, Anxiety Symptoms, Knowledge of the Infant, Caretaking Tasks). Both the predictors (Anxiety and Avoidance dimensions; included after centering procedures to avoid multicollinearity) and the moderator (group; dummy-coded: 0: comparison group, 1: clinical group) were included in the first step of the regression model (main effects). In the second step, the interaction terms (product terms: Anxiety x Group, Avoidance x Group) were introduced. Significant interactions were plotted and post hoc simple slope analyses were conducted using Modgraph (Jose, 2008) to determine their nature. The statistical significance level was set to $p < .05$, but marginally significant results ($p < .10$) were reported and discussed.

Results

Parental adjustment: Group, gender, and interaction effects

Regarding our first goal, we tested whether there were group (hypothesis 1: the clinical group will present significantly higher levels of psychological distress and significantly lower parental confidence than the comparison group) and gender (hypothesis 2: mothers will display significantly higher levels of psychological distress and parental confidence than fathers) effects. Table 2 presents the descriptive statistics for parental adjustment (psychological distress and parental confidence) according to group and gender.

(Insert Table 2 about here)

Psychological distress

The multivariate effects of group (Pillai's Trace = .03, $F_{2,87} = 1.32$, $p = .271$, $\eta^2 = .03$) and gender (Pillai's Trace = .05, $F_{2,87} = 2.30$, $p = .106$, $\eta^2 = .05$) in psychological distress were not significant. Similarly, there were no significant interaction effects between group and gender affecting levels of psychological distress (Pillai's Trace = .00, $F_{2,87} = 0.13$, $p = .877$, $\eta^2 = .00$).

Parental confidence

The multivariate effect of group on parental confidence was marginally significant (Pillai's Trace = .05, $F_{2,86} = 2.43$, $p = .094$, $\eta^2 = .05$). Univariate tests showed that parents in the clinical group presented higher levels of confidence in the Caretaking Tasks dimension compared with parents in the comparison group (see Table 2). Additionally, the multivariate effect of gender was significant (Pillai's Trace = .60, $F_{2,86} = 63.49$, $p < .001$, $\eta^2 = .60$), with mothers presenting higher scores than fathers in the dimensions Knowledge of the Infant and Caretaking Tasks (see Table 2).

Finally, the multivariate interaction effect between group and gender for parental confidence was significant (Pillai's Trace = .12, $F_{2,86} = 5.91$, $p = .004$, $\eta^2 = .12$), with univariate tests revealing a significant interaction effect in the Knowledge of the Infant dimension and a marginally significant effect in the Caretaking Tasks dimension (see Table 2). The results of post-hoc analyses revealed that mothers in the comparison group ($t_{88} = -1.86$, $p = .06$, $d = .39$) had marginally significant higher scores in the Knowledge of the Infant dimension than mothers in the clinical group. Fathers in the clinical group ($t_{88} = 1.98$, $p = .05$, $d = .42$) also had marginally significant higher scores in this dimension than fathers in the comparison group. In the Caretaking Tasks dimension, fathers in the clinical group had significantly higher scores ($t_{88} = 2.18$, $p = .03$, $d = .46$) than fathers in the comparison group,

but no significant differences were found between the two groups of mothers ($t_{88} = -0.09$, $p = .931$, $d = .02$).

The influence of attachment representations on maternal and paternal adjustment: The moderator role of group

Regarding our second goal, we tested the hypothesis that more insecure attachment representations (higher scores in the Anxiety and/or Avoidance attachment dimensions) predicted worse parental adjustment (higher psychological distress and lower parental confidence) in all parents. We also investigated the moderating effect of group (clinical vs. comparison) on these relationships, for mothers and fathers.

Maternal adjustment

Table 3 presents the regression models predicting levels of maternal psychological distress and confidence.

(Insert Table 3 about here)

Psychological distress. The first step of the model for depressive symptoms was significant. Higher scores in the Anxiety dimension of attachment and membership in the clinical group both predicted higher depressive scores. In addition, the first step of the regression model for anxiety symptoms was marginally significant; group was the only marginally significant predictor (see Table 3). No significant interaction effects were found between attachment representations and group for depressive or anxiety symptoms. The introduction of the interaction step did not significantly increase the explained variance of the models (see Table 3).

Parental confidence. The regression models for main effects, the step for determining the interaction effects, and the final models were not significant in either of the confidence dimensions (see Table 3).

Paternal adjustment

Table 4 presents the regression models predicting paternal levels of psychological distress and confidence.

(Insert Table 4 about here)

Psychological distress. For depressive symptoms, the first step of the model was significant and the second step significantly increased the explained variance of the model (see Table 4). In addition to the main effects of Anxiety and group, a significant interaction between Avoidance and group was found. Post-hoc simple slope analyses showed that higher scores in the Avoidance dimension of attachment were associated with higher levels of depressive symptoms for fathers in the clinical group ($b = 5.30, SE = 1.70, t = 3.12, p = .002$), but not for fathers in the comparison group ($b = -1.47, SE = 2.03, t = -0.72, p = .47$; see Figure 1). Additionally, a marginally significant interaction between Anxiety and group was found. Post-hoc simple slope analyses showed that higher scores in the Anxiety dimension of attachment were significantly associated with higher levels of depressive symptoms for fathers in the comparison group ($b = 2.37, SE = 1.03, t = 2.31, p = .02$). However, fathers in the clinical group had higher levels of depressive symptoms regardless of their scores in the Anxiety dimension of attachment ($b = -0.17, SE = 0.92, t = -0.18, p = .86$; see Figure 1).

(Insert Figure 1 about here)

The first step of the model for anxiety symptoms proved to be marginally significant, although no significant individual predictors were identified (see Table 4). The introduction of the second step did not significantly increase the explained variance of the model.

However, the final model remained significant, with the Anxiety dimension of Attachment (with higher scores predicting higher anxiety symptoms) and the interaction between Avoidance and group being predictive of paternal anxiety symptoms (see Table 4).

Parental confidence. The first step of the model for the Knowledge of the Infant dimension was significant, although no significant individual predictors were found. Additionally, the step that included the main effects for the Caretaking Tasks dimension was marginally significant, with group being the only marginally significant individual predictor of the model (i.e., membership in the clinical group predicted higher levels of confidence in the Caretaking Tasks; see Table 4). No significant interaction effects between attachment representations and group were found in either of the dimensions of parental confidence. The interaction steps did not significantly increase the explained variance of the models (see Table 4).

Discussion

This study produced three main findings: a) parents of infants with a CA did not display greater levels of psychological distress than parents of healthy infants, and maternal and paternal experiences were also found to be similar; b) although mothers of infants with a CA showed less confidence in their parenting skills, fathers of infants with a CA had higher levels of parental confidence than fathers of healthy infants; and c) attachment representations played a role in parental psychological distress after the infant's birth, but did not affect parental confidence, with group playing a moderator role only for fathers.

Parenting an infant with a CA: Impact on parental adjustment

Considering both indicators of parental adjustment, our results only partially confirmed our first and second hypotheses.

Psychological distress

Parents of infants who possess a CA and parents of healthy infants presented similar levels of psychological distress, and mothers in both groups were found to present higher levels of depressive symptoms than fathers, although no multivariate gender effects were found. The absence of group differences suggests that the additional challenges that may arise after the birth of an infant with a CA do not result in a significant increase in psychological distress for neither gender, which is contrary to the existing research. However, most of the existing studies on this topic use normative data for comparison rather than data obtained from parents of healthy infants (Aite et al., 2003; Brosig et al., 2007). Such comparison makes it impossible to determine which effects are specific to the CA and which are the result of the adjustment to parenthood. Additionally, the studies by Skari et al. (2006) and Pinelli et al. (2008) included parents of infants with a CA that required post-birth surgical treatment or hospitalization in a NICU. Such circumstances can create additional responsibilities for parents. Parents in this situation were a minority in our sample. Furthermore, although higher levels of psychological distress were found in parents of infants with a CA one month after the disclosure of the diagnosis (e.g., Fonseca et al., 2012), studies suggest a gradual process of parental adjustment to the diagnosis (e.g., Lalor et al., 2009), which also may explain these results.

During the first months of the infant's life, mothers face a greater number of changes by assuming the role of main caregivers of their infants (Katz-Wise et al., 2010), which may explain their increased levels of depressive symptoms, when compared to fathers. However, the absence of a multivariate gender effect underscores the similarity of the maternal and paternal experiences. In fact, such gender similarities were found in another study with parents of infants with a CA (Brosig et al., 2007) and support the idea that couples have a shared experience when facing stress-inducing events, such as raising an infant with a CA

(Fonseca et al., 2012). One possible explanation is that, given the infant's additional caregiving requirements, fathers may recognize the need of becoming more involved in the caregiving role and support their partners. On the other hand, both partners suffer from mutual influences within the couple (i.e., the mothers' psychological distress may impact their partner's adjustment and vice-versa; e.g., Gray, 2003). These hypotheses should be further explored.

Parental confidence

The results on parental confidence are the primary contribution of this paper to the field. Group effects were found, although the direction of those effects was different for mothers and fathers. Specifically, mothers in the clinical group experienced lower levels of confidence in the Knowledge of the Infant dimension, but similar levels of confidence in Caretaking Tasks when compared with mothers of healthy infants. In turn, fathers in the clinical group had more parental confidence in both dimensions than fathers of healthy infants. As mothers are the main caregivers (Hunfeld et al., 1999), raising an infant with a CA may place a greater strain on them adjusting to the parenting role (Freeman, 2006). While mothers may feel able to care for their infant, they also have to process a large amount of information about the infant's diagnosis, which may contribute to these mothers' lower perceived confidence in their ability to know the child and identify their needs, when compared to mothers of healthy infants. Increased parental confidence has been associated with more effective parenting, emotional wellbeing, and better adjustment to the parenting role (Jones & Prinz, 2005). Thus, mothers of infants with a CA should be a focus of clinical attention.

The fact that fathers of infants with a CA perceived higher levels of confidence than fathers of healthy infants was an unexpected result. As parental confidence is positively related with the number of opportunities for involvement in the caregiving tasks (e.g., Leahy-

Warren & McCarthy, 2011), it is possible that this result denotes increased paternal involvement in the caretaking tasks when the infant has a CA. As we mentioned earlier, this increased paternal involvement may be due to fathers' acknowledgement that caring for an infant with a CA has additional requirements, leading them to support mothers in their caregiving role. In fact, if mothers of infants with a CA perceived their ability to identify their infant's needs as lower than mothers of healthy infants, as shown by our results, they may resort more frequently to their partners for opinions and involvement in the caretaking activities. This hypothesis also aligns with the previously discussed idea of the shared experience of couples confronting an infant's diagnosis of a CA and should be further explored.

The influence of attachment representations on maternal and paternal adjustment

Our results showed that attachment representations influenced parental psychological distress but not parental confidence, which partially confirmed our third hypothesis. A different pattern of influence was found for each gender. Higher scores in the Anxiety dimension of attachment were associated with higher levels of depressive symptoms in both groups of mothers, which is consistent with previous studies of parents of healthy infants (Feeney, 2003) and of mothers of infants with a CA (Berant et al., 2001). Regardless of the infant's medical condition, mothers are faced with the majority of stressful demands of caretaking in the first months of life (Katz-Wise et al., 2010). When dealing with these stressful demands, mothers with insecure working models of the self (those who perceive themselves as unworthy of support) tend to exacerbate their psychological distress because they are excessively preoccupied with their own distress and tend to rely on emotion-focused coping strategies (Berant et al., 2001; Mikulincer & Florian, 1998).

Additionally, our results showed that mothers with insecure working models of others did not present higher levels of psychological distress, suggesting that they were able to cope

with the stressful events of caretaking through distancing coping strategies (Mikulincer & Florian, 1995, 1998). However, because diagnosis severity may increase the stress of the event so far as to compromise the effectiveness of distancing coping strategies, it is possible that Avoidant working models only influence the distress of mothers whose infants have a more severe CA (Berant et al., 2001). This hypothesis should be further explored.

For fathers, the influence of attachment representations on paternal psychological distress was moderated by group. More insecure working models of the self were predictive of higher levels of depressive symptoms in fathers of healthy infants, in accordance with previous studies (Feeney, 2003), but not in fathers of infants with a CA. Fathers of infants with a CA showed high levels of depressive symptoms regardless of the scores in the Anxiety dimension, suggesting that raising an infant with a CA has a considerable impact even on individuals with secure working models of the self. Additionally, similar to the findings of Berant et al. (2001), more insecure working models of others affected paternal psychological distress only in fathers of infants with a CA. For fathers with insecure working models of others, the stress of raising an infant with a CA seems sufficient to nullify the effectiveness of the distancing strategies, amplifying their psychological distress. Considering all the results of this study, the fact that group differences in the influence of attachment representations on parental adjustment were found only for fathers may be explained by the hypothesis that fathers of infants with a CA may be more involved in the caretaking tasks, so they are more often confronted with stressful and demanding situations than fathers of healthy infants.

Strengths and limitations

The main contribution of this study is its focus on the parental adjustment of couples raising an infant with a CA considering: a) both members of the couple; b) a comparison group of parents of healthy infants, which provides a more accurate understanding of the specific impact of the diagnosis-related demands; and c) important variables that provide a

more complete understanding of the adjustment to parenthood. These latter variables operate either as predictors (attachment) or as indicators of adjustment (parental confidence) and have seldom been studied in parents of infants with a CA.

Despite its research contributions, this study has several limitations. First, in spite of its longitudinal nature, the attachment representations of the parents of infants with a postnatal diagnosis of a CA were evaluated at the same time as parental adjustment, because it was not possible to identify during pregnancy the couples that would have an infant with a postnatally diagnosed CA. Nevertheless, attachment representations tend to be a stable construct, and no significant differences in attachment representations were found between this group of parents and the remaining parents. Second, we took a non-categorical approach to CA (inclusion of different types of CA). Although it was not possible in our study, it would be useful for future studies to objectively classify the severity of the anomalies. Third, there were statistical limitations, such as the internal consistency values marginally below the desirable of one of the used instruments, and the reduced power to detect small effects (namely interaction effects) due to limited sample size. Our results note important directions to be taken by future studies that may overcome these limitations, namely examining: a) whether there are differences in paternal involvement in the caregiving role, as a function of the infant's medical condition; and b) whether the relationship between attachment representations and parental adjustment is moderated by the severity of the CA. In addition, other issues such as interpersonal influences of attachment representations and parental adjustment within the couple and the evolution of parents' adjustment over time should also be explored.

Practical implications

The findings of the present study are clinically relevant for several reasons. First, they highlight the importance of assessing parental adjustment, including indicators such as parental confidence, of couples raising an infant with a CA. Parental confidence is of primary

importance because it may function as a protective factor in high-risk conditions, such as circumstances of prolonged stress (Jones & Prinz, 2005). Especially among mothers of infants with a CA, health professionals should promote parental confidence through strategies as organizing and conducting discussion groups of parents (where information about the CA and about general parenting skills is provided, doubts are clarified, and parents' experiences are shared, in a climate of support) and home visits (in order to address parents' specific needs and concerns in their own environment).

Second, the results suggest the need to consider the paternal role. When parents are confronted with a diagnosis of a CA, health professionals should assess for the presence of adjustment difficulties in both parents, as they share a common emotional experience. The ones at risk for maladjustment should receive specialized counseling. Interventions including both parents should be more beneficial for couples, given their joint involvement in caretaking.

Third, the results support the idea that secure attachment representations are an important individual resource in the face of stress-inducing events. Parents with insecure attachment representations should be the focus of specialized interventions that seek to modify the appraisal of stressful events (in order for them to be seen as less threatening) and the coping strategies used to address them. Some examples of intervention strategies include identifying parental skills which may be useful in dealing with the stressful situation and activating support networks that provide adequate emotional and instrumental support. Fathers should be a particular focus of concern because the lack of attachment security becomes particularly consequential when they are faced with the challenges of caring for an infant with a CA.

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Table 1 – Socio-demographic and clinical characterization of the sample

	Clinical group (<i>n</i> = 44)		Comparison group (<i>n</i> = 46)		Group differences	
<i>Socio-demographic characteristics</i>						
	Mothers	Fathers	Mothers	Fathers	Mothers	Fathers
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>t</i> ₈₈	<i>t</i> ₈₈
<i>Age (years)</i>	31.48 (4.47)	32.89 (5.02)	29.17 (2.74)	31.64 (4.26)	2.96**	1.26
<i>Educational level (years)</i>	14.93 (3.19)	12.12 (3.37)	13.85 (2.60)	11.98 (3.84)	1.79	0.18
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	χ^2	χ^2
<i>Professional status</i>						
Employed	38 (86.4)	41 (93.2)	37 (80.4)	44 (95.7)	4.06	2.06
Unemployed	6 (13.6)	3 (6.8)	9 (19.6)	2 (4.4)		
<i>Obstetric history</i>						
		<i>n</i> (%)		<i>n</i> (%)	χ^2	
<i>Parity</i>	Primiparous	29 (65.9)		26 (56.5)	2.78	

	Multiparous	15 (34.1)	20 (43.5)	
<i>Pregnancy loss history</i>		6 (13.6)	10 (22.8)	1.82
<i>Infertility history</i>		5 (11.4)	2 (4.7)	1.32
<i>Infant's data</i>				
		<i>n (%)</i>	<i>n (%)</i>	χ^2
<i>Gender</i>	Male	27 (61.4)	26 (56.5)	0.22
	Female	17 (38.6)	20 (43.5)	
		<i>M (SD)</i>	<i>M (SD)</i>	<i>t₈₈</i>
<i>Gestational weeks at birth</i>		38.55 (1.88)	39.22 (1.09)	-2.07*
	<i>Weight (gr)</i>	3197.07 (653.84)	3186.49 (504.03)	0.08

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

Table 2 – Parental psychological distress and confidence: Group, gender, and interaction effects

	Clinical group		Comparison group		Group effects		Gender effects		Interaction effects	
	Mothers	Fathers	Mothers	Fathers	<i>F</i>	η^2	<i>F</i>	η^2	<i>F</i>	η^2
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>						
<i>Psychological distress</i>										
Depressive symptoms	5.18 (4.72)	4.20 (4.93)	3.72 (3.64)	3.01 (3.81)	2.65	.03	4.62*	.05	0.27	.00
Anxiety symptoms	6.00 (5.15)	5.05 (5.11)	4.59 (3.62)	4.11 (3.63)	2.10	.02	2.41	.03	0.12	.00
<i>Parental confidence</i>										
Knowledge of the Infant	4.00 (0.44)	3.63 (0.53)	4.16 (0.42)	3.41 (0.49)	0.12	.00	104.82***	.55	11.56**	.12
Caretaking Tasks	4.89 (0.30)	4.26 (0.73)	4.88 (0.29)	3.87 (0.94)	4.59*	.05	74.95***	.46	3.92 [†]	.04

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3 – Predictors of maternal adjustment: Main and interaction effects

<i>Psychological distress</i>				
	Depressive symptoms		Anxiety symptoms	
	Step 1:	Step 2:	Step 1:	Step 2:
	$\Delta R^2 = .12$	$\Delta R^2 = .02$	$\Delta R^2 = .08$	$\Delta R^2 = .01$
	$F_{3,86} = 4.06^*$	$F_{2,84} = 0.72$	$F_{3,86} = 2.57^\dagger$	$F_{2,84} = 0.31$
	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
Anxiety	1.70 (0.67)*	0.90 (1.02)	1.07 (0.72)	0.54 (1.10)
Avoidance	0.73 (1.10)	0.98 (1.59)	1.37 (1.19)	1.43 (1.72)
Group	1.88 (0.86)*	1.91 (0.87)*	1.78 (0.93)†	1.80 (0.94)†
Anxiety x Group		1.53 (1.37)		1.03 (1.48)
Avoidance x Group		0.73 (2.26)		0.28 (2.45)
<i>Parental confidence</i>				
	Knowledge of the Infant		Caretaking Tasks	
	Step 1:	Step 2:	Step 1:	Step 2:
	$\Delta R^2 = .05$	$\Delta R^2 = .04$	$\Delta R^2 = .01$	$\Delta R^2 = .04$
	$F_{3,86} = 1.34$	$F_{2,84} = 1.67$	$F_{3,86} = 0.42$	$F_{2,84} = 1.87$
	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
Anxiety	-0.22 (0.44)	-0.69 (0.66)	-0.14 (0.15)	-0.22 (0.23)
Avoidance	-0.09 (0.72)	1.24 (1.03)	-0.08 (0.25)	0.37 (0.36)
Group	-1.12 (0.56)†	-1.15 (0.56)*	-0.05 (0.20)	-0.07 (0.20)
Anxiety x Group		0.62 (0.88)		0.06 (0.31)
Avoidance x Group		-2.67 (1.46)†		-0.96 (0.51)†

Note. Overall model statistics for depressive symptoms ($F_{5,84} = 2.71, p = .026, R^2 = .14$), anxiety symptoms ($F_{5,84} = 1.64, p = .158, R^2 = .09$), Knowledge of the Infant ($F_{5,84} = 1.48, p = .205, R^2 = .08$) and Caretaking Tasks ($F_{5,84} = 1.00, p = .421, R^2 = .06$).

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4 – Predictors of paternal adjustment: Main and interaction effects

<i>Psychological distress</i>				
	Depressive symptoms		Anxiety symptoms	
	Step 1:	Step 2:	Step 1:	Step 2:
	$\Delta R^2 = .10$	$\Delta R^2 = .07$	$\Delta R^2 = .08$	$\Delta R^2 = .05$
	$F_{3,86} = 3.25^*$	$F_{2,84} = 3.70^*$	$F_{3,86} = 2.42^\dagger$	$F_{2,84} = 2.23$
	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
Anxiety	0.85 (0.70)	2.37 (1.03)*	1.00 (0.72)	1.93 (1.06) [†]
Avoidance	2.59 (1.34) [†]	-1.47 (2.03)	1.91 (1.36)	-1.49 (2.10)
Group	1.71 (0.91) [†]	1.66 (0.89) [†]	1.38 (0.93)	1.34 (0.92)
Anxiety x Group		-2.54 (1.38) [†]		-1.47 (1.42)
Avoidance x Group		6.77 (2.65)*		5.73 (2.73)*
<i>Parental confidence</i>				
	Knowledge of the Infant		Caretaking Tasks	
	Step 1:	Step 2:	Step 1:	Step 2:
	$\Delta R^2 = .09$	$\Delta R^2 = .00$	$\Delta R^2 = .07$	$\Delta R^2 = .00$
	$F_{3,86} = 2.89^*$	$F_{2,84} = 0.09$	$F_{3,86} = 2.27^\dagger$	$F_{2,84} = 0.02$
	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
Anxiety	-0.54 (0.50)	-0.77 (0.76)	-0.28 (0.42)	-0.36 (0.64)
Avoidance	-1.29 (0.95)	-0.94 (1.50)	-0.71 (0.80)	-0.73 (1.26)
Group	0.99 (0.65)	0.99 (0.66)	1.02 (0.54) [†]	1.02 (0.55) [†]
Anxiety x Group		0.40 (1.02)		0.15 (0.85)
Avoidance x Group		-0.55 (1.96)		0.05 (1.64)

Note. Overall model statistics for depressive symptoms ($F_{5,84} = 3.55, p = .006, R^2 = .17$), anxiety symptoms ($F_{5,84} = 2.39, p = .045, R^2 = .12$), Knowledge of the Infant ($F_{5,84} = 1.73, p = .136, R^2 = .09$) and Caretaking Tasks ($F_{5,84} = 1.34, p = .257, R^2 = .07$).

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.