

The impact of socio-demographic variables, social support, and child sex on mother–infant and father–infant interaction

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Keywords: Mother-infant interaction | Father-infant interaction | Parenthood | Socio-economic status | Social class

Article:

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The Impact of Socio-Demographic Variables, Social Support and Child Sex on Mother-Infant and Father-Infant Interaction

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Abstract

In this study we examine the impact of family socioeconomic status (SES), of social support as perceived by mothers, and of their three-month-olds child's sex, on mother-infant and father-infant interaction. A total of 58 mothers and 52 fathers were observed interacting with their infants. Univariate Analysis of Variance (ANOVA) revealed several significant differences, particularly regarding maternal behaviors. Mothers from the highest SES level both talked to and interpreted their infants' behavior more than did lowest SES mothers. Social support perceived as unsatisfactory was associated with a greater amount of touch and stimulation during mother-infant interaction and also more infant vocalization. Mothers and fathers tended to talk more to their same-sex infants, and fathers tended to kiss and caress their sons more than they did their daughters. These results suggest particularities in the mother-infant and father-infant interaction when the infant was three months old.

Keywords: Mother-infant interaction; Father-infant interaction; Parenthood; Socio-economic status; Social class.

O Impacto de Variáveis Sociodemográficas, do Apoio Social e do Sexo da Criança na Interação Mãe-Bebê e Pai-Bebê

Resumo

O presente estudo buscou investigar o impacto do nível socioeconômico familiar, do apoio social percebido pela mãe e do sexo do bebê de três meses de idade na interação mãe-bebê e pai-bebê. Participaram do estudo 58 mães e 52 pais que foram observados interagindo com seus bebês. *Análises Multifatoriais de Variância* (MANOVA) revelaram algumas diferenças significativas, especialmente quanto aos comportamentos maternos. Em relação ao nível socioeconômico, mães de nível mais alto interpretaram/falaram mais por seus bebês. O apoio social insatisfatório foi associado a maior incidência de toque e estimulação na interação da mãe com o bebê e com mais vocalizações da criança. Mães e pais tenderam a falar mais com os bebês de sexo idêntico ao seu, e os pais tenderam a beijar/acariciar mais os bebês do sexo masculino. Estes resultados sugerem peculiaridades na interação mãe-bebê e pai-bebê aos três meses de idade da criança.

Palavras-chave: Interação mãe-bebê; Interação pai-bebê; Parentalidade; Nível socioeconômico; Classe social.

Mother-infant and father-infant interaction have been investigated by different authors, especially those aspects characterized as "good interaction" (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Kochanska, Aksan, Prisco, & Adams, 2008; Tronick & Cohn, 1989),

as a function of their impact on the child's cognitive, emotional and social development (Ribas, Seidl de Moura, & Ribas, 2003). It is understood that the caretaker needs to have sensitivity so as to be able to respond to the baby's signs with attunement, both in time and space. Their responses should be appropriate to the infant's developmental stage, as well as to his or her signs of excitement (Siefer & Shiller, 1995).

The interaction patterns tend to be jointly constructed, involving both the infant's and the caretaker's cha-

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racteristics (Siefer & Shiller, 1995). For instance, the infant's responsiveness ends up attracting the mother's attention and may lead to an increase in mutual stimulation. In that way, we can understand that the infant actively contributes to the interaction, be it through his or her clear facial expressions, the integration of different kinds of gesture or vocal expression, or through the intensity and rhythm of the signs and of the context in which his or her behavior is expressed.

The literature indicates that there seem to be differences in mother-infant and father-infant interaction (Belsky, 1979; Brazelton & Cramer, 1990/1992; Krob, Piccinini, & Silva, 2009; Parke, 1996). Mothers seem to differ from fathers in terms of activities with the child, because they are especially involved in infant care, and during play they tend to be more verbal and to play with objects, in activities that do not increase the child's agitation rate so much. Fathers tend to spend most of the time playing in a more physical way, with greater stimulation, which provokes more excitement in the infant (Brazelton & Cramer, 1990/1992; Bridges, Connel, & Belsky 1988; Laflamme, Pomerleau, & Malcuit, 2002; Parke, 1996).

An important consequence of those differences is that social interaction with each parent may end up predicting different aspects of the child's development and behavior (Brazelton & Cramer, 1990/1992). Moreover, the differences in mother-infant and father-infant interaction can be important for the infant's healthy development, because the infant learns about behavior differentiation and synchronization with each partner, and the parents learn the same with the infant. It is also necessary to highlight that the fact that the infant responds differently to the mother and to the father may make them feel important and help them re-signify their roles.

A possible explanation for differences in mother-infant and father-infant interaction may be the influence of socio-demographic factors, among which is family socioeconomic status (SES). In Ribas, Seidl de Moura and Bornstein (2003) study, with 64 Brazilian mothers of five-month-old children, the authors showed that knowledge about child development, together with education (considered as one of the main indicators of SES), helped parents to develop more realistic expectations regarding their children, to better interact with their children and to provide them with more favorable environments of development. Roopnarine, Fouts, Lamb and Lewis-Elligan (2005) observed African American families and they indicated that SES differences were evident in the way mothers and fathers behaved with their infants. High SES mothers tended to use more verbal strategies when they calmed their infants, demonstrated more affection, and more often held their infants

on their lap, than did mothers of middle and low SES backgrounds. As for fathers, those from the high SES group were found to be more available to interact with their female infants. Another study (Landry, Smith, Swank, Assel, & Vellet, 2001) involving SES, fathers' interaction with their infants, and children's cognitive and social development, revealed that the highest SES better predicted the children's cognitive and social development.

Similarly, Lordelo, Fonseca and Araújo (2000) investigated mothers' behaviors in response to their one-to-three-years-old children's demands. The families were from two Brazilian groups: those who lived in the slums and those from middle-class neighborhoods. Differences were observed in the maternal styles when dealing with a relatively conflictual situation such as talking to the interviewer while taking care of the child. Middle-class mothers tried to make sure the child was occupied with another activity, while the poor mothers responded less to the child's demands. The results of the study suggest that mothers' behaviors towards the child tend to vary according to SES.

One possible explanation for these differences in behaviors as a function of social class may stem from the fact that middle-class and working-class parents vary in terms of their child-rearing values and their beliefs about how best to develop these values in their children. Specifically, Kohn and his colleagues (Kohn, 1977, 1995; Kohn & Slomczynski, 1990) has shown that in a number of countries, including the United States, Poland, Italy, and Japan, that middle-class parents are more likely to value the child's autonomy whereas working-class parents are more likely to value children adapting themselves to the parents' wishes. Luster, Rhoades, and Haas (1989) found that these different values were reflected in specific beliefs about how to raise children and maternal behaviors towards their one-year-old children in the United States. Tudge and his colleagues (Tudge et al., submitted) found that middle and working-class Brazilian parents of three-month-old children also differed as Kohn had predicted in terms of their child-rearing values.

Another factor that may affect parent-child interaction is perceived social support (Dessen & Braz, 2000; Levandowski & Piccinini, 2002). Social support is essential for coping with the transitions along the individual's and family's developmental pathways. The potential overload provoked by infant care requires family reorganization in order to respond to the demands of this new situation (Dessen & Braz, 2000; Minuchin, 1982). However, having a support network may decrease stress in mothers and fathers, increase knowledge about child development, promote parents' self-esteem and perceived competence, as well as give practical help for infant and home care (Levandowski & Piccinini, 2002),

in addition to financial help, when needed (Dessen & Braz, 2000).

The literature has highlighted the fact that mothers with a more extensive support network are more sensitive in their interaction with their infants than those with a more restricted network, and also tend to provide their infants with a more stimulating environment (Burchinal, Follmer, & Bryant, 1996). In addition, the review carried out by Rapoport (2003) showed that mothers who can count on more people have more opportunities to fulfill their own emotional needs, which can make them focus more on the baby's needs. Feiring, Fox, Jaskir and Lewis (1987) also found that social support in poor families, before and after childbirth, was associated with the mothers' close behavior with their three-month-old high-risk infants. For these authors, the father's support may help the mother perceive his interest in the baby, and the relatives' and friends' support may make her feel secure with the baby and accepted in a network or community.

The infant's sex may also be a variable that affects parent-infant interaction. For instance, in the study carried out by Belsky (1979) with American families, there was a preference for mothers and fathers to interact with and kiss same-sex babies. Male infants also tended to vocalize more to their fathers than to their mothers and they preferred to interact with fathers. Contradicting these results, Tronick and Cohn's (1989) study indicated that there seem to be some differences in the emotional attunement between mothers and their babies of different sexes because they tend to manifest different emotional expressions according to the baby's sex.

Finally, several subjective, social, economic and cultural factors may potentially influence mothers' and fathers' interaction with their infants. In any case, those influences are permeated by the infants' interaction with their mother or father. As a result, the present study aimed to investigate the effect of the family SES, social support as perceived by the mother, and the infant's sex on the mother-infant and father-infant interaction, when the infant was three months old.

Method

Participants

Fifty-eight mothers, mean age 24.60 years old ($SD = 6.80$) and fifty-two fathers, mean age 26.75 years old ($SD = 7.34$) took part in the study. They were all married or lived together and had an only child (55% boys), who was three months old. The parents' age was not shown to be a relevant predicting variable of the differences in mother-infant and father-infant interaction. For that reason, adolescent and adult mothers and fathers were included. Mothers' education varied from some secondary education (17%), complete secondary education

(41%), some college (40%) to college degree (2%). The fathers' education varied from some secondary education (27%), complete secondary education (40%), college degree (29%), to postgraduate education (4%). The SES classification, according to Hollingshead's (1975) criteria, showed a variation from low (62%) to high SES (38%).

The sample was selected from the participants of the Porto Alegre Longitudinal Study – PALS (Piccinini, Tudge, Lopes, & Sperb, 1998). This study started with 81 primiparous, healthy women. The husbands or partners were invited to participate in the study, in cases in which the couple lived together. The participants represented several family configurations (nuclear, single parent, remarried), different ages (adults, adolescents), and diverse socioeconomic levels. The study involved multiple phases of data collection from pregnancy to the child's seventh year and investigated the subjective and behavioral aspects of early mother-father-infant interaction, as well as the impact of early developmental factors on family interactions, on preschool children's social behavior and on the transition to school. The initial invitation to participate in the study occurred when the pregnant women had their prenatal examination in public hospitals in the city of Porto Alegre (51%), in the health units of the same municipal district (7%), through announcement in newspapers (27%) and by referral (15%).

Procedure and Instruments

As part of PALS, in the third quarter of pregnancy the pregnant women filled out the *Initial Contact Form* (Grupo de Interação Social, Desenvolvimento e Psicopatologia [GIDEP/NUDIF], 1998a), requesting some data on the couple. The families who fulfilled the study's criteria (to be expecting the first child, to be in the third quarter of pregnancy and not to have physical problems during pregnancy) were contacted by telephone to arrange for a home visit. During this visit, parents filled out the *Informed Consent* (GIDEP/NUDIF, 1998b) and answered the *Demographic Data Interview* (GIDEP/NUDIF, 1998c), among other instruments about pregnancy. When the children were three months old, the families were contacted again by telephone and a new home visit was made. On this occasion, the mothers answered the *Interview on Motherhood Experience* (GIDEP/NUDIF, 1998d), which evaluates, among other things, the support received during the infant's first three months; the *Family Interaction Observation - 3rd month* (GIDEP/NUDIF, 1999) was also carried out.

Evaluation of Mother's, Father's and Infant's Behaviors. The observation session comprised a sequence of four episodes of free interaction: mother-father-infant, mother-infant, father-infant and, again, mother-father-infant interaction. Each episode of the

sequence lasted eight minutes. Fathers and mothers were asked to freely interact with their babies as they normally did when they were together. The father was requested to leave the room during mother-infant interaction in order to avoid possible interference, and the same procedure was used during the father-infant episode. The observation session was filmed in the residence of the families by researchers who avoided, during the filming situation, any type of verbal or behavioral interaction with the participants. For the present study, just the mother-infant and father-infant free-interaction episodes were used.

The analysis of the mother-infant and father-infant interactive behaviors was carried out based on the literature (Isabella, Belsky, & von Eye, 1989; van den Boom, 1994; Wendland-Carro, Piccinini, & Millar, 1999) and adapted for analysis of the infant's third month (Alvarenga, 2004; Piccinini, Alvarenga, & Frizzo, 2007). Initially, six minutes of mother-infant and father-infant interaction episodes (the three initial minutes and three final minutes) were divided into 12-second intervals. In the first six seconds the infant's behaviors were coded into six different categories: *he/she looks at mother/father* (directs gaze towards mother/father); *he/she looks at objects* (directs gaze towards one or more object in the environment); *he/she smiles* (baby visibly smiled); *he/she vocalizes* (baby babbles or moves his/her mouth, trying to vocalize or imitate mother's vocalization); *he/she cries/moans* (baby is visibly uncomfortable, restless or he/she cries); and *he/she moves* (baby moves his/her body in order to reach a goal, agitates his/her arms and/or legs in response to mother's/father's stimulation or holds a toy/object or parts of his/her own body or of mother's/father's body). The maternal and paternal responses to those behaviors were recorded during the same interval and during the subsequent interval, and coded into one of eight different categories: *he/she interprets/talks for the baby* (mother/father vocalizes, putting herself/himself empathically in the baby's place, interpreting his emotional state); *he/she talks to the baby* (mother/father vocalizes either talking to, singing to him/her or emitting sounds); *he/she looks at the baby* (mother/father directs gaze towards the baby); *he/she smiles at the baby* (mother/father smiles directing gaze towards the baby); *he/she puts him/her on the lap* (mother/father puts baby on the lap or bounces the baby in his/her arms or legs); *he/she caresses/kisses* (mother/father kisses, or gently puts fingers, hand or face on the baby's body or the baby's face, caressing him or her); *he/she accommodates the baby* (mother/father tries to put him or her in a more comfortable position); and *he/she touches/stimulates* (mother/father touches the baby with parts of his or her body to stimulate him/her or makes gestures with

the aid of objects or toys to call his/her attention to something).

Based on these categories, all mothers', fathers' and infants' behaviors were coded into categories that were not mutually exclusive. The selection of the analysis intervals did not take into consideration the fact that occasionally, for technical limitations of the filming situation, it was impossible to observe clearly both members of the dyad.

The video coding was carried out by two independent raters. The reliability between them was established after 20 videos of mother-infant interaction. The Kappa coefficient was calculated separately for each one of the categories. For the maternal behaviors the value of Kappa varied from 0.70 to 0.93 ($M = 0.82$). As far as the categories of infant behaviors is concerned, Kappa varied from 0.71 to 0.91 ($M = 0.81$).

Evaluation of SES. SES was calculated based on Hollingshead (1975), adapted for the PALS by Tudge and Frizzo (2002). This calculation considers four factors, mothers' and fathers' education and occupation, from which are derived the following categories: Level 1: unskilled laborers, menial service workers; level 2: machine operators, semiskilled workers; level 3: skilled craftsmen, clerical, sales workers; level 4: medium business, minor professional, technical; level 5: major business and professional. For the purpose of these analyses the levels were grouped together to form two main categories: Low SES, that combined levels 1, 2 and 3; and high SES, that combined levels 4 and 5. According to Seidl de Moura et al. (2001), Hollingshead measures correlates significantly ($r = 0.74$, $p < .001$) with the Brazilian Scale of Measurement of the Socio-economic-cultural Level (NESC), developed by Monteiro and Eiras (cited in Seidl de Moura et al., 2001), and indicates its validity for cross-cultural studies involving Brazilian participants. Pascual, Galperin and Bornstein (1995) also found a high correlation ($r = 0.88$) between the Hollingshead classification and an Argentinean index of SES.

Evaluation of Perceived Support. The general indicator of support as perceived by mothers was based on maternal reports during the interview that investigated the support received from the husband/partner, and the infant's maternal and paternal grandmother. In cases in which the mother reported that she was supported by one or more of these figures, the general indicator of support was considered as satisfactory and if she reported that she did not feel supported by any of them, the general indicator of support was considered unsatisfactory. The coding for support as perceived by mothers was carried out by four independent raters and reliability was established by consensus. As the perceived support was evaluated only in the interviews with

mothers, that category was not included in the father-infant interaction analyses.

Results

Univariate Analysis of Variance (ANOVA) examined mother-infant and father-infant interaction concerning the predictive variables: family SES, social support as perceived by mothers and the infant's sex.

Table 1 presents maternal behaviors in interaction with the infant. High-SES mothers *interpreted/talked*

for the baby significantly more than did low SES mothers ($p < .01$). On the other hand, low-SES mothers tended to *accommodate* to the baby more often than did those from high-SES backgrounds ($p < .02$). As for the general support as perceived by mothers, those who considered it to be unsatisfactory were more likely to *touch/stimulate* the baby ($p < .02$) than were those who perceived the support as satisfactory. As far as the infant's sex is considered, mothers of girls *interpreted/talked* for more ($p < .008$) and *talked to* more ($p < .03$) than did mothers of boys.

Table 1

Mean Incidence, Standard Deviation, F-value and Significance Level for Total Scores of Maternal Behaviors in Interaction with the Baby (N=58)

Categories	Mean (SD)	Mean (SD)	F ⁽¹⁾	p
SES ⁽²⁾	Low	High		
Interprets/talks for the baby	4.31 (3.75)	7.18 (4.14)	6.78	0.01
Talks to baby	17.19 (8.90)	20.68 (8.52)	1.75	0.19
Looks at baby	26.86 (7.34)	27.59 (4.33)	0.09	0.76
Smiles at the baby	1.44 (2.53)	1.55 (2.34)	0.02	0.97
Puts him/her on the lap and bounces him/her	6.69 (8.39)	6.09 (5.91)	0.09	0.76
Caresses/kisses	5.28 (5.45)	4.41 (3.72)	0.29	0.59
Accommodates	10.19 (5.01)	7.45 (3.39)	5.49	0.02
Touches/stimulates	13.17 (8.67)	12.41 (8.07)	0.29	0.59
Support ⁽³⁾	Unsatisfactory	Satisfactory		
Interprets/talks for the baby	5.14 (4.10)	5.43 (4.15)	0.12	0.73
Talks to baby	17.00 (10.03)	18.73 (8.77)	0.001	0.97
Looks at baby	29.14 (2.27)	26.86 (6.67)	1.11	0.29
Smiles at the baby	1.86 (4.06)	1.43 (2.19)	0.41	0.52
Puts him/her on the lap and bounces him/her	2.57 (3.21)	7.00 (7.77)	1.55	0.22
Caresses/kisses	2.57 (2.70)	5.27 (5.00)	2.23	0.14
Accommodates	9.29 (2.75)	9.14 (4.85)	0.17	0.68
Touches/stimulates	18.86 (8.17)	12.06 (8.15)	5.44	0.02
Baby's sex ⁽⁴⁾	Female	Male		
Interprets/talks for the baby	7.00 (4.46)	4.09 (3.33)	7.53	0.008
Talks to baby	21.46 (8.14)	16.13 (8.80)	4.77	0.03
Looks at baby	27.81 (3.59)	26.59 (7.91)	0.83	0.37
Smiles at the baby	1.81 (2.42)	1.22 (2.47)	1.03	0.31
Puts him/her on the lap and bounces him/her	7.58 (7.68)	5.27 (3.44)	0.53	0.47
Caresses/kisses	4.62 (3.67)	5.22 (5.68)	0.57	0.45
Accommodates	9.69 (5.15)	8.72 (4.19)	1.15	0.29
Touches/stimulates	13.81 (7.93)	12.13 (8.78)	1.77	0.19

Note. $df = 1$; ⁽²⁾ SES: Low: $n=36$; High: $n= 22$; ⁽³⁾ Perceived Support: Unsatisfactory: $n=7$, Satisfactory: $n=51$; ⁽⁴⁾Sex: Female: $n=26$; Male: $n=32$.

Table 2 presents infants' behaviors in the interaction with their mothers. There were no significant differences in the infant's behavior as a function of SES or the baby's

sex. However, mothers who perceived social support as unsatisfactory had babies who vocalized more than did those who perceived it as satisfactory ($p < .04$).

Table 2
Mean Incidence, Standard Deviation, F-value and Significance Level for Total Scores of Baby's Behavior in Interaction with Mother (N=58)

Categories	Mean (SD)		F ⁽¹⁾	p
	Low	High		
SES⁽²⁾				
Looks at mother	8.47 (7.35)	11.77 (7.91)	2.34	0.13
Looks at objects	19.42 (9.26)	18.55 (9.51)	0.16	0.69
Smiles	1.06 (2.56)	0.27 (0.63)	1.83	0.18
Vocalizes	5.33 (6.34)	4.09 (3.56)	1.11	0.29
Cries	3.08 (4.21)	4.64 (3.65)	1.98	0.16
Moves	10.50 (8.08)	9.86 (5.73)	0.19	0.66
Support⁽³⁾				
	Unsatisfactory	Satisfactory		
Looks at mother	11.86 (8.49)	9.43 (7.59)	0.60	0.44
Looks at objects	20.14 (9.46)	18.94 (9.34)	0.19	0.67
Smiles	0.29 (0.49)	0.82 (2.21)	0.32	0.57
Vocalizes	8.29 (6.32)	4.39 (5.22)	4.48	0.04
Cries	1.57 (1.62)	3.96 (4.20)	1.64	0.20
Moves	14.57 (7.07)	9.67 (7.12)	3.21	0.08
Baby's sex⁽⁴⁾				
	Female	Male		
Looks at mother	10.00 (6.89)	9.50 (8.35)	0.09	0.77
Looks at objects	19.62 (8.11)	18.66 (10.25)	0.25	0.62
Smiles	0.77 (2.23)	0.75 (1.98)	0.00	0.99
Vocalizes	5.50 (6.10)	4.34 (4.90)	1.86	0.18
Cries	4.50 (4.38)	3.00 (3.68)	0.98	0.33
Moves	10.42 (7.22)	10.13 (7.36)	0.35	0.55

Note. ⁽¹⁾ $d.f= 1$; ⁽²⁾ SES: Low: $n=36$; High: $n= 22$; ⁽³⁾ Perceived support: Unsatisfactory: $n=7$, Satisfactory: $n=51$; ⁽⁴⁾ Sex: Female: $n=26$; Male: $n=32$.

Table 3
Mean Incidence, Standard Deviation, F-value and Significance Level for Total Scores of Paternal Behaviors in Interaction with the Baby (N=52)

Categories	Mean (SD)		F ⁽¹⁾	p
	Low	High		
SES⁽²⁾				
Interprets/talks for baby	2.16 (2.24)	2.19 (2.14)	0.05	0.82
Talks to baby	18.48 (9.51)	17.81 (11.36)	0.01	0.91
Looks at baby	26.97 (7.73)	28.95 (2.91)	1.20	0.28
Smiles at baby	0.81 (2.30)	1.29 (2.01)	0.71	0.40
Puts him/her on the lap and bounces him/her	6.65 (9.84)	7.24 (9.86)	0.09	0.77
Caresses/kisses	3.32 (3.13)	5.05 (4.25)	3.65	0.06
Accommodates	8.58 (4.79)	7.19 (3.64)	1.33	0.25
Touches/stimulates	15.29 (10.27)	17.62 (10.51)	0.66	0.42
Baby's sex⁽³⁾				
	Female	Male		
Interprets/talks for baby	1.45 (1.41)	2.70 (2.49)	4.41	0.04
Talks to baby	15.91 (10.29)	19.90 (9.96)	1.90	0.17
Looks at baby	28.00 (5.38)	27.60 (6.95)	0.02	0.90
Smiles at baby	0.73 (1.35)	1.20 (2.63)	0.70	0.40
Puts him/her on the lap and bounces him/her	5.45 (8.15)	7.93 (10.80)	0.84	0.36
Caresses/kisses	2.95 (2.85)	4.80 (4.06)	4.13	0.05
Accommodates	8.27 (4.67)	7.83 (4.23)	0.21	0.65
Touches/stimulates	15.77 (10.45)	16.57 (10.41)	0.12	0.73

Note. ⁽¹⁾ $d.f= 1$; ⁽²⁾ SES Low: $n=31$; High: $n= 21$; ⁽³⁾ Sex: Female: $n=22$; Male: $n=30$.

Tables 3 and 4 present paternal behaviors during interaction with the baby. There were no significant differences in fathers' behaviors by SES. However, fathers of boys were significantly more likely to *interpret/talk*

for ($p < .04$) and *caress/kiss* ($p < .05$) than were fathers of girls. Table 4 presents the infants' behaviors in interaction with the father. Neither SES nor the infants' sex significantly differentiated the infants' behavior.

Table 4

Mean Incidence, Standard Deviation, F-value and Significance Level for Total Scores of Infant's Behavior in Interaction with Father (N=52)

Categories	Mean (SD)	Mean (SD)	F ⁽¹⁾	p
SES ⁽²⁾	Low	High		
Looks at father	7.97 (8.14)	7.90 (7.41)	0.002	0.96
Looks at objects	21.39 (9.54)	22.10 (10.23)	0.08	0.78
Smiles	0.48 (1.39)	0.38 (0.92)	0.10	0.75
Vocalizes	5.42 (5.10)	4.48 (4.78)	0.29	0.59
Cries	4.06 (4.90)	2.05 (3.84)	2.16	0.15
Moves	13.29 (9.64)	14.24 (9.15)	0.10	0.75
Baby's sex ⁽³⁾	Female	Male		
Looks at father	6.86 (7.45)	8.73 (0.05)	0.72	0.40
Looks at objects	21.27 (10.85)	21.97 (9.00)	0.07	0.79
Smiles	0.50 (1.53)	0.40 (0.93)	0.10	0.75
Vocalizes	3.73 (4.61)	6.00 (5.04)	2.55	0.12
Cries	2.18 (3.77)	4.03 (5.00)	1.79	0.19
Moves	14.18 (9.87)	13.30 (9.13)	0.09	0.77

Note. ⁽¹⁾ $d.f= 1$; ⁽²⁾SES: Low: $n=31$; High: $n= 21$; ⁽³⁾Sex: Female: $n=22$; Male: $n=30$.

In order to compare the infant's behaviors in mother–infant and father–infant interaction, paired t -tests were used. Table 5 presents the mothers' and fathers' behaviors in interaction with their baby. Mothers were significantly more likely to *interpret/talk* for the infant ($p < .001$) than were fathers, who

were significantly more likely than mothers to *touch/stimulate* ($p < .05$) their baby. Table 6 presents the infants' behaviors with their mothers and fathers. The only significant difference was that infants moved more in interaction with their fathers than they did with their mothers ($p < .008$).

Table 5

Mean, Standard Deviation and Significance Level of Maternal and Paternal Behaviors in Mother-infant and Father-infant Interaction (N=52)

Maternal and Paternal Behaviors	Mother-infant Interaction Mean (SD)	Father-infant Interaction Mean (SD)	p
Interprets/talks for baby	5.42 (3.88)	2.17 (2.18)	0.001
Talks to baby	18.52 (8.84)	18.21 (10.19)	0.87
Looks at baby	26.94 (6.60)	27.77 (6.28)	0.37
Smiles at baby	1.38 (2.39)	1.00 (2.18)	0.39
Puts him/her on the lap/bounces	6.21 (7.38)	6.88 (9.76)	0.66
Caresses/kisses	5.08 (4.93)	4.02 (3.69)	0.23
Accommodates	8.92 (4.57)	8.02 (4.38)	0.27
Touches/stimulates	12.71 (8.37)	16.23 (10.33)	0.05
Total	85.19 (20.71)	84.31 (24.96)	0.48

Table 6

Mean, Standard Deviation and Significance Level of Infant's Behaviors in Mother-infant and Father-infant Interaction (N=52)

Infant's Behaviors	Mother-infant Interaction	Father-infant Interaction	<i>p</i>
	Mean (SD)	Mean (SD)	
Looks at mother	9.50 (7.46)	7.94 (7.78)	0.28
Looks at objects	19.19 (8.92)	21.67 (9.73)	0.17
Smiles	0.81 (2.19)	0.44 (1.21)	0.32
Vocalizes	4.63 (5.01)	5.04 (4.95)	0.60
Cries	3.67 (4.16)	3.25 (4.58)	0.64
Moves	10.10 (6.76)	13.67 (9.36)	0.008
Total	47.90 (16.56)	52.01 (18.68)	0.15

Discussion

This study aimed to investigate the effect of family SES, of social support as perceived by mothers and of the infant's sex on mother-infant and father-infant interaction with three-month-old children. In terms of social class, there was a significant difference in the mothers' interaction with the infant, revealing that high-SES mothers tended to interpret and talk more for their infants, which corroborates the literature (Roopnarine et al., 2005) that indicate more verbal strategies among mothers of high SES. Lordelo et al. (2000) also found that compared to low-SES mothers, middle-SES mothers tend to communicate in a more verbal way with their children.

As for the social support as perceived by mothers, the literature indicates that this is important for the adaptation of maternal behaviors to the children (Dessen & Braz, 2000), because mothers who feel more supported tend to be closer to their children, and provide a more stimulating environment than mothers who feel less supported (Burchinal et al., 1996). In the present study, we observed that infants whose mothers felt less supported vocalized more, which may indicate that these children needed to make their mothers interact with them. This finding can be related to what Stern (1997) called a "reanimating baby". Stern has noted that pattern during interactions between depressed mothers and their babies, when children repeatedly assumed the task of starting the interaction with their mother. It is possible that this same behavior happens when babies notice their mothers' limited availability, rather than depression, which was not the focus of investigation of the present study.

The results of this study also indicated that the mothers who felt less supported were more likely to touch and stimulate their infants. The fact that these mothers were on their own to care for their children

may have led them to feel more responsible for providing greater stimulation, as there were no other available people to do that. The literature indicates that fathers, considered as one of the main support sources for mothers (Dessen & Braz, 2000; Stern, 1997), are more likely to take on the role of stimulating interaction with the infants, spending most of their available time playing with them. In that sense, it is possible that mothers, when perceiving their social support as unsatisfactory, began to take on the stimulation function in interaction with their child.

As far as the baby's sex is concerned, there were significant differences in the extent to which mother both interpreted or talked for the baby and talked to the baby, doing so more during interaction with girls than with boys. By contrast, fathers were significantly more likely both to interpret or talk for the baby and to caress or kiss when interacting with boys, which suggests that these fathers were more attentive and involved with boys, and were more affectionate towards them. These results support Laflamme et al.'s (2002) study regarding the greater involvement and dedication of fathers during interactions with boys. Corroborating these data, Belsky (1979) also indicated that mothers and fathers both tended spend more time interacting with and kissing their same-sex infants.

It is important to affirm that the baby's sex was the only factor that distinguished fathers' interaction with the baby. It is plausible to think that fathers' involvement tends to intensify with the infant's growth and development, and that older children tend to request more moments of interaction. A possible explanation for this is that the mother, independent of her SES, tends to interact more with the baby than the father does during the first year, especially in daily care, which may have contributed to the larger number of significant differences regarding mothers' interaction with the child (Roopnarine et al., 2005).

These differences in mother-infant and father-infant interactions are also corroborated by the literature (Brazelton & Cramer, 1990/1992; Bridges et al., 1988; Laflamme et al., 2002; Parke, 1996), which emphasizes that fathers tend to engage in more stimulating play than do mothers, which could explain the infants' greater excitement when they interact with the father. Moreover, those studies indicated that mothers tend to be more verbal than fathers, which was also found in the present study, with the greater incidence of the category interprets or talks for in the mother's interaction with their baby.

It is important to highlight that the present study consisted of a series of observations that focused on mother-infant and father-infant interactions at home; i.e. the focus was not on what fathers and mothers know, but on what they did when asked to interact with their children (Levandowski & Piccinini, 2002; Ribas et al., 2003). However, naturalistic observation seems to be the most appropriate method to evaluate interaction situations between parents and children (Kerig, 2001). In addition, the present study aimed to evaluate the behaviors of the child's two main interactive partners, the mother and the father, and not only the mother's behavior, as commonly seen in parent-interaction literature (P. Minuchin, 1985). The inclusion of the father in the studies enables not only a better understanding of family processes but also the investigation of the effect of the father's presence on child development (Kerig, 2001). Moreover, according to Brazelton and Cramer (1990), when infants interact with different people, in this case the father and the mother, their development is stimulated in different ways.

We suggest that other studies continue this type of investigation, considering other socio-demographic variables such as culture, marital status, and also evaluating the interrelations of parents' and child's behaviors, using the concepts of synchrony and/or responsiveness. In addition, it is important that longitudinal studies be carried out to evaluate if these interaction patterns maintain themselves throughout child development. This is so because maybe the behavioral repertory of three-month-olds is still very restricted, which may have led to few significant results.

References

- Alvarenga, P. (2004). *Problemas de externalização e competência social na infância: O impacto do temperamento infantil, da responsividade e das práticas educativas maternas* [Externalization problems and social competence in childhood: The impact of the child's temperament, maternal responsiveness and educational practices]. Unpublished doctoral thesis, PostGraduate Course in Developmental Psychology, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS.
- Belsky, J. (1979). Mother-father-infant interaction: A naturalistic observational study. *Developmental Psychology*, 15(6), 601-607.
- Brazelton, T. B., & Cramer, B. G. (1990). A formação do apego no pai [Attachment development in fathers] (M. B. Cipolla, Trad.). In T. B. Brazelton & B. G. Cramer (Eds.), *As primeiras relações* (pp. 39-50). São Paulo, SP: Martins Fontes.
- Bridges, L. J., Connel, J. P., & Belsky, J. (1988). Similarities and differences in infant-mother and infant-father interaction in the strange situation: A component process analysis. *Developmental Psychology*, 24(1), 92-100.
- Burchinal, M. R., Follmer, A., & Bryant, D. M. (1996). The relations of maternal social support and family structure with maternal responsiveness and child outcomes among African American families. *Developmental Psychology*, 32(6), 1073-1083.
- Collins, W. A., Maccoby, E. E., Steinberg, L., Hetherington, E. M., & Bornstein, M. H. (2000). Contemporary research on parenting: The case for nature and nurture. *American Psychologist*, 55, 218-232.
- Dessen, M. A., & Braz, M. P. (2000). Rede social de apoio durante transições familiares decorrentes do nascimento de filhos [Social support during family transitions after the birth of a child]. *Psicologia: Teoria e Pesquisa*, 16, 221-231.
- Feiring, C., Fox, N., Jaskir, J., & Lewis, M. (1987). The relation between social support, infant risk status and mother-infant interaction. *Developmental Psychology*, 23(3), 400-405.
- Grupo de Interação Social, Desenvolvimento e Psicopatologia. (1998a). *Ficha de Contato Inicial* [Initial Contact Form]. Unpublished manuscript, Instituto de Psicologia, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS
- Grupo de Interação Social, Desenvolvimento e Psicopatologia. (1998b). *Termo de Consentimento Livre e Esclarecido* [Informed Consent]. Unpublished manuscript, Instituto de Psicologia, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS.
- Grupo de Interação Social, Desenvolvimento e Psicopatologia. (1998c). *Entrevista de Dados Demográficos* [Demographic Data Interview]. Unpublished manuscript, Instituto de Psicologia, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS.
- Grupo de Interação Social, Desenvolvimento e Psicopatologia. (1998d). *Entrevista sobre a Experiência da Maternidade* [Interview on Motherhood Experience]. Unpublished manuscript, Instituto de Psicologia, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS.
- Grupo de Interação Social, Desenvolvimento e Psicopatologia. (1999). *Observação da Interação Familiar – 3º mês* [Family Interaction Observation]. Unpublished manuscript, Instituto de Psicologia, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS.
- Hollingshead, A. B. (1975). *Four factor index of social status*. Unpublished manuscript, Department of Sociology, Yale University, New Haven, CT.
- Isabella, R. A., Belsky, J., & Von Eye, A. (1989). Origins of infant-mother attachment: An examination of interactional synchrony during the infant's first year. *Developmental Psychology*, 25(1), 12-21.
- Kerig, P. K. (2001). Introduction and overview: Conceptual issues in family observational research. In P. K. Kerig & K. M. Lindhal (Eds.), *Family observational coding systems* (pp. 1-22). Mahwah, NJ: Lawrence Erlbaum.
- Krob, A. D., Piccinini, C. A., & Silva, M. R. (2009). Transition to fatherhood: from pregnancy to the second month of life of the baby. *Psicologia USP*, 20(2), 269-291.
- Kochanska, G., Aksan, N., Prisco, T. R., & Adams, E. E. (2008). Mother-child and father-child mutually responsive orientation in the first 2 years and children's outcomes at preschool age: Mechanisms of influence. *Child Development*, 79, 30-44.
- Kohn, M. L. (1977). *Class and conformity: A study in values* (2nd ed.). Chicago: University of Chicago Press.

- Kohn, M. L. (1995). Social Structure and personality through time and space. In P. Moen, G. H. Elder, Jr., & K. Lüscher (Eds.), *Examining lives in context: Perspectives on the ecology of human development* (pp. 141-168). Washington, DC: American Psychological Association.
- Kohn, M. L., & Slomczynski, K. M. (1990). *Social structure and self-direction: A comparative analysis of the United States and Poland*. Oxford, England: Basil Blackwell.
- Laflamme, D., Pomerleau, A., & Malcuit, G. (2002). A comparison of fathers' and mothers' involvement in childcare and stimulation behaviours during free-play with their infants at 9 and 15 months. *Sex Roles, 47*(11/12), 507-518.
- Landry, S. H., Smith, K. E., Swank, P. R., Assel, M. A., & Vellet, S. (2001). Does early responsive parenting have a special importance for children's development or is consistency across early childhood necessary? *Developmental Psychology, 37*(3), 387-403.
- Levandowski, D. C., & Piccinini, C. A. (2002). A interação pai-bebê entre pais adolescentes e adultos [Father-infant interaction in adolescent and adult fathers]. *Psicologia: Reflexão e Crítica, 15*, 413-424.
- Lordelo, E. R., Fonseca, A. L., & Araújo, M. L. V. B. (2000). Responsividade do ambiente de desenvolvimento: Crenças e práticas como sistema cultural de criação de filhos [Developmental environment's responsiveness: Beliefs and practices as child-rearing cultural system]. *Psicologia: Reflexão e Crítica, 13*(1), 73-80.
- Luster, T., Rhoades, K., & Haas, B. (1989). The relation between parental values and parenting behavior: A test of the Kohn hypothesis. *Journal of Marriage and Family, 51*(1), 139-147.
- Minuchin, P. (1985). Families and individual development: Provocations from the field of family therapy. *Child Development, 56*, 289-302.
- Minuchin, S. (1982). *Famílias: Funcionamento e tratamento* [Families and family therapy] (J. A. Cunha, Trad.). Porto Alegre, RS: Artes Médicas.
- Parke, R. D. (1996). *Fatherhood: Myths and realities*. Cambridge, MA: Harvard University Press.
- Pascual, L., Galperin, C. Z., & Bornstein, M. H. (1995). La medición del nivel socioeconómico y la psicología evolutiva. *Revista Interamericana de Psicología, 27*, 59-74.
- Piccinini, C. A., Alvarenga, P., & Frizzo, G. B. (2007). *Protocolo de observação da interação diádica* [Dyadic interaction observation protocol]. Unpublished manuscript, Instituto de Psicologia, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS.
- Piccinini, C. A., Tudge, J. R. H., Lopes, R. C., & Sperb, T. (1998). *Projeto longitudinal de Porto Alegre: Da gestação à escola* [Longitudinal project of Porto Alegre: From pregnancy to school]. Unpublished manuscript, Curso de Pós-Graduação em Psicologia do Desenvolvimento, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS.
- Rapoport, A. (2003). *Da gestação ao primeiro ano de vida do bebê: Apoio social e ingresso na creche* [From pregnancy to the infant's first year: Social support and school entry]. Unpublished doctoral thesis, Instituto de Psicologia, Programa de Pós-Graduação em Psicologia do Desenvolvimento, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS.
- Ribas, R. C., Jr., Seidl de Moura, M. L., & Bornstein, M. (2003). Socio-economic status in Brazilian psychological research: II socioeconomic status and parenting knowledge. *Estudos de Psicologia, 8*, 385-392.
- Ribas, A. F. P., Seidl de Moura, M. L., & Ribas, R. C., Jr. (2003). Responsividade materna: Levantamento bibliográfico e discussão conceitual [Maternal responsiveness: A literature review and conceptual discussion]. *Psicologia: Reflexão e Crítica, 16*, 137-145.
- Roopnarine, J. L., Fouts, H. N., Lamb, M. E., & Lewis-Elligan, T. Y. (2005). Mothers' and fathers' behaviors toward their 3-4-month-old infants in lower, middle and upper socioeconomic African American families. *Developmental Psychology, 41*, 723-732.
- Seidl de Moura, M. L., Silva, S., Salomão, N., Vieira, M. L., Santos, C., Piccinini, C., et al. (2001). *Idéias maternas sobre o desenvolvimento infantil: Um estudo transcultural em diferentes centros urbanos brasileiros* [Maternal ideas on child development: A crosscultural study in different Brazilian urban centres]. Unpublished manuscript, Instituto de Psicologia, Universidade Federal do Rio de Janeiro, RJ.
- Siefer, R., & Schiller, M. (1995). The role of parenting sensitivity, infant temperament, and dyadic interaction in attachment theory and assessment. In E. Water, B. E. Vaughn, G. Posada, & K. Kondo-Ikemur (Eds.), *Caregiving cultural and cognitive perspectives on secure-base behavior and working models: New growing points on attachment theory and research. Monographs of the Society for Research in Child Development, 60*(2/3), 146-176.
- Stern, D. (1997). *A constelação da maternidade: O panorama da psicoterapia pais/bebê* [The motherhood constellation: A unified view of parent-infant psychotherapy] (M. A. V. Veronese, Trad.). Porto Alegre, RS: Artes Médicas.
- Tronick, E. Z., & Cohn, J. F. (1989). Infant-mother face-to-face age and gender differences in coordination and the occurrence of miscoordination. *Child Development, 60*, 85-92.
- Tudge, J. R., & Frizzo, G. F. (2002). *Classificação baseada em Hollingshead do nível sócio-econômico das famílias do estudo longitudinal de Porto Alegre: Da gestação à escola* [Classification of socioeconomic status of the families from the longitudinal study of Porto Alegre, based on Hollingshead]. Unpublished manuscript.
- Tudge, J. R. H., Lopes, R. S., Piccinini, C. A., Sperb, T. M., Chipenda-Dansokho, S., Marin, A. H., et al. (submitted). Parents' child-rearing values in southern Brazil: Mutual influences of social class and children's development. Manuscript under review.
- van den Boom, D. C. (1994). The influence of temperament and mothering on attachment and exploration: An experimental manipulation of sensitive responsiveness among lower-class mothers with irritable infants. *Child Development, 65*, 1449-1469.
- Wendland-Carro, J., Piccinini, C. A., & Millar, W. S. (1999). The role of an early intervention on enhancing the quality of mother-infant interaction. *Child Development, 70*, 713-721.

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