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Early mother-child interactions in low-income, single-mother families attending Chilean day nurseries, and cultural differences between German and Chilean dyads

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To my parents, with whom I learned the vicissitudes of being a daughter.

To Pablo and my sons, with whom I have had the experience of being a mother and raising a family.

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Contents

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Abstract

Each day there are more children being born and raised in low-income, single-parent homes, a condition being associated to a greater bonding vulnerability between mothers and young children, and to a negative effect on children's mental health. This background information promoted a series of transversal and comparative studies on low-income, mother-child dyads. The global investigation includes two previous studies and two main studies, the first ones evaluating maternal stress and interaction quality, in single-parent and nuclear families. The results show a greater stress level and lower interactional quality in single-parent families.

The two main studies evaluated mother-child dyads of single-parent families. The first one considered Chilean families with children attending and not attending public day nurseries, and the second one, Chilean and German families. Both of them evaluated infant psychomotor development, stress levels, maternal depressive symptomatology and mother-child interaction quality with the CARE-Index instrument. In the intercultural study were also evaluated interdependence and independence in the construction of self, ideology of sexual roles and tightness or looseness of social and family norms.

The results of the first study show a positive effect by attending public day nurseries on infant psychomotor development, but a negative effect on mother-infant bonding quality. The negative effect on bonding quality increases when attendance to a day nursery starts before the child is 6 months old, just like the positive effect diminishes on infant psychomotor development, with the early start. The results of the second study show interactions of higher quality in Chilean dyads, and greater psychomotor development in German children, and higher scores on interdependence and tightness of family norms in Chilean mothers.

There is an opportunity for reflection on the support strategies for early infancy in Chile, on vulnerable families, and the parenting models considering cultural contexts to interpret the results.

Introduction

Even though nuclear constitution is the most frequent family form to this day, more and more children are born and grow up in single-parent families. Latin America and Europe show today an increase of this type of homes, as well as a concentration of higher poverty levels, (Arriagada, 2004; Cerrutti & Binstock, 2009; Federal Statistical Office, Microcensus, Germany, 2009).

This background has a great impact on infant mental health and early infant development. Studies show that the context in which the mothers and their children develop, influence the bonding quality, the baby's evolution and the general state of the mother. (Belsky, 1984; Bowlby, 1969; Coppola, Vaughn, Cassiba & Constantini, 2006; Pelchat, Bisson, Bois & Saucier, 2003; Stern, 1997).

In relation to the mother, single parenting within poverty context has been associated to high levels of stress (Cooper, McLanahan, Meadows & Brooks-Gunn, 2009), as well as to a higher depressive symptomatology (Lara-Cinisomo, Griffin & Daugherty, 2009). As to the children, this family condition has been associated to a delay in their psychomotor development, an increase in psychopathology and a lower interaction quality with the mother (Abidin, Jenkins & McGaughey, 1992; Figueredo, Costa, Pacheco & Pais, 2009; Kazdin, Mazurick & Bass, 1993; Moran, Pederson, Pettit & Krupka, 1992; Murray, Sinclair, Cooper, Ducournau & Turner, 1999; Rodríguez, 2006).

On the other hand, considering the immaturity of the newly born and the relevant neurological development they experiment during their first three years of age (Greenspan & Benderly, 1998), the postnatal environment and the interpersonal experience with their main caregivers in this stage will play an essential role in their development (Bedregal & Pardo, 2004). Thus a birth within a single-parent family of low income will represent a vulnerability condition for the dyad that will mainly affect the child.

One of the most relevant aspects to be taken in consideration during early childhood, especially in the case of vulnerable population, is the bonding between the child and his/her

primary caregiver. On this respect, it is worth noting the statements of John Bowlby (1969, 1973, 1980), who developed the Attachment Theory as a way to comprehend bonding's origin and evolution. The author emphasizes that the child will achieve a secure attachment pattern from the availability and adequate response of the caregiver to his/her signals and needs, enabling the child to develop a secure attachment pattern which will tend to remain throughout the years. Infancy secure attachment patterns have been associated to a healthy development, a higher stress-facing capacity and educational success (Fonagy, 1999), as well as social skills achievements and a higher repertoire of empathetic responses (Waters, Wippman & Sroufe, 1979; Sroufe, Egeland & Kreutzer, 1990).

The attachment patterns tend to repeat themselves from parents to children (Benoit & Parker, 1994) and it is generally stated that these patterns require an external factor as to be modified, like psychotherapy (Hesse, 1999). With this background, and considering the higher frequency of insecure attachment in mothers within populations at risk, like low-income, single-parent families, (Huth-Bocks, Levendosky, Bogat & Von Eye, 2004), the modification of maternal attachment patterns through psychotherapy –in order to avoid transmitting them to their children-, turns out to be slow and expensive.

Considering Ainsworth studies (1979), which associate an adequate maternal sensitivity with a secure attachment pattern in the child, many of the evaluations and bonding interventions within dyads with difficulties consider this variable in the mother (Zeifman, 2003). Studying the quality of mother-infant interactions in vulnerable populations through maternal sensitivity evaluation, enables obtaining relevant diagnostic information and orientation for subsequent interventions in a variable associated to infant attachment pattern, but with higher modification chances at a shorter term and lower cost.

The sensitive response is defined by Crittenden (2006), as a dyadic construct or behavior pattern of the adult that calms the infant and increases the infant's comfort, reducing his/her anguish and lack of interest. The sensitive response to the child implies the ability of the mother or significant caregiver to adequately recognize and interpret the child's signals, and then, to quickly and adequately act when facing these interpretations. (Marrone, 2001).

The studies on maternal sensitive response in single-parental contexts and low income associate this family condition to low sensitivity (Casady, Diener, Isabella & Wright, 2001; Pelchat et al., 2003; Keempinen, Kumpulainen, Moilanen, Ebeling, 2006), being necessary for these families to count with support programs in order to reduce the negative impact of these variables on the infant's development.

In 2006 in Chile, a program called "Sistema de Protección Integral de la Infancia, Chile Crece Contigo" (Integral Childhood Protection System, Chile Grows with You") was created in order to favor the attention of children belonging to the 40% poorest population in the country, providing free day nurseries for babies since they are 84 days old. This new system increased the coverage of day nurseries, as well as an admittance priority for the children of working mothers and those under vulnerability conditions, facilitating the vacancies to children from single-parent homes (Rojas, 2010). The day nursery supply in Chile constitutes the main intervention for supporting vulnerable families with small children.

Despite the intention of supporting small children in vulnerable contexts through a higher coverage of day nurseries, the existing studies on the effects of this attendance over the mother-infant bond show controversial findings. Some of these studies reflect a negative effect of the attendance when the children stay at the day nursery more than 20 hours a week (Schwartz, 1983; Belsky & Rovine, 1988; Sagi et al., 2002), and when the entry occurs before the child turns one year old (Vaughn, Gove & Egeland, 1980). Other studies report a positive effect in the case of high quality day nurseries, mitigating the negative effect of poverty over the infant (Andersson, 1989; Howes, 1990; Love et al., 2003).

Even though the early attendance to day care centers seeks to level the field of opportunities for children from vulnerable families, studies that review the consequences over the mother-child bonding quality and infant development in Chilean, single-parent families, are required.

Just as the type of family the dyad belongs to and the socioeconomic context where it stands are relevant aspects in order to understand the bonding styles between mothers and children, the culture where they are immersed is also defined as an influential variable, differences being present in the interaction aspects that parents privilege in the upbringing according to the group they belong (Matsumoto & Juang, 2008).

With respect to the cultural differences, Markus & Kitayama (1991), and later, Singelis (1994), developed a conceptual framework related to the construction of self and its relation with others within a particular cultural context. These authors hold that collectivist cultures would mainly have an interdependent self-construal, and individualistic cultures an independent one (Matsumoto & Juang, 2008). The independent self is characterized by its perception of being separate from its social surrounding, giving high importance to the fact of being unique and different, and organizing its behavior around its own thoughts and feelings. People who present an interdependent self-construal perceive themselves as interconnected with their social surrounding, emphasizing the relevance of public characteristics and are concerned about the effect of their behavior on others. This comprehensive culture model has also been used in the parental study, defining typical characteristics of independent and interdependent cultures (Keller, 2007).

Regarding the Chilean and German parental styles, recent studies on middle-class German mothers residing in urban areas show a predominance of independent parenting (Keller, 2007; Keller & Lamm, 2005). In Chile we do not count with studies that evaluate parenting, independence and interdependence altogether, but we are aware that in Hofstede's (1980) research, Chile was initially characterized as a collectivist culture, associated to a mainly interdependent construction of self.

As from the aforementioned background information, a few preliminary studies were carried out, as well as two main studies on low-income, single-parent families. The preliminary tests generated empirical Chilean background information about the reviewed subjects, and its results are reported in the first four developed articles. On the other hand, the main studies

sought to find the answers to specific research questions, and the results are reported in the sixth and eighth articles developed. The seventh one considered the application of the Battery of Multidimensional Cultural Questionnaires to a Chilean population sample, which was used in the Chilean-German study.

Main study Nr. 1 evaluated to what extent infant attendance to day nurseries in Chile contributes to improve the quality of mother-infant interactions and psychomotor development, as well as how it mitigates maternal depressive symptomatology and stress. The study considered 40 dyads with children attending public day nurseries and 40 dyads with children without attending, all of them residing in peripheral areas in Santiago, Chile.

Main study Nr. 2 compared Chilean and German dyads on the same variables, including cultural dimensions that would contribute to the comprehension of the differences found. 41 German dyads were evaluated, all residing in the surrounding areas of Heidelberg, Germany, and 40 Chilean dyads, residing in peripheral areas of Santiago, Chile.

Next are presented the general background contextualizing the various studies, then the eight articles developed, and finally, the conclusions with the aim to integrate and reflect on the findings.

Background

Early interactions and mother-child bonding quality

The birth of a human being happens before he has reached neurological maturity, so, a great part of the child's brain development takes place during the first years of his life (Greenspan & Benderly, 1998). Because of this, the postnatal environment and the initial interpersonal experiences between a child and his main caregivers will influence the structural and functional evolution of his brain, as well as his general development and subsequent mental health (Schore, 2000; Storfer, 1999). Concordantly with these findings, infancy investigations have considered the first three years in the life of a child as a period with special relevance (Bedregal & Pardo, 2004), this information being a motivation for various studies on early bonding between parents and their children, which in turn, have generated changes in the way we understand them.

After microanalytical studies on mother-child interactions were done, theories on child development have been changing, from the idea of a unilateral determination of the mother towards the child, to a new direction, the conception of mutual influence (Stern, 1985, Hedenbro, 2002). This has generated that subsequent investigations on early interactions consider the caregiver-child dyad as a study unit. Following this line, nowadays there is consensus that the mutual process of verbal and non-verbal exchange in the dyad contributes to the development of reciprocity and the exchange of information and feelings between them (Tronick & Cohn, 1989; Weinberg & Tronick, 1994; Trevarthen & Aitken, 2001). Therefore, the interactive capacity of the caregiver is associated with the child's affective expression and response type, especially during the first years of his life (Kivijarvi, Voeten, Niemela, Raiha, Lertola, Piha, 2001).

In the understanding of early bonding, the theoretical statement of John Bowlby (1969, 1983, 1985) stands out, with the development of the Attachment Theory, as a way of explaining its origin and evolution. He stated that human beings have an innate behavioral

attachment system, which is activated when we experience anxiety, fear or stress, which moves us to look for care and physical proximity with our primary caregivers. The purpose of this system would be to guarantee the survival of the species.

Later on, Mary Ainsworth, a disciple of Bowlby, developed with some collaborators a proceeding called the “strange situation” for the evaluation of children’s attachment quality. This work identified three characteristic styles and showed that one-year-old children generated consistent behavior patterns, which allowed them to regulate their parents’ behavior, looking to maintain their availability. The children whose mothers consistently responded to the attachment conducts were identified with a secure attachment pattern or type B. The children with mothers who consistently rejected the attachment conducts were identified with an avoidant insecure attachment pattern or type A. And the children whose mothers inconsistently responded to the attachment conducts were identified with an ambivalent insecure attachment pattern or type C. (Ainsworth, Blehar, Waters & Wall, 1978).

From the studies of at-risk populations and the observation of strategies of adaptation that children develop to face danger, Main, Kaplan & Cassidy, incorporated in 1985 a fourth bonding pattern called disorganized. In this same context, Crittenden (1985), a disciple of Ainsworth, expands the ABC attachment patterns adding the mixed A/C pattern, generally associated to abuse or negligence.

Bowlby (1983), stated that from the degree of availability and the response capacity of the primary caregiver, children develop differential patterns of interaction with the other significant persons, shaping characteristic styles of attachment which remain in time. The child learns through the bond with his caregiver to regulate his emotional states and build internal operative models of himself, of others and his relations, defining particular bonding modalities which tend to remain stable throughout life.

Based on these assumptions, several authors state that attachment security developed between the child and his progenitors would be a protecting factor during child

development, just like attachment insecurity would be a risk factor (Greenberg, 1999). Safe attachment patterns allow the prediction of a child with a healthy development, positive self-esteem, integrated identity, school success and a greater capacity to face stressful situations (Fonagy, 1999). It is also seen in children with safe attachment, a greater emotional resistance, higher self-confidence, adequate social development, a greater empathic repertoire and abilities to establish deeper interpersonal relationships (Waters, Wippman & Sroufe, 1979; Sroufe, Egeland & Kreutzer, 1990), becoming safe attachment a protecting element on children's development and a promoter of their mental health.

The importance of predicting danger in early bonding and P. Crittenden's Dynamic-Maturational Model

Most of the attachment theorists emphasize the importance of security when understanding and evaluating the bonding quality between a child and his parents. On a different line, P. Crittenden, basing her statement on studies of populations at risk, says that the fundamental aspect for the understanding of bonding and functioning of a child's mind, is on predicting danger. For the author, the relevant information to predict danger and develop protecting strategies, is the basis of attachment quality. In this process, the developing child's mind, can generate various types of "distortions" while processing information, for the purpose of keeping the attachment relationship. These distortions become the means to develop and maintain the psychopathology (Crittenden, 2002).

Based on these ideas, Crittenden developed the Dynamic-Maturational Model in order to understand the functioning of the various attachment patterns, explaining them in two dimensions, the source of information (cognitive versus affective) and its level of integration (integrated versus unintegrated).

In terms of the source of information, cognitive refers to the processing of stimuli following their order in time, providing background as to "when" danger can be expected.

Affective information refers to vague feelings of uneasiness or well-being, which imply high or low activation. It relates with the intensity and the novelty of the stimulation in specific contexts, and it provides information about “where” danger can be expected.

The author proposes that each type of stimulation occurs in different neurological structures, which can have different degrees of integration and are associated to different types of memories.

In a healthy development (secure attachment or type B), it is expected that the affective, as well as the cognitive information, would be integrated and available to organize the behavior, which allows mental representations of a greater richness and closeness to reality. In the case of the avoidant attachment patterns or type A, affective information is excluded, with the tendency to distort it, so, behavior is organized from cognitions.

In the ambivalent anxious attachment pattern or type C, cognitive information is excluded and distorted, organizing behavior from the affective information. It is assumed that each of these strategies to face danger has advantages and disadvantages, and that they have risen as part of an adaptation to a particular context (Crittenden, 2002).

In the development of her theories, the author integrates concepts from various theories, such as the evolutionary, on learning, Piaget, Vygostky and the attachment theory. She gathers the principles of Bowlby (1969), on the innate ways of behavior of the species, which imply reflexes and the ability to learn associations and feelings. She considers that children show an unlearned propensity to establish temporary mental associations, which imply lived real contingencies, while the feelings of anxiety and well-being in this process comply with the behavior modifying function to reduce the probability of risk. So, the reflex models, the learning models and the affect are present since birth.

These various types of functioning provide the basis to face the evolutionary task of establishing patterns of communication with the caregivers, from where will come significant information about the future conditions of the interaction (Stern, 1985; Tronick & Cohn, 1989).

Crittenden considers, too, the concept of zone of proximal development, created by Vygotsky (1979), in order to understand how mothers support the child's organization by providing a "scaffolding" for his learnings. From this perspective, as the proximal zone advances, the attachment figures must adjust their functioning to respond to the new needs of the child. This way, the adult's adequate interaction proposal includes the consideration of the stage of development where the child is, and the adult generates contexts for the development of abilities to take place, without inhibiting or hurrying the achievements.

In terms of the child-caregiver exchange, when the caregiver responds in a comfortable manner to the reflexive, conditioned and affective behavior of the child, the child is reinforced and learns about the communicative meaning of his behavior, and how predictable is the caregiver's behavior.

When the adult responds with rejection to the child's signals, the effect is punishment to his behavior, so, the child will learn to inhibit it. Children who present avoidant patterns when they are one year old, frequently experienced maternal rejection to their affective signals, which are wishes for intimacy (Ainsworth, 1979). When children protest to this unpleasant result, generally receive an expression of uneasiness and anger from the mother. The child, then, inhibits his affective signals, as a way of reducing the mother's rejection and anger, while at the same time, learning that expressing affection is counterproductive. If, as well, the affective behavior of the caregiver is not genuine, the task of learning the meaning of affects becomes much more difficult. It is frequently seen that rejecting caregivers display fake affection (Crittenden, 2002; Main & Cassidy, 1988). When children offer some affective signals, these caregivers participate from a false positive affect, as if they wanted closeness with the child, but when children corresponds them, they receive rejection. This type of exchange teaches the child to inhibit the expression of anger and the need for closeness, and it complicates the understanding of the meaning of affective signals. Children who use avoidance to reduce rejection from their mothers, learn that direct rejection often generates, as well, hostility on the part of the adult, so, they learn to stay in visual contact with the caregiver, but avoiding physical and affective contact.

Avoidant children with rejecting and withdrawn mothers, learn to falsify affects, replacing their real emotions by positive affects, as a way of generating psychological closeness with the caregiver. This dynamic has been called role reversal, since the child is the one making an effort to improve the quality of the interaction, and not the adult (Bowlby, 1983). This form of interaction in the child Crittenden has called *compulsive caregiver*, and behaviorally it is expressed through crooked smiles, changes in the expression in front of another observer who might show an opposite affect (Ekman, 1992). Positive affect is very brief or out of context, and when the adult responds positively, the child shows himself inhibited, avoiding intimacy. Children who show a *compulsive caregiver* attitude are positively reinforced in their captivating behavior by the adult, and the child's spontaneous behavior not directed at the adult is negatively reinforced with the psychological retreat of the caregiver. The purpose of this pattern is to get the attention of an unavailable caregiver, and it is typically associated, even though not in an exclusive manner, to cases of abandonment and parental depression (Crittenden, 2006).

Another form of relating between avoidant children and their caregiver, can be seen in the cases of hostile, intrusive and demanding mothers, who generate the child's inhibition of wishes and a submissive behavior when they are asked to do something. Frequently, even though not in an exclusive manner, this pattern has been associated to cases of child abuse (Crittenden & DiLalla, 1988). Considering that the surrounding is dangerous, these *compulsive pleasing* children watch the behavior of the caregiver to anticipate his wishes, in order to avoid hostile behavior. Frequently, this pattern is followed by excessive accomplishment, especially when the mother looks for obedience and intellectual success. The behavior of *compulsive pleasing* children also has fear and caution, and they tend to accept the responsibility of the parental behavior, so, when their parents get angry or show rejection, they have the tendency to feel shame (Crittenden, 2002).

In the case of anxious insecure attachment, the caregiver is clear in his affective communication, but he reacts in an inconsistent manner to the child's signals, so, the child

can't predict the behavior, neither organize himself from these predictions, generating anxiety and anger.

At the end of the first year of life, children are able to show their anger and to know who is causing it, and when they are two years old, they can have enchanting and disarming behavior of the adult's aggression, to obtain care and protection. To explain this type of interaction, the author considers the theoretical work of Eibl-Eibesfeldt (1979), about what mammals do when facing conflict. Eibl-Eibesfeldt states that during a fight, when it is clear that an animal is losing, it ends the fight before being destroyed. The way this is carried-out includes acknowledgement of the dominance of the winning animal, showing submission (exposing the belly and the neck), while, at the same time he is looking for his care (friendly looks, hiding his teeth). In the case of inconsistent caregivers, they reinforce the disarming strategies of the child, generating that the child learns to alternate between selectively showing his anger, on the one hand, and his fear and wishes of being cared, on the other. With this, the child has learned to show enchanting behavior to cover his anger and feelings of vulnerability, and to alternate the expression of those feelings.

Even though the majority of investigations on attachment state the continuation of the patterns from infancy throughout life (Benoit & Parker, 1994; Fraley, 2002), Crittenden states that maturation can change the quality of the attachment, since neurological and cognitive changes experienced as part of development, modify mental functioning. The new mental abilities create conditions that facilitate the reorganization of representational models, which can be used to predict future conditions with greater precision. For the author, the mind looks for regularities and discrepancies between what is expected and what happens, increasing in the child the perception of discrepancies in his caregivers, while he is growing-up. This, generates that the less integrated models of their mothers as "good" or "bad", become richer, from the possibility of perceiving and interpreting conducts in a tighter manner. This information must be integrated to the previous representational models, which allows a greater complexity and differentiation in the case of secure bonding.

Children with anxious and avoidant attachment must resolve the discrepancies between the model and reality, having less experience on integration processes than secure children. For the author, each discrepancy coming from maturation, allows an opportunity for self-correction of the imprecise models and for the generation of interpersonal strategies of greater effectiveness. During the periods when maturation happens faster, the possibility to start integrating activity presents itself, triggered by a high level of discrepancies. The moment when a child is starting to become conscious of information not previously considered, the author thinks it is an evolutionary achievement she calls reorganization of the attachment pattern.

Maternal sensitive response

In terms of attachment pattern modification in adults, some investigations show the need for an external agent, such as psychotherapy, for this to take place (Hesse, 1999). On the other hand, investigations related to the transmission of attachment patterns from mothers to their children, show a repetitive tendency (Benoit & Parker, 1994). With this background, and considering the greater proportion of insecure attachments in mothers of populations at risk, like single-parent, low-income families (Huth-Bocks, Levendosky, Bogat & Von Eye, 2004), the labor to modify the mothers' attachment pattern through psychotherapy, so the transmission to the children can be avoided, is slow and expensive.

Considering the studies by Aisworth (1979), associating an adequate maternal sensitivity with a secure attachment pattern in the child, many of the bonding interventions in dyads with difficulties are focused on improving this capacity in the mother (Zeifman, 2003). The meta-analyses done by Bakermans-Kranenburg, van Ijzendoorn & Buffer (2003), show, as well, that the most successful interventions in promoting a maternal sensitive response, are those focused and with a low number of sessions, becoming an effective and brief intervention option.

The study of the quality of mother-infant interactions in vulnerable populations, through the evaluation of maternal sensitivity, offers valuable diagnostic information and orientation for the design of subsequent interventions, in a variable associated to the child's attachment pattern, but with greater possibilities of modification in a short period of time and at a low cost.

The maternal sensitive response has been considered a central concept at the time of evaluating the dyad's early interactions, significantly influencing the subsequent baby's development (Stern, 1997; George & Salomon, 1999). Crittenden (2006) defines it as a dyadic construct related to any conduct pattern done by the adult which calms the child and increases his comfort, reducing his anguish and lack of interest. How able the mother and caregivers are in responding in a sensitive manner to a child, will imply acknowledging his signals, adequately interpreting them, and acting in a fast and appropriate way to these readings (Marrone, 2001).

From the perspective of the baby, caregiver sensitivity is perceived as a special connection between them, which enables the baby to feel that he is attractive and valuable to others (Bringen & Robinson, 1991). For this same reason, in later development, it plays an important role in the feeling of integration of self, self-valuation and the ability to offer loving, cooperative and reciprocal responses. (Marrone, 2001).

Furthermore, caregiver sensitivity gives the baby the confidence to communicate and transmit his needs, (Stern 1985). Uneasiness and even crying can vary in frequency and duration depending on the caregiver's response (Bell & Ainsworth, 1972).

Some studies show fluctuations on the maternal sensitive response as the years go by (Belsky & Fearon, 2002). Others (Kivijarvi Voeten, Niemela, Raiha, Lertola & Piha, 2001), mention a moderate stability during the first year of the baby, and some, a slight stability (Beckwith, Cohen & Hamilton, 1999). Trying to solve these differences, Kemppinen, Kumpulainen, Raita-Hasu, Moilanen y Ebeling (2006), studied the evolution of maternal sensitivity during the first years of the baby, finding that the maternal low sensitivity observed early on, remains stable until the child is two years old. Considering this information, the transversal study on maternal sensitivity of at risk populations, with children of 4 to 15

months old, provides relevant information related to the dyad's bonding quality during the first two years of the child's age.

Considering the importance of the caregiver's sensitive response on the child, studies show that an adult's adequate sensitivity during the first year is considered a significant predictor of subsequent secure attachment patterns, and a favorable emotional, social and cognitive development (Ward & Carlson, 1995; Coppola, Vaughn, Cassibba, Constantini, 2006; Friedman & Boyle, 2008; Smith & Pederson, 1988; Isabella, 1993; Van Ijzendoorn & Wolf, 1997; Landry et al., 2000; Kivijarvi, Raiha, Virtanen, Lertola, Piha, 2004; Landry et al., 2000). Complementing these findings, a low sensitive response on the part of the caregiver has been associated to a low cognitive development and a low symbolic ability on the part of the baby (Feldman, Eidelman, & Rotenberg, 2004).

Studies with Chilean samples found that the mothers' low educational level, frequently observed in low-socioeconomic level families, negatively affects the sensitive response with their children (Valenzuela, 1997; Guillén, 2007). Similar results appear in international studies, which consider the mothers' educational level as a good predictor of their ability to sensitively respond to their children's signals (Pelchat et al., 2003; Coppola et al., 2006).

Early interactions and infant's gender

The infant's gender has been a relevant variable in the study of mother-child interactions. Some investigations show that healthy male, newborn infants have more intense responses to stress than female infants, read from an increase in cortisol levels (Davis & Emory, 1995). Following this line, other investigations show that boys are more irritable and difficult than girls (Osofsky & O'Connell, 1977).

How each gender expresses aggression has also been reviewed, and the findings report that male children get more easily excitable, have more difficulties regulating emotions, and reach higher levels when expressing aggression (Knight, Guthrie, Page &

Fabes, 2002). Agreeing with these findings, some studies express that boys have a higher number of conduct problems than girls (Bettencourt & Miller, 1996; Lahey et al., 2000), and that boys take more risks than girls. (Byrnes, Miller & Schafer, 1999).

The relation between infant gender and maternal depression has also been studied, and the study done by Tychey et al. (2006), shows a higher presence of postnatal depression in mothers with male newborns.

Studies show that differences on infant gender also act as a relevant factor when evaluating early mother-child interactions, affecting the quality of the bond they establish (McBride, Schoppe, & Rane, 2002)**.** Following this line, investigations considering parental sensitivity, bonding quality and infant gender in dyads with one-year-old children, state that mothers show greater sensitivity for their daughters than their sons (Schoppe-Sullivan, Diener, Mangelsdorf, Brown, McHale, & Frosh, 2006). Feldman (2003), explains these differences by mentioning that the mothers would be more sensitive with their daughters than their sons since they share innate mechanisms of emotional regulation, which favors a greater quality interaction among each other.

Present studies on 6 year old children (Tamis-LeMonda, Briggs & McClowry, 2009), show greater maternal sensitivity with daughters than sons among the US Afro-American population, the boys being less communicative with the mother, showing less involvement in the chores she proposes and a lower capacity of response. Complementarily, the mothers appear to be more controlling in the interaction with their sons, which makes it possible to understand the mother-child interaction in a dyadic dimension where they affect each other.

Considering the relevance of infant gender in the quality of the mother-child interactions, this variable is studied in dyads of low-income, single-parent, Chilean families, and the results are reported in the article:

Early Interactions and child gender in Chilean, single-mother families.

Single parenting, poverty and early bonding

Even though most of the investigations on early childhood have focused on the mother-baby bonding, a growing number of studies explore the father's importance. Investigations show that childhood attachment bonds develop towards both parents, and that fathers, as well as mothers, are capable of providing sensitive care to their children (Keller, 2007; Lamb, 1977; Lamb, 1982). In terms of the benefits gained by the father's presence, some studies show that an adequate father-child bonding is associated with the absence of behavioral problems in children (Verschueren & Marcoen, 1999), high sociability, and an adequate infant cognitive development (Fagan & Iglesias, 1999).

On the other hand, the birth and upbringing of a small child generates demands on the family, and some studies show that for a couple to express affection for each other and having some complicity, these are protecting factors for the parental experience (Shapiro, Gottman & Carrere, 2000). This way, sharing the activities involved in the process and coordinating the maternal and paternal roles contribute in obtaining an adequate upbringing (Brazelton & Cramer, 1993; Fivaz-Depeursinge & Corboz-Warnery, 1999).

While observing the child play with both parents, it is possible to capture his ability to establish triadic interactions, and when the child is 12 weeks old his capacity to share feelings of pleasure, interest or uneasiness with both parents, alternating his gaze and affection signals with his father and mother (Fivaz-Depeursinge, Favez, Lavanchy, de Noni & Frascarolo, 2005). The authors define the triangular interactions in which the baby participates (the three together, or two interacting and the third one present), as part of the baby's normative development. They highlight that when the child faces stress due to the experiences with one of his parents, the other parent being present can recognize the uneasiness and act in a protecting or corrective manner, contributing to improve the quality of the interaction (Fivaz-Depeursinge & Favez, 2006).

In spite of the previous information, there is an increasing number of children who are born and raised in single-parent homes, having Latin America and Europe a growing number of these type of homes with a woman in charge, which have the highest indexes of poverty (Arriagada, 2004; Cerrutti & Binstock, 2009; Federal Statistical Office, Microcensus, Germany, 2009). In Chile, a 7,3% of the homes total are single-parent with the mother in charge, and a 9% of them belong to the poorest ones in the country. This group, as well, has a greater number of preschool children than the homes with the same family constitution, but with a greater income (Arriagada & Aranda, 2004).

Several studies have shown how the context where the mother and her children live influences the quality of their interactions, showing how family income, educational level, family constitution, and the presence or absence of a support social network can have a positive or negative impact on the bonding quality, the baby's evolution and the general state of the mother (Belsky, 1984; Bowlby, 1969; Coppola, Vaughn, Cassiba & Constantini, 2006; Pelchat, Bisson, Bois & Saucier, 2003; Stern, 1997).

Multiple studies mention family constitution as a relevant variable on child development, showing a positive relation between the support given by the father to the mother, something common in nuclear families, and the sensitive response ability to the children's signals (Hyunjeong, Young-Joo, Mi Ja, 2006; Valenzuela, 1997). Some studies on single-parent families show an association between this family constitution and difficulties to sensitively respond the signals and needs of their young children (Casady, Diener, Isabella & Wright, 2001).

In relation to the mother-baby bonding quality, studies done by Huth-Bocks, Levendosky, Bogat & Von Eye (2004), associate single parenting when the mother is in charge of the home with the development of insecure attachment on the part of the children. These findings are not conclusive, since studies done in Chile show secure attachment patterns on mothers and children belonging to single-parent families (Guillén, 2007). These differences could be explained by the mother's social and affective networks, being frequent

in Chile for mothers with children without the father's support to include themselves in the extended family, as a way of sharing costs, obtaining affective support and improving the quality of life (Cerrutti & Binstock, 2009).

In terms of other effects of single parenting on child development, some studies associate this family constitution on poverty conditions with parental low involvement on their children's pre-school activities (Arnold, Zeljo & Doctoroff, 2008). This has negative repercussions on the children's psychosocial performance (Filgueira & Peri, 2004). This association is observed in Chilean studies, showing a relation between poverty and slow psychomotor development on pre-school children (Schonaut, Rojas & Kaempffer, 2005; Proposals of the Presidential Advisory Council, Chile, 2006). Even if the studies connect single-parenting, having the mother in charge, with difficulties on school performance of these families' children (Luisi & Santelices, 2000), the individual characteristics and bonding quality with their primary caregivers could also revert this situation or reduce the impact (Arancibia, 1996; Grant et al., 2003).

Other investigations show significant relations between low-income families and low sensitive response of mothers with their children (Pelchat et al., 2003; Keempinen, Kumpulainen, Moilanen, Ebeling, 2006), poverty negatively influencing the quality of the dyadic interactions and mother-child bond.

Studies on Chilean samples found that the mother's low educational level, frequently observed in low socioeconomic level families, negatively affects the sensitive response towards the child (Valenzuela, 1997; Guillén, 2007), just like other international studies consider the mother's educational level as a good predictor of the maternal ability to sensitively respond to the child's signals (Pelchat et al., 2003; Coppola et al., 2006).

From the background described, it was considered relevant to evaluate if inside low-income families existed differences in the quality of mother-child interactions associated to

family constitution. To answer this question, a comparative study was done on the bonding quality between nuclear and single-parent families, and the results are presented in the following article:

Father's presence and the quality of mother-child interaction: a comparative study on Chilean, nuclear and single-mother families.

Single-parenting, maternal stress and their consequences

The high level of stress observed in mothers of low-income, single-parent families (Cooper, McLanahan, Meadows & Brooks-Gunn, 2009; Landero & González, 2006), hinders an adequate exercise of the parental role and obtaining a satisfying quality of life, and as studies show, a greater symptomatology of maternal depression and a lower educational level of this group (Bastos, Casaca, Nunes & Pereirinha, 2009; Lara-Cinisomo, Griffin & Daugherty, 2009). When we consider the effects of the variables described on the mothers and their young children, some studies show a negative effect on the psychomotor and emotional development, an increase in children's psychopathology and a deficit on the bonding quality with the mother (Abidin, Jenkins & McGaughey, 1992; Figueredo, Costa, Pacheco & Pais, 2009; Kazdin, Mazurick & Bass, 1993; Moran, Pederson, Pettit & Krupka, 1992; Murray, Sinclair, Cooper, Ducournau & Turner, 1999; Rodríguez, 2006; Stern, 1997).

It has been stated that stress in the parental system during the first three years of the child's life is especially critical to his emotional and behavioral development, as well as for the development of the relationship with his parents (Abidin, 1995; Sheeber & Johnson, 1992).

Studies report that high levels of parental stress are associated to dysfunctional parental conducts, negative interactions between parents and children and psychopathology, as well as deviations on the child's development (Abidin et al., 1992; Kazdin, Mazurick & Bass, 1993; Moran, Pederson, Pettit & Krupka, 1992).

Also, investigators who have studied mothers, have found that high stressors associated to the child are related to the perception of a diminishing social support, as well as depression, anxiety and hostility symptoms. On the other hand, mothers whose sense of competence and attachment to her children has been hurt, experience greater psychological stress (Kazdin, 1990; Quittner, Jackson & Glueckauf, 1990).

Low-income families have less financial resources to take care of their children's needs than parents from higher income levels, which makes it difficult for them to have access to adequate social and material resources. Some of the identified repercussions are poor nutrition, less access to health-care, a low-quality housing and neighborhood, and a lack of materials and cognitively stimulating experiences, necessary for school achievement (Lipman & Boyle, 2008). The socioeconomic position does not predict mental health, but, belonging to a low-income family implies, with greater chances, an unfavorable family environment, adverse parental conduct and life stressors with family mental health repercussions (Grant et al., 2006).

The mother's financial difficulties, also limit her probabilities of giving an adequate nutrition and health-care to her children, affecting her emotional state and perception of self-effectiveness in relation to her maternal competence (Khawaja, Barazi & Linos, 2007).

A study done in Chile by Farkas and Valdés (2010), with 121 low-income mothers in high psychosocial risk, whose children were between 4 and 9 months old, showed that family characteristics, especially the number of people living at home, per capita income and the mother's age, were more relevant to explain maternal stress than the child's characteristics.

Due to the importance of stress in the mother-child relationship, and its high presence in low-income families, it was considered relevant to evaluate if family constitution, nuclear and single-parent, explain in some degree the levels of maternal stress. In order to answer this question a comparative study was done of this variable in Chilean, single-parent and nuclear, low-income families. The results are reported in the following study:

Maternal stress and family constitution: Comparative study on Chilean, single-parent and nuclear, low-income families.

Attendance to day nursery and mother-child bonding

Modernity and the incorporation of women to the work force, favor the use of alternative care for infants, making attendance to public day nurseries in Chile a recurring solution, especially in low-income, single-parent families, with working mothers and young children (Arriagada, 2004; Cerrutti & Binstock, 2009). In Chile, from the recent coverage increase of children younger than 3 years old in day nurseries and child-care centers, this tendency has been encouraged.

The debate around the different types of alternative care received by children during their first year of development, and the effects on the mother-child bond has a long history, with important discrepancies. With this background as a starting point, a theoretical review is done, of the main investigations related to alternative care and infant attachment patterns developed between children and their parents. The results of this review are reported in this article:

Early assistance to day nurseries and patterns of child attachment: A review.

Various studies on the effect of alternative care and its association with the type of mother-child bonding, have been focused on different aspects. Some, on the number of daily hours and place where the care occurs; others, on the quality of the care received and the starting age of the children, and the most recent ones, consider multiple variables to explain the effect on the mother-child bond.

In relation to the number of weekly hours the child stays at a care center, some studies show the extended week (more than 20 weekly hours) having a negative effect on the mother-child bond (Schwartz, 1983; Belsky & Rovine, 1988; Sagi et al., 2002). Other

studies show that more than the number of weekly hours at the day nursery, the mother's sensitive response, her general well-being and the family variables are the ones that predict the quality of the mother-child bond, lowering the importance of the time spent at the day nursery (Belsky & Braungart, 1991; Barglow, Vaughn & Molitor, 1987).

In terms of the starting age, studies done by Vaughn, Gove & Egeland (1980), show a negative effect on the mother-child bond when the child starts attending before becoming one year-old. The children who start before that age exhibit a higher proportion of ambivalent, anxious and insecure attachment. The authors explain these results by the low availability the child has of his mother, which would generate insecurity and anxiety.

In general terms, the existing studies consider an early starting age at a day nursery when it happens before the child becomes one year old, and not a lower range. When a lower range is considered in Chilean samples, a debate could arise about extending the postnatal working time off for Chilean mothers, which now dictates that she must return to work 84 days after the baby is born, and with that, in many cases, her children begin attending a day nursery (Infancy Policies, Chile, 2006).

Another relevant aspect when evaluating the effect of alternative care on children is the quality of the attention they receive, considering the number of children per adult caregiver, the training and preparation the professionals have, the infrastructure of the place where they work, as well as the mental health and work stability of the caregivers. On this, there are studies showing positive effects on the attendance to high quality day nurseries during the child's first year of age in low-income families, mitigating the negative effect of poverty on the child (Andersson, 1989; Howes, 1990; Love, Harrison, Sagi-Schwartz, van Ijzendoorn & Ungerer, 2003).

The study done by the National Institute of Child, Health and Human Development (NICHD), in the United States (Friedman y Boyle, 2008), shows significant correlations between the socioeconomic level, the mother's educational level, the presence of maternal

depression, separation anxiety with the mother, and the presence of both parents at home, with the attachment style developed by the children, and it states that the mother's sensitivity is the best predictor of secure attachment at the age of 15 months. In terms of alternative care, they state that the starting age, stability, the type and the quality of the care don't have an effect on the attachment pattern developed by the child towards the mother.

Taking into consideration that the characteristics of the care provided at day nurseries varies from one country to another, it was relevant to evaluate in Chile the bonding quality between the educational staff and the children attending day nurseries, and to compare it with the bonding quality they establish with their parents. A group of children who regularly attended public day nurseries was studied. The results of this investigation are reported in the following article:

Comparative study of early interactions in mother-child dyads and care centre staff-child within the context of Chilean crèches.

Day care centers and public policy in Chile

The year 1990 the Chilean state ratified the "Convention on the Rights of the Child", promising to generate the conditions, so all Chilean children would have equal rights and opportunities. This strengthens the creation of new public policies, to guarantee the access to support services for children's development, complementing the resources contributed by the family group (Gobierno de Chile, Política Nacional a favor de la Infancia y adolescencia 2001-2010).

The importance of early childhood is highlighted (Bedregal & Pardo, 2004), and environmental stimulation in the expression of the child's potential receives the appropriate recognition, considering that the lack of support during this stage, not only generates the loss of opportunities, but also risks the children being harmed. This promoted the review of service programs directed at children between the ages of 0 and 3 years old, with special

emphasis on the programs targeting low-income families, who attend day nurseries and child-care centers in lower numbers than their peers of higher-income groups (Fundación para la Superación de la Pobreza, 2010), and have an insufficient coverage of preschool services (Instituto Nacional de Estadísticas, INE, Chile 2008).

The previous statements take into consideration that Chilean context studies show an association between poverty and low achievement at school (Ministerio de Educación, Chile, 2004) on the one hand, and on the other, that the economic stratification where a child is born constitutes a good predictor of the place he will have in the socioeconomic stratification when he becomes an adult (Núñez & Risco, 2004) and (Torche & Wormald, 2004). This way, Chile has looked to develop mechanisms to diminish the differences and increase opportunities since birth.

These new policies consider, as well, that Chile follows the world tendencies related to the diminishing number of members in a family, the increasing number of single-parent families and homes with a woman in charge (Arriagada, 2004), which means that many mothers have the dilemma between taking care of their children at home or send them to a day-care center, so they can work, and improve the family quality of life (Instituto Nacional de Estadísticas, Servicio Nacional de la Mujer, Chile, 2004; Fundación para la Superación de la Pobreza, 2011).

Preschool education in Chile is not compulsory, so, each family group decides what type of care will give to their children who are younger than 3 years old (Gobierno de Chile, 2006). An important part of the services are offered by state institutions, or with state financing, looking to offer daytime services, especially to the children of the most vulnerable segments of the population.

Looking for “equity from the beginning”, the Chilean State developed a *National Policy* and an *Integrated Action Plan for Infancy and Adolescence 2001-2010* (García, 2001). This policy looked to be an orienting referent for government actions, and it states as a basic principle to consider children and adolescents as the social capital of the country. Social

investment, therefore, looks to create opportunities for the best development and integration of children in a future society.

At present, according to the Chilean Labor Code, maternity protection policies allow women with a labor contract, a leave of absence with subsidy starting 6 weeks before the date of birth until 12 weeks after the child is born, as well as having maternal legal protection that prevents their employer from dismissing them from the job for up to 15 months after her postnatal period is over. They also have permission to leave work to feed the baby after the end of the postnatal period, until the child is 2 years old, as well as permission for sick leave when the child is ill and up to one year old. Companies or institutions who have more than 19 women in fertile years must have a day nursery in their premises, or pay for the service until the children are 2 years old (Proposals of the Presidential Advisory Board on Infancy, Chile, 2006).

In the year 2006 the “Child Integral Protection System” called “Chile Grows-up with You” was created in Chile, with the purpose of giving special attention to the service given to the 40% of the poorest children in the country, offering free day nurseries since the baby is 84 days old to working mothers, as well as service at child-care centers to children of 2 to 3 years old, at least, for half a day. Such services include meals and specialized care, which have received investment to regulate and certify their quality, especially when it is with children of 0 to 2 years old of vulnerable families (Rojas, 2010). In terms of the coverage, between the years 2003 and 2006, it increased from 19.8% to 26.5%, and from this percentage, 49.2% received service from state financed programs (Raczynski, 2005). During 2008 and 2009, service at day nurseries and child-care centers was increased 240%, and it was projected to have full coverage of service demand during the year 2010 (Vegas, Cerdán-Infantes, Dunkelberg y Molina, 2006).

Public day nurseries in Chile are open to the public from Monday through Friday, 8 hours a day, with the possibility of extending the schedule to 12 hours a day. Each group inside a day nursery has a maximum of 20 children with three adults in charge, a preschool teacher and two technical assistant preschool teachers. Also, they have a nutritionist and

support personnel. In the day nurseries there is a regular checking of children's general health condition and psychomotor development, with the promotion of networking with institutions of physical and mental health, city governments and social support, among others.

In terms of the quality of these centers, there are no studies done on them, yet, even though they are more regulated in the public than in the private system.

Considering the increase of day-nursery coverage as part of public policy supporting early infancy, and the studies on alternative care showing how this type of care reduces stress and improves the quality of the mother-child bond (Green, Ferrer & McAllister, 2007), studies were done to evaluate how attendance to day nurseries would affect the relationship of children 4 through 15 months old, from a vulnerable group, such as low-income, single-parent families, with their mothers. Specifically, the effect of early starting age at a day nursery was evaluated, considering the debate in Chile on the extension of the postnatal period for the mother. The results are reported in the article:

Quality of the mother-child interaction, attendance to day nurseries and importance of the starting age: Comparative study on Chilean single-mother families.

Early interactions, culture and parenting

Just like the dyad's type of family and its socioeconomic context are relevant aspects to understand the mother-child bonding, the culture they live in is defined, as well, as an influential variable, where it is possible to observe differences in the interaction aspects that parents favor during child-raising, according to what group they belong (Matsumoto & Juang, 2008).

It is observed during the practice of parenting, the transmission of norms, values and specific practices from parents to their children, contributing these experiences to the preparation of the adaptation process to the economic, physical and social conditions

typical of the culture and the particular environment where the family develops its life (Keller, 2007; Weisner, 2002).

On the other hand, children grow and develop in interpersonal and interactional contexts, building bonds and acquiring parameters that define their relationships, generating the basis for the construction of their self. These bonds emerge from the infant's need for care, on the one hand, and the adults' motivation to protect and stimulate, on the other. This way, the care the adult gives to the child could be understood as practices of a cultural model in a particular environment (Keller, 2007).

In terms of the implications of parental behavior on children's mental health, studies show a relation between the type of experiences from early infancy and children's mental health (Schore, 2000). For example, the frequency that a child is touched will affect his subsequent development (Montagu, 1988), the regularity somebody talks to him will affect how he acquires language (Tamis-LeMonda, Bornstein, Cyphers, Toda & Ogino, 1992), just like the frequency that the caregiver establishes visual contact with him, will contribute to his ability to self-regulate his emotions during infancy (Keller 1992).

In spite of the different parental styles, some authors state the existence of intuitive competencies present during interactions with their children (Papoušek & Papoušek, 1987). These are expressed while interacting with the baby during preverbal stages, and are based on biological predispositions. They are universal, independent of age, gender and culture, and are at the service of the attachment system and adaptation. They transmit protection and acceptance at times of anxiety or stress, promoting, the development of secure attachment patterns. They adjust to the child's age and context, and contribute to the integration of experiences and their symbolic representation through language and the baby's preverbal communication. When intuitive competencies are adequately developed, parents come closer, to 20 cms. of the baby's face, at the center of his visual field, looking at him so they may interact, and contingently the baby expresses himself with mimicry and sounds. Intercultural studies on the contingency of the interactive response, face to face, between parents and their babies, show their activation in a short period of time, leaving no

time for a cognitive or intentional mediation. Because of this, it is possible to consider this type of parental response, as part of intuitive competencies (Keller, Schölmerich & Eibl-Eibesfeldt, 1988).

Parents talk the baby's language (*motherese*), which has a slower rhythm, the use of pauses, a higher and exaggerated voice tone, and the reinforcement of the mimicry and sounds with which the child responds.

When considering the caregiver's sensitivity as a measure of the quality of the interaction between parents and their children, there is a consensus among the attachment theorists to associate high sensitivity and an adequate quality during the first year of life (Ainsworth, Blehar, Waters & Wall, 1978; Coppola, Vaughn, Cassibba, Constantini, 2006; Kivijarvi, Raiha, Virtanen, Lertola, Piha, 2004). Understanding a sensitive response as the fast behavioral response of the caregiver, contingent, adequate, warm and emotionally syntonized with the child's signals. Sensitivity, understood this way, is associated to a parental behavioral style typical of cultures that favor independence in the construction of the self, which is related, causally, to security in the child's attachment pattern (Posada, Jacobs, Richmond, Carbonell, Alzate, Bustamante, 2002; Rothbaum, Pott, Azuma, Miyake & Weisz, 2000). Some studies on parents-children early interactions, in occidental and non-occidental cultures, evaluate the universality of the attachment theory and the relevance of the caregiver's sensitivity in the formation of the child's bonding patterns, confirming these statements (van Ijzendoorn & Sagi, 1999).

Heidi Keller (2007), presents intercultural investigations on parenting, in which maternal sensitivity, warmth and contingency indexes don't show association as it would be expected from the attachment theory, stating that these variables must be evaluated separately. She mentions that the contingent response of the caregiver is part of the intuitive parenting, and that the auditive stimuli have a relevant place in the various interactional styles, but it is differentially expressed depending on specific cultural emphases. With greater frequency around what's tactile in the interdependent cultures, and

around what's visual in the independent cultures (Kärtner, Keller, Lamm, Abels, Yovsi, Chaudhary & Su, 2008).

The author develops, from her investigations on culture and interactions between parents and children, the Component Model of Parenting (Keller, 2000).

Heidi Keller's Component Model of Parenting

The author (2007), states the existence of phylogenetic universal repertoire of parenting systems, which are individually modulated by interactional mechanisms. She defines 6 parental systems, which make it up, and 3 interactional mechanisms, which modulated it:

The first parenting system is the one of *primary cares*, and considers the delivery of food, shelter and adequate hygienic conditions. It varies from one culture to another, especially, in contexts of poverty and high maternal stress, and its psychological function is to reduce uneasiness and generate a positive, initial, behavioral state. From the speed of the adult's response, the child experiences a reduction of pain and stress, feeling secure, protected and trusting, while experiencing the availability of those around him. These experiences create the basis for the building of his self (Bowlby, 1969).

The second parenting system centers on *body contact*, and it includes carrying the children. There are, also, differences among cultures, and some show body contact most of the day, or carrying by several family members other than the mother, or mother-infant contact at night time, by sharing the bed. The psychological function of this system is to generate experiences of emotional warmth, which are associated to feelings of belonging, social cohesion and connecting with others. Permanent body contact, by carrying the child, allows, as well, the mother to continue with other productive activities, important for the family livelihood.

The third system refers to *body stimulation*, which uses contact and movement, that the parents practice on their children to promote motor abilities. Parents from some cultures positively value the child's development, especially in getting to walk, practicing specific

activities with the child, so it will take place. Its psychological function is to intensify the perception of the body, and to offer the child the experience of discovering his abilities by exploring the environment. It contributes, as well, to the emergence of the body self.

The fourth system is about *stimulation with objects*, and looks to connect the child with the physical environment and its various material objects. This system has the psychological function of contributing to the cognitive development, while favoring the achievement of greater independence for the child.

The fifth system relates to *face to face contact*, and it is characterized by the mutual visual contact. This type of interactions is highly exciting, full of affect, brief, with a high amount of social and cognitive information. The child perceives contingencies and learns rules through this type of exchange, contributing to the development of verbal abilities and the capacity for self-regulation.

The sixth system refers to the *narratives*, and it considers that the self is discursively created, so, its attributes can be understood when considered as a part of conversations, instead of mental entities. The way caregivers talk to children reflects their cultural models of the self, and the relation between the self and others. Language is, then, a tool through which the child incorporates the cultural notion of the self, especially, from the mother's narrative styles.

The expression of parental conducts associated to each of the systems, vary according to the interactional mechanisms. These mechanisms modulate and individualize the interaction parental systems with the children and their psychological consequences. Keller (2007), defines three main interactional mechanisms, *attention, warmth* and *contingency.*

In terms of the *attention,* there are differences among the cultures in the predominant attention patterns on child care. In some studies on dyadic interactions in occidental cultures, the attentional focus of the caregiver on the child, especially, on the part of the mother, is assumed as part of adequate parenting (Ainsworth et al., 1978).

Other investigations show an also frequent attentional pattern in caregivers, the *shared attention* (Rogoff, Mistry, Göncü & Mosier, 1993), which refers to the caregiver taking care of the baby, who is near, and performing other daily activities simultaneously. It is considered adequate in contexts where the mother must do important activities to take care of the family group, while at the same time, take care of the child (Keller, Voelker & Yovsi, 2005). This way of attention by the caregiver allows for the child to never be alone, even though it is never the caregiver's center of attention. On the other hand, when the caregiver's attention style is exclusive, the interactional experience contributes to the development of the concept of individually and unique self in the child.

In terms of *warmth* as an interactional mechanism, it is considered as the expressive giving and positive affects exchange between the caregiver and the child. It contributes to the development of empathy, social and emotional competences, as well as social imitation and identification with the parents (MacDonald, 1992).

C*ontingency* is defined as the third interactional mechanism, including the fast parental response to the child's signals, and it has been considered as part of the sensitivity of the caregiver and the intuitive parenting (Ainsworth et al., 1978; Papoušek & Papoušek, 1991). The contingent response generates smiles in the child, and it shows to be innately pleasant. It is associated to personal effectiveness and the possibility to predict others' behavior, determining the conception of self as a causal agent.

In terms of the cultural differences, Markus & Kitayama (1991), and later, Singelis (1994), developed a conceptual structure relative to the building of the self and its relations within a particular cultural context. These authors state that collectivist cultures would have, mostly, an interdependent self-construal, and individualist cultures an independent self-construal (Matsumoto & Juang, 2008). The independent self is characterized by being separate from his social environment, by giving importance to the unique and different self, and by organizing his conducts around his own thoughts and feelings. Those who show an interdependent self-construal see themselves interconnected with their social environment,

emphasizing the relevance of public characteristics, and being concerned with the effect of their conduct on others.

This comprehensive cultural model has also been used in parenting studies, defining characteristics that are typical of independent and interdependent cultures (Keller, 2007). Studies on infancy and parenting that consider these dimensions, show that interdependent cultures have family support networks of a greater size (Keller, Abels, Lamm, Yovsi, Voelker & Lakhani, 2005), a greater participation of brothers in the creation of daily routines (Maynard, 2002), a greater stimulation of the gross motor development on children (Keller, 2003), greater body contact and stimulation (Keller, Yovsi, Borke, Kartner, Jensen & Papaligoura, 2004), and greater frequency of shared beds between mother and young child (Morelli, Rogoff, Oppenheim & Goldsmith, 1992). The last characteristic is associated to a lower use of transitional objects in children, and a greater demand of mother's milk during the night (Mosko, Richard, McKenna, Drummond & Mukai, 1997).

Parents of individualistic cultures, associated to building an independent self, privilege, mostly, that their children pursue autonomy, seeing them with will, wishes and needs of their own (Keller, 2007), they value face to face interactions with the child, objects stimulation (Keller, Borke, Yovsi, Lohaus & Jensen, 2005), and the child's capacity for self-regulation (Keller, Lamm, et al., 2006), as well as cognitive and intellectual development (Keller, Voelker, & Yovsi, 2005). In terms of Chilean and German parenting styles, present studies on middle-class German mothers, residing in urban areas, show a predominantly independent exercise of parenting (Keller, 2007; Keller & Lamm, 2005).

It is also observed that German mothers positively value the child's emotional expression, which becomes an effort to understand what happens to the baby when he cries, before acting to calm him down. This contrasts with what is seen in dyads of collectivist cultures, associated to the interdependent building of the self, where crying is interpreted as a sign of problems and loss of health, which activates fast strategies to calm the child down, especially through breast-feeding (Keller & Otto, 2009).

In Chile we don't have studies jointly evaluating parenting, independence and interdependence, but we know that in investigations done by Hofstede (1980), Chile was initially characterized as a collectivist culture, associated to building a self, mainly, interdependent. Recent Chilean investigations on these dimensions, on general urban population, show high scores on interdependence and independence (Olhaberry et al., *submitted article*), being relevant to investigate how this affects the exercise of parenting, and specifically, on the quality of mother-child interaction on populations of single-parent, low-income families.

From the background given, the purpose was to evaluate and compare the quality of the interactions, the child's psychomotor development, the maternal depressive symptomatology and cultural variables on Chilean and German mother-child dyads, from single-parent, low-income families. It was also the purpose to determine the bonding risk level and the predominant interactions on mothers and children of each group. The results of this study are presented in the article:

Early mother-child interactions, in low-income, single-parent, Chilean and German families.

Before the development of the comparative, Chilean-German, early mother-child interactions study, it was necessary to have an instrument that would allow the evaluation of cultural variables associated to psychological variables. For this purpose, the Multidimensional Questionnaires Battery, developed in Heidelberg, Germany (Freund et al., 2010), was translated and applied on a Chilean population sample. The results of this application and the psychometric properties of the instrument are presented in the article:

Battery of multidimensional cultural questionnaires for research in psychology: Application in a Chilean population sample.

Some considerations on the concept of culture.

Keller (2007), states that for the conceptualization of the term culture, it is necessary to consider that it is a part of a dynamic process, and it is socially interactive between two components, the shared activity that is part of cultural practices and the creation of shared meanings which leads to cultural interpretations. To share activities would be the material side of culture, and sharing meanings, the symbolic side, culture being present within and without the individual.

He considers that the physical environment (climate and geography), generates a base for the development of population parameters such as fertility and mortality. Then, the socioeconomic structure creates a frame for socialization strategies, and it includes ideas and practices that determine family and social structures. These practices, in turn, have specific ideas and conducts related to child raising, which directly influence the child's development.

The cultural model, that includes specific and characteristic ideas, the socialization goals, which communicate emotions, values and motivations through actions, and the parental ethnotheories, which are organized and shared ideas about adequate child care, are part of the socialization strategies. This becomes specific parental conducts, which directly affect the child's development (Keller, 2007).

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Early interactions and child gender in Chilean single-mother families

M. Olhaberry

Abstract

A transversal study of mother-child interactions in Chilean, low-income, single-mother families, was developed considering child gender differences. The participants were 80 dyads, with 39 girls and 41 boys with ages distributed between 4 and 15 months old. The dyadic interaction quality was evaluated with the CARE-Index instrument. High depression and maternal stress scores were found, as well as a quality of interaction mean, which indicates the need for intervention, showing vulnerability in the dyads of the study. Dyads with boys showed significantly more *difficult* behavior with their mothers than girls, who showed significantly more *passive* behavior than boys. The observed effect sizes differences are moderate in both cases. Complementary behaviors in mothers and children are observed, resulting significant correlations between maternal *sensitivity* and infant *cooperativeness*, maternal *control* and *difficult* behaviors of infants, and between *un-responsive* behavior of mothers and *passive* behavior in children.

Keywords: early interactions – infant gender – single-parent families.

Background

Early interactions and infant gender

Studies related to infant gender and its influence on the quality of parent-child interactions, have a long history and multiple controversies, which make it relevant to evaluate if there are differences between boys and girls when bonds are created with their mothers, especially in high-risk groups, such as low-income, single-parent families.

Some studies focus on the biological differences between men and women, finding more intense responses to stress in healthy male newborns, than in female infants, read from an increase in the cortisol levels (Davis & Emory, 1995). Following this line, other investigations show that boys are more irritable and difficult than girls (Osofsky & O'Connell, 1977).

How each gender expresses aggression has also been reviewed, standing-out the meta-analysis done by Knight, Guthrie, Page & Fabes (2002), who examined 30 years of investigations and reported that male infants are more easily excitable, less skilled at regulating their emotions, and showing higher levels of aggression than girls. Agreeing with these findings, some studies express that boys have a higher number of conduct problems than girls (Bettencourt & Miller, 1996; Lahey et al., 2000), and the higher presence of externalizing conducts by boys is understandable if we consider the difficulties they have in regulating emotions, something apparently higher in the male gender. Other studies mention that boys take more risks than girls, but with some variations according to context and age (Byrnes, Miller & Schafer, 1999).

Recent longitudinal studies on externalizing conducts, done on children from 3 months through 15 years old, associate the starting presence of the adversity of the psychosocial context during adolescence in both genders. On girls, low self-control at 2 years old is a good predictor of these conducts, and on boys, it would be at 11 years old (Pitzer, Esser, Schmidt & Laucht, 2009).

The relation between infant gender and maternal depression has also been studied, and the study done by Tychey et al. (2006), shows a higher presence of postnatal depression in mothers with male newborns.

In order to understand the behavioral differences between female and male infants, some authors mention the weight of the inhibiting mechanisms in the process of adaptation for men and women, stating that sexual and reproductive strategies are different for men and women, and this could explain the higher ability to regulate emotions in women than in men (Bjorkland & Kipp, 1996).

Other authors state that the cultural and personal meaning parents give to their child's gender, would also be a relevant factor in understanding the peculiarities of the mother-infant interaction (Boyce & Hickey, 2005).

Other hypotheses mention that the differences of infant gender on parent-child interactions could be explained by the parents' psychological difficulties, where the identification with a child of the same sex could facilitate his care and a quality interaction (Tychey et al., 2006). In the opposite direction, the interactions with children of the opposite gender than the progenitor, would need a greater psychological and emotional effort, due to the stirring of conflicts that the relation could activate, which could show as low parental sensitivity.

Maternal sensitive response and infant gender

Studies show that differences on infant gender also act as a relevant factor when evaluating early mother-child interactions, affecting the quality of the bond they establish (McBride, B.A., Schoppe, S.J. & Rane, T.R., 2002)**.** In relation to the mother-child bonding quality, the sensitive response of the caregiver has been considered a central concept at the time of evaluating early interactions in a dyad, since it influences in a significant manner the

subsequent development of the baby (George & Salomon, 1999; Stern, 1997). It is defined by Crittenden (2006), as the dyadic construct of any conduct pattern displayed by the adult that calms down the infant and increases his comfort, reducing his anguish and lack of interest.

The mother's capacity to respond in a sensitive manner to a child, will imply acknowledging his signals, adequately interpreting them, and acting in a fast and appropriate way in relation to these readings (Marrone, 2001). Following this line, investigations considering parental sensitivity, bonding quality and infant gender in dyads with one-year-old children, state that mothers show greater sensitivity for their daughters than their sons (Schoppe-Sullivan et al., 2006). Feldman (2003), explains these differences by mentioning that the mothers would be more sensitive with their daughters than their sons since they share innate mechanisms of emotional regulation, which favors a greater quality interaction among each other.

Present studies on 6 year old children (Tamis-LeMonda, Briggs, McClowry & Snow, 2009), show greater maternal sensitivity with daughters than sons among the US Afro-American population, the boys being less communicative with the mother, showing less involvement in the chores she proposes and a lower capacity of response. Complementarily, the mothers appear to be more controlling in the interaction with their sons, which makes it possible to understand the mother-child interaction in a dyadic dimension where they affect each other. This study also includes in its analysis the ethnic and cultural variables, where in some groups maternal control could favor the infant adaptation to the context, and not be only understood as a mistake of parental sensitivity.

Single-parenting, early interactions and gender differences

Even though infant gender differences seem to constitute a relevant aspect in the quality of mother-child interactions, the contextual conditions that surround the dyad are also important, as several authors mention its influence on the type of bonding between a mother

and her young child (Belsky, 1984; Bowlby, 1969; Coppola, Vaughn, Cassiba & Constantini, 2006; Pelchat, Bisson, Bois & Saucier, 2003; Stern, 1997). Studies show how family income, the parents educational level, the presence or absence of a support social network and single-parenting can have an impact on bonding quality, the baby's evolution and the general state of the mother.

Multiple studies mention the importance of family constitution on infant development, showing a positive relation between the support given by the father to the mother, something frequent in nuclear families, and the capacity of a sensitive response to the child's signals (Hyunjeong, Young-Joo & Mi Ja, 2006; Valenzuela, 1997). Unlike nuclear families, studies on single-parent families show an association between this family configuration and difficulties in answering the signals and needs of the young children (Casady, Diener, Isabella & Wright, 2001).

On the other hand, the birth of a baby in low-income, single-parent families implies a greater vulnerability for the dyad in relation to child raising chores, due to experiences of greater stress, promoting a greater risk of depressive symptomatology in the mother, lower income, and frequently, a maternal lower educational level (Casaca, Nunes & Pereirinha, 2009; Cooper, McLanahan, Meadows & Brooks-Gunn, 2009; Lara-Cinisomo, Griffin, Daugherty, 2009; Bastos, A., Casaca, S., Nunes, F. & Pereirinha, J., 2009). Some studies state the negative effect of these variables on the child's integral development and on the mother-child bonding quality (Figueredo, Costa, Pacheco & Pais, 2009; Murray, Sinclair, Cooper, Ducournau & Turner, 1999; Rodríguez, 2006; Stern, 1997).

If we understand early mother-child interactions from a dyadic perspective, where they influence each other, the particular characteristics of the dyad's members will influence the type of relationship they'll be able to establish. In terms of the mother, her general state, educational level, the presence, or not, of depressive symptomatology, her conception of gender roles, family constitution and the number of children, will be relevant variables, and in

terms of the child, his temperament, gender and own characteristics, will be activated when it comes to interacting and building a particular bond.

Based on the background given, this study intends to evaluate the existence of gender differences in the mother-child interaction quality in dyads of single-parent, Chilean, low-income families.

In order to carry out the study, the following objectives were established:

1. To describe, analyze and compare the mother-child interactions in dyads with female infants and dyads with male infants of single-parent, low-income families.
2. To determine the existence, or not, of predominant, specific describers in the interactions of the mother-child dyads with female infants and male infants.
3. To evaluate the complementarity of the interactive conducts between mother and children.

It is expected to find an equivalent quality in the mother-child interaction in the dyads of mothers with female and male infants. It will be possible, most likely, to see the differences on the negative aspects of the interaction.

The hypothesis is to find differences in the interactions depending on the infants' gender, expecting to find a greater number of difficult and controlling conducts in the dyads of mother-infant with a male gender, than in the dyads of mother-infant with a female gender.

High and positive correlations are also expected, among the complementary aspects of the mother-infant interaction in the groups with both genders, especially, "sensitive" mother with "cooperative" child, "controlling" mother with "difficult" child and "unresponsive" mother with "passive" child.

Method

Participants

80 Mother-baby dyads of single-parent families participated, belonging to the two poorest quintiles of the population, residing in Santiago, Chile, in the municipalities of La Granja, La Pintana and La Florida. The sample was made-up by 41 dyads with male infants and 39 dyads with female infants.

The ages of the female infants went from 4,6 through 15 months old with a mean of 10,26 (DE = 2.86). The ages of the male infants went from 4 through 14.7 months old with a mean of 10.22 (DE = 3.06). The age mean of the mothers with male infants was 24.95 years old, the youngest being 15 and the oldest 43 (DE = 7.28), and the age mean of the mothers with female infants was 25.18 years old, the youngest being 15 and the oldest one 43 (DE = 7.56).

The inclusion criteria considered for the study were, to reside in one of the mentioned municipalities, to belong to the two poorest quintiles of the population and to be part of a single-parent family where the mother is in charge, having a child between the ages of 4 and 15 months old. The exclusion criteria used were, the presence in one of the members of the dyad of an already diagnosed physical or psychiatric pathology. The mothers voluntarily accepted to participate in the study, after having signed the informed consent letter.

Procedure

This investigation is a comparative, transversal, non-experimental study. The families were selected from the information provided by the directors of the care centers, and they were invited to participate in a voluntary manner. The families who complied with the sample requisites were contacted by phone, single-parent with the mother in charge, with at least one child younger than 15 months old, both without already diagnosed physical or psychiatric pathologies.

The evaluations were done between May and August, 2009, at the care centers where the families usually attended.

The evaluation took place after the mothers signed the informed consent letter. The children and the adults were evaluated on interaction with the CARE-Index instrument (Crittenden, 2006), with the same set of toys and materials in all cases. First, the dyad was videotaped on free play, and later, the information was gathered and the Scales were applied. A didactic toy was given to each participating dyad, with a brief feedback about the strengths and weaknesses observed during the interaction. The dyads evaluated as risky were referred to health centers, after having the mother's consent.

Instruments

Child-Adult Relationship Experimental Index: CARE-Index *(Crittenden, 2006)*

The CARE-Index is an evaluation method for the infant-adult interaction under non-threatening conditions, based on the attachment theory, and developed by P. Crittenden in 1997. The evaluation procedure consists of 3 to 5 minutes of video recording of free play interaction between the adult and the child. The codification system is based on main dyadic constructs, the adult's sensitivities to the child's signals and the cooperation of the child with the adult. The adult and the child interaction are coded according to 7 variables (facial expression, verbal expression, body position and contact, affect expression, taking turns contingencies, control and activity election). The first four variables define the affective aspects of the interaction and the three last ones the cognitive aspects of it. Each adult and each child is separately evaluated in relation to each one of these 7 interaction behavioral aspects. Each one of these 7 variables can receive a score of 2 points, and could accumulate a total of 14.

There are 3 specific describers for the adult's interactive conduct, "sensitive", "controlling" and "unresponsive":

1. "Sensitive": the adult can adequately read and interpret the child's signals, giving concordant and contingent responses, and also, can get the infant's attention and reduce his stress and anxiety.
2. "Controlling": the adult shows signs of hostility or anger in his interaction with the infant, which he does in an open or hidden manner, and can manifest it by having incongruent conducts or direct intrusions.
3. "Unresponsive": the adult doesn't perceive the infant's signals, especially the negative ones, since he is more focused on his own perspective and experiences than in the internal stat of the infant and his conducts.

And 4 describers for the infant, "cooperative", "difficult", "compulsive" and "passive":

1. "Cooperative": the infant's level of excitement is moderate, he is relaxed, receives with interest what the adult proposes, shows signs of continuously being involved during the interaction.
2. "Difficult": the infant shows a high level of excitement, protests or actively rejects what the adult proposes, his body is tense and reactive and avoids the encounter.
3. "Compulsive": the interaction is not very spontaneous, the infant appears tense and physically inhibited, he can act in various ways, like making an effort to animate and captivate his mother, to please her, without taking into consideration his own wishes, trying to reduce maternal hostile conducts or anxiety.
4. "passive": shows a low level of excitement, doesn't participate much in the interaction, inactively tolerating what the adult proposes.

Crittenden defines a dyadic scale that goes from 0 to 14 points, 0-4 indicating "risk", 5-6 "inept or inadequate", 7-10 "adequate" and 11-14 "sensitive", these criteria being used to evaluate the quality of the interaction in this study. The author defines that scores below 7 require some type of intervention, recommending short-term psychoeducation or intervention

for those dyads with scores 5-6, and psychotherapy for parents-infant for those with scores 0-4. A psychologist trained by the author of the instrument, having a reliability of 0.8 in the training course, did the video codifications.

Edinburgh Post-Natal Depression Scale (EPDS)

The Edinburgh Post-Natal Depression Scale is a screening instrument, self-administered and developed for the detection of depressive symptoms in women with recently-born children. The Scale has 10 multiple-selection questions, each having four alternative answers, scored from 0 to 3 according to the increasing severity of the symptoms. The scores vary from 0 through 30, a higher score indicating a greater severity of depressive symptomatology. The version used was the one validated in Chile (Jadresic, Araya & Jara, 1995), which has a 10 cut-off point.

Sex-Role Ideology Scale (SRIS)

This Scale was developed by Kalin & Tilby (1978), and considers the beliefs of gender characteristics and adequate conducts for men and women. It was designed from a bidimensional construct that considers the ideologies of gender sexual roles in a continuum, from the traditional to the egalitarian. It has 9 items, where the degree of agreement or disagreement with the statement proposed is recorded, using a *likert* type format of 7 points (1 = total disagreement, 7 = total agreement). The scores go between 9 and 63 points, with low scores meaning ideology of traditional sexual roles, and high scores, egalitarian ideologies. The version used was the one recently applied on Chilean population (Olhaberry et al., 2010).

Parental Stress Index (PSI)

The PSI developed by Richard Abidin (1995), evaluates the stress of the mother in relation to her role, and it can be applied since the baby is one month old. The abridged form used in this investigation, has 36 items, and its application takes 10-15 minutes. It gives scores on 3 subscales: parental stress (PD), parents-children dysfunctional interaction (P-CDI) and difficult child (DC), and a total score, having percentile norms.

Results

In terms of the sociodemographic background of the groups of the dyads of the study, close frequencies can be seen among the groups with female and male infants in the considered variables. The descriptive analysis related to the gender of the participating children, to the number of brothers, the maternal educational level, the number of adults at home, the amount of time the mother stays at home, and keeping contact, or not, with the father, are presented on table 1.

Table 1. *Frequencies and % of the studied sociodemographic variables in the dyads with male infants (n=41) and the dyads with female infants (n=39).*

	Dyads with male infants n=41		**Dyads with female infants n=39**	
Variables	**Freq**	**%**	**Freq**	**%**
Brothers/Sisters				
None	22	53.7%	17	43.6%
One or more	19	46.3%	22	56.4%
Nº adults at home				
1	7	17%	4	10.2%
2 or 3	13	31.7%	18	46.2%
4, 5 or 6	18	44%	16	41%
7 or+	3	7.3%	1	2.6%
Nº years mother's education				
<8 years	3	7.3%	4	10.3%
8 years	13	31.7%	12	30.8%
12 years	21	51.2%	22	56.4%
>12 years	4	9.8%	1	2.6%
Time mother at home				
≥ half day	12	70.7%	14	35.9%
< half day	29	29.3%	25	64.1%
Contact with the father				
Yes	28	68.3%	30	76.9%
No	13	31.7%	9	23.1%

The mothers were evaluated on ideology of sexual roles, the presence of depressive symptomatology and stress levels, since it is considered that the variations among the groups in these variables could explain incidental differences in the interaction of the dyads, when considering the infants gender. The analysis done with the *t* test for independent samples show that the mothers of female and male infants don't show significant differences in their ideology of sexual roles (t = (78) = 1.632; $p > 0.05$). When the same analysis was done on the variables of depressive symptomatology and maternal stress, the results are similar, getting values showing absence of significant differences, with scores t = (78) = -.410; $p > 0.05$ and $t = (78)$ = -1.112; $p > 0.05$, respectively.

On table 2 are presented the descriptive statistics obtained in the Edinburgh Postnatal Depression Scale (EPDS), in the Sexual-Role Ideology Scale of (SRIS) and in the Parental Stress Index (PSI), in the groups of dyads with female and male infants.

Table 2. *Means, SD and mean typical error of the results obtained in the SRIS, EPDS and PSI Scales in mothers with male infants and female infants.*

	Mothers with male infants n=41			**Mothers with female infants n=39**		
Scales	**Mean**	**SD**	**St error of the mean**	**Mean**	**SD**	**St error of the mean**
SRIS	45.63	11.260	1.759	41.54	11.182	1.791
EPDS	11.98	5.327	0.832	12.51	6.382	1.022
PSI	72.80	17.603	2.749	77.69	21.596	3.458

In terms of the mother-infant interaction, the descriptive analysis indicates that the maternal *sensitivity* mean obtained by the dyads with male infants (M = 6.93) places them in the "inept or inadequate" category, which makes some type of intervention necessary. In the dyads with female infants the maternal *sensitivity* mean places them in the same category (M = 6.69). It's important to highlight that in both groups the mean scores are very close to the

lower limit of the “adequate” range in relation to the quality of the interaction. In the remaining specific describers, the mothers with male infants obtain a score of M = 2.12 on *control* and M = 5.0 on *unresponsiveness*; and the mothers with female infants, M = 1.54 on *control* and M = 5.41 on *unresponsiveness*. In the specific describers for male infants, there are means of M = 6.71 points on *cooperativeness,* M = 1.10 on *compulsivity*, M = 3.61 on *difficult*, and M = 2.59 points on *passivity*. The female infants obtained a mean of M = 6.46 points on *cooperativeness,* M = 0.79 on *compulsivity,* M = 2.23 points on *difficult,* and M = 4.36 on *passivity*.

In table 3 are presented the descriptive statistics of the different dimensions of the mother-child interaction, grouped according to the infant gender.

Table 3. *Means, SD and mean typical error of the results obtained in the describers of the interaction for mothers and children, grouped according to infant gender.*

	Dyads with male infants n=41			**Dyads with female infants n=39**		
Describers	**Mean**	**SD**	**St error of the mean**	**Mean**	**SD**	**St error of the mean**
Sensitive mother	6.93	2.161	.337	6.69	2.261	.362
Controlling mother	2.12	1.749	.273	1.54	1.620	.259
Unresponsive mother	5.0	1.817	.284	5.41	2.245	.388
Cooperative infant	6.71	2.657	.415	6.46	2.426	.389
Passive infant	2.59	2.398	.374	4.36	2.978	.477
Difficult infant	3.61	2.756	.430	2.23	2.265	.363
Compulsive infant	1.10	2.498	.390	0.79	1.824	.292

The correlation between maternal *sensitivity* and *cooperativeness* is positive and high in both groups, being $r = 0.910$ ($p<0.01$) for the dyads with male infants and $r = 0.842$ ($p<0.01$) for the dyads with female infants, indicating that the greater is the maternal *sensitivity,* the greater is the infant *cooperativeness* in both groups.

The correlations between maternal *control* and *difficult* child are positive and significant in both groups, with values $r = 0.358$ ($p<0.05$) for the dyads with male infants and 0.604 ($p<0.01$) for the dyads with female infants. The correlations between maternal *unresponsiveness* and infant *passivity* are also high and positive in both groups with values *r*

= 0.551 (p <0.01) for the dyads with male infants and r = 0.566 (p *<0.01)* for the dyads with female infants, confirming the hypothesis in relation to the mother-infant complementarity in the interactions.

The results of the correlations between the describers for the mothers and the ones for the children, grouped according to infant gender, are presented in table 4.

Table 4*. Pearson bivariate correlations between the interaction describers for the mothers and for the infants, grouped according to infant gender.*

Dyads with male infants n=41	Sensit. M.	Controll. M.	Unresp. M.	Dyads with female infants n= 39	Sensit. M.	Controll. M.	Unresp. M.
Cooperative Inf.	.910**	-.503**	-.590**	**Cooperative Inf.**	.842**	-.266	-.668**
Compulsive Inf.	-.388**	.421**	.050	**Compulsive Inf.**	-.341*	.252	.025
Difficult Inf.	-.328*	.358*	.045	**Difficult Inf.**	-.248	.604**	-.090
Passive Inf.	-.228	-.292	.551**	**Passive Inf.**	-.233	-.439**	.566**

* = p < .05. ** = p < .01

When comparing the scores of the two groups of dyads in the various describers of the interaction through the t test for independent samples, it shows that male infants have significantly higher scores in the *difficult* describer (t (78) = 2.438; p < 0.05), and female infants have significantly higher scores in the *passive* describer (t (78) = -2.941; p < 0.01). The effect sizes of the differences evaluated with Cohen d are medium in both cases, with values d = 0.547 and d = 0.654 for *difficult* and *passive,* respectively. The describer *controlling* has higher scores in the mothers of male infants, but the differences are not significant when compared with the mothers of female infants. In the *unresponsive* describer for the mothers, the ones with higher scores are the mothers of female infants, but the differences, just like in the previous describer, are not significant when the groups are compared. This allows for a partial confirmation of the study's hypothesis, differences can be seen according to infant gender, which refer to more difficult conducts in boys and more passive in girls, even though these differences are not significant in the complementary describers of the mothers.

The results of the comparisons between the groups of maternal and infant describers of interaction, are presented in table 5.

Table 5. *t Test and effect sizes (ES) for the comparison of the describers of the mothers (Mo) and the children (Inf), between the groups of dyads with male (M) infants and the ones with female (F) infants.*

	t Test for equal means							
						95% CI for the diff.		
	t	Fr. deg.	Sig.(bilat)	Means diff.	St. error of diff.	Sup.	Inf.	ES*
Sensit. Mo. dyads M & F Inf.	.474	78	.637	.235	.494	-.750	1.219	.108
Controll. Mo. dyads M & F Inf.	1.546	78	.126	.583	.377	-.168	1.335	.344
Unresp. Mo. dyads M & F Inf.	-.853	70.35	.396	-.410	.481	-1.369	.549	.191
Cooper. Inf. dyads M & F Inf.	.431	78	.667	.246	.570	-.889	1.380	.098
Compuls. Inf. dyads M & F Inf.	.616	78	.539	.303	.491	-.675	1.280	.141
Difficult Inf. dyads M & F Inf.	2.438	78	.017	1.379	.566	.253	2.505	.547
Passive Inf. dyads M & F Inf.	-2.941	78	.004	-1.774	.603	-2.974	-.573	.654

*The effect sizes reported correspond to Cohen d values.

Discussion

In terms of the general findings of the study, it's relevant to highlight the high scores in stress and depression on the part of the mothers, showing both groups of dyads maternal stress levels that place them over the 60 percentile and means over the cut-off point on depression. This alerts about the influence of the family constitution and the context on maternal mental health, which is consistent with the studies reviewed in relation to single parenting and low-income, and their consequences (Bastos, Casaca, Nunes & Pereirinha, 2009; Cooper, McLanahan, Meadows & Brooks-Gunn, 2009; Lara-Cinisomo, Griffin, Daugherty, 2009).

Just like previous studies show it (Belsky, 1984; Bowlby, 1969; Coppola et al., 2006; Stern, 1997; Pelchat et al., 2003), it is possible to see how contextual conditions and

maternal depressive symptomatology are related, in turn, with the quality of the mother-child interaction, showing the dyads of the study means that indicate the need for some type of intervention in both groups. This way, belonging to a low-income, single-parent family with the mother in charge could generate a vulnerable condition for the dyad, independently of the child's gender, being these results concordant with previous studies on these variables (Casady, et al., 2001).

Even though the studies reviewed state a greater quality interaction among mothers and their daughters, since they share gender and strategies of emotional regulation (Feldman, 2003), these differences are not seen, since the dyads show very similar scores on *sensitivity* and *cooperativeness,* both describers pointing at the adequate aspects of the interaction. The differences by gender that the study shows are focused on the lacking aspects of the interaction between mothers and their children.

It is possible to observe in the maternal interactive behavior a predominance of *sensitivity* followed by *unresponsiveness* and *control* in both groups of infants, but higher scores on *control* with male infants, and also, higher on *unresponsiveness* with female infants. On infants, complementarily with the mothers, males vary in the interaction between *cooperativeness*, *compulsivity* and *difficult* conducts*, and females* between *cooperative* and *passive* behaviors*.* This indicates that when mothers are not able to adequately read and interpret their children's signals and act in a consistent manner to receive their needs, they show hostility with the male infants and a self-centered conduct with the female infants, failing in a differential way according to the child's gender. The same takes place from the children's perspective when they don't show *cooperative* behaviors in the interaction with their mothers. Males complain and reject the proposal, or they become tense and make an effort to please the mother, and the females inactively tolerate the interactive proposal of the mother.

In terms of the hypothesis stated in this study, as it was expected, significant differences were found between female and male infants, the boys showing significantly higher scores than the girls in the *difficult* describer*,* with a medium effect size, and the girls having significantly higher scores than the boys in the *passive* describer, with a medium effect size, as well. In relation to the complementarity of the mothers' describers, they show the highest scores in the *control* describer with male infants, and *unresponsive* with female infants, but these differences are not statistically significant. Even though it is possible to see the complementarity of the describers shown by the mothers and their children, and in this sense the confirmation of mutual influence inside the dyad, the statistically significant difference is in the children's behavior, and not in the mothers' behavior.

The correlations observed among the describers for the mothers and the children, also, indicate complementarity inside the dyads, and it is possible to see high and positive correlations, especially, between maternal *sensitivity* and infant *cooperativeness* in both groups. The describers *control* for the mothers and *difficult* for the infants, show positive correlations in both groups, as well, but with the male infants the *compulsive* describer shows, also, a positive and significant correlation not observed with the girls. This could show child gender differences as an answer to maternal *control* in the dyads of the study, while it is possible to observe *compulsive* and *difficult* conducts with the male infants*,* and with the female infants only *difficult* responses associated with conducts expressing control on the part of the mother. The compulsive conducts in the boys indicates tension, little spontaneity and a child's effort to accommodate himself to the mother, which refers to an effort to overregulate his emotions, probably looking to reduce the mother's hostility and to have more pleasant interactions. It is surprising that this correlation is not seen in the girls, who when faced with maternal *control*, which is expressed less frequently in the dyads with female infants, they become *difficult.*

When trying to explain the differences observed in the mother-infant interaction of both groups, from the cultural context and the mothers' ideologies of the sexual roles, no

significant differences are observed between the groups of dyads with female gender and male gender infants. Both groups obtain mean scores, which are very close to the ones seen in the Chilean general population of the same socioeconomic level (Olhaberry et al., 2010). This shows that the conception the mothers have of the roles and conducts for men and women would not allow us to explain the differences found between the dyads with female gender and male gender infants.

If we consider the hypotheses explaining the gender differences in the mother-infant exchange, from the maternal difficulties to identify herself with a child of a different sex (Tychey et al., 2006), it is possible to hypothesize that mothers who don't have the daily presence of the father of the child to raise him, and neither may count on his support as a partner, could transfer many of the conflicts generated by the separation to the relation with a male infant. Following this line, the presence of greater *control* on the part of the mother with the male infants, which means hostility or anger, could be explained from the feelings the mother has for the child's father that could be projected on the infant who has the father's gender, and probably, some of his physical characteristics. There is a need for mixed studies that consider, besides the quantitative evaluations of the mother-infant interaction quality, qualitative evaluations of the meanings the mothers have about the children, the father's perception and the separation, in order to check these hypotheses.

In order to deepen the findings of the study, new investigations are necessary. They should explore the differences of infant gender in the quality of the mother-child interactions, considering nuclear families, since this would allow us to dimension if the differences of gender found are something particular to single-parent families with the mother in charge, or a more general aspect of Chilean, low-income level mother-child dyads.

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Father's presence and the quality of mother-child interaction: a comparative study on Chilean nuclear and single-parent families.

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Abstract

Recent studies show the importance of the father's presence on the family's mental health, affecting, among others, the mother-child bond. Considering this information, the present study does a comparative analysis on the quality of the mother-child interaction on dyads of nuclear and single-mother, Chilean, low-income families. 80 Dyads were studied, 40 belonging to single-parent families and 40 to nuclear families. The children's ages were between 4 and 17 months old (M = 12.36, SD = 3.20), and the mothers' ages between 15 and 44 years old (M = 26.74, SD = 7.53). The mothers' sensitivity response and the quality of the interaction were evaluated with the CARE-Index instrument (Crittenden, 1997). The results show a greater interaction quality among nuclear families, with important differences and medium effect sizes on the cognitive aspects of the interaction.

Keywords: single-parent families, nuclear families, interaction quality.

Background

The presence of the father in the quality of the mother-child interaction

Even though most of the investigations on early childhood have focused on the mother-baby bonding, a growing number of studies explore the father's importance.

Investigations show that childhood attachment bonds develop towards both parents, and that fathers as well as mothers are capable of providing sensitive care to their children (Keller, 2007; Lamb, 1977; Lamb, 1982). Some authors describe qualitative differences between the type of playfulness that the father establishes with his child, and the one developed by the mother, mentioning that fathers generate a more vivacious and stimulating playing activity, which elevates the general excitement of the child, having positive repercussions on his affective and cognitive development (Brazelton & Cramer, 1993). In terms of the benefits gained by the father's presence, some studies show that an adequate father-child bonding is associated with the absence of behavioral problems in children (Verschueren & Marcoen, 1999), high sociability, and an adequate infant cognitive development (Fagan & Iglesias, 1999).

On the other hand, the birth and upbringing of a small child generates demands on the family, and some studies show that for a couple to express affection for each other and having some complicity are protecting factors for the parental experience (Shapiro, Gottman & Carrere, 2000). This way, sharing the activities involved and coordinating the maternal and paternal roles contribute in obtaining an adequate upbringing (Brazelton & Cramer, 1993; Fivaz-Depeursinge & Corboz-Warnery, 1999).

While observing the child play with both parents, it is possible to capture his ability to establish triadic interactions, showing when the child is 12 weeks old his capacity to share feelings of pleasure, interest or uneasiness with both parents, alternating his gaze and affection signals with his father and mother (Fivaz-Depeursinge, Favez, Lavanchy, de Noni, & Frascarolo, 2005). The authors define the triangular interactions in which the baby participates (the three together, or two interacting and the third one present), as part of the baby's normative development. They highlight that when the child faces stress due to the experiences with one of his parents, the other parent being present can recognize the uneasiness and act in a protecting or corrective manner, contributing to improve the quality of the interaction (Fivaz-Depeursinge & Favez, 2006).

Single-parenting and low-income

Even though nuclear homes, with the mother and father present, continue to be the context where many children are born, there is a growing number of single-parent families. This tendency, as well, is present in Latin America, especially, in homes where the mother is in charge, which are, also, the poorest ones (Arriagada, 2004; Cerrutti & Binstock, 2009).

Several studies have shown how the context where the mother and her children live influences the quality of their interactions, showing how family income, educational level, family constitution, and the presence or absence of a support social network can have a positive or negative impact on the bonding quality, the baby's evolution and the general state of the mother (Belsky, 1984; Bowlby, 1969; Coppola, Vaughn, Cassiba & Constantini, 2006; Pelchat, Bisson, Bois & Saucier, 2003; Stern, 1997).

Single-parenting in poverty has been associated to a higher maternal stress (Cooper, McLanahan, Meadows & Brooks-Gunn, 2009; Landero & González, 2006; Olhaberry & Farkas, 2011), just like to depressive symptomatology (Lara-Cinisomo, Griffin, Daugherty, 2009; Bastos, Casaca, Nunes & Pereirinha, 2009). These variables negatively affect infant development and the quality of the mother-child bonding (Murray, Sinclair, Cooper, Ducournau & Turner, 1999; Pelchat, Bisson, Bois & Saucier, 2003; Rodríguez, 2006; Figueredo, Costa, Pacheco & Pais, 2009; Stern, 1997).

Some investigations associate child raising in a single-parent home to the mother's difficulties to sensitively respond to her children's signals and needs (Casady, Diener, Isabella & Wright, 2001). Following this line, studies reviewing the father's importance on his children's raising, show how the support he gives to the mother contributes to improve the maternal sensitive response in the interaction with her children (Hyunjeong, Young-Joo, Mi Ja, 2006; Valenzuela 1997).

Considering the studies reviewed, we can clearly mention the value of the father's presence on his young children's raising, on two main aspects. In terms of the mother, it contributes to reduce her stress by receiving affective and concrete support when sharing roles and chores. In terms of the child, it contributes on his integral development, providing another significant bonding relationship, different from the one the mother generates (Verschueren & Marcoen, 1999; Fivaz-Depeursinge & Corboz-Warnery, 1999).

On the other hand, independently of the family constitution, poverty contexts have frequently been associated to a low-quality mother-child interaction (Figueredo, Costa, Pacheco & Pais, 2009; Murray, Sinclair, Cooper, Ducournau & Turner, 1999; Rodríguez, 2006; Stern, 1997). These findings are not conclusive, since there are low-income families with an adequate bonding quality with their children (Crittenden, 1985; Egeland & Sroufe, 1981; Guillén, 2007).

Early interactions and maternal sensitive response

Nowadays, there is consensus that the mutual process of verbal and non-verbal exchange in the child-caregiver dyad contributes to the development of reciprocity and the exchange of information and feelings between them (Trevarthen and Aitken 2001). The conduct of young children is, then, strongly influenced and modified by the caregiver's conduct, thus, the studies on the child-caregiver interaction in a playing situation tell us that the child's response and his affective expression are directly related to the interactive capacity of the caregiver, especially during the first years of the child's life (Kivijarvi, Voeten, Niemela, Raiha, Lertola, Piha, 2001).

When the adult responds with a sensitive and receptive conduct to the child's communication signals during a playing interaction, he enriches the interaction and favors the experiencing of shared affects in the dyad. The game allows, this way, the expression of pleasure, uneasiness, or the need for help, providing the moment for the child to learn about

taking turns and reciprocity, as well as about emotional regulation on others and himself (Tronick 1989, Weinberg & Tronick 1994).

In terms of the mother-baby bonding quality, the sensitive maternal response has been considered a central concept when evaluating early interactions in the dyad, since it influences in a significant manner the baby's subsequent development (Stern, 1997; George & Salomon, 1999). It is defined by Crittenden (2006), as a dyadic construct of any conduct pattern displayed by the adult that calms down the baby and increases his comfort, reducing his anguish and lack of interest. The capacity of the mother and significant caretakers in responding in a sensitive manner to the baby, will imply recognizing his signals, interpreting adequately and acting in a fast and appropriate way to these readings (Marrone, 2001).

In relation to the importance of the maternal sensitivity to the child's communication signals, studies show that an adequate sensitivity on the part of the adult during the first year of the child's life, is considered a significant predictor of a healthy subsequent development, of a baby's secure attachment patterns and a favorable emotional, social and cognitive development (Coppola, Vaughn, Cassibba, Constantini, 2006; Friedman & Boyle, 2008; Isabella, 1993; Kivijarvi, Raiha, Virtanen, Lertola, Piha, 2004; Landry, Smith, Swank & Miller-Loncar, 2000; Smith & Pederson, 1988; van Ijzendoorn & Wolf, 1997; Ward & Carlson, 1995). Complementing these findings, a caregiver's low sensitive response has been associated to a poor cognitive development and a low symbolic capacity on the part of the baby (Feldman, Eidelman, Rotenberg, 2004).

Studies on maternal sensitivity with a Chilean sample discovered that the low educational level of mothers, frequently observed in low socioeconomic level families, negatively affects the sensitive response to children (Valenzuela, 1997; Guillén, 2007). Similar results appear in international studies, which consider the mother's educational level as a good predictor of her capacity to sensitively respond to her children's signals (Pelchat, Bisson, Bois & Saucier, 2003; Coppola, Vaughn, Cassiba & Constantini, 2006).

Considering the importance of the father's presence, the influence of poverty contexts in raising young children, and the relevance of the maternal sensitive response on children's development and mental health, this study looks to evaluate the existence of differences in the quality of the mother-child interactions among single-parent and nuclear, low-income families.

The hypothesis is to find a higher quality in the dyads' interaction of nuclear families, considering that the father's support could be a positive contribution.

It is also expected a high and positive correlation between the maternal sensitive response and the children's cooperativeness in both groups, since these variables are defined as part of a dyadic construct, where the mother and baby influence each other. And also, the family constitution, together with other variables are expected to act as predictors of the interaction quality in the total sample.

Method

Design

A non-experimental, transversal of the comparative type study was done, which included two groups of mother-baby dyads, one of single-parent families, and the other of nuclear families. Only children attending day nurseries were included, after reviewing Chilean and foreign studies that show a significant effect of this condition in the quality of the mother-child interaction (Love, Harrison, Sagi-Schwartz, van Ijzendoorm & Ungerer, 2003; Olhaberry, 2011; Sagi, Koren-Karie, Gini, Ziv & Joels, 2002).

Participants

80 Mother-child dyads participated, of the two poorest quintiles of the population, residing in Santiago, Chile, in vulnerable municipalities. Of the participating dyads, 40 belonged to single-parent families and 40 to nuclear families. The group of single-parent families was made of 15 girls (37.5%) and 25 boys (62.5%), whose ages were between 4 and 15 months with a mean of 10,49 (SD = 3.21). The group of nuclear families was made of 14 girls (35%) and 26 boys (65%) and their ages went from 8 to 17 months with a mean of 14.23 (SD = 1.83). The age mean of the mothers of single-parent families was 25.63 years, the youngest being 15 and the oldest 43 (SD = 8.39), and the age mean of the mothers of nuclear families was 27.85 years, the youngest being 16 and the oldest 44 (SD = 6.47). The sample was intentioned and the inclusion criteria considered for the study were, belonging to the two poorest quintiles of the population, attending a public day nursery, and being in a nuclear or single-parent family in charge of the mother, with at least one child between 4 and 17 months old. The exclusion criteria used were the presence of some diagnosed physical and/or mental pathology on some of the dyads members. The mothers voluntarily accepted to participate in the study, after signing and informed consent letter.

Instruments

Child-Adult Relationship Experimental Index: CARE-Index

It's an evaluation method for the infant-adult interaction under non-threatening conditions, based on the attachment theory, and developed by P. Crittenden in 1997. The evaluation procedure consists of 3 to 5 minutes of video recording of free play interaction between the adult and the child. The codification system is based on main dyadic constructs, the adult's sensitivities to the child's signals and the cooperation of the child with the adult. The adult and the child interaction are coded according to 7 variables (facial expression, verbal expression, body position and contact, affect expression, taking turns contingencies, control and activity election). The first four variables define the affective aspects of the

interaction and the three last ones the cognitive aspects of it. Each adult and each child is separately evaluated in relation to each one of these 7 interaction behavioral aspects. Each one of these 7 variables can receive a score of 2 points, and could accumulate a total of 14. Of these 14 points, the cognitive items score a maximum of 6 points and the affective items score a maximum of 8 points.

There are 3 specific describers for the adult's interactive conduct, "sensitive", "controlling" and "unresponsive", and different describers for the children according to the developmental stage they are in (infant or toddler). 4 Describers are defined for children between the ages of 0 and 15 months old, "cooperative", "difficult", "compulsive" and "passive", and 3 for the children of 15 to 30 months old, "cooperative", "compulsive" and "coercive".

Since this study considers children in these two age ranks, the describers "difficult", "passive" and "coercive" were grouped in the "ambivalent" category, indicating similar conducts, but more complex in the children older than 15 months old.

Crittenden defines a dyadic sensitivity scale that goes from 0 to 14 points, indicating 0-4 as "risk", 5-6 "inept or inadequate", 7-10 "adequate" and 11-14 "sensitive", and these criteria are used to evaluate the interaction quality in this study. The author defines that scores below 7 require some type of intervention, recommending psychoeducation or short-term intervention for those dyads with scores 5-6, and parents-infant psychotherapy for the ones with scores 0-4. Psychologists trained by the author of the instrument, having a reliability of 0.8 in the training course, did the video codifications.

Sociodemographic card

The participants were interviewed, completing a card in order to obtain information related to their family constitution and sociodemographic variables.

Procedure

The families were selected from the information provided by the directors of the day nurseries, and they were invited to participate in a voluntary manner. The dyads were contacted by phone, and assigned by group according to their family constitution.

It was decided that all day nurseries would have similar procedures and conditions related to: quality of service, infrastructure, number of hours per day and number of children per adult. The evaluations were done between May and August 2009, and they took place at the day nurseries were the children attended regularly.

The evaluation was done after the mothers signed the informed consent letter. The children and the adults were evaluated with the CARE-Index instrument (Crittenden, 2006). First, the recording of the dyad was done in a free-playing interaction, and later, the information was gathered. The dyads at risk were referred to health centers of the municipalities were they resided, already having the mother's consent.

Results analysis

The presence of atypical values and the compliance with the assumptions of the statistical tests done were evaluated, and a significance criterion of $\alpha = 0.05$ was used. Initially, a descriptive analysis was done of the sociodemographic background and the quality of the mother-child interaction in both groups of dyads, considering the various defined describers for adults and children. Then, the *t* test was applied for independent samples in order to evaluate the differences between the groups, on maternal sensitivity and infant cooperation.

Later, correlational analyses were done between maternal sensitivity and child cooperativeness inside each group, in order to determine the association levels among these variables. Finally, a linear regression analysis was done to evaluate what variables predict

maternal sensitivity and child cooperativeness in its various dimensions, using the *stepwise* method of variable selection.

Results

Some sociodemographic data in relation to the gender of the participating children, the maternal educational level and the number of adults at home appear on table 1. A relevant finding is that 87.5% of the studied nuclear families, don't have other adults than the father and the mother living at home, as opposed to single-parent families where 77.5% live with other adults besides the mother.

Table 1. *Frequencies and % of the sociodemographic variables studied in the groups of dyads of nuclear families (n=68) and single-mother families (n=40)*

	Nuclear families n=40		Single-mother families n=40	
Variables	**Freq**	**%**	**Freq**	**%**
Nº adults at home				
1	-	-	9	22.5%
2	35	87.5%	9	22.5%
3	2	5%	5	12.5%
4	2	5%	9	22.5%
5 o +	1	2.5%	8	20.0%
Nº years mother's educ				
<8 years	5	12.5%	2	5.0%
8 a 11 years	9	22.5%	13	32.5%
12 years	16	40%	20	50.0%
>12 years	10	25%	5	12.5%
Child's gender				
Male	26	65%	25	62.5%
Female	14	35%	15	37.5%

The data descriptive analysis in relation to the specific describers of the interaction defined for the dyads, indicates that the mothers of single-parent families have a mean of 6.60 points (SD = 2.03) on *sensitivity*, 2.08 (SD = 1.80) on *control,* and 5.15 (SD = 2.21) on *unresponsiveness*. On the other hand, the mothers of nuclear families have 7.40 (SD = 2.59) on *sensitivity*, 1.65 (SD = 1.74) on *control,* and 4.75 (SD = 2.98) on *unresponsiveness*. On the specific describers for the children of single-parent families, the means are 6.45 points (SD = 2.56) on *cooperativeness,* 1.08 (SD = 2.36) on *compulsivity*, and 6.45 points (SD =

2.71) on *ambivalent*. The children of nuclear families have a mean of 6.63 points (SD = 3.06) on *cooperativeness,* 0.98 (SD = 1.8) on *compulsivity,* and 6.40 (SD = 3.09) on *ambivalent*.

The correlation between maternal *sensitivity* and child's *cooperativeness* is positive and high in both groups, being $r = 0.916$ ($p<0.01$) for the dyads of nuclear families, and $r = 0.891$ ($p<0.01$) for the dyads of single-parent families, showing that the higher the maternal *sensitivity,* the higher is the child's *cooperativeness*.

After analyzing the scores on maternal *sensitivity* on the affective and cognitive items that make up the scale, it is possible to say that the differences on *sensitivity* between the groups would be on, mainly, the cognitive aspects of the interaction, where the mothers of nuclear families receive higher scores ($M = 2.55$, SD =1.51), than the ones received by the mothers of single-parent families ($M = 1.80$, SD = 1.34). Complementary to what was observed on the mothers, it is also possible to see differences on the cognitive aspects of the children's *cooperativeness* in both groups, with means of 2.85 (SD = 1.67) and 2.08 (SD = 1.34*)* for the children of nuclear and single-parent families, respectively.

The descriptive statistics obtained on maternal sensitivity and child cooperativeness, considering the cognitive and affective dimensions of the interaction appear on table 2.

Table 2. Means and standard deviation on maternal sensitivity and child cooperativeness, *considering the cognitive and affective dimensions of the interaction.*

Dimensions	Group	N	Minimum	Maximum	Mean	St. dev.
Affect. mater. sensit.	Single-mother	40	3	8	4.80	1.305
	Nuclear	40	1	8	4.85	1.610
Cognit. mater. sensit.	Single-mother	40	0	4	1.80	1.344
	Nuclear	40	0	6	2.55	1.518
Total maternal sensit.	Single-mother	40	3	11	6.60	2.036
	Nuclear	40	3	12	7.40	2.590
Affect. Child Coop.	Single-mother	40	2	8	4.38	1.531
	Nuclear	40	0	8	3.78	1.747
Cognit. Child Coop.	Single-mother	40	0	4	2.08	1.347
	Nuclear	40	0	6	2.85	1.673
Total Child Coop.	Single-mother	40	2	12	6.45	2.562

	Nuclear	40	2	12	6.63	3.069

The *t* test for independent samples, shows that the dyads of nuclear families receive significantly higher means than the dyads of single-parent families on the cognitive aspects of maternal sensitivity (t = - 2.340; $p < 0.05$), being the effect size of the difference evaluated with Cohen d, medium (d = 0.52). Complementary to this, significant differences appear on the cognitive aspects of child cooperativeness (t = -2.282; $p > 0.05$), with higher scores on children of nuclear families, and with a medium the effect size of the difference (d = 0.50). The results obtained in the comparison of the groups with the *t* test appear on table 3.

Table 3. *t Test for the comparison of maternal sensitive response and child cooperativeness, on its affective and cognitive aspects, and totals.*

	Statistics by group			*T* Test For means				Equality 95% CI.	For the diff.
	Group	Mean	SD	*T*	fd.	Sig.(bil)	Diff. means	St.error of diff.	Inf	Sup
Affec. Sens.	Single-m	4.80	1.30	-.15	78	.879	-.050	.328	-.702	.602
	Nuclear	4.85	1.61							
Cog. Sens.	Single-m	1.80	1.34	-2.34	78	.022	-.750	.321	-1.38	-.112
	Nuclear	2.55	1.51							
Tot. Sens.	Single-m	6.60	2.03	-1.53	78	.129	-.800	.521	-1.83	.237
	Nuclear	7.40	2.59							
Affect. Coop.	Single-m	4.38	1.53	1.63	78	.106	.600	.367	-.131	1.33
	Nuclear	3.78	1.74							
Cogn. coop.	Single-m	2.08	1.34	-2.28	78	.025	-.775	.340	-1.45	-.099
	Nuclear	2.85	1.67							
Tot. Coop.	Single-m	6.45	2.56	-0.27	78	.783	-.175	.632	-1.43	1.08
	Nuclear	6.63	3.06							

An analysis of the linear regression was done in order to evaluate what sociodemographic variables predict maternal sensitivity and child cooperativeness in the total sample. The variables considered in the analysis were: the age of mothers and children, child's gender, educational level of the mother, number of adults at home and family constitution (nuclear or single-parent). The results show that the child's age is the best variable predicting the total maternal sensitivity, explaining a 12.5% of the variance, so, the older the child is, the mother shows more sensitivity. In relation to total child cooperativeness, the child's age with family constitution are the variables that better predict

it, explaining together an 11.5% of the variance. This indicates that the older the child is, together with belonging to a nuclear family, the higher is the total child cooperativeness.

Discussion

It is important to highlight about the findings in the study, the confirmation of the theoretical statements, in relation to the sensitive response as a dyadic construct, where the child and his mother influence each other and build a particular interaction that includes the characteristics of both of them (Crittenden, 2005; Hedenbro, 2002). This can be seen, especially, in the complementary scores obtained on adult sensitivity and child cooperativeness, where, as the mother's sensitive response grows, it also grows the child's cooperativeness.

Similar tendencies can be seen on the predominant describers, on the mothers of the groups studied, both showing a predominance of "sensitivity", mainly on the affective aspects, and "unresponsiveness" as a secondary describer. The means on the "controller" and "unresponsive" describers are higher on the mothers of the single-parent families, but the difference is not significant. Complementary to this, the children in both groups show a predominance of "cooperativeness", mainly on the affective aspects of the interaction, followed by the "ambivalent" integrated describer.

Agreeing with the hypotheses stated and the studies associating single-parenting with lower quality of mother-child interaction (Casady, Diener, Isabella & Wright, 2001), the results in this variable show higher scores on the dyads of nuclear families, appearing as significant differences on the means obtained on maternal sensitivity, on the cognitive aspects of the interaction. Also, significantly higher scores were seen on the cognitive aspect of child cooperativeness on children of nuclear families, which could be associated to the specific contribution of the father's presence, promoting higher emphasis on playing and the exploration of the world, which could have an effect on the increase of the quality of the interaction on the cognitive aspects.

On the other hand, the fact that the mothers of nuclear families show “unresponsive” as a predominant second describer, shows that when mothers of both groups don’t get an adequate sensitive response with the children, their difficulties are focused on errors recognizing and responding adequately to the child’s signals, by probably being focused on their own experiences and perspective than in the conduct and general state of the child. This type of interaction gives little information to the child, making it difficult for him to get organized on the interaction by not knowing what to expect, or sometimes, it implies disagreement between the happy interaction the adult shows and the child appearing sad. These elements could guide to which would be the necessary intervention.

Even though the difference between the groups on maternal sensitivity is not significant, the scores show different categories in the Sensitivity Scale (Crittenden, 2006). The dyads of nuclear families show a mean that places them in the “adequate” category, which indicates an inconstant sensitivity, but it doesn’t require some type of intervention. The dyads of single-parent families have means on total sensitivity, which place them in the rank considered “inept-inadequate”, showing difficulties to read the child’s signals, to adequately recognize his point of view and to respond in a fast manner, requiring some type of intervention.

On specific terms, the sensitivity of mothers of nuclear families is greater on the cognitive aspects, just like with children’s cooperativeness of this group, so, the strength of dyads of nuclear families over the ones of single-parent families is in the capacity to create turns, which allow the alternating participation of both parents, the ability to share the control in relation to the task, and to select an activity in the game according to the stage of development where the child is. This difference could be explained by the investigations showing a relation between an adequate quality of the father-child interaction and greater cognitive abilities (Fagan & Iglesias, 1999). Studies are necessary to measure, as well, the quality of this dyad’s interaction in order to confirm or refute this hypothesis.

The results are particularly relevant, due to being a vulnerable population and to the predictive value of the adequate sensitive response of the caregiver in relation to the subsequent quality of child attachment (Coppola, Vaughn, Cassibba, Constantini, 2006; Friedman & Boyle, 2008; Isabella, 1993; Kivijarvi, Raiha, Virtanen, Lertola, Piha, 2004; Landry, Smith, Swank & Miller-Loncar, 2000; Smith & Pederson, 1988; van Ijzendoorn & Wolf, 1997; Ward & Carlson, 1995), of his cognitive (Landry *et al*., 2000), emotional and social development (Landry *et al*., 2000; Kivijarvi, Raiha, Virtanen, Lertola, Piha, 2004).

Some of the limitations to be considered in this study and its findings, is the lack of control of other variables that could be relevant in the mother-child interaction quality, and the lack of homogeneity between the dyads of both groups.

It would be relevant in future investigations to study other significant adults for the child who are present in single-parent families, evaluating if other members of the family, like grandparents or uncles could also contribute to better the quality of the interactions the child develops, and this way enrich, as well, his integral development.

This way, new studies, ideally longitudinal, with larger samples are necessary, which should consider the various forms of creating a family, to deepen these findings.

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Maternal stress and family constitution: Comparative study on Chilean, single-parent and nuclear, low-income families

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Abstract

Studies on maternal stress during child raising have taken into consideration contextual variables to explain it. The socioeconomic level, as well as the family constitution, have been relevant variables, associating single-parenting in low-income families with greater levels of maternal stress. The study is about maternal stress levels in Chilean, nuclear and single- parent, low-income families, considering stress in various dimensions, associated to the maternal role, to the mother-child interaction and the mother's perception of the child as being difficult. 169 Dyads were studied, 80 of them of single-mother families and the other 89 of nuclear families, with children between the ages of 4 to 15 months. Maternal stress levels were measured with the Parental Stress Index, abridged version, developed by R. Abidin (1995). The results show significantly higher stress levels in mothers of single-parent families on stress associated to the maternal role, to the perception of a difficult child, and to total stress.

Key words: maternal stress – single-parent family – nuclear family.

Background

Family constitution, poverty and early childhood.

In families with both parents or biparental nuclear families, is still the most frequent way for children be born and raised in Latin America, and within the continent, in Chile (Arriagada, 2004; Cerrutti & Binstock, 2009). Nevertheless, there is an increase of single-parent families, being Latin America a representative of this tendency. Our continent shows an increase of single-parent homes with a woman in charge of it, as well as high levels of poverty in this group (Arriagada, 2004; Cerrutti & Binstock, 2009). In Chile, a 7.3% of the homes total are single-parent with the mother in charge, and 9% of these homes belong to the poorest in the country. This group presents, as well, a greater number of children in pre-school years, than homes with this family constitution, but with greater income (Arriagada & Aranda, 2004), being a growing group, which needs to be studied in a deeper way.

Several authors mention the influence of the context on the interaction quality between mothers and young children (Belsky, 1984; Bowlby, 1969; Coppola, Vaughn, Cassiba & Constantini, 2006; Pelchat, Bisson, Bois & Saucier, 2003; Stern, 1997), mentioning that the family income, the educational level, belonging to single-parent families, and the presence or absence of a support social network can affect the bonding quality, the child's development and the mother's general condition. On the other hand, the birth of a child in low-income, single-parent families represents greater vulnerability for the dyad on child-raising chores, due to a greater exposition to stressors that could negatively affect the attention to the basic needs of early childhood.

Some studies show that parents' stress has an impact on the quality of the mother-child interaction (Pelchat et al., 2003), negatively influencing the mother's capacity to adapt to the child, of accepting his peculiarities, to feel competent doing her work, and adequately responding to his signals and needs.

The high level of stress observed in mothers of low-income, single-parent families (Cooper, McLanahan, Meadows & Brooks-Gunn, 2009; Landero & González, 2006), hinders an adequate exercise of the parental role and obtaining a satisfying quality of life, and as studies show, a greater symptomatology of maternal depression and a lower educational level of this group (Bastos, Casaca, Nunes & Pereirinha, 2009; Lara-Cinisomo, Griffin & Daugherty, 2009). When we consider the effects of the variables described on the mothers and their young children, some studies show a negative effect on the psychomotor and emotional development, an increase in children's psychopathology and a deficit on the bonding quality with the mother, who will act as a reference in future relations (Abidin, Jenkins & McGaughey, 1992; Figueredo, Costa, Pacheco & Pais, 2009; Kazdin, Mazurick & Bass, 1993; Moran, Pederson, Pettit & Krupka, 1992; Murray, Sinclair, Cooper, Ducournau & Turner, 1999; Rodríguez, 2006; Stern, 1997).

In terms of the mother-child bonding quality, some studies show that child-rearing in a single-parent home negatively affects the mother's capacity to sensitively respond to the signals and needs of her young children (Casady, Diener, Isabella & Wright, 2001). Complementary to this, studies reviewing the importance of the partner's role in raising the children, show a positive relation between the support given by the father to the mother and the response capacity to the children's signals (Hyunjeong, Young-Joo, Mi Ja, 2006; Valenzuela, 1997).

Maternal stress

Stress can be defined as the lack of equilibrium between the demands of the external environment and the perceived inner ability to respond to such demands. Considering the stress of the caregiver on children, it is important to identify the factors that promote it. Several authors have proposed variables that could fit this function, including the child's characteristics (for ex., age, gender and conduct), the caregiver's characteristics (for ex.,

age, marital status and satisfaction, and confronting style), and family or social characteristics (for ex., social support, employment, socioeconomic status) (Bourke et al., 2008).

It has been said that stress in the parental system during the first three years of the child's life is especially critical for his emotional and behavioral development, as well as for the development of the relationship with his parents. The child and his parents' characteristics, the family context and the stressful life events, are some of the family system facets, which have been identified as important (Abidin, 1995; Sheeber & Johnson, 1992).

The number and intensity of available resources to deal with these aspects determines that a parental dysfunction will take place or not. The children who are exposed to these conditions, generally, develop behavioral and emotional problems (Abidin, 1995). Several studies report that high levels of parental stress are associated to dysfunctional parental conducts and negative interactions between parents and children. High parental stress is associated, as well, with deviations on the child's development and the presence of psychopathological diagnosis (Abidin et al., 1992; Kazdin, Mazurick & Bass, 1993; Moran, Pederson, Pettit & Krupka, 1992).

Also, investigators who have studied mothers, have found that high stressor associated to the child are related to the perception of a diminishing social support, as well as depression symptoms, anxiety and hostility. On the other hand, mothers whose sense of competence and attachment to her children has been hurt, experience greater psychological stress (Kazdin, 1990; Quittner, Jackson & Glueckauf, 1990).

Maternity in vulnerable social contexts

A study done by Emerson, Hatton, Llewellyn, Blacker and Graham (2006), showed that socioeconomic disadvantages are associated to a lower well being of mothers who have children with intellectual problems.

Low-income families have less financial resources to take care of their children's needs than parents from higher income levels, which makes it difficult for them to have access to adequate social and material resources. Some of the identified repercussions are poor nutrition, less access to health-care, a low-quality house and neighborhood, and a lack of materials and cognitively stimulating experiences, necessary for school achievement (Lipman & Boyle, 2008). The socioeconomic position does not predict mental health, but, belonging to a low-income family implies, with greater chances, an unfavorable family environment, adverse parental conduct and life stressors with family mental health repercussions (Grant et al., 2006).

The mother's financial difficulties limit her probabilities of giving an adequate nutrition and health-care to her children, affecting her emotional state and perception of self-effectiveness in relation to her maternal competence (Khawaja, Barazi & Linos, 2007).

A study done in Chile by Farkas and Valdés (2010), with 121 low-income mothers in high psychosocial risk, whose children were between 4 and 9 months old, showed that family characteristics, especially the number of people living at home, per capita income and the mother's age, were more relevant to explain maternal stress than the child's characteristics.

Using the previously mentioned information, they looked to determine in low-income families with young children, if the single-parent or nuclear family constitution, is a variable that explains differences on maternal stress. They tried to evaluate, as well, the existence of differential relations between the sociodemographic variables studied (child's age, number of persons at home, brothers presence, mother's age, her educational level and time she spends out of home) and maternal stress in each group.

Higher stress means are expected on mothers belonging to the single-parent family group than on mothers of nuclear families, considering that previous studies associate raising young children without the father's support, to a greater load and amount of stress on the mother. On the specific dimensions of the evaluated maternal stress, greater differences are expected on maternal stress associated to the mothers' personal characteristics among the groups of the study.

It is also expected that the single-parent constitution will become a good predictor of maternal stress in the total group, but, inside each group the sociodemographic variables acting as stress predictors, will do it in a different way for the mothers of single-parent families than the ones from nuclear families.

Method

Design

A comparative, transversal, non-experimental study was done. Comparative, because two groups were compared, single-parent and nuclear families, and transversal because time is measured only once. The independent variable studied was the family constitution, as well as the sociodemographic variables, and the dependent variable was maternal stress associated to the role.

Participants

A total of 169 mother-child dyads participated, from the poorest two quintiles of the Chilean population. 80 Belonging to single-parent families and 89 to nuclear families. In both groups families reside in Santiago, Chile, in the municipalities of La Florida, La Granja, La Pintana, Lo Prado, Macul, Pudahuel, Renca, San Ramón, Puente Alto or Recoleta. In terms of the children, the single-parent group had 48,8% girls and 51,2% boys, whose ages went from 4 to 15 months with a mean of 10,24 (SD = 2.95). The nuclear families' group had

42.7% girls and 57,3% boys, and their ages went from 4 to 9 months with a mean of 7 months (SD = 1.16). The mothers of the single-parent families had an age mean of 25.06 years, in a range of 15 to 43 (SD = 7.37), and in the nuclear families group the mothers' age mean was 27.31 years, in a range of 16 to 41 (SD = 5.79). The inclusion criteria considered for the study were, to reside in one of the municipalities mentioned before, to belong to the two lowest-earning quintiles, to be part of a single-parent or nuclear family, with a child between 4 and 15 months old. The exclusion criteria used were that one of the members of the dyad had a diagnosed physical or psychiatric pathology. The mothers voluntarily accepted to participate in the study, after signing an informed consent letter.

Instrument

Richard Abidin (1995) developed the Parental Stress Index (PSI) used. This questionnaire evaluates the mother's stress in relation to her role, and it can be applied since the baby is one month old. The abridged form (PSI-SF), used in this study, has 36 items and gives scores in 3 subscales: "Parental stress" (PD) which refers to the stress perceived by the mother in relation to her personal characteristics associated to maternity, "parents-children dysfunctional interaction" (P-CDI), which covers the stress perceived by the mother on the interaction with her child, and "difficult child" (DC), which refers to the stress generated on the mother by the child's characteristics. It also gives a total score, and has norms on percentiles.

The abridged version has studies on reliability and validity. The reliability was studied in an 800 case sample, with test-retest studies (indicators from .68 to .85) and internal reliability (indicators from .80 to .91) (Abidin, 1995). Roggman, Moe, Hart y Forthun (1994), reported a reliability that oscillated between .78 and .90 in a sample of 103 parents. Its concurring validity was established with the complete PSI version, having correlations between .73 and .95 (Abidin, 1995).

Procedure

The families were contacted and invited to participate through the institutions they normally attend, and the evaluations were done at day nurseries and health centers. Initially, the mothers were asked to sign an informed consent letter, and to answer a form to gather sociodemographic information evaluated in the study. The compliance was also checked with the stated inclusion criteria, and finally, the PSI-SF was given to them, individually.

Results analysis

Before doing the data statistical analysis, the presence of atypical values was evaluated and the compliance of the assumptions of the statistical tests was done. The significance criteria used was $\alpha = 0.05$. A descriptive analysis of the sociodemographic information and maternal stress in all of its areas was done, the *t* test for independent samples was applied, in order to compare the sociodemographic variables and the stress level among the groups. Then, correlational analysis among the studied variables and the sociodemographic variables was done, in order to determine the existence of an association between them. Finally, a linear regression analysis was done, to evaluate what variables predict maternal stress in the total sample, and separately, inside the single-parent and nuclear family groups, using the variables selection method, *stepwise*.

Results

Descriptive statistics

In relation to the sociodemographic information of the study groups, it is possible to observe significant differences on the ages, being older the mothers belonging to the nuclear

families group (t = -2.21 ; p < .05), and older, as well, the children of the single-parent families (t = 9.19; p < .05).

Furthermore, there are significant differences in the number of children, with a greater number in the nuclear families (t = -4.03; p < .05), and in the number of persons making-up a home, with a greater number in the single-parent families (t = -1.99; p < .05), and a greater educational level among the mothers of nuclear families (t = 3.13; p < .05) (see Table 1).

Table 1 *Distribution by Frequency and Mean of the studied sociodemographic variables in nuclear and single-parent families.*

	Nuclear Fam. N=89		Single parent Fam. n=80	
Variables	**Frec**	**%**	**Frec**	**%**
Brothers				
None	18	20.2%	39	48.8%
1 or more	71	79.8.%	41	51.3%
Ner persons at home				
2 a 3	9	10.1%	11	13.8%
4 a 6	67	75.3%	41	51.3%
7 a 9	10	11.2%	22	27.5%
10 o +	3	3.4%	6	7.5%
Ner years mother's education				
<8 years	2	2.2%	7	8.8%
8 to 11 years	39	43.8%	25	31.3%
12 years	33	37.0%	43	53.8%
>12 years	15	16.8%	5	6.3%
Time mother at home				
≥ half day	35	39.5%	54	67.5%
< half day	54	60.7%	26	32.5%

Descriptive analysis of the maternal stress levels in the total sample

The results of the maternal stress measure in the total sample show means located within the adequate range in all areas. The "parental stress" mean was 31.41 (SD = 10.27) (adequate in the upper limit, close to high stress); the mean in "dysfunctional interaction" was 18.45 (SD = 6.32) (adequate); the mean for "difficult child" was 21.84 (SD = 7.03) (adequate in the lower limit, close to low stress). Finally, the "total stress" mean was 71.50 (SD = 18.56), considered adequate.

Comparative analysis of the maternal stress levels in nuclear and single-parent families

Mothers of single-parent families had significantly higher scores than mothers of nuclear families on the "parental stress" area (t = 2.543; p < 0.05), being a medium the effect size of the difference evaluated with Cohen d (d = 0.390). Also, they receive significantly higher scores in the "difficult child" area and in total stress (t = 2.089; p < 0.05 and t = 2.102; p < 0.05, respectively), being, in both cases, a medium the effect size of the difference evaluated with Cohen d (d=0.321 and d=0.322, respectively). There are no significant differences, on the other hand, among the groups in the "dysfunctional interaction" area (see Table 2).

Table 2. *Mean, SD and typical error in nuclear and single-parent families.*

	Nuclear Fam. n=89			Single-parent Fam. n=80		
PSI	**Mean**	**SD**	**Std. Error of the mean**	**Mean**	**SD**	**Std. Error of the mean**
Maternal stress	29.54	59.46	1.00	33.50	10.77	1.20
Dysfunctional interaction	18.49	5.73	0.60	18.40	6.95	0.77
Difficult child	20.78	6.14	0.65	23.03	7.76	0.86
Total stress	68.69	17.36	1.84	74.64	19.45	2.17

Correlational analysis between sociodemographic variables and maternal stress

The analysis shows in both groups a negative correlation between the mother's stress and her years of formal education, indicating that the higher the educational level, the lower is her total stress level. The mother's age, on the other hand, does not appear as a relevant variable.

The age of the child also appears as a relevant variable in both groups, showing that the older the child is, the mother perceives him as more "difficult". The existence of brothers shows, as well, a positive correlation with maternal stress and total stress in both groups, but, with higher scores on the mothers of single-parent families. The number of persons at home shows a positive correlation with total stress and interaction, but, only on mothers of nuclear families (see Tables 3 and 4).

Table 3. *Correlations between stress and sociodemographic variables in single-parent families.*

	Maternal stress	Disfunc. interact.	Difficult child	Total stress
Brothers	.344**	.114	.301**	.363**
Maternal Education	-.338**	-.241*	-.189	-.357**
Child's age	-.089	.144	.248*	.094
Mother's age	.108	.111	.164	.166
Ner of persons	.028	.162	.140	.138

** The correlation is significant at level 0.05 (bilateral). ** The correlation is significant at level 0.01 (bilateral).*

Table 4. *Correlations between stress and sociodemographic variables in nuclear families.*

	Maternal stress	Disfunc. interact.	Difficult child	Total stress
Brothers	.228*	.088	.169	.210*
Matternal Education	-.195	-.211**	-.270*	-.265*
Child's age	.006	.032	.242*	.122
Mother's age	-.086	-.062	-.037	-.067
Ner of persons	.153	.226*	.193	.226*

** The correlation is significant at level 0.05 (bilateral). ** The correlation is significant at level 0.01 (bilateral).*

Linear regression analysis in the total sample

Linear regression analysis was done to evaluate how much the sociodemographic variables predict maternal stress in its various dimensions in the total sample. The analysis shows that the model that better predicts "maternal stress" includes the variables, the mother's years of education, brothers' presence and family constitution, both explaining a 15.8% of the variance. This means that, less years of mother's schooling, having more than one child, and belonging to a single-parent family is associated to a higher level of maternal stress. In terms of the "dysfunctional interaction", the predictive model only includes the variable of the mother's formal education years, which explains the 4.4% of the variance, associating a higher maternal educational level to a lesser dysfunctional interaction.

The selected variables that better predict maternal perception of the child as being "difficult", are the child's age, the presence of brothers and the number of years of the

mother's formal education, explaining together the 14.3% of the variance. In other words, the older the child is, with brothers being present and the lower is the mother's educational level, the greater is the mother's perception of the child as being "difficult".

In relation to "total stress", the variables that better predict it are the years of the mother's formal education, the presence of the child's brothers and the family constitution, explaining together the 15.3% of the variance, which is, the maternal lower educational level, the presence of brothers and belonging to a single-parent family are associated to a greater total stress level on the mother.

When the predictors are analyzed per group, it's possible to see differences among them: the presence of brothers and the maternal educational level predict together the 17.5% of the total stress in single-parent families, whereas, in nuclear families, the maternal educational level and the number of persons living at home are the best predictors of the total maternal stress, explaining a 10.2% of the variance.

Discussion

The first result that stands out in the study is the adequate maternal stress level in the total sample, indicating that in spite of being groups formed by low-income persons, their stress levels associated to maternity would not complicate their parental performance. In spite of this, the total scoring of the mothers of both groups in the "parental stress" area is in the adequate range, but in the upper limit, in the 83 percentile, which means that the most affected aspect in the mothers of the study is the perception they have of themselves in their maternal role, over the perception of difficulties with the child or in the interaction.

Agreeing with the investigations reviewed (Cooper et al., 2009; Landero & González, 2006), the stress levels observed in the mothers of the study are higher among those belonging to single-parent families, taking place in the areas of "parental stress", "difficult child" and "total stress". This difference is not seen in "dysfunctional interaction", where the

mothers of both groups have similar means, which show “adequate” stress levels of the interaction in both groups (percentile 45).

High means in the “parental stress” area stand-out, associated to the mother’s perception of her maternal role, where the mean obtained by the group belonging to single-parent families (M = 33.50, SD = 10.77) is located in the percentile 85, indicating a high stress. The mean score obtained by the mothers of nuclear families on “parental stress” (M = 29.54, SD = 9.46), places them in the percentile 70, showing an adequate stress level. These results confirm that the support of the other member of the couple is an important contextual backing that can be of great help with the mother’s rearing chores.

Among the sociodemographic variables studied, the maternal educational level is a good predictor in both groups, just like the presence of siblings, associating a greater maternal educational level to lower stress, and the presence of siblings to greater stress. When the predictors inside each group are considered, the educational level continues to be a relevant variable to explain maternal stress, but in nuclear families the number of persons who are in a family group is added as a predictor to explain total stress and stress in the interaction, which does not appear in single-parent families. Probably, living with a greater number of people, in the case of single-parent families, can be experienced as a network of financial and affective support in raising young children, which is not associated to greater maternal stress, but in the case of mothers of nuclear families, sharing a home with an extended family could create a stressful living situation.

The presence of siblings, is also a variable acting differently as a predictor in the groups, being associated to greater stress in single-parent families, but, not in the nuclear ones. Probably, raising more than one child overloads the mother who does not have the support of a partner, since it implies greater responsibilities and work, but, for a mother in a nuclear family, having more than one child can be experienced as the consolidation of the

family and not as an additional load, therefore, not becoming an experience associated to greater stress.

Summarizing, in relation to the study, it's important to underline that the family constitution is a relevant variable, with a distinguishable effect on maternal stress in low-income groups, as mothers of single-parent families have higher stress levels. Besides, it was possible to notice that some sociodemographic variables act in a differential manner according to the family constitution. A high number of people who make-up a home can act as a stressor for mothers of nuclear families but, maybe, as a support factor to a single-parent family, just like the presence of more than one child can be associated to higher stress for mothers of single-parent families, but not to those who are part of nuclear families.

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Early assistance to day nurseries and patterns of child attachment: A review

M. Olhaberry & M.P. Santelices

Abstract

This paper reflects on the influence of alternative care in the mother-child attachment. The findings of the research being studied are controversial, since they do not establish that the children receive a specific influence by their attendance to child-care centers in their first year of life. Studies from 1978 to 2008 on early alternative care and their effect on infant attachment patterns were reviewed, as well as studies referred mainly to out-of-home care in specialized centers.

The definition of alternative care, the importance of adherence and the role of caregivers as a secure base are developed. Studies that focus on the amount of time in which children are cared by someone other than the mother, the quality of care and the variables associated with the family and social context are reviewed. This allows a more comprehensive and complex view of the effect of alternative care in the development of infant attachment patterns. Various findings are discussed and those of consistency that could contribute to understanding the discussion of the effect of child-care centers and their relation to patterns of infant attachment are highlighted.

Keywords: alternative care, child attachment, child-care centers.

Introduction

Modern life and the increasing incorporation of women into the labor force have promoted many children to attend daily and early alternative care provided by adults other than the mother. The study of the effects of this alternative care on children has been done for a long time, and it has become of great importance due to the higher numbers of children attending child-care centers nowadays while their mothers go to work. Friedman & Boyle, (2008), define alternative care as all the various routines of daily care done by adults other than the mother, which includes the father, grandparents, nannies, other members of the family and staff from child-care centers.

In Chile, the main reason for small children to attend day nurseries has been, often, the need of the mother and/or the family group to go to work. On the other hand, as more day-care centers for children younger than three years old were available in Chile, looking to increase the opportunities on integral development for low-income children, and the information showing the protecting value of the safe attachment benefit between children and their parents, it becomes necessary to review the present studies related to the consequences of institutional care on the attachment patterns children develop.

To have the option of alternative care as day nurseries and child-care centers could be favorable to mothers and families who live under high levels of psychosocial stress, a betterment of the bonding with their children from experiencing greater support. From this approach, Crittenden's proposals, (1985), could support this idea, by stating the existence of a positive relationship between adequate support systems for the mother and a lesser mistreatment and negligence frequency towards their children, which makes it possible to acknowledge the care centers as a network of family support.

On the other hand, recent studies done by Green, Ferrer & McAllister, (2007), show that parents who can count on greater support systems improve the interactions with their children, which can be greatly observed in parents with an anxious attachment pattern, and

not in parents with an avoidant pattern. This allows the conclusion that, probably, the support given by child-care centers could have different effects depending on the attachment style of their parents. In this context, this article intends to review the effects of alternative child-care on child attachment.

Child attachment styles and implications on its development

John Bowlby develops the Attachment Theory, as a way of explaining human affective development. He states that the need to establish stable bonds with the progenitors (or substitutes) is a basic need, not learned, intrinsic to the human species (Bowlby, 1958). This tendency to develop strong affective bonds is expressed in conducts initially developed during childhood, and later, during adulthood, in order to obtain proximity with the attachment figures, identified as better able to confront the world, during moments of anxiety, fear or stress (Bowlby, 1969, 1980, 1995, 1997). Based on these assumptions, several authors state that attachment security developed between the child and his progenitors would be a protecting factor during child development, just like attachment insecurity would be a risk factor (Greenberg, 1999).

Child attachment patterns, as defined by Mary Ainsworth, initiated by the strange situation procedure, are the safe, ambivalent anxious and avoidant patterns (Ainsworth, Blehar, Waters & Wall, 1978).

Children with secure attachment are able to explore their environment by perceiving their mother as a secure base. They resent separating from the mother and look to be consoled in the reencounter.

The children with ambivalent anxious attachment respond with intense anguish to a separation, alternating conducts of attachment with anger and resistance when the reencounter takes place. They don’t trust the protecting and timely response of the caregiver,

since their experience is of an inconsistent caregiver, which makes it difficult for them to have a clear expectation of the caregiver's conduct. They show difficulties in adequately regulating their emotions, having the tendency to amplify them.

Children with avoidant attachment appear to be very independent to separations and experiences of threat, avoiding closeness. They freely explore their environment without resorting to their mother when difficulty, stress, or fear arises. They reject the mother's contact when they meet again, or show little interest on her. They over-regulate their emotions, showing indifference and calmness, in spite of experiencing tension.

A fourth attachment pattern developed by Main & Salomon in 1986 (quoted by Marrone, 2001), is the disorganized attachment pattern. It was developed afterwards, looking to classify those children who didn't fit the other three patterns already described by Ainsworth. They show characteristics of the safe, ambivalent anxious and avoidant patterns, but in an alternating manner. They act in a confusing way, sending contradictory messages, complicating the interpretation of their behavior.

In relation to what is the effect on children's mental health, safe attachment patterns allow the prediction of a child with a healthy development, positive self-esteem, integrated identity, school success and a greater capacity to face stressful situations (Fonagy, 1999). It is also seen in children with safe attachment, a greater emotional resistance, higher self-confidence, adequate social development, a greater empathic repertoire and abilities to establish deeper interpersonal relationships (Waters, Wippman & Sroufe, 1979; Sroufe, Egeland & Kreutzer, 1990), becoming safe attachment a protecting element on children's development and a promoter of children's mental health.

The various studies on alternative care have focused, mainly, on the three patterns defined by Ainsworth, and they have, chiefly, used the strange situation as an evaluating measure of child attachment. The usage of this procedure in the evaluation of children attending care centers has been criticized, since getting used to daily long separations might

not be enough to activate the attachment system. Friedman & Boyle, (2008), state that the strange situation would be a good procedure to evaluate attachment on children with a large alternative care number of daily hours. They base their statement on studies done on children in kibbutz with 50 weekly hours of alternative care, which showed high levels of stress from the separation from their mothers, and high activation of the attachment system, disproving the idea that children get used to frequent and long separations.

Alternative care

The debate about the effects of the various types of alternative care received by children during their first year of development, on the attachment relationship with their mother, has a long history with important discrepancies.

Various studies done on alternative care and their association to children's attachment styles have focused on different aspects. Some have placed their attention on the number of hours and the place where the caring takes occurs; others, on the quality of the care received, on the age when the care is initiated, and the most recent ones consider multiple variables, besides the attachment and the care given by someone other than the mother to explain the mother-child bond.

Initially, from the studies done by Belsky & Steinberg (1978), it was stated that small children attending high quality care-centers would not receive a negative effect on their intellectual development, would not interfere the emotional bond with their mother, and it would increase the level of positive or negative interaction with their peers.

These results reinforced the idea of how enriching was for a child to attend a day nursery and a day-care center, as positive places where they could learn new skills when the home context didn't promote them, and to contribute to the development of social skills by sharing with their peers.

Later, in 1988, Belsky did new studies, finding that when children attend care-centers before they are one year-old, it creates in the child a socio-emotional vulnerability that could predispose him to the development of an insecure attachment pattern towards the mother, contradicting the findings of his earlier study. These studies reflect historical controversies on alternative care, which present studies look to clarify.

The importance of extended hours on alternative care

In relation to the weekly number of hours on alternative care, studies done by Schwartz, (1983), on children who attended day-care centers full-time before becoming nine-months old, he observed a greater frequency of avoidant conduct at the final stage of the strange situation, than on children attending part-time. Later on, the meta-analysis done by Belsky & Rovine in 1988 confirmed Schwartz' findings that a great time extension (20 hours or more) of alternative care for children before they become one year-old becomes a risk factor, promoting the development of unsafe attachment, mainly, avoidant, which doesn't happen when the child attends less than 20 hours a week. The opposite of these findings are the results obtained by Belsky & Braungart (1991), who only evaluated children with avoidant attachment and weeks of 20 hours or less and more than 20 hours, finding that the long week was associated to crying and more intense protesting on the part of the children and not due to over-regulation of their emotions because of separation, as it would be expected according to the avoidant attachment pattern. Besides, these studies show that the alternative care that appeared to hurt the most the formation of a safe bond with the mother, apart from the ones that implied a greater number of hours, were the ones taking place outside of their home at care centers. When children who showed safe attachment and a schedule greater than 20 weekly hours were analyzed, other variables become important, such as the mother's sensitivity, her marital satisfaction, both parents being present, the mother's perception of the child and the attachment style developed by the child with the

father. This supports the idea that a high number of hours of alternative care received by the children during their first year of life could become a risk factor, promoting the development of unsafe attachment, which could, or not, develop according to the family variables mentioned before.

With studies done by Barglow, Vaughn & Monitor, (1987), evaluating the effect of alternative care before children being one year-old, done at home, on the children's attachment pattern, the findings are similar, which is, when the mother is absent from home for the whole working day, it becomes a risk factor, promoting the development of insecure attachment on children, yet, it doesn't happen when the mother is absent for only half a day.

Later studies done by Hoffman (1989), contradict these findings and show a weak relation between alternative care during the first year of age and the attachment style developed by the child, explaining the attachment insecurity from family variables more than the fact of being cared by people outside the family group. Roggman et al (1994), criticized the meta-analysis done by Belsky & Rovine, arguing that they didn't include in their analysis unpublished studies that didn't find a relation between a greater time of alternative care and insecure attachments. They look to test, again, the importance of the number of hours of alternative care received by children in a week, studying three groups, total time, partial (between 10 to 20 hours) and without alternative care. They found that the children who had insecure attachment, in a greater proportion attended in a part-time schedule. These results could be explained by the greater tension and anxiety of their mothers who must comply, simultaneously, with maternal and professional roles. These results make us reflect about the weight of the mothers' bonding style, their relationship with work and the representations around the attendance to a day nursery or child-care center as influential variables in the type of interaction with the children and the subsequent attachment pattern they develop.

The importance of the moment when alternative care begins

The studies done by Vaughn, Gove & Egeland (1980), analyze the importance of the moment when the children begin their attendance to care centers and the effect in the attachment pattern towards the mother in families of low socio-economic level. They found that the children who receive alternative care in specialized centers before becoming one year-old show, in greater proportion, ambivalent anxious attachment towards their mother, than the children who start attending after they are one year-old, or when they are cared by their mothers. These findings show that children may not harm their development and bonding quality with their mother if the attendance to a care center takes place after they are one year-old, probably, since the child has better affective and cognitive resources to understand the experience, and greater daily interaction time to spend with his mother, which allows him a greater clarity about what to expect from her in terms of her availability as a secure and trustful base. On the other hand, they only included low-income families, where it might be necessary to consider other contextual variables that could influence the results beyond the attendance starting age, such as the family configuration, the mother's depression, the mother's sensitivity and the parents educational level, which are influential variables in the mother-child bonding quality.

The importance of the quality of alternative care centers

Another relevant aspect in terms of the impact of alternative care on children, is the quality of the care they receive, where it could be considered the number of children an adult is in charge of, the training and preparation the professionals have, the care center's infrastructure, as well as the mental health and work stability of the caregivers. In relation to this, the longitudinal studies done by Andersson (1989, 1992), standout. He did them in Sweden, where he discovered that the children who received alternative care during their first year of age are evaluated by their teachers during their school years (when they are 8 and 13 years-old) as more socially, emotionally and cognitively competent than the children

only cared by their mothers. On the other hand, he also found that the fact that children attend a care center during their first year of age could mitigate their low socioeconomic level in the development of the abilities mentioned before for the 8 and 13 year-olds. These results don't agree with Belsky's findings, being possible that cultural and public policies variables could explain the differences between the US and Swedish populations, due to the high quality of Swedish centers. Howe's' studies (1990), also signal in this direction, that the best predictor of children's later adaptation is the care center's quality they attended during their first year of age.

Still, children who show insecure attachment not always have emotional problems during their pre-school years, probably, since in some instances the small children's attendance to a day nursery could lighten-up some of the mother's responsibilities on her child's care, positively influencing her emotional state, her ability to respond with sensitivity, bettering the quality of her bond. Egeland y Hiester's studies (1995), support this idea, finding that the children who are cared by their parents, who show secure attachment at 12 months of age, also show an adequate emotional adaptation during the pre-school stage, and the ones who show insecure attachment don't, but in the case of children who received alternative care this relation is not present, finding that the children have insecure attachment and good subsequent adaptation. In terms of the effect of attending a care center, this was negative for the children with secure attachment and positive for the children with insecure attachment, in relation to the socio-emotional adaptation when they are 3 ½ years old. This makes us wonder if the subsequent school adaptation is a good measure of the bonding quality between parents and children, or if it could also be found in children who over regulate their emotions and, probably, show avoidant insecure attachments. Another reading could be that in spite of having insecure attachments, the positive effect of care centers positively influences their subsequent school adaptation, even though the attachment pattern with their mother doesn't change.

Differences on types of alternative care

Studies done by Sage et al (2002), show that children who attend care centers during their first year of age develop, with greater probabilities, insecure attachments towards their mother when they become one year-old, than the ones cared by their mother, by a paid individual, a non-relative, or by another relative. They also observed that the majority of children developed ambivalent insecure attachments, and only a few had avoidant attachments, being these findings consistent with the previous studies done by Scher & Mayseles (2000) y van Ijzendorm & Sagi (1999).

The studies done by Love et al (2003), show that the centers' quality is the best predictor about the type of attachment the children might develop with their mother, having this quality, as well, a moderating effect over the time children receive alternative care: the higher the quality, the lower the negative impact of time.

Within the variables considered on the influence of children attending care centers before they are one year-old, about the attachment style with the mother developed during that first year, maternal sensitivity has been evaluated as an important aspect (De Wolf & Van Ijzendoorn, 1997). Studies done by Avizier, Sagi-Schuartz & Koren-Karie 2003, question the relation between adequate maternal sensitivity and the child's secure attachment, since this association is observed only on children who have an individual caregiver, but the ones who attend care centers and share a caregiver, insecure attachments appear in the same proportion on children with sensitive as well as insensitive mothers. These findings question how good a predictor is the mother's sensitivity in relation to attachment security, and they suggest that sharing a caregiver at the care center could moderate the relationship with the mother. The metaanalysis developed by Wolf & van Ijzendorm, (1997)**,** shows a relation between maternal sensitivity and the attachment style developed by children, but it wouldn't be an exclusive condition. They explain this by saying that most studies are of middle-class families or a non-clinical population, where the relation between maternal sensitivity and

secure attachment in children is greater, but in low-income families the weight of contextual variables could interfere this relation, and it needs to be studied.

In order to understand these differences it's important to consider, as well, the quality of the bond between the child and his caregiver, and we could hypothesize that a positive relationship with the caregiver could compensate for the inadequate relationship with his mother, and this, improve his later adaptation during his pre-school stage. Supporting this, studies by Sagi (1990), done on children attending a kibbutz, show that the best predictor for the emotional development of these children is the attachment style established with his alternative caregiver.

Various studies have noticed the importance of alternative care's quality, stating that it is the aspect that has the greatest effect associated to later infantile development and to its attachment pattern, moderating the effect of the amount of time of this care (Sagi, 2002; Love et al, 2003). The methodological validity of Love, 2003, is backed by the fact that he studied 264 care centers in the U.S. and Israel, including centers of various qualities, and defining quality by how formal or informal the center was, and the existence or not of regulations for the care given.

The importance of considering multiple variables to explain the effect of alternative care on the development of children's attachment style

The initial studies on alternative care are questioned because they did not consider important variables on the mother-child attachment pattern that would go beyond time and quality, and for the restricted sample number. This promoted new studies to solve these limitations. Some of them are the National Institute of Child, Health and Human Development (NICHD) Study of Early Child Care and Youth Development (SECCYD) in the U.S. (Friedman y Boyle, 2008), where they considered the importance of evaluating other variables when measuring the effect of attending care centers, including the starting age, the

child's characteristics, the reasons for the mother's employment, the mother's satisfaction on her role, the couples' relationship, the social and family support networks, the mother's sensitivity, the mother's presence of depression, and the parents' educational level, among other factors, to take into consideration the various aspects affecting the attachment to the mother when receiving alternative care.

The NICHD's longitudinal study stands-out due to the great size of the sample (1000 children and their families), the long period of time for the evaluation (from birth through 15 years of age), and the great diversity of the sample (different types of alternative care, socioeconomic level, educational level, among others). These aspects of the study make the results more relevant, and the significant relations between the socioeconomic level showed, the mother's educational level, the mother's presence of depression, separation anxiety with the mother, and the presence of both parents at home, with the attachment style developed by the child. When doing logistic regressions, maternal sensitivity at 6 and 15 months is the only variable that allows predicting secure attachment at 15 months. They also found that maternal depression interacts with maternal sensitivity, and predicts insecure attachment in the child.

Maybe, the most surprising findings are the ones related to the effects of alternative care on the attachment pattern of the child, showing that the starting age on alternative care, the stability of the care, the type of care, and the quality of them, don't have an effect on the attachment developed by the child for the mother.

Discussion and conclusions

Even that the methodological support of the NICHD study is quite powerful, it makes us wonder if the 9% of the sample that attended care centers is enough to state that associated variables to extension, quality, and starting age would not have an effect on the attachment style of the child. It's difficult to think that the quality of the substitute caregiver

would not have an effect, whatsoever, on the attachment pattern of a child younger than 1 year-old who attends a day nursery on a full-time basis, since, probably, that child shares a great number of hours with the alternative caregiver. This could be explained, maybe, since the influence of this relationship could not be appreciated in the attachment pattern, but in other variables. If we think of the child and the caregiver as a dyad, influencing each other, probably, it would be necessary to study other more subtle variables present in the child's attachment pattern, in order to evaluate if the exchange with the substitute caregiver generates any positive or negative modification in the child's bonding style, which is not directly observed in the general pattern.

On the other hand, it's also possible to think that the attachment patterns are established in the relationship with the parents or primary caregivers, so, children attending a day nursery on extended periods of time, and who have their parents on a stable manner from birth, could have affectively significant interactions with other adults, who don't become attachment figures. This ponders the question on when an adult becomes an attachment figure, if by the shared time and positive and negative emotional experiences, or by the permanence of the bonding, whether it's positive or negative it is recognized by the child as a stable one.

Another possible explanation to understand the absence of effect of the associated variables to alternative care on the attachment pattern developed by the child, could probably be that the mothers and fathers make decisions on alternative care for their children based on their own internal working models. This would imply that the most rejecting mother, probably, would consider her child's early starting age at a day nursery or the early weaning as a good option, without considering the emotional aspects that this decision could bring on the child. The secure mother could look for care options that include the emotional well-being, and have a greater conscience about her child's needs, and the anxious mother might explore many alternatives without finding a stable option, generating on each one, from her

bonding style, the conditions that tend to strengthen the attachment pattern established with her children.

Conversely, it is relevant to think how can a quality alternative care center influences children with insecure attachment patterns with their parents, having, maybe, a favorable effect. The studies done by Egeland & Hiester, 1995, show that avoidant children show positive changes by attending care centers, but not the secure ones, support these ideas. If we think on how the attachment patterns on adults can change, we come up with psychotherapy as a possible corrective emotional experience that allows representational model changes of themselves and others, as well as significant couples' relationships, or maternity could also act as corrective bonds. When we think, again, of small children, it's hard to imagine that significant affective relationships with a caregiver would not have any effect on the child's bonding development. Maybe, something that could help clarify this point is to evaluate the attachment of children who receive alternative care with a substitute caregiver who's permanent and stable throughout time, since a corrective experience might take place with a different attachment from the one observed with the mother, but without modifying the bonding style developed with the primary caregiver.

The findings about the mother's sensitive response as a good predictor of secure attachment (Friedman & Boyle, 2008), alert us about the importance of this variable when designing family intervention programs, especially, when they are directed to the early family. These findings are also consistent with the multiple studies associating an adequate maternal sensitive response during the first year of age and secure child attachment (Braungart-Rieker, Garwood, Powers & CNAG, 2001; Coppola, Vaughn, Cassiba, Constantini, 2006; Isabella, 2003; Smith & Pederson, 1988; Thompson, 1997; Van Ijzendoorm & Wolf, 1997; Ward & Carlson, 1995). This finding is especially hopeful, when we think that the caregiver's sensitive response can be successfully trained with focused interventions in a short number of sessions (Bakermans-Kranenburg, Van Ijzendoorm & Buffer, 2003).

It's possible that evaluations of the alternative caregiver's sensitive answer of the care center and the cooperation shown by the child in the interaction, could demonstrate the effect of that daily exchange, and its positive or negative quality. It could also be observed if there are any differences in these dimensions in the interaction with the mother. This way, maybe, the attachment patterns are a gross measure of the bonding styles that do not allow the discrimination of modifications or differences on variables associated to the easiest attachment to change

Finally, another aspect to be considered are the cultural variables that could influence and generate differences in similar studies to the one by the NICHD, done in different cultures to the one of the U.S., which would require doing studies in different countries in order to evaluate if these findings repeat themselves.

Summarizing, even the findings are multiple and contradictory about the care centers and their effect on children's attachment, the longitudinal studies done by the NICHD stand-out due to their methodological rigorousness and scope of the variables taken into consideration. These findings show the importance of an adequate maternal sensitivity as a predictor of secure attachment, while showing the little weight of the characteristics of the alternative care given at care centers in the development of children's attachment styles.

If alternative care centers and their characteristics can't be associated to particular attachment styles, it might be relevant to reverse the initial question, and to ask how could care centers contribute to improve the bonding in children who exhibit insecure attachments with their parents.

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Comparative study of early interactions in mother-child dyads and care centre staff within the context of Chilean crèches.

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Abstract

Background: Bowlby (1969) developed the concept of "caregiver" to refer to significant adults with whom young children interact daily. Not only parents are considered significant caregivers but also the care centre staff where the child attends regularly. Within caregiver-infant interactions, sensitive response on the part of the adult is a key concept in the assessment of the quality of the relationship, as it integrates the experiences and emotions that will influence the attainment of a secure attachment and a favorable emotional, social and cognitive development in the child.

Method: This study is a comparative analysis between the dyadic interactions between a child and its principal caregivers in the home and in the crèche; it is based on a group of 185 children between 8 and 24 months old, who attend a crèche regularly. The CARE-Index instrument was used to assess interaction between children and adults, analyzing sensitive response in the adults and cooperativeness in the children.

Results: The sensitive response of adults to children was complementary; mothers and primary caregivers showed greater sensitivity in the affective aspects of the interaction, while the care-centre staff showed greater sensitivity in the cognitive aspects. The fact that caregivers show significant differences in response sensitivity is consistent with existing studies, as are corresponding significant differences in the children's cooperativeness, which

demonstrates that a child could benefit from interacting with adults whose different skills could strengthen diverse aspects of health child development.

Conclusions: The presence of children in the crèche can be a positive experience in that it favors quality exchanges with the child, developing cognitive aspects of the interaction which are cultivated to a lesser degree by mothers or primary caregivers who principally develop affective aspects.

Keywords: alternative caregivers, early interactions, sensitive response.

Introduction

Bowlby (1969) developed the concept of “caregiver” to refer to significant adults with whom young children interact daily. Within caregiver-infant interactions, sensitive response on the part of the adult is a key concept in the assessment of the quality of the relationship, as it integrates the experiences and emotions that will influence the attainment of a secure attachment and a favorable emotional, social and cognitive development in the child.

Studies in caregiver sensitive response have centered mainly on mother-child interaction, and to date there are no Chilean studies that assess the quality of sensitive response on the part of caregivers removed from the family group and its effect on the children. At present, there is a large number of Chilean children under three years of age, belonging to the two poorer quintiles of the population, who attend crèches and interact daily with their care centre staff. In spite of this, we lack Chilean measurements that study these interactions and that enable us to describe the types of interactions that the children develop with their mothers and care centre staff.

Therefore, the objective of this study is to describe, compare and analyze the sensitive response and cooperativeness in mother-child dyads and care centre staff on the basis of the Child-Adult Experimental Relationship Index, CARE-Index Toddlers (Crittenden 2005) applied to the participants in FONDECYT Project Nº 1070839. The instrument was applied to a total group of 185 children of both sexes, with two evaluations per child, one with the primary caregiver (in most cases, the mother), and the other with the child's principal caregiver at the crèche, which can be the Pre-school teacher or his/her assistant.

The results obtained will be used to provide empirical data for the study of the types of interaction that children establish both with their mothers and with their significant caregivers in the crèche, and at the same time determine the predominant descriptors for the adults (sensitive, controlling or non- responsive), and for the children (cooperative, compulsive and ambivalent) together with the levels of relational risks and aspects of affective or cognitive interaction that predominate in both sets of dyads.

Background

Early Interactions

From the microanalysis undertaken in research on mother-infant interaction (Stern, 1985; Trevarthen & Aitken, 2001), theories on child development have started to modify the idea of a unilateral determination of the mother towards the infant, to the concept of a mutual influence in the relationship (Stern, 1985; Hedenbro & Lidén, 2002). This has generated the need for subsequent research into early interactions focused on the "caregiver-child" dyad, and not only on the separate participants.

For example, there is a consensual opinion today that the mutual process of verbal and non-verbal exchange in the child-caregiver dyad, and in the child-parent or other significant caregiver dyad, begins at birth and is a contributing factor in the development of reciprocity and exchange of information and feelings (Trevarthen & Aitken, 2001).

Young children's behaviors then, are strongly influenced and modified by the behavior of their caregiver. Studies on caregiver-infant interaction at play show that the infant's responsiveness and expressions of affection are directly related to the response capacity of the caregiver, especially in the first years of a child's life. (Kivijarvi et al, 2001).

The value of the interaction that emerges in games that are co-constructed by infants and caregivers resides in the fact that they promote shared affections and reciprocity on the basis of the sensitive and perceptive attitude of the adults to vis-à-vis the communicative signals of the infant. Play enables the baby to express pleasure, displeasure or need of help, giving him/her the chance to learn about turn-taking and reciprocity, and to regulate his/her emotional states and those of others (Tronick & Cohn, 1989; Weinberg & Tronick, 1994).

In regard to the above, one of the most important aspects of caregiver-child interactions is the child's opportunity to develop emotional regulation and self-regulation on the basis of his/her interaction with the adult, as it will enable the child to become aware of, and channel, positive and negative emotions, which affect his/her interpersonal relations and psychological development later in life (Tronick & Cohn, 1989).

Caregiver sensitivity

Sensitive response in the caregiver is considered a core concept in the assessment of early

caregiver-infant interactions, as it integrates the experiences and emotions that will influence the development of the infant later in life (Stern, 1997; George & Solomon, 1999).

Crittenden (2005) defined caregiver sensitivity with the infant as a dyadic construct corresponding to any behavior pattern shown by the adult that enables the infant to explore an activity with interest and spontaneity, with no inhibition or exaggeration of negative affection. A sensitive adult manages to catch the infant's attention and to keep him/her involved, distinguishing whether the infant requires stimulation or calm to be able to focus on the interaction. But adult behaviors are not adequate or inadequate per se, they are adequate depending on the temperamental features and present state of mind of the infant.

The capacity of parents and significant caregivers to respond sensitively to a child implies that they should recognize the child's signals, interpret them adequately and act speedily and appropriately to them (Marrone, 2001). For example, the caregiver's sensitivity includes the timing for an adequate response and the coordination between this response and the baby's expression of affection (Crockenberg & Leerkes, 2000).

From the perspective of the baby, caregiver sensitivity is perceived as a special connection between them, which enables the baby to feel that he/she is attractive and valuable to others (Bringen & Robinson, 1991). For this same reason, in later development, it plays an important role in the feeling of integration of self, self-valuation and the ability to offer loving, cooperative and reciprocal responses. (Marrone, 2001).

Furthermore, caregiver sensitivity gives the baby the confidence to communicate and transmit his/her needs, through crying, for example (Stern, 1985). Uneasiness and even crying can vary in frequency and duration depending on the caregiver's response, so the

caregiver's sensitive response to the baby's cries will determine the individual differences in the development of the baby's crying patterns (Bell & Ainsworth, 1972).

In regard to the importance of caregiver sensitivity to the communicational signals of the child, studies show that adequate sensitivity on the part of the adult during the child's first year is a significant predictor of a healthy future development. An adequate sensitive response on the part of the caregiver has also been associated with the baby's secure attachment style. (Ward & Carlson, 1995; Coppola, Vaugh, Cassiba & Constantini, 2006; Smith & Pederson, 1988; Isabella, 1993; Van Ijzendoorn & De Wolf, 1997; Braungart-Rieker, Garwood, Powers & Wang, 2001), to his/her favorable emotional and social development (Landry, Smith, Swank & Miller-Loncar, 2000; Kivijarvi, Raiha, Virtanen, Lertola, Piha, 2004), adequate cognitive development (Landry et al., 2000), and obedience between the age of 15 to 31 months (Brauch, Lehman, Steier, Guidash & Wanna, 2002). As a complement to these findings, low caregiver sensitive response has been associated with poor cognitive development and a low symbolic capacity in the baby (Feldman, Eidelman & Rotenberg, 2004).

Kivijarvi and colleagues (2001, 2004,2005) found that babies whose mothers responded sensitively to their signals, showed good moods, expressed their emotions more and made greater social and visual contact in play situations between the ages of 3 and 12 months.

As most studies have focused on maternal sensitivity, it is important to consider the dynamics of other significant caregivers´ sensitivity in connection with its impact on the development of the babies. Along these lines, research carried out to assess the existence of differences between fathers and mothers in their interaction with their children, it is important to refer to the research done from the Theory of Attachment based on the strange situation proceeding, showing certain differences in the interaction patterns developed by father and mothers with their offspring (Parke & Sawin, 1980; Belsky *et al.* 1984). Other studies on

attachment patterns and sensitive response show that mother and father sensitivity is complementary in the quality of their interactions, with variations in the quality of father-child interaction in relation to the quality of the mother-child interaction, replacing or improving what is deficient in the interaction with the other parent, especially in the case of father to mother interactions (Shoppe-Sullivan et al., 2006; Fletcher, 2005). These differences reinforce hypotheses that consider the different interactions between children and their significant caregivers to be complementary, with each party being able to contribute to the development of the child.

Observations of interactions between parents and their children and significant caregivers can be extrapolated to the caregivers at the crèche, given the daily, early and prolonged contact that they establish with the children. The Chilean reality of children under the age of 3 belonging to the poorer economic sectors implies that they are sent to crèches and nursery schools at a very early age to allow their mothers to work, improve family quality of life, and promote an integral development of the children based on proper nourishment, specialized care and support programmes. In this context, the role of preschool teachers and their assistants turns them into significant caregivers, who will influence the later development of the children.

The economic and family contexts of the children can have a negative or positive influence on the quality of their interactions (Bowlby, 1969, Stern 1997, Pelchat, Bisson, Bois & Saucier, 2003, Belsky, 1984, Coppola et al, 2006), with some investigations showing a definite link between poverty and low maternal sensitive response (Pelchat et al., 2003; Keempinen, Kumpulainen, Raita-Hasy, Moilanen & Ebeling, 2006). These antecedents allow us to believe that low SEL families could be a risk factor in the development of later psychopathologies in children. Although this relationship is observed, studies indicate that it is not absolute, as there are children from poor families who achieve a healthy psychological development in spite of stressors (Crittenden, 1985; Egeland & Sroufe, 1981). Additionally,

studies on child development and poverty state that the relationship between SEL and psychopathology is mediated by parenting qualities (Grant et al., 2003), confirming that poverty alone is not a sufficient enough factor for the development of later psychopathology and that the quality of early caregiver-child interactions can act as a protective factor.

On the other hand, research into predictive variables of sensitive response to children establishes that educational level is a good predictor of maternal sensitive response (Pelchat et al., 2003).

Institutional caregivers and implication on early bonding.

From the point of view of the Theory of Attachment, the role of alternative caregivers in children is controversial as, on the one side, they are required for the incorporation of women into the workforce but, on the other, their effects on the emotional development of the child are still not clear. Studies by Belsky and Rovine (1988) establish a relationship between the number of hours that a child receives alternative care and the development of insecure attachments, observing that children with more than 35 hours a week of alternative care presented insecure attachments. These studies show that in addition to the greater number of hours involved, alternative care that took place outside the home appeared to cause more damage to maternal bonding than alternate care that took place inside the home.

Later studies by Hoffman (1989) contradict these findings and establish a weak relationship between alternative care during the baby's first year and the attachment pattern he/she will develop, explaining that attachment insecurity stems from other family variables, and not from being cared for by outsiders. Research by Green and colleagues (2007) show the possible effects of family differences on infant care center attendance. Their findings (Green et al., 2007) demonstrate that parents with larger support networks have better interaction

with their children, and that this is observed principally in parents with adult anxiety attachment patterns, which are characterized by an emphasis on autonomy and the minimization of negative affections and experiences (Hesse, 1999). In contrast, adults with avoidant attachment patterns, which are characterized by an inflated need for closeness and contact, and by exaggerated negative, have smaller support networks and poorer interaction with their children (Hesse, 1999).

Another relevant aspect of the impact of alternative care on children is the quality of care they receive, and this should take into consideration factors like the number of children under the care of a single adult, the training and preparation of the professionals involved, the infrastructure of the care centre premises, and the mental health and work stability of the caregivers. Studies carried out by Anderson (1992) in Sweden, a country that is well known for the high quality of attention given at pre-school care centers, found that infants who received alternative care during their first year are later assessed by their schoolteachers as being more competent in terms of social, emotional and cognitive skills than children who have been cared for exclusively by their mothers. The findings provided by Howes (1990) point in the same direction, showing that the best predictor of later adaptation in children is the quality of the care centre which they attended during their first year.

The studies of Egeland & Hiester (1995) support this idea, finding that children who receive parental care and have secure attachments at 12 months show good emotional adaptation in their pre-school education, and that those who present insecure attachments do not. However, this relationship is not present in children who receive alternative care, since children who demonstrated insecure attachment patterns still showed good adaptation later on.

In order to understand these differences it is also important to consider the quality of the child's bonding with the caregiver at the crèche, and hypothesize that a positive relationship

with the caregiver might compensate the deficient relationship with the mother and that this would improve later adaptation in the pre-school stage. In this sense, Sagi (1990), who studied children who attended kibbutzim showed that the best predictor of emotional development in these children is the type of attachment established with their caregiver.

Present-day longitudinal studies developed by the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development in the U.S.A. (Friedman & Boyle, 2008) consider the importance of evaluating other variables when it comes to measuring the effect of care provided in institutions, such as enrollment age, the characteristics of the child, reasons for maternal employment, the mother's satisfaction with her role, parental relationships, and social and family support networks, maternal sensitivity, evidence of maternal depression, and the educational level of the parents, among others, taking into account the diversity of factors involved in the effect of alternative care on the child's attachment to his or her mother.

A large sample was used in this study (1000 children and their families) and the children were evaluated from birth to the age of 15, covering different types of alternative care, socioeconomic level, and education level of the primary caregivers, among others. Significant correlations were found between the attachment patterns developed by the children and socioeconomic level, maternal education level, the presence of maternal depression, anxiety at being separated from the mother and the presence of both parents in the family. Logistical regressions showed that adequate maternal sensitive response at the age of 6 and 15 months can predict secure attachment at the age of 15 months. On the other hand, the findings also showed that maternal depression interacts with maternal sensitivity, affecting it in a negative way, and predicting attachment insecurity in children.

It is difficult to think that the quality of the substitute caregiver has no effect on the

attachment pattern of an infant under the age of one year who is sent to a crèche for a long period each day, as this child probably shares a large number of hours with his/her alternative caregiver. If we take the child and caregiver as a mutually influential dyad, it might be necessary to study more subtle variables in the child's attachment pattern to assess whether the exchange with the substitute caregiver generates some positive or negative modification in the child's attachment style, which is not observed directly in the general pattern. In this sense, the caregiver's sensitive response and the cooperativeness of the child could be considered attachment pattern variables that account for the quality of the interaction.

Although it is impossible to give a categorical definition of the effect of alternative care on the development, mental health and parental attachment of Chilean children, we know that the quality of care given is an important factor.

As Chile is a developing country, with numerous families that still live in poverty, the quality of care provided by alternative caregivers, especially in the case of children under three years of age, can help reduce differences in inequalities in later development in comparison to children belonging to higher income families, and improve the quality of life of their families by favoring the involvement of their mothers into the workforce.

Day care centers guarantee care for the basic needs of low income children, the early detection of mental and physical health problems and timely treatment. Although an adequate family standard of living does not guarantee infantile mental health, and poverty is not necessarily automatically associated with later psychopathology (Crittenden, 1985; Egeland & Sroufe, 1981; Guillen, 2007), but the option that poor families be given the possibility of free care at day centers is a step forward towards equal opportunities and the encouragement of mental health.

Objectives

Based on the above antecedents, the following objectives were defined:

1. To describe, analyze and compare sensitive response and cooperativeness in family-mother-child, primary care giver-child and care centre staff-child dyads.

2. To describe and analyze the predominant (affective or cognitive) descriptors of the interaction of the children with their mothers or primary caregivers and the care centre staff.

The hypothesis is that the study will show similar levels of cooperativeness in the children, but that these levels will differ between the mother and the institutional caregiver, with the understanding that dyadic interactions developed in the first year of a child's life with his/her principal caregiver will be the matrix for future dyadic interactions, but might be influenced by interactions with another adult that is significant for the child. On the other hand, we expect to find differences in the sensitive responses of the mother and care centre staff, with higher levels of sensitivity in the latter, due to their specialized training in caring for small children and to the greater vulnerability existing in mothers or primary caregivers of low socioeconomic level groups.

It is expected to find a predominance of affective aspects in the interactions of mothers or primary caregivers, and a predominance of cognitive aspects in the interactions of care centre staff. It is possible that the influence of the teacher training received by care centre staff might promote the incorporation of permanent educational contents, focusing on task-based interaction, whereas physical contact, looks and affection would prevail in the primary caregiver interactions as a product of the cultural context in which the families live.

Method.

Participants

This piece of research corresponds to a non experimental study. The participants were 185 children, their primary caregivers (mother/father/relative) and their care centre staff. The children's ages ranged from 8 to 24 months, with an average of 18.96 months (*SD*= 3,31). The children came from low socioeconomic level families and were starting their public preschool education in 22 crèches in Santiago, Chile. Inclusion criteria were an age of 0 to 2 years and regular attendance at the crèche. Exclusion criteria were the presence of any physical or mental pathology. The mothers agreed to take part in the study voluntarily, after having signed an informed consent form.

The group was composed of a total of 185 primary caregivers (81% mothers, 8% fathers, 8% grandmothers, 1% siblings, 2% another relative). The average age of participating primary caregivers was 29 years (*SD* = 9,41) and the total number of teachers involved was 46 (*M* = 34,7, *SD* = 10,35).

Participants were part of a FONDECYT project, and this study was the first measurement performed prior to an intervention programme. All the children belonged to low or middle-low SEL families, and attended public crèches in Santiago, Chile.

Procedure

Children and adults were evaluated with the CARE-Index instrument (Crittenden, 2005).

Before carrying out the statistical analysis of the data, the presence of atypical values was assessed, together with the fulfillment of assumptions of the statistical tests carried out. The

significance criterion used was α = 0,05.

Instruments

The Child-Adult Relationship Experimental Index Toddlers: CARE-Index (Crittenden, 2005):

The CARE-Index is a toddler-adult interaction evaluation index in non threatening conditions based on the theory of Attachment. It can be applied from the infant's birth to the age of 30 months and supposes that all human babies are prepared to look for and respond to the interactive behavior of adults (Crittenden, 2005). The assessment procedure consists of a 3 to 5 minute video recording of an adult-child free play. The coding system is based on two principal dyadic constructs, adult sensitivity to the child's signals and the child's cooperation with the adult. This adult-child interaction is coded into 7 variables divided into affective items (facial expression, vocal expression, position and body contact, and expression of affection) and cognition items (pacing of turns, control and choice of activity). The child and adult in each dyad are evaluated separately in terms of each of these seven aspects of interactive behavior. Each of the 7 variables can score 2 points, with a total score of 14. The scores for each scale are added up to make seven scales, 3 for adults and 3 for children.

Descriptors for adults are: 1.sensitive, 2.controlling, and 3.unresponsive .

Descriptors for the children are: a.cooperative, b.compulsive and c.ambivalent.

Crittenden (2006) also defines a dyadic sensitivity scale ranging from 0 to 14, with 0-4 indicating "risky"; 5 to 6 "inept"; 7 to 10 "adequate", and 11 to 14 "sensitive". The videos were coded by a person trained by the author of the instrument, who obtained adequate reliability scores during the training.

Results

A descriptive data analysis shows that primary caregivers had average scores of 6.78 (*SD*=2,49) for sensitivity, 2,25 (*SD*=2,63) for control and 4,99 (*SD*=2,98) for unresponsiveness, and the care centre staff scored 7,82 (*SD* = 2,69) for sensitivity, 2,58 (*SD* = 2,41) for control and 3,61 (*SD* = 2,87) for non-responsiveness.

On their part, the children had average scores of 6,31 (*SD* = 2,71) for cooperativeness, 1,62 (*SD* = 2,92) for compulsiveness and 6,04 (*SD* = 3,26) for ambivalence with the primary caregiver; and 6,79 (*SD* = 2,89) in cooperativeness, 1,83 (*SD* = 2,98) in compulsiveness and 5,34 (*SD* = 3,46) in ambivalence.

The correlation between caregiver sensitivity (primary caregiver or care centre staff) and child cooperativeness is positive and high (r= 0,91 in the first case and r = 0,80 in the second), showing that the greater the caregiver's sensitivity, the greater the child's cooperativeness.

On the other hand, the child's cooperativeness with primary caregiver and care centre staff is only moderately correlational. Both variables share a 12% variance (r = 0.345; $p< 0.01$).

The t test for independent samples showed that the care centre staff had significantly higher average scores in sensitivity, $t(367)= 3.85$ $p< 0.01$, and lower average scores in non-responsiveness with the child when compared to primary caregivers, $t(367)= 4.536$; $p< 0.01$), with no significant differences in the control averages scored by each group, $t(366)= 1.277$; $p> 0.05$). Averages for each of the groups are given in table 1.

Table 1. *Care Index Scale Descriptive statistics according to group*

CARE-Index Scale	Group	N	Mean	SD	St. Error of the mean
Sensitivity	Primary caregiver	185	6.7784	2.49119	.18316
	Care centre staff	184	7.8152	2.68544	.19797
Control	Primary caregiver	185	2.2486	2.62985	.19335
	Care centre staff	183	2.5847	2.41383	.17844
Non responsive	Primary caregiver	185	4.9892	2.97999	.21909
	Care centre staff	184	3.6087	2.86473	.21119

On breaking down sensitivity scores for the affective and cognitive items that comprise the scale, it is possible to point out that differences in sensitivity between primary caregivers and care centre staff are mainly given in the cognitive items, in which care centre staff scored significantly higher (*M* = 2,68; *SD* =1,71) against (*M* = 2,23; *SD* = 1,54) (See table 2) for primary caregivers.

Table 2. *Comparison of affective and cognitive sensitivity items in primary caregivers (Pc) and care centre staff (Ccs)*

	Statistics by group			T Test for equal means						
	Group	Mean	SD	t	gl	Sig.(bilat)	Diff. means	St Error of diff.	95% CI for the diff. Sup.	Inf.
Affective Items	Pc	4.097	1.742	-.096	367	.923	-.0168	.175	-.361	.328
	Ccs	4.114	1.621							
Cognitive Items	Pc	2.232	1.545	-2.633	367	.009	-.447	.170	-.781	-.113
	Ccs	2.679	1.712							

The t test for related samples shows that the children presented higher average cooperativeness scores, $t(180) = 2{,}015$; $p < 0.05$), and lower ambivalence scores, $t(179) = 2.55$; $p < 0.05$, with the care centre staff than with their primary caregivers, with no significant

differences in cooperativeness or compulsiveness scores, $t(180)=0.882$; $p>0.05$). Average scores for each of the interactions appear in table 3.

Table 3. *Descriptive statistics of the child's Care-Index scores compared with primary caregiver and care centre staff scores.*

	Dyad	Mean	N	SD.	St error of the mean
Pair 1	Cooperative child with primary caregiver on first evaluation	6.27	181	2.693	.200
	Cooperative child with care centre staff on first evaluation	6.74	181	2.847	.212
Pair 2	Compulsive child with primary caregiver on first evaluation	1.65	181	2.947	.219
	Compulsive child with care centre staff on first evaluation	1.86	181	3.000	.223
Pair 3	Ambivalent child with primary caregiver on first evaluation	6.06	180	3.267	.243
	Ambivalent child with care centre staff on first evaluation	5.37	180	3.461	.258

Discussion

The first aspect to point out in the findings of this study is the confirmation of the theoretical proposals regarding the fact that sensitive response is a dyadic construct, in which the child and caregiver mutually influence each other and build a unique interaction that includes the characteristics of both (Crittenden, 2005; Hedenbro & Lidén, 2002). This is especially clear in the complementary characteristic of sensitivity scores in the adult and cooperativeness scores in the child, in which the cooperativeness in the child increases as the sensitive response in the adult increases. Therefore, it is possible to state that caregivers other than the mother can have a differential effect on the interactive capacities of the child, seeing that infants modify their behaviors when faced with different interaction proposals, and that adults also respond in accordance with the proposal of each child. Another relevant aspect of the study is the differences found in the interactions of the two dyad groups evaluated. On the one hand, there are similar trends in the predominant descriptors in mother-child dyads and care centre staff-child dyads, with both having

sensitivity and non responsiveness as predominant elements in the interaction, although the "controlling" descriptor shows higher scores in the care centre staff and the "non-responsive" descriptor shows higher scores in primary caregivers.

As a complement to this, the children show predominant "cooperativeness" and "ambivalence", with the latter descriptor having higher scores in interaction with mothers.

On the one hand, this data enables us to state that although interaction with the mother is a fundamental aspect in child development and mental health, children are able to develop qualitatively different interactions with other adults on the basis of greater levels of sensitive response, as is also seen in the studies that assess maternal and paternal differences in quality of interaction with their children (Parke & Sawin, 1980; Belsky, Gilstrap & Rovine, 1984, Shoppe-Sullivan et al., 2006; Fletcher, 2005). This aspect is especially relevant in vulnerable populations due to the predictive value of the adequate sensitive response of the caregiver in relation to future secure attachment (Ward & Carlson, 1995; Coppola et al, 2006; Smith & Pederson, 1988; Isabella, 1993; Van Ijzendoorn & De Wolf, 1997), adequate cognitive development (Landry et al., 2000), and adequate emotional and social development (Landry et al., 2000; Kivijarvi et al, 2004). Despite the fact that the aforementioned studies recognize the mother as the principal caregiver, it is important to take into account the positive influence that the daily interaction of the children with their care centre caregivers has on their integral development. In light of this data, new studies are needed to further look into these findings.

On the other hand, the fact that mothers score higher in the "unresponsive" descriptor warns us of a possible depressive symptomatology, as recent research on the subject (Friedman & Boyle, 2008) shows that depression interacts negatively with sensitive response. Although this variable was not taken into account in our study, it is a sign that it should be taken into

consideration in future research and an indication of the possible benefits that children in crèches may experience from participating in interactions with adults that give a positive response to their interactive proposals.

The second predominant descriptor in care centre staff and mothers is “non responsiveness”, with higher scores for mothers in spite of being the second highest score for both groups of adults. This makes us hypothesize that when care centre staff and primary caregivers do not establish an adequate sensitive response with the children, their difficulties are centered on their failure to identify and give adequate responses to the child’s signals, especially if these are negative because they are centered on their own perspective rather than on the child’s behavior or feelings. In future studies, it would be interesting to assess whether the specific aspects of the “non responsive” behavior in both groups of adults could be differentiated into an overt non responsive attitude, that gives the child little information and makes his/her interaction difficult because he/she doesn’t know what to expect, and a covert non responsive attitude, whose salient feature is the discordance between the happy interaction displayed by the adult and the child, and their lack of a happy appearance, with both forms of non-response behavior having differential effects on the children.

The slightly higher score of the “controlling” descriptor in care centre staff vs mothers might be explained by the professional role of the former. The work objectives of staff members, which are under permanent assessment in terms of their fulfillment, might involve greater activation and direction in the interaction.

Another relevant aspect in the findings refers to the significantly higher scores achieved by care centre staff in the cognitive items, which showed that they had a higher degree of sensitivity than the mothers for interacting with the children, taking into account that both types of caregivers can display their interests and start an interaction, decide which activity

they wish to carry out and propose tasks that adjust to the development stage of the children without being over-demanding or underestimating their capacities and resources. These findings were explained by the specialization and professional training received by the care centre staff, which includes foundational elements such as design of adequate child stimulation activities, and a knowledge of developmental psychology. The mothers' lower scores in the cognitive items can be explained by their low educational level and probable ignorance of adequate activities for their children's age, and by the nature of family links.

Finally, it is important to note to the predominance of adequate sensitive response in the affective aspects of interactions between mothers or caregivers and the children. This indicates an adequate capacity to develop active attention, receptivity and expressive ability in accordance with the emotional state observed in the child, a warm tone of voice and at an adequate rhythm, a comfortable position that allows for mutual access, and a general expression of warmth, shared smiles and expressions of affection. The contributions of mothers or primary caregivers to interaction with the children are evident and are seen as complements of those observed between the children and their care centre staff, with both adults favoring differential aspects that are required for healthy child development.

Therefore, the results of the study show that the presence of children in the crèche is positive in the measure that it is a space that favors quality interactions, as it has been observed that the care centre staff provides an adequate sensitive response. The interactions children have with mothers or primary caregivers are complemented by exchanges with care center staff, which enrich the child's relational experiences, developing both cognitive and affective aspects essential in child mental health.

Key messages:

* There are a large number of Chilean children who attend crèches and interact daily with their care centre staff so that their mothers can work.

*The effects of alternative caregivers on the emotional development of the child are still not clear.

* This study assesses the quality of sensitive response of care centre staff and its effect on the children.

*The results show statistically significant results in sensitivity scores obtained by the adults, with care centre staff showing greater sensitivity in the cognitive aspects of the interaction and the mothers or primary caregivers showing greater sensitivity in the affective aspects.

* The sensitivity scores in the care centre caregiver were followed by high cooperativeness scores in the child, while as sensitive response in the adult increases the cooperativeness in the child does the same.

* Care centre staff and mothers or primary caregivers strengthen the interaction with the child in a complementary way, with the former contributing principally to the cognitive dimension of the exchange and the latter to its affective dimension.

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Quality of the mother-child interaction, attendance to day nurseries and importance of the starting age: Comparative study on Chilean single-mother families

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Abstract

The study is about the quality of mother-child interactions in Chilean, single-mother, low-income families, considering the children's attendance to day nurseries and their starting age before and after they are 6 months old. The sample is of 80 dyads, with children between 4 and 15 months old, and the quality of the interactions is evaluated with the CARE-Index instrument. The dyads without attendance to day nurseries show higher quality interactions on the affective aspects, with a medium effect size. The dyads with children starting attendance before becoming six months old show significantly inferior quality interactions to the ones observed in the dyads of children who started attending after that age, with medium and large effect sizes.

Keywords: early interactions, single-mother families, day nurseries.

Introduction

Modern times and the incorporation of women into the labor force promote the attendance of young children to day nurseries while their mothers go to work, especially, in single-parent, low-income families (Arriagada, 2004; Cerrutti & Binstock, 2009). In Chile, with the recent greater offer of day nurseries and day-care centers for children who are younger than 3 years old, this tendency is increasing. Even though the attendance of small children to early care centers intends to level the developmental opportunities, especially, of the lowest-income sectors of the population, studies are necessary for reviewing the consequences on the mother-child bonding quality in single-parent families of this attendance to day nurseries.

Studies on the effect of alternative care on children have been done for a long time, initially, highlighting the positive value of attending a day nursery for the child's social and cognitive development, and later, the negative effect on the bonding quality with their parents, associated to the number of daily hours, the centers' quality, the children's starting age, and family variables (Olhaberry & Santelices, 2009).

On the other hand, the sensitive response of the main caregiver, in the case of single-parent families, mainly, the mother, it is a consistently associated variable with the mother-baby bonding quality, and to the later child's mental health, so, studying it could offer tools for the early diagnosis and later design of intervention programs.

In this context, this article looks to study in a Chilean sample the effects of attending day nurseries and the starting age, in relation to the quality of mother-child bonding in single-parent, low-income families.

Background

Attendance to day nurseries and mother-child bond

The debate around the different types of alternative care received by children during their first year of development, and the effects on the mother-child bond has a long history, with important discrepancies.

Some authors state that having the option of alternative care, such as day nurseries or child-care centers, could be favorable for the strengthening of an adequate mother-child bond of women in charge of their home, with the institutional support contributing to reduce the high psychosocial stress they live in (Crittenden, 1985; Green, Ferrer & McAllister, 2007).

On the other hand, various studies done on alternative care and their association with the mother-child bond have focused on other aspects, such as days with long hours and the place where the care takes place, and others, on the quality of the care received by the children and the age when they start attending, and most recent studies consider multiple variables to explain the effect on the mother-child bond.

In relation to the number of weekly hours the child stays at a care center, some studies show the extended week (more than 20 weekly hours) having a negative effect on the mother-child bond (Schwartz, 1983; Belsky & Rovine, 1988; Sagi et al., 2002). Other studies show that more than the number of weekly hours at the day nursery, the mother's sensitive response, her general well-being and the family variables are the ones that predict the quality of the mother-child bond, lowering the importance of the time spent at the day nursery (Belsky & Braungart, 1991; Barglow, Vaughn & Molitor, 1987).

In terms of the starting age, studies done by Vaughn, Gove & Egeland, (1980), show a negative effect on the mother-child bond when the child starts attending before becoming one year-old, with the children who actually start before that age exhibiting a higher

proportion of anxious attachment. The authors explain these results by the low availability the child has of his mother, which would generate insecurity and anxiety.

In general terms, the existing studies consider an early starting age at a day nursery before the child becomes one year old, and not a lower range. When a lower range is considered in Chilean samples, a debate could arise about extending the postnatal working time off for Chilean mothers, which now dictates that the mother must return to work 84 days after the baby is born, and with that, decide if that child will attend a day nursery (Propuestas del Consejo asesor presidencial para la Reforma de las Políticas de Infancia Políticas de Infancia, Chile, 2006).

Another relevant aspect when evaluating the effect of alternative care on children is the quality of the attention they receive, considering the number of children per adult caregiver, the training and preparation the professionals have, the infrastructure of the place where they work, as well as the mental health and work stability of the caregivers. On this, there are studies showing positive effects on the attendance to high quality day nurseries during the child's first year of age in low-income families, mitigating the negative effect of poverty on the child (Andersson, 1989; Howes, 1990; Love et al., 2003).

The study done by the National Institute of Child, Health and Human Development (NICHD), Study of Early Child Care and Youth Development (SECCYD) in the United States (Friedman y Boyle, 2008), show significant correlations between the socioeconomic level, the mother's educational level, the presence of maternal depression, separation anxiety with the mother, and the presence of both parents at home with the attachment style developed by the children, and it states that the mother's sensitivity allows to predict secure attachment at the age of 15 months. It also shows that the starting age, stability, the type of care and the quality of the care don't have an effect on the attachment developed by the child for the mother.

Maternal sensitive response

In terms of the mother-baby bonding, the maternal sensitive response has been considered a central concept at the time of evaluating the dyad's early interactions, significantly influencing the subsequent baby's development (Stern, 1997; George & Salomon, 1999). It is defined by Crittenden (2006), as a dyadic construct related to any conduct pattern done by the adult which calms the child and increases his comfort, reducing his anguish and lack of interest. How able the mother and caregivers are in responding in a sensitive manner to a child, will imply acknowledging his signals, adequately interpret them, and acting in a fast and appropriate way to these readings (Marrone, 2001).

Considering the importance of the mother's sensitivity to the child's communicative signals, studies show that an adult's adequate sensitivity during the first year is considered a significant predictor of subsequent healthy development, of secure attachment patterns, and a favorable emotional, social and cognitive development (Ward & Carlson, 1995; Coppola, Vaughn, Cassibba, Constantini, 2006; Friedman & Boyle, 2008; Smith & Pederson, 1988; Isabella, 1993; Van Ijzendoorn & Wolf, 1997; Landry et al., 2000; Kivijarvi, Raiha, Virtanen, Lertola, Piha, 2004; Landry et al., 2000). Complementing these findings, a low sensitive response on the part of the caregiver has been associated to a low cognitive development and a low symbolic ability on the part of the baby (Feldman, Eidelman, and Rotenberg) 2004).

Studies on Chilean samples found that the mother's low educational level, frequently observed in low socioeconomic level families, negatively affects the sensitive response towards the child (Valenzuela, 1997; Guillén, 2007), and also, other international studies consider the mother's educational level as a good predictor of the maternal ability to sensitively respond to the child's signals (Pelchat et al., 2003; Coppola et al., 2006).

Recent Chilean studies on low-income families show that day nurseries' caregivers show higher sensitivity averages on interaction cognitive aspects with the child than the

mothers, improving with this, cooperativeness on children (Santelices, Olhaberry, Pérez-Salas & Carvacho, 2009). This makes us wonder about how the sensitive interactions between the child and the caregiver affect the quality of the interactions the child establishes with his mother, especially, in single-parent homes where the possibilities of significant bonds with an adult are less probable due to the presence of only one progenitor.

On the other hand, early experiences with both parents the first three years of life will clearly influence mental health and subsequent child development (Nagera, 2001; Bedregal & Pardo, 2004), which makes relevant the study done at the baby's early age on the characteristics of the mother-baby relation and its implications in single-parent families, when there is a single mother in a low-income context.

Single-parenting and poverty: their effects on child development

Multiple studies mention the importance of family configuration on child development, showing a positive relation between the support given by the father to the mother, something common in nuclear families, and the sensitive response ability to the children's signals (Hyunjeong, Young-Joo, Mi Ja, 2006; Valenzuela, 1997). As opposed to nuclear families, studies on single-parent families show an association between this family configuration and difficulties to sensitively respond the signals and needs of their small children (Casady, Diener, Isabella & Wright, 2001).

The special consideration of mother-baby dyads as part of single-parent families, is the consequence of the enormous increase in the formation of this type of family around the world, in our continent and in Chile. In Latin America we can see an increase of single-parent families with the woman in charge of them, as well as the concentration of the highest level of poverty in this group (Arriagada, 2004; Cerrutti & Binstock, 2009). In Chile, a 7,3% of the total number of homes are single-parent families where the mother is in charge, and a 9% of these belong to the poorest homes in the country, showing this group, as well, a greater

number of children in pre-school years, than homes with this family configuration, but with higher income (Arriagada & Aranda, 2004).

Even if the family configuration is relevant on the quality of the mother-baby interaction, the contextual conditions around the dyad are also important, as various authors mention their influence on the type of bond between the mother and her small child (Bowlby, 1969; Stern, 1997; Pelchat et al., 2003; Belsky, 1984, Coppola et al., 2006). Studies show family income, the parents' educational level, the presence or absence of a support social network, and the family configuration could have a positive or negative impact on the bonding quality, the baby's evolution and the mother's general state.

On the other hand, the birth of a baby in low-income, single-parent families implies a greater vulnerability for the dyad on the upbringing chores, having greater stress, greater vulnerability towards depression symptoms on the part of the mother, lower income and lower educational level (Cooper, McLanahan, Meadows & Brooks-Gunn, 2009; Lara-Cinisomo, Griffin, Daugherty, 2009; Bastos, Casaca, Nunes & Pereirinha, 2009). Multiple studies state the negative effect of these variables on the integral development of the child and on the mother-baby bonding quality (Murray, Sinclair, Cooper, Ducournau & Turner, 1999; Rodríguez, 2006; Figueredo, Costa, Pacheco & Pais, 2009; Stern, 1997).

In relation to the mother-baby bonding quality, studies done by Huth-Bocks, Levendosky, Bogat & Von Eye (2004), associate single-parenting when the mother is in charge of the home with the development of insecure attachment on the part of the children. These findings are not conclusive, since studies done in Chile show secure attachment patterns on mothers and children belonging to single-parent families (Guillén, 2007). These differences could be explained by the mother's social and affective networks, being frequent in Chile for mothers with children without the father's support to include themselves in the extended family, as a way of sharing costs, obtaining affective support and improving the quality of life (Cerrutti & Binstock, 2009).

In terms of other effects of single-parenting on child development, some studies associate this family configuration on poverty conditions with parental low involvement on their children's pre-school activities (Arnold, Zeljo & Doctoroff, 2008). This has negative repercussions on the children's psychosocial performance (Filgueira & Peri, 2004). This association is observed in Chilean studies, showing a relation between poverty and slow psychomotor development on pre-school children (Schonaut, Rojas & Kaempffer, 2005; Proposals of the Presidential Advisory Council, Chile, 2006). Even if the studies connect single-parenting, having the mother in charge, with difficulties on school performance of these families' children (Luisi & Santelices, 2000), the individual characteristics and bonding quality with their primary caregivers could also revert this situation or reduce the impact (Arancibia, 1996; Grant et al., 2003).

Other investigations show significant relations between low-income families and low sensitive response of mothers with their children (Pelchat et al., 2003; Kemppinen et al., 2006), poverty negatively influencing the quality of the dyadic interactions and mother-child bond.

Studies with Chilean samples found that the mothers' low educational level, frequently observed in low socioeconomic level families, negatively affects the sensitive response with their children (Valenzuela, 1997; Guillén, 2007), just like other international studies consider the mothers' educational level as a good predictor of their ability to sensitively respond to their children's signals (Pelchat et al., 2003; Coppola et al., 2006).

Based on the previous information, the following objectives were defined:

1. To describe, analyze and compare the quality of the interactions in mother-baby dyads of single-parent families with children, with and without attendance to a day nursery, considering the starting age of the children attending.

2. To describe, analyze and compare the cognitive and affective aspects of the interaction, as well as the specific describers for mothers and children.

The hypothesis is to find a better quality interaction in the group attending day nurseries, considering that institutional support could act as a protecting network for the mothers and their children, especially, in vulnerable populations, being this attendance a positive contributor to the bonding quality. Even though the attendance to day nurseries could promote an adequate quality in the mother-child interaction, the age of the child when he starts attending would be a relevant variable, so, it is expected a higher quality interaction in the dyads with children attending after they are 6 months old.

It is also expected a high and positive correlation between the mother's sensitive response and the child's cooperativeness in both groups, since these variables are defined as a dyadic construct, where the mother and the child influence each other.

In terms of the interaction's affective and cognitive aspects, it is expected a predominance of the first ones over the second ones, since, according to recent studies physical contact, the gaze and the affect are especially used in mother-child interaction in low-income, Chilean families (Santelices, Olhaberry, Pérez-Salas & Carvacho, 2009).

Method

Participants

80 Mother-baby dyads participated, belonging to single-parent families of the two most impoverished quintiles of the population, residing in Santiago, Chile, in the municipalities of La Granja, La Pintana and La Florida, with a sample of 40 children in each of the two groups. The group attending a day nursery was composed of 15 girls (37.5%) and 25 boys (62.5%), and their ages went from 4 to 15 months with an average of 10.49 (SD = 3.21). The group not attending a day nursery had 24 girls (60%) and 16 boys (40%), and their ages went from 4.6 and 14.7 months with an average of 10.02 (SD = 2.68). The average age of the mothers with attendance to a day nursery was of 25.63 years, being the youngest 15 years old and the oldest 43 (SD = 8.39), and in the non-attending group the mothers' age average was 24.50 years, being the youngest 16 and the oldest 41 (SD =

6.24). The inclusion criteria considered for the study was, residing in one of the mentioned municipalities (La Granja, La Pintana or La Florida), belonging to the two most impoverished quintiles of the population, and be part of a single-parent family with the mother in charge, with a child between 4 and 15 months of age. The exclusion criteria used was the presence of some diagnosed physical or psychiatric pathology in some of the members of the dyad. The mothers voluntarily accepted their participation in the study, previously signing an informed consent letter.

Procedure

This investigation is a non-experimental transversal study. The municipalities where the participants live were selected taking into account where the two most impoverished quintiles of the population live, the presence of public day nurseries and the access to a public health center. All the day nurseries had procedures of similar care, infrastructure and adult/children ratio per room, having one adult per six children in each center. The number of hours each child spent at the care center during the day was similar in all of the day nurseries, ranging from 8 to 10 daily hours. The families were selected from the information given by the director of each institution, and they were invited to participate in a voluntary manner. The families who complied with the sample requirements, such as, single-parent family in charge of the mother, with at least one child younger than a year, mother and child without diagnosed physical or mental pathologies, were contacted by phone. Two mothers rejected participating in the study, one from the group attending a day nursery and one from the group not attending, stating, the first one, that she didn't have enough available time, and the second one, some difficulties to attend the evaluation.

The evaluations were done between May and August, 2009, taking place at the Health Center in the case of the dyads not attending a day nursery, and in the corresponding day nursery for the dyads attending.

The evaluation was done after the mothers signed the letter of informed consent. The children and the adults were evaluated at interaction with the Care-Index instrument (Crittenden, 2006), with the same set of toys and materials in all cases. First, the video recording of the dyad playing freely took place, and afterwards, the information was compiled. A didactic toy was given to each participating dyad and a brief feedback of the strengths and weaknesses observed during the interaction. Those dyads evaluated at risk were referred to corresponding Health Centers, previously having the mother's consent.

Instrument

Child-Adult Relationship Experimental Index: CARE-Index (Crittenden, 1997). It's an evaluation method for the infant-adult interaction under non-threatening conditions, based on the attachment theory, and developed by P. Crittenden in 1997. The evaluation procedure consists of 3 to 5 minutes of video recording of free play interaction between the adult and the child. The codification system is based on main dyadic constructs, the adult's sensitivities to the child's signals and the cooperation of the child with the adult. The adult and the child interaction is coded according to 7 variables (facial expression, verbal expression, body position and contact, affect expression, taking turns contingencies, control and activity election). The first four variables define the affective aspects of the interaction and the three last ones the cognitive aspects of it. Each adult and each child is separately evaluated in relation to each one of these 7 interaction behavioral aspects. Each one of these 7 variables can receive a score of 2, and could accumulate a total of 14. There are 3 specific describers for the adult (sensitive, controlling and non-responsive) and 4 for the child (cooperative, difficult, compulsive and passive).

Crittenden defines a dyadic sensitivity scale that goes from 0 to 14 points, indicating 0-4 as "risk", 5-6 "inept", 7-10 "adequate" and 11-14 "sensitive", and these criteria are used to evaluate the interaction quality in this study. The author defines that scores below 7 require some type of intervention, psychoeducation or short- term intervention is recommended for

those dyads with scores 5-6, and parents-infant psychotherapy for the ones with scores 0-4. A person trained by the author of the instrument, having a reliability of 0.8 in the training course, did the video codifications.

Results

The mother's sensitive response is a main aspect in the mother-child bonding, as existing studies show a relation between this variable and the mother's educational level and her family networks. From this information, the contingent relations between these variables are considered in the previous analysis. Correlational analysis is done, using Kendall's Tau coefficient to evaluate the existing relation between these variables and the maternal sensitive response in the study's dyads. Opposing the reviewed studies, the analysis indicates that in the total sample don't exist significant relations between the mother's educational level, the numbers of adults present at home with the maternal sensitive response. These results could be explained by the special vulnerability and complexity of the sample, since these are low-income families, and also, with a single-parent configuration, which probably, overloads the mother on her role, over the benefits that could generate the higher educational level and the presence of a greater number of adults living with the dyad. The results of the correlational analysis appear on table 1.

Table 1. *Correlational analysis between the mother's educational level, the number of adults at home and the maternal sensitive response.*

			Mother's educational level	Number of adults at home
Kendall's Tau	Affective mater sens	Correlation coefficient	.113	-.085
		Sig. (unilateral)	.201	.254
	Cognitive mater sens	Correlation coefficient	.106	.061
		Sig. (unilateral)	.217	.317
	Maternal sens Total	Correlation coefficient	.160	-.020
		Sig. (unilateral)	.114	.437

The descriptive analysis related to the participants' gender, the number of brothers, the mother's educational level, the number of adults at home, the amount of time the mother

spends at home, and whether there is contact kept, or not, with the father, are presented on table 2.

Table 2. *Frequencies and % of the sociodemographics studied in the groups not attending a day nursery (n=40) and attending a day nursery (n=40), considering in the second group the children's starting age (before they are 6 months old n=15, and after they are 6 months old n=25).*

		Group not attending a day nursery n =40		Group attending a day nursery n=40					
				Starting < 6 months (n=15)		Starting ≥ 6 months (n=25)		Total n=40	
Variables		**Freq**	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Gender	Male	16	40%	10	66.7%	15	60%	25	37.5%
	Female	24	60%	5	33.3%	10	40%	15	62.5%
Brothers	Doesn't have	20	50%	7	46.7%	12	48%	19	47.5%
	One or more	20	50%	8	53.3%	13	52%	21	52.5%
Adults at home	1	2	5%	4	26.6%	5	20%	9	22.5%
	2 or 3	17	42.5%	5	33.4%	9	36%	14	35%
	4, 5 or 6	17	42.5%	6	40%	11	44%	17	42.5%
	7 o +	4	10%	0	0%	0	0%	0	0%
Years of mother's formal education									
	<8 years	5	12.5%	1	6.7%	1	4%	2	5%
	8 years	12	30%	5	33.4%	8	32%	13	32.5%
	12 years	23	57.5%	8	53.3%	12	48%	20	50%
	>12 years	0	0%	1	6.7%	4	16%	5	12.5%
Time spent at home									
	≥ half day	31	77.5%	9	60%	14	56%	23	57.5%
	< half day	9	22.5%	6	40%	11	44%	17	42.5%
Contact with the father									
	Yes	27	67.5%	12	80%	19	76%	31	77.5%
	No	13	32.5%	3	20%	6	24%	9	22.5%

The data descriptive analysis indicates that the average of the quality mother-child interaction in the dyads with children attending a day nursery (M=6.60, SD=2.08), places them on the "inept or inadequate" category, which shows the need of some type of intervention. In the dyads with children not attending a day nursery the average of the interaction quality places them in the "adequate" category (M = 7.03, SD = 2.35), indicating a sufficiently good interaction. In the specific describers, the mothers of the group with day nursery attendance obtain an average of 6.60 points (SD = 2.03) on *sensitivity*, 2.08 (SD = 1.80) on *controlling* and 5.15 (SD = 2.21) on *unresponsive*; and the mothers of the group not attending a day nursery 7.03 (SD = 2.35) on *sensitivity*, 1.60 (SD = 1.58) on *controlling,* and

5.25 (SD = 2.07) on *unresponsive*. In the specific describers of the children attending a day nursery, the averages are 6.45 points (SD = 2.56) on *cooperativeness,* 1.08 (SD = 2.36) on *compulsivity*, 3.40 (SD = 2.65) on *difficult*; and 3.05 (SD = 2.90) on *passivity*. The children not attending a day nursery had an average of 6.73 points (SD = 2.53) on *cooperativeness,* 0.83 (SD = 2.01) on *compulsivity,* 2.48 (SD = 2.50) on *difficult,* and 3.85 (SD = 2.71) on *passivity*.

The correlation between maternal *sensitivity* and infant *cooperativeness* is positive and high, being $r = 0.891$ ($p<0.01$) for the dyads with children attending a day nursery and $r = 0.869$ ($p<0.01$) for the dyads with children not attending, showing that when there is a greater *sensitivity,* there is a greater *cooperativeness* on the part of the children in both groups.

When the scores of *maternal sensitivity* are looked in detail on the affective and cognitive items making up the scale, it is possible to say that the differences on *sensitivity* among the mothers of the groups with and without attendance to a day nursery would be due to, mainly, the affective items, where the mothers of non-attending children would have significantly higher scores (M = 5.38, SD = 1.25) to the ones of the mothers of attending children (M = 4.80, SD = 1.30). The results from the t test and the ES appear on table 3.

Table 3. *t test and effect sizes (ES) for the comparison of cognitive and affective aspects of the sensitive interaction in mothers from the groups with children attending and not attending a day nursery.*

	Statistical	By	Groups	*t* test			for	Equal	means		
									95%	CI for diff	
	Group	Mean	SD	*T*	Gl	Sig(bilat)	Diff Mean	St error of difference	Inf.	Sup.	ES
Affective items	With nursery	4.80	1.305	- 2.009	78	.048	-.575	.286	-1.145	-.005	0.45
	Without nursery	5.38	1.254								
Cognitive items	With nursery	1.80	1.344	-0.232	78	.817	-.075	.323	-.718	.568	0.05
	Without nursery	1.88	1.539								

The *t* test for independent samples shows that the mothers of children not attending day nurseries receive significantly average higher scores than the mothers whose children attended, on interaction quality of the affective items (t = - 2.009; $p < 0.05$), being medium the effect size of the difference evaluated with Cohen's d (d = 0.453). There are no significant differences in the groups' average scores on cognitive items (t = - .232; $p > 0.05$), on the *sensitivity* total (t = -.863; $p > 0.05$), on *controlling* (t = 1.252, $p > 0.05$), and on *unresponsive (t* = -.209; $p > 0.05$). The averages for each group on the affective and cognitive dimensions of the interaction for mothers and children are presented on table 4.

Table 4. *Mean and SD on the affective and cognitive dimensions of the interaction in groups with and without attendance to a day nursery.*

Dimensions	Group	N	Minimum	Maximum	Mean	Typical deviation
Matern sens affective items	With day nursery attendance	40	3	8	4.80	1.305
	Without day nursery attendance	40	3	8	5.38	1.254
Matern sens. cognitive items	With day nursery attendance	40	0	4	1.80	1.344
	Without day nursery attendance	40	0	5	1.88	1.539
Maternal sens. Total	With day nursery attendance	40	3	11	6.60	2.036
	Without day nursery attendance	40	3	12	7.03	2.359
Infant coop. affective items	With day nursery attendance	40	2	8	4.40	1.566
	Without day nursery attendance	40	1	8	4.68	1.639
Coop. Infant items cognitive	With day nursery attendance	40	0	4	2.05	1.300
	Without day nursery attendance	40	0	5	2.05	1.358
Coop. Infant Total	With day nursery attendance	40	2	12	6.45	2.562
	Without day nursery attendance	40	2	12	6.73	2.532

Grouping the dyads according to the children's starting age when entering the day nursery, the descriptive analysis shows an interaction quality average of mothers with children entering day nurseries before 6 months old of M = 5.60 (SD = 1,50), which places them on the "inept or inadequate" category, and shows a need for intervention. The dyads with children who entered after being 6 months old show an average interaction quality that places them in the "adequate" category (M = 7.20; SD = 2.10). On the specific describers, the mothers of children attending a day nursery before they are 6 months old receive an average of 5.60 points (SD = 1.50) on *sensitivity,* 2.53 points (SD = 2.233) on *controlling,* and

5.93 points (SD = 1.870) on *unresponsive.* The mothers of children attending a day nursery after they are 6 months old receive an average of 7.20 points (SD = 2.10) on *sensitivity,* 1.80 points (SD = 1.472) on *controlling,* and 4.68 points (SD = 2.304) on *unresponsive.*

On the children's specific describers, those who entered a day nursery before being 6 months old received an average of 5.07 points (SD = 2.15) on *cooperativeness,* 1.53 (SD = 3.29) on *compulsivity*, 4.07 (SD = 3.47) on *difficult*, and 3.27 points (SD = 3.17) on *passivity*. The children who started attendance at a day nursery after being 6 months old received an average of 7.28 points (SD = 2.45) on *cooperativeness,* 0.80 points (SD = 1.60) on *compulsivity,* 3.00 points (SD = 2.00) on *difficult,* and 2.92 (SD = 2.79) on *passivity.*

The correlation between maternal *sensitivity* and infant *cooperativeness* continues to be high and positive when the dyads are grouped according to the age of starting attendance (before and after the child's 6 months old), being $r = 0.826$ ($p<0.01$) for the dyads starting attendance before the child being 6 months old, and $r = 0.892$ ($p<0.01$) for the dyads starting attendance after the child being 6 months old, showing that the higher the *sensitivity,* the higher is the child's *cooperativeness*.

The *t* test for independent samples inside the group attending a day nursery, shows that the dyads with children who started attendance after being 6 months old exhibit significantly higher quality interactions than the dyads whose children started attendance before being 6 months old, with medium and high effect sizes evaluated with Cohen's d. The mothers of the children who started attendance after being 6 months old receive significantly higher averages on *t total sensitivity* (36.679 = 2.797; $p < 0.01$); (*d* = 0.876), on *t sensitivity on cognitive items* (38) = - 2.30; $p < 0.05$; (d = 0.764), on *t total cooperativeness* (38) = - 2.88; $p < 0.05$; (d = 0.95), and on *cooperativeness on t cognitive items* (38) = - 2.02; $p < 0.05$; (d = 0.683) and *t affective* (38) = - 2.97; $p < 0.05$; (d = 0.994). The average difference is not significant on the mothers' *controlling* and *unresponsive* describers, and *difficult, compulsive* and *passive* on children. The results on the t test and the ES for the comparison of maternal sensitivity and infant cooperativeness inside the group attending a day nursery is presented on table 5.

Table 5. *t test and effect sizes (ES) for the comparison of the mother's sensitive response and infant cooperativeness inside the group, with day nursery attendance, according to starting age.*

	Statistic	By	group		t	Test	for	equal	means		
									95%CI	for diff.	
	Group	Mean	SD	t	fd	Sig(Bilat)	Diff Mean	St error of diff	Inf.	Sup.	ES
Affec sens	< 6m	4.40	1.35	-1.52	38	.135	-.640	.419	-1.48	.208	.49
	≥ 6m	5.04	1.24								
Cogn sens	< 6m	1.20	1.20	-2.30	38	.027	-.960	.416	-1.80	.117	.76
	≥ 6m	2.16	1.31								
Total Sens	< 6m	5.60	1.50	-2.79	36.67	.008	-1.60	.572	-2.75	-.441	.87
	≥ 6m	7.20	2.10								
Affe coop	< 6m	3.53	1.30	-2.97	38	.005	-1.38	.467	-2.33	-.442	.99
	≥ 6m	4.92	1.49								
Cog coop	< 6m	1.53	1.06	-2.02	38	.050	-.827	.409	-1.65	.001	.68
	≥ 6m	2.36	1.35								
Coop Tot.	< 6m	5.07	2.15	-2.88	38	.006	-2.21	.768	-3.76	-.659	.95
	> 6m	7.28	2.45								

Discussion

Similar tendencies can be seen on the prevailing describers of the mother-child dyads, with and without attendance to a day nursery, both showing a predominant "sensitivity", mainly, on the affective and "unresponsive" aspects of the interaction, even though the scores on the "controlling" describer are higher in the mothers of children who attend a day nursery, and the "unresponsive" describer are higher in the mothers whose children don't attend a day nursery.

Complementary to this, the children of the day nursery group show higher averages on the "difficult" and "compulsive" describers, and lower ones on the "passive" and "cooperative" ones than the children without attending a day nursery. In spite of these differences, the only one that is statistically significant is the one with higher sensitivity on the interaction affective aspects on mothers with children not attending day nurseries. Contrary to what is expected from the study's initial hypothesis, attending a day nursery doesn't favor the quality of the mother-child interaction.

This difference can be explained by two hypothesis: the first one considers that the mothers of both groups belong to the same municipalities and have access to public day nurseries by being heads of their homes in low-income, single-parent families, so, probably, those with a greater bonding quality with their children could postpone the attendance to a day nursery, in spite of the material and emotional cost it could represent to them. This could make us think that, probably, the interaction quality in these dyads could be higher on the affective aspects, even if we would compare both groups before entering the day nursery. From this we could deduct that, maybe, the higher or lower quality of the interaction on the affective aspects could be present before entering the day nursery, therefore, would not be depending on an effect of the type of alternative care the children receive.

A second hypothesis about the contextual conditions of the dyad, could also explain these results, from the lack of family networks present to support the mother with the activities associated to raising a child, especially in single-parent families. This can be seen in the lower number of adults the dyad shares the home with in the day nursery attending group, being the children's attendance to a care center more of an answer to the mother's needs than something she chose to do. On the other hand, known are the effects and the importance of the mother's educational level on the bonding quality with her children and in the improvement of the family life conditions, as it is possible to see in mothers of the group attending a day nursery with a higher number of years of schooling. Even though no significant correlations are observed between the mother's educational level and the mother-child quality interaction, it is possible that attending a day nursery benefits the mother pursuing an education, and this, later, making it more likely for her to get better paying jobs, which could have positive repercussions on the mother-child bonding quality, from the stress reduction and the improvement on quality life. Longitudinal studies are necessary, with samples of similar characteristics, in order to verify these hypotheses.

Even the differences found in the interaction quality of the groups of dyads, evaluated with and without day nursery attendance, are statistically significant, and the effect size of

these differences is medium, the samples are small, so, new studies are required with larger size samples for their confirmation.

On the other hand, the analysis done inside the group with day nursery, organized according to the starting age of the child, before or after 6 months old, are relevant. In these analysis it is possible to see a higher quality bonding in the dyads starting attendance after the children become 6 months old, showing higher "sensitivity" and "cooperativeness" on their cognitive and affective aspects, than the group of dyads with children entering the day nursery before the children are 6 months old. There are, also, lower averages for the mothers on "controlling" and "unresponsive", and for the children on “difficult”, “passive” and “compulsive”. Of these differences, the statistically significant are total maternal “sensitivity” and “sensitivity” on the cognitive aspects, just like total “cooperativeness” on children, an on the cognitive and affective items. These differences show high effect sizes for the total maternal “sensitivity”, total infant “cooperativeness” and infant cooperativeness on the affective aspects of the interaction. The remainder significant differences (maternal sensitivity on cognitive aspects, and infant cooperativeness on cognitive aspects, as well), show medium effect sizes. It is important to highlight, also, that interaction quality in the dyads with children entering day nurseries before 6 months old is located in the intervention rank, which requires psychoeducational support.

Starting attendance at a day nursery before the children become 6 months old with days of 8 to 10 hours, leaves little room for the daily space and time for mother-child contact and daily interaction, obstructing, probably, this event, the forming of an adequate bonding. This way, starting attendance after being 6 months old allows for an initial time of getting to know each other and exchange in the dyad that could benefit the bonding quality and promote better conditions to face the separation that implies attending a day nursery.

On the other hand, the fact that the mothers with and without attendance to a day nursery show as a prevailing second describer “unresponsive”, alerts us about possible

depressive symptomatology, a variable that in some investigations is presented as interacting with the maternal sensitive response, and negatively affecting her (Friedman & Boyle, 2008). This agrees with the studies reviewed on single-parenting, which state that a greater depressive symptomatology on mothers could interfere their ability to adequately read, interpret and take care of their children's signals (Lara-Cinisomo, Griffin, Daugherty, 2009; Bastos, Casaca, Nunes & Pereirinha, 2009).

Even though this variable was not taken into consideration in this study, it alerts us about the need to consider it in future investigations.

This leads to hypothesize that when the mothers of both groups don't get an adequate sensitive response from the children, their difficulties are focused on their mistakes, in order to be able to adequately respond to the child's signals by, probably, being focused on their own experiences and perspective than on the conduct and general condition of the child. Even though it is not reported in the results, the mothers of the study show an open and hidden unresponsive conduct. The open ones are characterized by giving little information to the child, which complicates her organization during interaction, since she doesn't know what to expect, and the hidden ones show a disagreement between the happy interaction the adult shows and the infant who doesn't appear to be content, having both ways of interacting differential effects on the children.

The slightly higher score on the "controlling" describer of mothers with children attending a day nursery, compared to the mothers of non-attending children, could be explained by the demands of necessary order and structure for the daily chores necessary to prepare a little child attending a care center. Complying with schedules which, generally, are complementary to the mother's daily job, probably, makes it necessary to put pressure on the child, and in this sense, produces a greater activation and directivity in the interaction, leaving less room for the child's needs. The mothers of the group without a day nursery, in a greater percentage are at home all day, or have part-time jobs, making it innecessary to

create rigid structures of activities, this way, without producing an excessive control of the interactions with their children. This allows, also, for the understanding of the mother-child interaction as a part of survival adaptation strategies, where postnatal legislation, financial liabilities and the stress of being in a single-parent family could explain the errors in the interaction quality as a part of an adaptation process to a difficult reality.

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Battery of Multidimensional Cultural Questionnaires for Research in Psychology: Application in a Chilean Population Sample[1]

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Abstract

This study reports the results of the application, in Chile, of the Battery of Multidimensional Cultural Questionnaires for research in psychology, developed in Heidelberg, Germany (Freund et al., 2010). The battery is composed of adaptations of the Self-construal Scale (SCS; Singelis, 1994), the Sex-Role Ideology Scale (SRIS; Kalin & Tilby, 1978), and the Tightness-Looseness Scale (TLS; Gelfand et al., 2007). The purpose of this battery was to contribute to intercultural research in psychology by measuring a wide range of cultural variables on an individual level. A representative sample consisted of 343 participants from Santiago, the capital of Chile. All of the scales used were found to have adequate psychometric properties. The results show that Chileans score high on independent and interdependent measures of self-concept; demonstrate greater tightness to family norms than to social norms; and that women, youths, and people of higher income have more egalitarian attitudes about gender roles.

[1] This study is part of the research conducted by the International Doctoral Programme in Psychotherapy at the Pontificia Universidad Católica de Chile, Universidad de Chile, and the University of Heidelberg.

Keywords: culture, independence-interdependence, self-construal, sex-role ideology, tightness-looseness, Chile.

Freund et al. (2010) developed and validated the Battery of Multidimensional Cultural Questionnaires for research in psychology in Heidelberg, Germany. Their battery included adaptations of the Self-Construal Scale (SCS; Singelis, 1994), the Sex-Role Ideology Scale (SRIS; Kalin & Tilby, 1978), and the Tightness-Looseness Scale (TLS; Gelfand et al., 2007).

This battery was selected for adaptation and application in Chile because it consists of scales that allow cultural variables to be measured at the individual level. This makes it a useful tool for empirical studies that seek to deepen the relationship between specific and measurable aspects of culture and psychological variables.

Although cross-cultural research has a long history, it has gained momentum in recent decades and has become an area that encompasses a wide range of psychological phenomena (Berry, Poortinga, Segall, & Dasen, 1992; Matsumoto & Juang, 2008). Several authors (Berry et al. 1992, Matsumoto & Juang, 2008) have established specific cultural variables to account for the complex cultural issues that influence both changes in behaviour and human experience.

Current trends in cross-cultural psychology have benefited from the use of individual-level measures of culture as contextual variables, assessed on individuals, that detail the psychological dimensions associated with significant levels of cultural variability (Matsumoto & Juang, 2008).

The Battery presented in this study sought to evaluate contextual variables derived primarily from the cultural dimension, identified by Hofstede (1980), called “individualism versus collectivism”.

The Self-Construal Scale (SCS), result of theoretical advances developed by Markus and Kitayama (1991), evaluates these variables. These authors suggested that individualistic

and collectivist cultures differ in the type of self-concept with which they identify. According to this theory, individualist cultures promote the development of an independent self-construal, and collectivist cultures promote the development of an interdependent self-construal. To measure these variables, Singelis (1994) created the SCS.

The Sex-Role Ideology Scale (SRIS, Kalin & Tilby, 1978), which measures an individual's attitudes about gender roles, is also derived from the cultural dimensions of Hofstede (1980). The scale was created from the findings of studies on the individualism versus collectivism dimension; which showed that individualistic countries adhered to more liberal gender ideologies whereas collectivist countries conformed to more traditional ones (Williams & Best, 1990).

The Tightness-Looseness Scale (TLS) developed by Gelfand et al. (2007), rather than being associated with individualism and collectivism variables, evaluates variables related to population density, cultural homogeneity or heterogeneity, and the degree of isolation of a community (Chan, Gelfand, Triandis, & Tzeng, 1996).

To select the instruments of the battery, Freund et al. (2010) required: (1) that they have a theoretical basis, i.e., that they be derived from known contextual or cultural variables or that they be embedded in a developed cultural model; (2) that they could be used to test different cultural groups in a reliable and valid way; (3) that they could distinguish between different cultural groups; (4) that they were correlated with relevant psychological variables; and (5) that, theoretically and empirically, they considered diverse variables.

The battery is intended to be a contribution to cross-cultural studies, especially to those that do not consider cultural variables to be direct antecedents of a resulting behaviour, but to be indirect influences that explain the behaviour.

Thinking of cultural variables in this new way would allow us to apply models of mediation to determine the effect that each of the different cultural variables has on the

psychological aspects under consideration, this would also allow us to identify the presence of intra-cultural variance (Berry et al., 1992).

Literature Review

Self-Construal

Markus & Kitayama (1991) and Singelis (1994), after searching for distinct and significant variables that could account for the relationship between culture and identity have developed a conceptual framework for understanding self-construal.

It has been argued that collectivist cultures have an interdependent self-construal and individualist cultures an independent self-construal (Matsumoto & Juang, 2008). According to the approaches of these authors, the independent self is characterised as perceiving himself separately from others; he admires unique personalities and organises his behaviour around his own thoughts and feelings. Those with an interdependent self-construal perceive themselves as being connected to others, emphasise the importance of public characteristics, and are concerned about the effect of their behaviour on others.

Sex Role Ideology

In recent years, the influence of beliefs about gender roles on behaviour has been increasingly recognised. After the emergence of the feminist movement in the late 1960s, a series of new scales addressing this phenomenon was developed.

In this context, Kalin & Tilby (1978) created a scale that has been widely used. This scale assesses an individual's ideology of gender roles, understood as prescriptive beliefs about appropriate behaviour for men and women. The instrument considers the ideology of gender roles as a unidimensional variable with two poles: one traditional and the other egalitarian. The traditional ideology is based on belief in the basic differences between the sexes and the assignation to women of the roles of housewife and mother. The man is the actor, the supplier, and the final authority. The egalitarian ideology states that psychological

sex differences are largely socially determined, and the roles of men and women should be essentially the same.

The original scale contained 82 items, 30 of which were selected for the final scale. These can be grouped into five major areas: (a) work roles of men and women; (b) parental responsibilities; (c) interpersonal relations between men and women, such as friendship, courtship, and sexuality; (d) the special role of women and the term "pedestal"; and (e) maternity, abortion, and homosexuality (Kalin & Tilby, 1978).

In the present study, we modified the 18-item shortened version developed by Cota & Xinaris (1993). The internal consistency of the short form and its correlations with age, educational level, and social desirability are comparable to those of the full form. The intercorrelations between the short and full forms were at least .94. Overall, minimal information is sacrificed when a researcher chooses to use the short SRIS rather than the full version.

The final version of the scale was developed by Freund et al. (2010), who selected the 9 items with the best predictability, thus shortening the scale for the Battery of Multidimensional Cultural Questionnaires used in this study.

Tightness-Looseness

While it has received less attention than other variables of inter-cultural differentiation, the construct of tightness-looseness has been considered relevant to the dimensions that describe variations among cultures. This variable is seen as different from and complementary to other cultural dimensions, such as individualism-collectivism, tolerance for uncertainty, and power distance (Gelfand, Nishii & Raver, 2006).

The construct of tightness-looseness arose from the observation that in all human groups there exist more or less explicit or norms to regulate the conduct of members and create penalties for transgression. Tightness-looseness refers to the extent to which the

culture imposes clear rules for its members and provides reliable penalties to those who break these rules (Chan, Gelfand, Triandis, & Tzeng, 1996). This unidimensional construct consists of two elements: 1) the strength and clarity of social norms and 2) the degree of tolerance for deviation from those norms (Gelfand, Nishii & Raver, 2006).

The tightness-looseness construct was originally developed by Pelto (1968), who described loose cultures as those in which the rules are expressed through many alternative channels and in which there is a lack of regularity and discipline and a propensity to be tolerant of deviant behaviour. Values such as formality, group organisation, and solidarity would be less developed in such cultures.

At the other end of the continuum, Pelto (1968) noted that tight cultures have clear rules and that their members behave in a disciplined and regulated manner; there is low tolerance and a clear penalty for those who deviate from rules. Triandis (1977, 1989) has hypothesised that tight cultures have a more complex and differentiated social organisation. Gelfand, Nishii, & Raver (2006) have developed a multilevel theory of cultural tightness-looseness, relating the degree of social norms and sanctions to individual psychological and organisational processes.

In the Battery presented, the tightness-looseness variable was assessed using the 6-item scale developed by Gelfand et al. (2007) and adapted to the social norms of each country (TLS-S). Following the recommendation of the authors of the scale concerning its applicability to other units of analysis, Freund et al. (2010) adapted the scale to assess the strictness or permissiveness of the rules within the family (TLS-F). This scale was added to the Battery.

Method

Participants

The sample comprised 343 participants residing in Santiago, the capital of Chile. To ensure the representation of general population, participants were selected in consultation with information from the latest national census, performed in 2002 (National Statistics Institute, 2003), which corresponds to the national survey developed by the government of Chile to assess and socio-demographically characterise the country's population.

Frequencies were determined for gender, age, family income quintile, and educational level. 171 (49.85%) females and 172 (50.15%) males participated in the sample. Of the participants, 34 (9.91%) were aged between 15 and 19 years, 167 (48.69%) between 20 and 39 years, 110 (32.07%) between 40 and 59 years, and 32 (9.33%) were 60 years of age and older. Income quintiles in Chile distribute the total population into five groups according to their income, Quintile I representing the lowest income and Quintile V the highest. Income ranges were defined for each quintile based on the average household income for Santiago, defined by the CASEN (National Socio-Economic Characterisation) Survey in 2006. The distribution of the participants in each quintile was then determined: 78 (22.74%) were found to be in Quintile I, 111 (32.36%) in Quintile II, 37 (10.79%) in Quintile III, 41 (11.95%) in Quintile IV, and 76 (22.16%) in Quintile V. When grouped according to education level, 11 (3.21%) were found to have received less than eight years of schooling, 20 (5.83%) had received eight years of schooling, 60 (17.49%) had received between 9 and 11 years, 137 (39.94%) had received 12 years, 52 (15.16%) had received 14 years, and 63 (18.37%) had received 17 or more years of schooling.

Instruments

The battery was composed of the three above-mentioned cultural scales (SCS, SRIS, and TLS). A questionnaire was to collect information about the socio-demographic background and cultural origins of the participants. Gender, age, marital status, number of children, educational level, current employment, total number of persons in the household, and family income level were included in this questionnaire.

Self-Construal Scale (SCS). This scale, developed by Singelis (1994), consists of 30 items, 15 of which measure the subjects' level of independence and 15 of which measure their level of interdependence. In each item, the subjects express their level of agreement or disagreement with the proposed statement using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). Possible scores range between 15 and 105 for each subscale.

This instrument showed adequate psychometric properties in its original validation, with Cronbach's alpha values of .70 and .74 for independence and interdependence, respectively (Singelis, 1994).

Sex-Role Ideology Scale (SRIS). This scale was developed by Kalin & Tilby (1978). The internal consistency of the scale has been demonstrated by item-total correlations and split-half reliability measures (median r = .79). The test-retest reliability was 87.

We used the abbreviated version of the SRIS, which contained 9 items (Freund et al., 2010). In each item, the subjects indicate their degree of agreement or disagreement with the proposed statement using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). The scores of the items written in a traditional direction were reversed before obtaining the total scale score. Possible scores range between 9 and 63. The lowest scores correspond to traditional ideologies and the high scores correspond to more egalitarian gender roles ideologies.

Tightness-Looseness Scale, Social Version (TLS-S).

This scale, developed by Gelfand et al. (2007), explores in 6 items the tightness or looseness with which social norms are perceived and the weight given to social discipline. Subjects indicate their degree of agreement or disagreement with the proposed statement using a standard 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). The possible scores range from 6 to 36. The score in item 4, which is worded in the direction of looseness, is reversed before obtaining the total scale score. Higher scores indicate a greater tightness

of social norms. This study is yet unpublished, and data on the scale's psychometric properties has therefore been omitted.

Tightness-Looseness Scale, Family Version (TLS-F). This scale, adapted by Freund et al. (2010), is similar to the TLS-S, but the items refer to the perceived tightness or looseness of rules and sanctions within the family group. This scale has six items with the same response options and scores as the TLS-S.

In the study by Freund et al. (2010), the TLS-F produced two measures. The first corresponded to the presence of rules and sanctions and grouped items 1, 2, and 5, which had a Cronbach's alpha of .73. The second corresponded to the degree of consensus in the family rules (items 3 and 6), which yielded a Cronbach's alpha of .63.

Procedure

The application process began with the translation and adaptation of the new battery to the international recommendations to ensure cultural appropriateness and semantic equivalence to the original scales (Wild et al., 2005). Two independent translations from English into Spanish were conducted by bilingual members of the research team. These translations were then compared and merged into one version. This version was then back-translated into English by a native English-speaking translator. A comparison was made between the back-translated version and the original scales to ensure semantic equivalence between the two. A pilot study, with 60 participants and 4 interviews, was then conducted to assess whether people with low education levels were able to understand the items in the scales. These interviews revealed the difficulties in understanding encountered by that sociocultural group, and additional corrections were made to the scales to improve their comprehensibility. Once the process of translation and linguistic adaptation was completed, the battery was applied to the Chilean sample.

The data collected were first subjected to an analysis of lost data, which showed that no variable had more than 5% of lost items and that information was lost completely at

random (Little's MCAR test). They were also subjected to a data allocation process through multiple regression analysis, using as independent variables in each prediction the rest of the variables in each subscale. The parameters of this estimation were determined by the method of residuals.

To determine the psychometric properties of the battery in the Chilean sample, we conducted factor and reliability analyses. The factor analysis was exploratory in nature and was used to discern the dimensional structures of the scales. Using CEFA software (Browne, Cudeck, Tateneni, & Mels, 1998), the data from each scale were subjected to maximum likelihood factor extraction using the oblique Quartimax rotation procedure.

Reliability tests were conducted on each scale using Cronbach's alpha coefficient. The results of these tests allowed us to identify problematic items and assess whether their removal was necessary.

In a complementary procedure, correlational analyses were performed between the scales to explore possible relationships between constructs to determine the level of independence between the scales.

Finally, descriptive analyses of the averages of each scale were made on the gender, age, and income level variables using an ANOVA and t test to evaluate the statistical significance of the differences found.

Results

The results of the factor analysis of the SCS did not provide clear evidence to support the two-dimensional structure of the individualism-collectivism construct. Following the precedent of previous studies that have used the scale (Hardin et al., 2004, Freund et al., 2010) and that account for its multifactorial structure, the search was oriented to new groups under the assumption of its theoretical consistency. However, this was not found in the

Chilean sample, leading us to conclude that there was an insufficient trend towards two-dimensionality.

Factor I grouped 13 of the 15 items of independence and 6 of the items of interdependence. Factor II grouped 7 of the items of interdependence; 4 of the items (two in each dimension) did not obtain high enough factorial loadings to be associated with either of the two factors. However, the reliability analysis of the SCS showed acceptable psychometric properties.

The Cronbach's alpha coefficient had a value of .66 for the independence subscale and .69 for the interdependence subscale. The detailed analysis did not identify items whose removal would have significantly improved the Cronbach's alpha coefficients of the subscales.

A factor analysis provided evidence for the unidimensionality of the SRIS scale. Only two of the nine items had loads less than .3 in the factor solution, while the remaining items had loads greater than .5, indicating a high association with the factor. The items that had low loads corresponded to the items whose scores were reversed. A reliability analysis of the scale obtained a Cronbach's alpha coefficient value of .75. A detailed analysis did not identify items whose removal would have significantly improved the coefficient.

For the TLS-S and TLS-F scales, a factor analysis confirmed the presence of a factor in each, including 5 of the 6 items (all with loads exceeding .4). The reliability analysis supported the findings of the factor analysis. In each scale, however, a problematic item was identified.

The Cronbach's alpha coefficient of the TLS-S had a value of .51, considered an indicator of low reliability. However, when item 4 ("People in Chile have great freedom to decide how to behave in most situations") was removed, the Cronbach's alpha coefficient improved to .68. Similarly, the Cronbach's alpha coefficient of the TLS-F was .57. When item 10 ("People in my family have great freedom to decide how to behave in most situations")

was removed, the coefficient increased to .72. Therefore, we decided to exclude the problematic items from the respective scales.

Table 1 presents a summary of Cronbach's alpha coefficients obtained for all the scales, reflecting the elimination of item 4 from the TLS-S and item 10 from in TLS-F.

Table 1. *Reliability Analysis of Scales by Cronbach's α*

	N of items	Cronbach's Alpha
Independent SCS	15	.66
Interdependent SCS	15	.69
SRIS	9	.75
TLS-S	5	.68
TLS-F	5	.71

The analysis of inter-scale correlations showed significant correlations between several scales and subscales.

Two of the SCS subscales correlated with each other (Pearson correlation = .250, $p < .000$). In the sample, people who scored high on interdependence also scored high on independence.

The interdependence subscale of the SCS, had its highest correlation with the TLS-F (Pearson correlation = .373, $p < .000$), indicating that, in the presence of greater interdependence, there is more strictness in the family rules and penalties. This subscale also had a positive association with the subscale TLS-S (Pearson correlation = .224, $p < .000$).

The SCS independence subscale followed a similar pattern in its correlations. First, its highest relation occurred with the TLS-F, indicating that greater independence is associated with more strictness in family norms and penalties. This subscale also had a positive association with the TLS-S (Pearson correlation = .213, $p < .000$).

The SRIS presented a significant and negative correlation with the SCS interdependence subscale (Pearson correlation = .334, p < .000); people with a more egalitarian gender role ideologies had lower scores on interdependence.

The SRIS also presented negative correlations with the TLS-S and TLS-F, which, although lower, were also of significant. The more egalitarian an individual's ideology of gender roles is, the lower the strictness of family and social rules and sanctions is.

Finally, TLS-S and TLS-F show a significant correlation (Pearson correlation = .299, p < .000). In other words, the greater the strictness of social norms and sanctions is, the greater the strictness of family rules and penalties is.

Table 2 presents the results of the correlational analysis across all scales.

Table 2. *Pearson's Correlations between Scales and Bilateral Significance.*

		SCS Interd.	SCS Indep.	SRIS	TLS-S	TLS-F
Interd. SCS	Correlation	1	.250**	-.334**	.224**	.373**
	Sig.		.000	.000	.000	.000
Indep. SCS	Correlation	.250**	1	-.021	.213**	.275**
	Sig.	.000		.694	.000	.000
SRIS	Correlation	-.334**	-.021	1	-.109*	-.129*
	Sig.	.000	.694		.044	.017
TLS-S	Correlation	.224**	.213**	-.109*	1	.299**
	Sig.	.000	.000	.044		.000
TLS-F	Correlation	.373**	.275**	-.129*	.299**	1
	Sig.	.000	.000	.017	.000	

The descriptive statistics of the Chilean sample, after the modifications already mentioned, showed the following averages and standard deviations: SCS interdependence, M = 79.67, SD = 10.68; SCS independence, M = 75.66, SD = 11.53; SRIS, M = 44.53, SD = 11.19; TLS-S, M = 20.73, SD = 4.82; and TLS-F, F = 23.68, SD = 4.50.

We compared the averages obtained in the TLS-S and TLS-F using a t test. We concluded that the Chilean population is significantly stricter (tightness) in their family norms than in their social norms (p < .001).

We conducted an analysis on each scale for the variables of gender, age, and level of family income. We obtained a 2.95 point difference between men and women on the SRIS scale; men obtain an average of 43.06 (SD = 11.41) and women an average of 46.01 (SD = 10.79). Student's t test for independent samples indicated that differences in the averages were statistically significant ($t(341) = -2.454$, $p < .05$), which indicates that Chilean women have a significantly more egalitarian ideology of gender roles than Chilean men.

Table 3 shows the averages obtained from the scales when men and women were considered separately.

Table 3. *Mean Scores According to Gender*

	Men		Women	
	Mean	SD	Mean	SD
Interdependent SCS	79.24	10.87	80.10	10.50
Independent SCS	75.35	11.67	75.97	11.41
SRIS	43.06	11.41	46.01	10.79
TLS-S	20.56	4.85	20.89	4.80
TLS-F	23.44	4.47	23.92	4.52

To assess the impact of age on the outcome of the SRIS scale, an ANOVA was performed to record the age variables in four categories: 15-19 years, 20-39 years, 40-59 years, and 60 years or older. The age groups generated significantly different scores on the SRIS scale ($F(3, 339) = 2.695$, $p < .05$). By examining in detail the differences between age groups (we used the Bonferroni adjustment for multiple comparisons) we identified that people between 20 and 39 years of age scored significantly higher than those aged 60 years or older, with averages of 45.86 (SD = 10.94) and 40.55 (SD = 13.31), respectively. Student's t test for independent samples confirms that these differences are statistically significant ($t(57.460) = 2.411$, $p < .05$). This indicates that persons 60 years or over have significantly more traditional ideologies of gender roles and stereotypes than do people between the ages of 20 and 39.

Table 4 shows the averages obtained from the scales for each of the four age groups listed.

Table 4. *Means Scores According to Age Group*

	15 to19 years		20 to 39 years		40 to 59 years		60 or older	
	Means	SD	Means	SD	Means	SD	Means	SD
Interdependent SCS	79.55	8.75	79.74	10.94	79.00	10.77	81.14	10.62
Independent SCS	70.98	8.82	75.48	11.64	76.11	10.99	77.83	13.27
SRIS	43.75	8.99	45.86	10.95	44.23	10.82	40.56	13.31
TLS-S	21.13	3.79	20.50	4.96	20.87	4.74	21.01	5.08
TLS-F	24.17	3.42	23.27	4.76	24.19	4.16	23.67	4.77

When considering the family income quintile to which participants belonged and comparing the averages obtained on each scale of the battery, significant differences in the SRIS scale reappeared ($F(4, 333) = 7.872$, $p < .001$). A detailed analysis of the differences between the quintiles showed that people belonging to the higher income quintile of the population (QV) had higher averages in the SRIS scale than people belonging to quintiles I, II, and III. Student's t test for independent samples indicated that the differences in the averages were statistically significant between quintiles I and V ($t(152) = -5.343$, $p < .001$); between quintiles II and V ($t(180) = -4.54$, $p < .001$); and between quintiles III and V ($t(111) = -3.557$, $p < .005$). These results show that people with a higher income (QV) have significantly more egalitarian ideologies of gender roles and stereotypes than do people from the three poorest quintiles (I, II, and III). This trend was also observed between the three poorest quintiles and the fourth quintile, but the differences were not statistically significant.

Table 5 shows the averages obtained from the scales according to the family income quintile of the participants.

Table 5. *Mean Scores According to Income Quintile*

	I Q		II Q		III Q		IV Q		V Q	
	Means	SD	Means	SD	Means	SD	Means	SD	Means	SD
INDEP. SCS	79.65	9.29	79.23	10.56	78.45	11.51	81.36	13.60	79.99	10.46
INTER. SCS	75.41	13.24	75.64	11.64	77.85	11.61	74.96	11.19	74.61	9.04
SRIS	40.94	10.84	43.52	10.53	42.40	11.58	45.80	11.31	50.03	10.24
TLS-S	20.93	5.01	20.75	4.95	20.83	4.42	19.74	5.31	20.95	4.37
TLS-F	23.60	4.67	23.41	5.26	24.24	3.68	23.51	4.33	23.70	3.59

Discussion

The results generally show adequate psychometric properties for the battery. All scales had reliability coefficients (Cronbach's alpha) between acceptable and good. The TLS and SRIS scales also met expectations in their factor analyses, which were performed to verify construct validity. These results led us to consider these scales to be valid and reliable instruments in Spanish, especially suitable for the Chilean population and for cross-cultural research in psychology.

The unsatisfactory results of the SCS scale's factor analysis were consistent with previous studies (Hardin et al., 2004; Hardin (2006), which identified problems in the construct validity of the scale. It is worth mentioning that Freund et al. (2010), in applying the instrument to a sample of 515 people in Heidelberg, produced similar results using the 6 higher order factors developed by Hardin et al. (2004), which can be theoretically derived from the two original dimensions. Nevertheless, these results were not found in Chile.

Because of the important contribution that Markus & Kitayama (1991)'s constructs of independent and interdependent self-construal have made to cross-cultural psychology, it is important to review the applicability of SCS in Chile. It is likely that such a review would need to be focused on its multidimensionality so that this would enable it to be a useful tool for enhancing cross-cultural studies between Chile and other cultures. This remains a challenge for further research.

The correlations between the scales of the battery were generally moderate to low, confirming the heterogeneity of the variables. Those correlations with higher scores

represent relationships that make theoretical sense, for instance, the relationship between interdependent self-construal and strictness in family rules. It is reasonable that people with more interdependent self-images, who value ownership, and who seek to adapt their behaviours to the expectations of their reference group, also perceive and/or belong to a family group organised around clearly defined standards with defined penalties for deviation. There was another significant correlation of even higher value between interdependent self-construal and traditional gender roles ideology, a correlation that has also been confirmed in other studies (Barry & Beitel, 2006).

Significant and negative correlations were found between gender role ideology (SRIS) and TLS social norms, TLS family norms, and the interdependence SCS. This means that people with more egalitarian gender role ideologies are more flexible in their social and family norms and are less interdependent. The same is true of the more egalitarian ideologies manifested in the higher income people in the study, who have a higher level of education and better job prospects, which leads to them to see themselves as separate from others and to place their own goals and accomplishments above the group's.

It is worth mentioning the existing correlation between the two sub-scales of the SCS. In the Chilean sample, people who scored high on interdependence also scored high on independence. This result may account for the characteristics of the studied population. However, the less than satisfactory findings of the factor analysis do not guarantee this.

Nevertheless, these results are consistent with a recent study on Chilean population (Kolstad & Horpestad, 2009). Initial studies identified Chile as a collectivist country (Hofstede, 1980) composed of people with a primarily interdependent self-construal (Markus & Kitayama, 1991). However, Kolstad and Horpestad (2009) have suggested that collectivism and individualism dimensions are probably unable to account for the complexity of modern societies like Chile's. Moreover, the construction of the independent and interdependent self would be present in all cultures to some extent; its expression would

depend upon economic, political, and historical variables and values. The presence of one construct could not be predicted from the absence of the other because they would not be poles of the same variable, but separate concepts that together can have a pronounced expression. Such has been demonstrated in studies done on other cultures as well (Shafiro, Himelein, Best, 2003).

Another hypothesis about these results is related to the adaptive strategies that each human group develops according to the context in which it lives. It is conceivable that in societies such as Chile, where the state and its social protection policies still fail to guarantee the basic needs of its citizens, the privileging of relationships and their importance (interdependence) may be necessary to ensure survival and improve the quality of life. On the other hand, initiative, the ability to focus on one's own goals, and autonomy (independence) are adaptive tools that can give individuals greater access to education and better jobs. This could be seen in the averages obtained for measures of independence and interdependence according to income quintiles: people belonging to the three poorest quintiles showed higher scores on interdependence, and persons belonging to the two richest quintiles scored high on independence.

In the Chilean sample women expressed more egalitarian sex role ideologies than men, a result consistent with the general trend showed in SRIS results in other countries. The Chilean results could be explained by recent societal changes, including the incorporation of women into the workforce, the increase in female-headed households, and the greater influence of women in positions of power (Arriagada, 2004; Cerrutti & Binstock, 2009). These changes could contribute to more egalitarian attitudes toward gender roles in women because these individuals have directly experienced the benefits of increased equality in the workplace and in other aspects of their lives.

The elder people traditional attitudes towards gender roles could be explained realising that over 60 year old people are nearing the end of their reproductive period and

formed their families about 30 years ago, when many women worked predominantly to care for children and as housewives. This is consistent with studies that have indicated that men and women have been becoming increasingly egalitarian since the 1990s (Davis & Greenstein, 2009).

The relationship found between income and the gender roles ideology, are consistent with previous studies that have associated economic development with liberal and egalitarian ideologies (Triandis, 1995). In the Chilean sample; people belonging to higher income quintiles showed more egalitarian than those belonging to the poorer quintiles.

The significant average difference between the TLS-S and TLS-F is remarkable. Family rules of the Chileans were more rigid than were social norms, which may be explained based on criteria proposed by Chan, Gelfand, Triandis, & Tzeng (1996) for determining the strictness or flexibility of group norms. The family of each individual represents a more immediate and concrete group than Chilean society in general. Within the family, people experience a high degree of interpersonal contact and interdependence, which require a larger number of rules and regulations for care, coexistence, and privacy. The family is also a more homogeneous group than society and is, therefore, less tolerant of difference and deviation from the rules.

It would be interesting, in the future, to apply these scales to the measurement of the potential mediating and/or moderating effects of cultural variables, such as sex-role ideology or the tightness-looseness of norms, in the understanding of psychological phenomena and their expression in different cultures or in different groups within the same culture. Another future challenge will be the complexity involved in addressing the concerns that have arisen around the SCS its relevant constructs.

A limitation of our study is that the sample consisted only of residents of Santiago, so results cannot therefore be generalised to other Chilean towns. It is also important to note

that the study did not consider the conceptual or construct equivalence of the Spanish scales to the original scales in English, though it could have been useful to do so.

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Early Mother-Child Interactions in Single-Parent, Chilean and German, Low-Income Families

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Abstract

Every day, more and more children are born and grow up within low-income, single-parent homes, thus associating this condition to a higher vulnerability bonding between mothers and their small children. Just as the family constitution has been a relevant variable in the studies on early bonding, belonging to a particular culture is also considered to be an influential aspect in the way mothers and small children interact. With this background as a starting point, 81 mother-child, Chilean and German dyads with infants between 3 and 14 months old, were surveyed. The child psychomotor development was evaluated, as well as the cultural variables and depression in the mothers, and the dyadic interactions quality with the CARE-Index instrument. Higher quality interactions are observed in the Chilean dyads, and a higher psychomotor development in the German infants. The Chilean mothers show a higher interdependency in the construction of the self and higher scores in terms of strictness in family norms.

Key words: Early interactions – single-parent families – cultural variables.

Background

Early infancy, single-parenting and quality of mother-infant interaction

Human beings are born before reaching neurological maturity, which implies that an important part of the development of the infant brain occurs within the first years of existence (Greenspan & Benderly, 1998). Thus, both the global postnatal surroundings and the interpersonal experiences between a child and his/her main caregivers will influence the structural and functional evolution of the child's brain, and will also affect the child's general development and subsequent mental health (Schore, 2000; Storfer, 1999).

Within the contextual conditions that surround the dyad, the family income, the educational level of the parents, the presence or lack of a supporting social net, and the family constitution, are all variables considered to be influential over the general state of the mother and the kind of interaction she establishes with her baby (Bowlby, 1969; Stern, 1997; Pelchat, Bisson, Bois & Saucier, 2003; Belsky, 1984, Coppola, Vaughn, Cassiba & Constantini, 2006).

Along these lines, the studies on single-parent, low-income families show high levels of family stress, maternal depression symptomatology, and low living standards, as well as a low parental educational level (Cooper, McLanahan, Meadows & Brooks-Gunn, 2009; Lara-Cinisomo, Griffin, Daugherty, 2009; Bastos, Casaca, Nunes & Pereirinha, 2009). These variables have a negative influence over the child and the bonding quality with the mother (Murray, Sinclair, Cooper, Ducournau & Turner, 1999; Rodríguez, 2006; Figueredo, Costa, Pacheco & Pais, 2009; Stern, 1997).

Within the variables taken into consideration when studying early mother-child interactions, the sensitive maternal response occupies a leading role, being associated to

the child attachment style (Ainsworth, 1978) and to the subsequent development of the baby (Stern, 1997; George & Salomon, 1999). Crittenden (2006) defines as a dyadic construct, any behavioral pattern displayed by the adult that calms the infant down and increases his/her comfort, thus reducing the child's anguish and lack of interest. The ability of the mother to respond to a child on a sensitive way will imply signal awareness, an adequate interpretation of these signals, and acting quickly and properly in the light of these interpretations (Marrone, 2001).

Studies that take family constitution and maternal sensitivity in consideration show a positive connection between the father's support on the mother's upbringing of the child and the ability of the mother to act on a sensitive basis when facing the children's signals (Hyunjeong, Young-Joo, Mi Ja, 2006; Valenzuela, 1997). In accordance with these findings, the studies on single-parent families show a connection between this family constitution and difficulties to sensitively respond to the signals and needs of small children (Casady, Diener, Isabella & Wright, 2001; Olhaberry & Santelices). *(Article sent for publication).*

Early interactions and cultural parenting models

Just as the type of family the dyad belongs to and the socioeconomic context where it develops are relevant aspects for the comprehension of the bonding styles between mothers and children, the culture where they are embedded in is also defined as an influential variable, with differences being observed in the interaction aspects that parents favor, according to the groups they belonging to (Matsumoto & Juang, 2008).

Through the parenting exercise, fathers and mothers pass on norms, values, and particular practices that will contribute in the preparation of their children, to adapt themselves to the economic, physical and social conditions, according to their specific culture (Keller, 2007; Weisner, 2002; Yoseff, 2005).

Children grow up and develop within interpersonal and interactional contexts, building up bonds and acquiring parameters that will define their relationships and generate the grounds of the construction of their self. On one hand, these bonds emerge from the child's need for care, and on the other, from the need of the adults to protect and stimulate. This way, the care that the adult provides the infant may be understood as a practice that belongs in a particular cultural model (Keller, 2007).

In terms of the cultural differences, Markus & Kitayama (1991), and later, Singelis (1994), developed a conceptual structure relative to the building of the self and its relations within a particular cultural context. These authors state that collectivist cultures would have, mostly, an interdependent self-construal, and individualist cultures an independent self-construal (Matsumoto & Juang, 2008). The independent self is characterized by being separate from his social environment, by giving importance to the unique and different self, and by organizing his conducts around his own thoughts and feelings. Those who show an interdependent self-construal see themselves interconnected with their social environment, emphasizing the relevance of public characteristics, and being concerned with the effect of their conduct on others.

This comprehensive cultural model has also been used in parenting studies, defining characteristics that are typical of independent and interdependent cultures (Keller, 2007). Studies on infancy and parenting that consider these dimensions, show that interdependent cultures have family support networks of a greater size (Keller, Abels, Lamm, Yovsi, Voelker & Lakhani, 2005), a greater participation of brothers in the creation of daily routines (Maynard, 2002), a greater stimulation of the gross motor development on children (Keller, 2003), greater body contact and stimulation (Keller, Yovsi, Borke, Kartner, Jensen & Papaligoura, 2004), and greater frequency of shared beds between mother and young child (Morelli, Rogoff, Oppenheim & Goldsmith, 1992). The last characteristic is associated to a lower use of transitional objects in children, and a greater demand of mother's milk during the night (Mosko, Richard, McKenna, Drummond & Mukai, 1997).

Parents of individualistic cultures, associated to building an independent self, privilege, mostly, that their children pursue autonomy, seeing them with will, wishes and needs of their own (Keller, 2007), they value face to face interactions with the child, objects stimulation (Keller, Borke, Yovsi, Lohaus & Jensen, 2005), and the child's capacity for self-regulation (Keller, Lamm, et al., 2006), as well as cognitive and intellectual development (Keller, Voelker, & Yovsi, 2005). In terms of Chilean and German parenting styles, present studies on middle-class German mothers, residing in urban areas, show a predominantly independent exercise of parenting (Keller, 2007; Keller & Lamm, 2005).

It is also observed that German mothers positively value the child's emotional expression, which becomes an effort to understand what happens to the baby when he cries, before acting to calm him down. This contrasts with what is seen in dyads of collectivist cultures, associated to the interdependent building of the self, where crying is interpreted as a sign of problems and loss of health, which activates fast strategies to calm the child down, especially through breast-feeding (Keller & Otto, 2009).

In Chile we do not have studies evaluating parenting, independence and interdependence altogether. However, we are aware that in the research performed by Hofstede (1980), Chile was initially characterized as a collectivist culture, associated to a mainly interdependent self construction. Recent Chilean research in this dimensions on urban general population report high scores regarding interdependence and independence (Olhaberry et al., *article sent for publication*), thus becoming relevant to investigate how this affects the parenting exercise and specifically the quality of the mother-child interaction in populations of low-income, single-parental families.

Based upon the given background, this study seeks to evaluate and compare the quality of interactions, the child psychomotor development, the maternal depressive symptomatology, and cultural variables in Chilean and German mother-infant dyads of low-

income, single-parent families. It also seeks to determine the bonding risk levels, as well as the prevailing type of interactions of mothers and children in each group.

It is expected to find dysfunctional interactions on a high percentage in both groups of dyads -taking into account that they represent a vulnerable group-, but also a higher quality in the cognitive aspects of the interaction within the German dyads and in the affective aspects in the Chilean ones. In terms of infant psychomotor development, higher scores are expected in the German children's group, considering both the higher scoring in the cognitive and intellectual development in the upbringing in individualistic cultures and the higher general educational level in Germany. High averages are expected in both groups in terms of maternal depressive symptomatology, though significantly higher in the Chilean mothers due to the fewer economic and mental health support programs they are offered, compared to the German mothers.

Regarding the cultural variables, differences between the groups are also expected to be found, with the Chilean mothers reaching higher scores in interdependence, more traditional ideologies on sex roles, and a higher adherence to family and social norms. German mothers are expected to obtain higher scores in independence, more egalitarian ideologies on sex roles, and lesser adherence to family and social norms.

High and positive correlations between the complementary aspects of the dyadic interaction in the groups are expected, especially between maternal sensitivity and infant cooperativeness.

Method

Design

This research represents a comparative, transversal, non-experimental study, since it compares two groups and carries out only one measuring in time. The independent variable studied was the nationality of the participating families, whereas the dependent

variables were the quality of the mother-infant interaction, the infant psychomotor development, the dependence and interdependence in the construction of the self, the ideology of sex roles, and the tightness/looseness in family and social norms.

Participants

The participants were 81 mother-infant dyads, 40 Chilean and 41 German ones, from single-parent, low-income families. The Chilean dyads belong to the two poorest quintiles of the population, and reside in urban, peripheral areas of Santiago, Chile. The German dyads receive a monthly family income equal or lower than 2.250 Euros and live in urban areas in the surroundings of Heidelberg, Germany.

With respect to the population background of each country, Germany has 82 million inhabitants, 91,5% of which are of German ethnic origin, 2.4% of Turkish origin and 6,1% of other origins, especially Greek, Italian, Polish, Russian, Serbo-Croatian, and Spanish. In terms of the population distribution as per age, 13.5% are located between 0 and 14 years old, 66.1% between 16 and 64 and 20.4% over 65. Life expectancy for males is of 76.4 years and for females, 82.5. The infant mortality rate is of 3.95 per 1.000 live births and schooling expectations are of 16 years, with a 99% of the population over 15 years of age who can read and write. On the other hand, Chile has a population of nearly 17 million inhabitants, 95.4% of which are of white-Amerindian origin, 4% of Mapuche origin, and a 0.6% belongs to other indigenous groups. The population distribution as per age shows a 22.7% located between 0 and 14 years of age, a 67.9% between 15 and 64, and a 9.3% over 65 years of age. Life expectancy for males is of 74.2 years and for females of 80.9. Infant mortality rate is 7.52 per 1.000 live births and schooling expectations is of 14 years with a 95.7% of the population over 15 years of age who can read and write.

As for the amount of single-parent families, this family constitution in Chile represents the 19% of the families with children under 18 years old. In Germany there are

1.6 million single-parent families and in 90% of them women raise their children by themselves (Cerrutti & Binstock, 2009; Federal Statistical Office, Microcensus, Germany, 2009; Hintereder, 2010).

The Chilean group consisted of 15 girls (37.5%) and 25 boys (62.5%), all of them between the ages of 4 and 14 months with an average of 10.49 (SD = 3.21), and the German group consisted of 17 girls (41.5%) and 24 boys (58.5%), between the ages of 3.3 and 12.16 months, with an average of 5.20 (SD = 1.88). The average age of the mothers in the Chilean group was of 24.5 years, the youngest 16 and the oldest 41 (SD = 6.24), whereas in the German group the average age of the mothers was 29.72 years, the youngest 17 and the oldest 46 (SD = 7.21).

The inclusion criteria considered for this study were Chilean or German nationality for mothers and children, respectively, residing in urban peripheral areas in Santiago, Chile, or in the surroundings of Heidelberg, Germany, belonging to the lowest income groups in both countries, and being part of a single-parent family in charge of the mother, of at least one child between 3 and 15 months of age.

The exclusion criteria include the presence of any physical and/or psychiatric pathology in any of the members of the dyad at the time of the evaluation. The mothers voluntarily agreed to participate in this study, and previously signed an informed consent letter according to the requirements of each country.

Instruments

Child-Adult Relationship Experimental Index: CARE-Index (Crittenden, 2006). It's an evaluation method for infant-adult interaction under non-threatening conditions, based upon the theory of attachment developed by P. Crittenden in 1997. The evaluation procedure consists of 3 to 5 minutes of videotaping of free play between the adult and the child. The

coding system is based on two main dyadic constructs: the sensitivity of the adult towards the child's signals, and the child's cooperation towards the adult. The interaction of the adult and the child is encoded as per 7 variables: facial expression, verbal expression, body position and contact, affective expression, turn taking contingencies, control and selection of activity. The first four variables define the affective aspect of the interaction, whereas the last three define its cognitive aspect. Both, the adult and the child are evaluated on a separate basis on each of the mentioned seven aspects of interaction behavior. Each of the seven variables may be scored with 2 points, which can lead to a 14 point outcome.

There are 3 specific describers for the adult: "sensitive", "controlling" and "non-responsive", whereas there are 4 describers for the infant: "cooperative", "difficult", "compulsive" and "passive":

Crittenden defines a dyadic sensitivity scale from 0 to 14 points, where 0-4 indicates "risk", "5-6" "inept or inadequate", "7-10" "adequate", and "11-14" "sensitive", criteria used to evaluate the interaction quality in this study. The author states that scores below 7 require some kind of intervention, recommending psychoeducation or intervention in the short term in the case of those dyads that scored 5-6 points, and parents-infant psychotherapy for those that scored 0-4. People trained by the instrument author, obtaining a reliability grade of 0.8, carried out the video codings.

Edinburgh Postnatal Depression Scale: Screening instrument, self-administered, designed with the purpose of detecting depressive symptoms in women with newborn children. The scale is composed of 10 multiple choice questions, with four answering alternatives each, scoring from 0 to 3 according to the increasing severity of the symptoms. Scores vary from 0 to 30, the higher representing a stronger presence of depressive symptomatology. The

version validated in Chile (Jadresic, Araya & Jara, 1995) was used, with a cut-off point of 10.

Battery of Multidimensional Cultural Questionnaires (Freund et al, 2010). The version developed in Heidelberg, Germany, was used, translated into Spanish and recently applied on Chilean population (Olhaberry et al., *article sent for review)*.

The battery is composed of 4 scales:

Self Construal Scale (SCS): This scale, created by Singelis (1994), is composed of 30 items, 15 of which measure independence in the construction of the self, and the other 15 measure interdependence. In each item, the subjects express their degree of agreement or disagreement with the proposed statement, using a Likert-type format of 7 points (1 = strongly disagree, 7 = strongly agree). Scores vary between 15 and 105 on each subscale.

Sex-Role Ideology Scale: This scale was developed by Kalin & Tilby (1978), and considers the beliefs on gender characteristics and the adequate behavior of men and women. It was designed from a bidimensional construct that considers the gender sex-role ideologies in a continuum, from the traditional to the egalitarian. It is made of 9 items where the agreement or disagreement degree is registered in relation to a particular statement, using a Likert-type format of 7 points, (1 = strongly disagree, 7 = strongly agree). Scores vary between 9 and 63 points, where low scores indicate traditional sex-role ideologies and high scores indicate egalitarian ideologies.

Tightness-Looseness Scale, Social Version (TLS-S): This scale, designed by Gelfand et al. (2007), explores through six items the tightness or looseness with which the social norms are perceived and how relevant the social sanction is. The subjects express their agreement or disagreement degree with a particular statement, using a Likert-type format of 6 points (1 = strongly disagree, 6 = strongly agree). The scores in this scale vary between 6 and 36 points. The higher scores indicate more tightness to social norms.

Tightness-Looseness Scale, Family Version (TLS-F). This scale, adapted by Freund et al. (2010), is similar to the one described above, but its items focus on the tightness or looseness in the perception of norms and sanctions within the family group. It consists of 6 items with both the same answer choices and scoring as in TLS-S.

Ages and Stages Questionnaires (ASQ). The ASQ is a questionnaire designed by Diane Bricker & Jane Squires (1999) to be filled-in by the child's parents or main caregivers, in order to evaluate the child's development. It enables the evaluation of children between 4 and 60 months old from 19 specific questionnaires that consider five areas: *communication, gross motor movements, fine motor movements, problem solving,* and the *personal/social area.* It is a screening instrument by which the adults, directly, observe specific behaviors of the children according to a guideline designed for each age, marking "yes" when the child achieves the particular behavior, "sometimes" when the child only achieves the behavior on an irregular basis, and "not yet" when it relates to behaviors still to be achieved. The validity of the instrument has been widely studied. There are psychometric studies based upon normative samples of over 18,000 questionnaires, which show a high reliability (over 90%), internal consistency and specificity (85%).

Procedure

The Chilean families were contacted by a public health center and selected according to their family constitution, income level, and presence of at least one child between 3 and 14 months of age. The German families were contacted through two sources: the control Group of the "Projekt Frühe Interventionen für Familien" (PFIFF), which

allowed the selection of 25 dyads, and on the other hand, the local newspaper in Heidelberg, Germany, through which 16 more dyads were contacted.

The evaluations were carried out after the signing of an informed consent letter by the mothers. Both the children and the adults were evaluated in the health center through the CARE-Index instrument (Crittenden, 2006), with the same set of toys and same material in the Chilean dyads, and with the available toys at home, in the case of the German dyads. The videotaping of the dyad on free play was carried out first, and the data compilation and questionnaire application afterwards.

Completed Analyses

The presence of atypical values was evaluated, as well as the compliance with the assumptions of the statistical tests done, using a significance criterion of $\alpha = .05$. A descriptive analysis of the sociodemographic data was carried out subsequently and the differences between the groups were evaluated by the *t* test for independent samples. Since these were natural groups, differences were found that could not be controlled in the initial design and that according to the reviewed literature are defined as influential in the dependent variables. As to analyze the variances between the groups in the studied variables, and in order to reduce the undesired effect of the sociodemographic differences, these were controlled by means of a simple ANOVA in each dependent variable. Afterwards, analyses of linear regression within each group were carried out, in order to evaluate the association level of the reviewed variables and their differential predictive value in both the Chilean and German dyads.

Outcomes

Descriptive Statistics

In terms of sociodemographic backgrounds, differences in some variables between the groups are observed. The ages of the mothers and the children are significantly different, being the Chilean children older than the German ones (t = 9.30; p < .01), and the German mothers older than the Chilean ones (t = -3.44; p < .01). There are, also, differences in terms of formal education years, as well as regarding the number of household members, where German mothers show a higher educational level (t = -3.55; p < .01), and a bigger number of people sharing a home in the case of the Chilean families (t = 9.24; p < .01). The sociodemographic backgrounds of the studied groups are specified in Table 1.

Table 1 *Distribution according to Frequencies and Percentages of the studied sociodemographic variables in Chilean and German families.*

		German dyads N = 41		**Chilean dyads N = 40**	
		Frequency	%	Frequency	%
Birth position	**1**	27	65.9	20	50
	2	10	24.4	8	20
	3	1	2.4	10	25
	≥ 4	3	7.3	2	5
Formal education	**< 8**	0	0	5	12.5
	8 – 10	15	36.6	12	30
	12 – 13	14	34.1	23	57.5
	> 13	12	29.3	0	0
Nr of household members					
	2	23	56.0	0	0
	3	14	34.1	1	2.5
	4	1	2.4	7	17.5
	5	2	4.9	11	27.7
	≥ 6	1	2.4	21	52.5

Descriptive Statistics and comparative analysis on quality of mother-infant interaction

Regarding the dyads' distribution in the Sensitivity Scale, the German group shows higher levels of interaction risk than the Chilean group. 15 German and 4 Chilean dyads obtained scores between 0 and 4 in *total sensitivity*, 36.6% and 10%, respectively. 18 German dyads and 14 Chilean dyads are located in the *inept* or *inadequate* category

(scores between 5 and 6), which correspond to a 43.9% and 35%, respectively. Adding up the *adequate* category (7 to 10 points) to the *sensitive* category (11 to 14 points) -which indicates sufficient interaction quality in interaction and no need of intervention-, 8 German dyads and 22 Chilean dyads were located between these ranges, corresponding to a 19.5% and 55%, respectively.

The adjusted mean scores in total maternal sensitivity locate the Chilean group in the diagnosis category of "inept or inadequate", and the German group in the "risk" category, according to the dyadic sensitivity scale defined by Crittenden, with 6.69 (SD = 2.35) and 4.68 (SD = 2.31) points for the Chilean and German mothers, respectively. Furthermore, the Chilean children obtain 6.67 (SD = 2.5) points in total cooperativeness, while the German children obtain 4.49 (SD = 2.51). In terms of association levels between infant cooperativeness and maternal sensitivity, the correlation is positive and high in both groups, with values of r = .87 in the Chilean and r = .80 in the German dyads.

The performed covariance analyses -considering as dependent variables the different describers of the dyadic interaction, and controlling the variables of schooling, maternal age, number of household members, children's gender and age-, throw significant differences in some of them. The total maternal sensitivity dependent variable shows significantly higher scores in the Chilean mothers $F(1,74) = 4.07$, $p < .05$, with a medium effect size of ($\eta^2p = .05$). When breaking down the maternal sensitivity in its affective and cognitive aspects, the Chilean mothers show much higher scores than the German mothers in the affective aspects of sensitivity $F(1,74) = 13.67$, $p < .001$, with a large effect size ($\eta^2p = .16$) and an adequate power (.95).

Significant differences between both groups are also observed in the controlling describer, where the German mothers obtain much higher scores than the Chilean ones, $F(1,74) = 5.23$, $p < .05$, with a medium effect size ($\eta^2p = .06$).

Regarding the infant describers, significant differences in total cooperativeness are observed, $F(1,74) = 4.31$, $p < .05$, and in the affective aspects of cooperativeness, $F(1,74) = 15.14$, $p < .001$, where the Chilean children obtain higher scores and medium and large effect sizes, respectively.

The adjusted means and the ANOVA results with variable control are presented in Table 2.

Table 2 *Adjusted means and simple ANOVA results performed for variance analysis in the mother and infant describers of the interaction.*

		Chile N = 40	**Germany N = 41**			
		Mean (SD)	Mean (SD)	F(1-74)	η²p	Power
Mother	Total sensitivity	6.69 (2.35)	4.68 (2.31)	4.07*	.05	.51
	Affect. Sensitivity	5.24 (1.25)	2.95 (1.53)	13.67***	.16	.95
	Cogni. Sensitivity	1.61 (1.53)	1.86 (1.20)	.18	.00	.07
	Controlling	1.75 (1.58)	4.50 (3.46)	5.23*	.07	.61
	Unresponsive	5.31 (1.95)	4.48 (3.49)	.418	.00	.09
Infant	Total cooperativ.	6.67 (2.53)	4.49 (2.51)	4.31*	.05	.53
	Affect. cooperativ.	4.93 (1.63)	2.32 (1.54)	15.14***	.17	.97
	Cogni. cooperativ.	1.73 (1.35)	2.16 (1.38)	.545	.00	.11
	Compulsive	1.03 (2.01)	2.75 (3.89)	1.52	.02	.22
	Difficult	3.07 (2.50)	3.20 (3.77)	.00	.00	.05
	Passive	3.00 (2.71)	3.55 (3.00)	.250	.00	.07

η²p = partial eta square.

*$p < .05$. **$p < .01$. ***$p < .001$.

Descriptive Statistics and Comparative Analyses on maternal depression, infant psychomotor development and cultural variables

In terms of the mean scores in maternal depression, no significant differences between both groups are observed.

When evaluating the infant psychomotor development in both groups, German children show significantly higher scores than Chilean ones on *communication,* $F(1,74) = 4.75$ $p < .05$, on *fine motor,* $F(1,74) = 5.51$, $p < .05$ and on *problem solving),* $F(1,74) = 13.10$, $p < .01$. The effect sizes of these differences are medium in the two first variables and big in the last.

No differences in *gross motor* or in the *personal social* area are observed.

In terms of the evaluated cultural variables, the results show significant differences in *interdependence*, $F(1,71) = 7.39$, $p < .001$ and in *family norms tightness,* $F(1,71) = 8.06$, $p < .001$, with higher scores in the group of Chilean mothers. The effect sizes of the differences are in both cases large.

No significant differences are observed in *independence, sex-role ideology* or in *social norms tightness/looseness.*

The adjusted means and the variance analyses for *maternal depression*, *cultural variables* and *infant psychomotor development* are presented in Table 3.

Table 3 Adjusted means *and simple ANOVA results, carried out for variance analyses on maternal depression, infant development and cultural variables.*

		Chile N = 40	**Germany N = 41**			
		Mean (SD)	Mean (SD)	F(df)	η^2p	Power
Matern. depression	EDPS	12.52 (5.54)	13.49 (7.04)	.12 (1-69)	.00	.06
Infant development	Communication	-.43 (1.09)	.47 (.74)	4.75 (1-74)*	.06	.57
	Gross motor	-.29 (1.06)	.01 (1.09)	.412 (1-74)	.00	.09
	Fine motor	-1.34 (1.37)	.13 (1.44)	5.51 (1-74)*	.06	.64
	Probl. solving	-1.46 (1.57)	.57 (.89)	13.10 (1-74)**	.15	.94
	Personal social	-.46 (1.05	.20 (.84)	2.49 (1-74)	.03	.34
Cultural variables	Independence	79.35 (9.38)	81.09 (7.66)	.210 (1-71)	.00	.07
	Interdependence	79.61 (11.97)	66.88 (8.12)	7.39 (1-71)**	.09	.76
	SRIS	40.73 (12.51)	44.55 (9.63)	.61 (1-72	.00	.12
	TLS-Fam	24.94 (4.68)	19.46 (3.95)	8.06 (1-71)**	.10	.80
	TLS-Soc	22.14 (4.66)	21.36 (3.17)	.18 (1-71)	.00	.07

η^2p = partial eta square.

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

Linear regression per group analysis

The results show differential predictors in the interaction quality per group. In the German mothers' group, the years of education of the mothers explain both, the 9% of their *total sensitivity* and the 11% of their *cognitive sensitivity*. The infant gender in this group

explains the 12% of the *controlling interaction* towards the children, as well as the 12% of the *unresponsive* maternal behavior, with an association of infant male gender to *controlling* mother and infant female gender to *unresponsive* mother.

In the German children's group, the years of education of the mothers predict *total cooperativeness* and *affective cooperativeness*, explaining a 10% and 12% of these variables, respectively. The family TLS explains the 9% in *passive* infant behavior, associating higher tightness in family norms to lesser infant passivity. The scores obtained by the mothers in SRIS predict an 8% in infant compulsivity, associating more traditional sex-role ideologies to higher compulsivity. The results of these analyses are shown in Table 4.

Table 4 *Analysis of linear regression for the maternal and infant describers of interaction quality in the German group.*

	Dependent variable	Predictors	R^2	R^2 Change	*B*	*F*
Mother	Total sensitivity	Years of education	.11	.09	.34	4.64*
	Affec. sensitivity.	N.S.	-	-	-	-
	Cogn. Sensitivity	Years of education.	.13	.11	.36	5.35*
	Controlling	Child gender	.14	.12	.38	5.94*
	Unresponsive.	Child gender	.15	.13	-.39	6.44*
Infant	Total cooperativene.	Years of education	.12	.10	.35	5.10*
	Affec.cooperativ.	Years of education	.14	.12	.38	6.04*
	Cognit. cooperativ.	N.S.	-	-	-	-
	Compulsive	SRIS	.11	.08	-.325	4.24*
	Difficult	N.S.	-	-	-	-
	Passive	TLS-F	.12	.09	-.34	4.75*

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

In the case of the Chilean mothers, the age of the child turns out to be the best predictor of *total sensitivity*, explaining the 18% of its variance, as well as the 11% in *affective sensitivity* and the 24% in *cognitive sensitivity*. The older the child is, the higher is the sensitivity shown by the mother in the interaction. Furthermore, the younger the child, the higher *controlling* and *unresponsive* interaction of the mother are shown. This predictor explains the respective 8% and 10% of the variables.

In the group of Chilean children, the age factor continues to be a good predictor and explains a 23% of the variance in *total cooperativeness* and an 8% in *affective cooperativeness*. The age of the child, together with its gender and the mothers schooling years explain a 44% of the variance in *cognitive cooperativeness*. The same way this variable predicts the *mother sensitivity*, the older the child is, the higher the *cooperativeness* is, as well.

Family TLS explains a 36% of the variance in infant *compulsivity*, associating high TLS-F scores to low compulsivity.

Infant gender and maternal schooling years explain the 29% of variance in the passive behavior of the child, associating high passivity scores to low maternal schooling years and female gender. The results of this analysis are shown in Table 5.

Table 5 *Linear regression analysis for the mother and infant describers of interaction quality in the Chilean group.*

	Dependent variable	Predictors	R^2	R^2 Change	*B*	*F*
Mother	Total sensitivity	Child age	.20	.18	.45	9.49**
	Affec. sensitivity.	Child age	.13	.11	.36	5.63*
	Cogni. Sensitivity	Child age	.26	.24	.51	13.15**
	Controlling	Child age	.10	.08	-.32	4.12*
	Unresponsive.	Child age	.12	.10	-.35	4.99*
Infant	Total cooperativene.	Child age	.25	.23	.50	12.48**
	Affec. cooperativen.	Child age	.11	.08	.33	4.43*
	Cognit. cooperativen.	Child age	.48	.44	.60	10.75***
		Child gender			-.32	
		Years of education			.30	
	Compulsive	TLS-Family	.37	.36	-.61	22.05***
	Difficult	Child Gender	.18	.16	.425	8.17**
	Passive	Child Gender	.32	.29	-.44	8.57**
		Years of education			-.38	

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

Discussion

Although high levels of risk in the quality of mother-infant interactions in both groups were expected, as well as a subsequent intervention, higher percentages are observed in the German group, with an 80.5% of the dyads in the *risk* or *inept inadequate* categories. This

percentage contrasts with the results of the Chilean group, where a 45% of the dyads are located in some of these categories.

The above mentioned is concordant with the association between single-parenting in poverty and mother-child low bonding quality (Murray, Sinclair, Ducournau & Turner, 1999; Rodríguez, 2006; Figueredo, Costa, Pacheco & Pais, 2009), but also with the idea that this is not a causal relation, for there are families with these characteristics that do present an adequate bonding (Egeland & Sroufe, 1981; Guillén, 2007).

The maternal depressive symptomatology did not throw differences as expected, as both groups obtained high average scores, over the cut-off points defined for each country. The high scores in this variable match previous studies, which associate single-parenting in poverty and maternal depression (Bastos, Casaca, Nunes & Pereirinha, 2009; Lara-Cinisomo, Griffin & Daugherty, 2009).

Regarding the interaction specific describers, Chilean mothers show significantly higher scores in *total sensitivity* and *sensitivity in the affective aspects,* and complementarily, the Chilean children obtained higher scores in *total cooperativeness* and *affective cooperativeness*. As expected, significant differences between the groups in the cognitive sensitivity and cooperativeness aspects were not found.

The German mothers obtained significantly higher scores in *control*, indicating an open or hidden hostility in the interaction with the child, which probably reflects the high levels of stress they face in their upbringing. When trying to explain these results, the existence or lack of a family network could constitute a protective factor in the Chilean group, whereas it could be a risk factor in the German group, considering Chilean studies that show that the insertion of a single-parent family into an extended family constitutes an affective and economic way of supporting the mother (Cerruttti & Binstock, 2009). In this sense, the fact that the majority of the German mothers live alone with their children and do not count

with a direct support network on a day-to-day basis, could explain the low interactional quality in the group studied.

As a complement to the higher *mother control* observed in the German dyads, the children in this group show higher scores in *compulsivity,* and even though these differences do not prove to be statistically significant, they do indicate the infant's effort to regulate maternal hostility. Considering both, the young age of the German children in the study and the statements developed by Crittenden (2002), it is probable that the response of these children to the hostile interaction of the mother is divided in two types: *difficult* behaviors, that explicitly show displeasure, and *compulsive*, which hides the real emotions. It should be taken into consideration that the falsifying of emotions requires a higher level of neurological development in the child (Crittenden & DiLalla, 1988).

Regarding the infant psychomotor development, and just as expected, the German children obtain significantly higher scores than the Chilean ones in *communication, problem solving* and *fine motor development.* Considering the studies that show a positive association between the mother's schooling and infant psychomotor development (Lira, 1994; Schonaut, Rojas & Kaempffer, 2005). These results may be explained by the higher educational level of the German mothers, a 29% over 13 years of formal education, in contrast with the Chilean mothers, where none of them counts with more than 13 years of formal education.

In terms of *gross motor* and *personal/social area,* no significant differences are found between the groups. Therefore, the mother's educational level would not be enough to comprehend the infant's psychomotor development. This result could be related to the collectivist aspects of the Chilean mothers, associated to the construction of the interdependent self which, according to the reviewed studies, would grant high relevance to the gross motor stimulation, thus generating a higher development in this area (Keller, 2003).

As to the personal/social area development, the absence of significant differences could be explained by the extension of the family net in the groups. A 56% of the German

dyads present families formed of only mother and infant, whereas the family constitution in the Chilean dyads shows that 80.2% include 5 or more people, thus, favoring the acquirement of social skills. This background matches the family characterization of independent and interdependent cultures stated in previous studies, the first ones having a small family group, and the latter ones an extended family group (Keller, Abels, Lamm, Yovsi, Voelker & Lakhani, 2005).

In the case of the cultural variables, the Chilean mothers show higher scores in interdependence and higher tightness in family norms than the German ones, which is consistent with the consideration of Chile as a collective culture, associated to the construction of the interdependent self (Hofstede, 1980).

The higher tightness in family norms in Chilean mothers can be explained from the criteria considered by Chan, Gelfand, Triandis, & Tzeng (1996), as determining the tightness or looseness in group norms. They state that the immediate and concrete family coexistence implies interpersonal contact and interdependence, thus, requiring a greater number of norms and regulations in order to protect both, harmony and intimacy. Therefore, the fact that Chilean mothers and their children are part of more numerous families than the German mothers, would imply a greater need for norms to regulate the behavior at home.

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General conclusions and discussion

The results of the investigation done can be divided in three parts. The first one refers to the development of previous studies. The second one, to the effects of attending a day nursery on early bonding and children's development in Chile. And the third one, to cultural variables and the comparison of Chilean and German mother-child dyads.

This investigation is the result of the interest on early infancy and children's mental health, in the context of low-income, single-parent families, which is considered a growing and vulnerable group (Arriagada, 2004; Landero & González, 2006; Prud'homme, 2003). As a first step, it was considered necessary to evaluate in Chile, if family constitution has any influence on the quality of mother-child interaction and the maternal stress levels, or if low-income and general living conditions explain these variables. The analyses answering these questions are from the previously developed studies.

In relation to the findings on maternal stress, the results agree with the investigations reviewed (Cooper et al., 2009; Landero & González, 2006). Mothers of single-parent families show higher stress levels than those of nuclear families, taking place in the areas of "parental stress", "difficult child" and "total stress". This difference is not seen in "dysfunctional interaction", where the mothers of both groups have similar means, which show "adequate" interaction stress levels in both groups.

High means in the "parental stress" area stand-out, associated to the mother's perception of her maternal role, where the mean obtained by the group belonging to single-parent families, indicates a high level of stress. Mothers of nuclear families show an "adequate" "parental stress". These results confirm that the support of the other member of the couple is an important contextual backing that can be of great help with the mother's child-raising chores.

Among the sociodemographic variables studied, the maternal educational level is a good predictor in both groups, just like the presence of siblings, associating a greater

maternal educational level to lower stress, and the presence of siblings to greater stress. When the predictors inside each group are considered, the educational level continues to be a relevant variable to explain maternal stress, but in nuclear families the number of persons who are in a family group is added as a predictor to explain total stress and stress in the interaction, which does not appear in single-parent families. Probably, living with a greater number of people, in the case of single-parent families, can be experienced as a network of financial and affective support in raising young children, which is not associated to greater maternal stress, but in the case of mothers of nuclear families, sharing a home with an extended family could create a stressful living situation.

The presence of siblings is also a variable acting differently as a predictor in the groups, being associated to greater stress in single-parent families, but not in the nuclear ones. Probably, raising more than one child overloads the mother who does not have the support of a partner, since it implies greater responsibilities and work, but, for a mother in a nuclear family, having more than one child can be experienced as the consolidation of the family and not as an additional load, therefore, not becoming an experience associated to greater stress.

Summarizing, in relation to the study, it's important to underline that the family constitution is a relevant variable, with a distinguishable effect on maternal stress in low-income groups, as mothers of single-parent families have higher stress levels.

After confirming the effect of family constitution on maternal stress levels of Chilean families, beyond the influence of socioeconomic conditions, the purpose was to evaluate the existence of differences in the quality of the mother-child interaction between single-parent families and nuclear families. The studies considered were the ones associating high maternal stress and negative parental interactions with their children (Abidin et al., 1992; Kazdin, Mazurick & Bass, 1993; Moran, Pederson, Pettit & Krupka, 1992), as well as single-parenting and low maternal sensitive response (Casady, Diener, Isabella & Wright, 2001).

Agreeing with the hypotheses stated and the studies associating single-parenting with lower quality of mother-child interaction, the results in this variable show higher scores on the dyads of nuclear families, appearing as significant differences on the means obtained on maternal sensitivity, on the cognitive aspects of the interaction. Also, significantly higher scores were seen on the cognitive aspect of child cooperativeness on children of nuclear families, which could be associated to the specific contribution of the father's presence, promoting higher emphasis on playing and the exploration of the world (Brazelton & Cramer, 1993), which could have an effect on the increase of the quality of the interaction on the cognitive aspects.

On the other hand, the fact that mothers of nuclear families show "unresponsive" as a predominant second describer, shows that when mothers of both groups don't get an adequate sensitive response with the children, their difficulties are focused on errors recognizing and responding adequately to the child's signals, by probably being focused on their own experiences and perspective than in the conduct and general state of the child. This type of interaction gives little information to the child, making it difficult for him to get organized on the interaction by not knowing what to expect, or sometimes, it implies disagreement between the happy interaction the adult shows and the child appearing sad. These elements could guide to which would be the necessary intervention.

Even though the difference between the groups on maternal sensitivity is not significant, the scores show different categories in the Sensitivity Scale (Crittenden, 2006). The dyads of nuclear families show a mean that places them in the "adequate" category, which indicates an inconstant sensitivity, but it doesn't require some type of intervention. The dyads of single-parent families have means on total sensitivity, which place them in the rank considered "inept-inadequate", showing difficulties to read the child's signals, to adequately recognize his point of view and to respond in a fast manner, requiring some type of intervention.

On specific terms, the sensitivity of mothers of nuclear families is greater on the cognitive aspects, just like with children's cooperativeness in this group, so, the strength of dyads of nuclear families over the ones of single-parent families is in the capacity to create turns, which allow the alternating participation of both parents, the ability to share the control in relation to the task, and to select an activity in the game according to the stage of development where the child is. This difference could be explained by the investigations showing a relation between an adequate quality of the father-child interaction and greater cognitive abilities (Fagan & Iglesias, 1999). Studies are necessary to measure, as well, the quality of this dyad's interaction in order to confirm or refute this hypothesis.

With the information gathered in the two previous studies, indicating the existence of greater maternal stress and lower quality in the mother-child interaction, in low-income, single-parent, Chilean families, it was considered necessary to investigate the service and support options present in Chile for these families with children who are younger than 3 years old.

In the year 2006, the "Sistema de Protección Integral a la Infancia" (Integral Protection System for Children), called "Chile Crece Contigo" (Chile Grows with You) was created in Chile, looking to promote services for children from the poorest 40% of the population, offering free day nurseries for babies since they are 84 days old. This new system included the increase in coverage of day nurseries and day-care centers, with a special preference for children of working mothers and children in a vulnerable condition, making it easier for those from single-parent homes to have a place in the program (Rojas, 2010).

Considering that the offer of day nurseries is the main intervention in recent times to support vulnerable families with young children in Chile, there was interest to find-out how much it was helping the interactions of children attending. To answer this question, the type

of interaction the child establishes with the family caregiver and the institutional one, were evaluated and compared.

The first aspect to point out in the findings of this study is the confirmation of the theoretical proposals regarding the fact that sensitive response is a dyadic construct, in which the child and caregiver influence each other mutually and build a unique interaction that includes the characteristics of both (Crittenden, 2005; Hedenbro, 2002). This is especially clear in the complementariness of sensitivity scores in the adult and cooperativeness scores in the child, in which as sensitive response in the adult increases, so does cooperativeness in the child. So, it is possible to state that other caregivers than the mother can also have a differential effect on the interactive capacities of the child, seeing that infants modify their behavior when faced with different interaction proposals, and that adults also respond in accordance with the proposal of each child.

Another relevant aspect of the study is the differences found in the interactions of the two dyad groups evaluated. On the one hand, there are similar trends in the predominant describers in mother-child dyads and care center staff-child dyads, with both having sensitivity and non-responsiveness as predominant elements in the interaction, although the "controlling" describer shows higher scores in the care center staff and the "non-responsive" describer shows higher scores in primary caregivers.

As a complement to this, the children show predominant "cooperativeness" and "ambivalence", with the latter describer having higher scores in interaction with mothers.

On the one hand, these data enable us to state that although interaction with the mother is a fundamental aspect in child development and mental health, children are able to develop qualitatively different interactions with other adults on the basis of greater levels of sensitive response. This aspect is especially relevant in a vulnerable population owing to the predictive value of the adequate sensitive response of the caregiver in relation to future secure attachment (Ward & Carlson, 1995; Coppola, Vaughn, Cassibba, Constantini, 2006;

Smith & Pederson, 1988; Isabella, 1993; Van Ijzendoorn & Wolf, 1997), adequate cognitive development (Landry et al., 2000), adequate emotional and social development (Landry et al., 2000; Kivijarvi, Raiha, Virtanen, Lertola, Piha, 2004). Despite the fact that the studies mentioned give the mother as the principal caregiver, it is significant to take into account the positive influence that the daily interaction of the children with their care center caregivers has on their integral development; in this sense, new studies are needed to look into these findings further. On the other hand, the "adequate" range of the institutional caregivers' sensitive response might reflect a good relationship with the child, which in previous studies had been associated with the development of secure attachment patterns (Sagi, 1990).

The mothers' average sensitivity scores and those of the care center staff differ in the range of sensitivity in Crittenden's (2006) Dyadic Sensitivity Scale. Mothers are in the upper limit of the "inept" band score and care center staff in the intermediate range of the "adequate" band scores, which speaks of a positive difference for Chilean children who are sent to crèches early in life, as they take part in better quality interactions daily.

The second predominant describer in care center staff and mothers is "non responsiveness", with higher scores for mothers in spite of being the second highest score for both groups of adults. This makes us hypothesize that when care center staff and primary caregivers do not establish an adequate sensitive response with the children, their difficulties are centered on their failing to identify and give adequate responses to the child's signals, especially if these are negative, because they are centered on their own perspective rather than on the child's behavior or feelings.

The slightly higher score of the "controlling" describer in care center staff vs. mothers might be explained by the professional role of the former, which might imply greater activation and direction in the interaction as much as the activity is more related to the objectives of their work, as teachers are under permanent assessment in terms of their fulfillment of their care center staff objectives.

Another relevant aspect in the findings refers to the significantly higher scores achieved by care center staff in the cognitive items, which showed that they had a higher degree of sensitivity than the mothers for interacting with the children, taking into account that both can display their interests and start an interaction, decide which activity they wish to carry out and propose tasks that adjust to the development stage of the children without being over-demanding or underestimating their capacities and resources. These findings were explained by the specialization and professional training received by the care center staff, which includes foundational elements such as design of adequate child stimulation activities, and a knowledge of developmental psychology. The mothers' lower scores in the cognitive items can be explained by their low educational level and probable ignorance of adequate activities for their children's age, and by cultural features that make them privilege the expression of affection and physical contact over other activities.

Therefore, the results of the study show that the presence of children in the crèche is positive in the measure that it is a space that favors positive and quality interactions, as it has been observed that the care center staff involved gives an adequate sensitive response. These differences should go in favor of the children, being relational experiences that could compensate for certain failings, considering the fact that the children come from low socioeconomic level families.

Considering the contribution of day nurseries to the quality of child-caregiver interactions and the vulnerability observed in mother-child dyad of low-income, single-parent families, it was considered that this type of alternative care could have a positive effect in the child's development and the bonding quality of the children and their mothers. This was expected, taking into consideration, as well, studies stating that day nurseries could mitigate the negative effects of the family's low-income onto the child (Andersson, 1989; Howes, 1990; Love et al., 2003).

To test these statements, mother-child dyads, the children with and without attendance to a day nursery, were compared on the quality of their interactions, the child's psychomotor development, as well as stress and maternal depression levels.

In the results, similar tendencies can be seen on the prevailing describers of the mother-child dyads, with and without attendance to a day nursery, both showing a predominant "sensitivity", mainly, on the affective and "unresponsive" aspects of the interaction, even though the scores on the "controlling" describer are higher in the mothers of children who attend a day nursery, and the "unresponsive" describer are higher in the mothers whose children don't attend one.

Complementary to this, the children of the day nursery group show higher averages on the "difficult" and "compulsive" describers, and lower ones on the "passive" and "cooperative" ones than the children without attending a day nursery. In spite of these differences, the only one that is statistically significant is the one with higher sensitivity on the interaction affective aspects on mothers with children not attending day nurseries. Contrary to what is expected from the study's initial hypothesis, the results show that in the studied group, attending a day nursery doesn't benefit the quality of the mother-child interaction.

This difference can be explained by two hypothesis: the first one considers that the mothers of both groups belong to the same municipalities and have access to public day nurseries by being heads of their homes in low-income, single-parent families, so, probably, those with a greater bonding quality with their children could postpone the attendance to a day nursery, in spite of the material and emotional cost it could represent to them. This could make us think that, probably, the interaction quality in these dyads could be higher on the affective aspects, even if we would compare both groups before entering the day nursery. From this we could deduct that, maybe, the higher or lower quality of the interaction on the affective aspects could be present before entering the day nursery, therefore, would not be depending on an effect of the type of alternative care the children receive.

A second hypothesis about the contextual conditions of the dyad, could also explain these results, from the lack of family networks present to support the mother with the activities associated to raising a child, especially in single-parent families. This can be seen in the lower number of adults the dyad shares the home with in the day nursery attending group, being the children's attendance to a care center more of an answer to the mother's imperative needs than something she chose to do. On the other hand, known are the effects and the importance of the mother's educational level on the bonding quality with her children (Pelchat et al., 2003) and in the improvement of the family life conditions, as it is possible to see in mothers of the group attending a day nursery with a higher number of years of schooling. Even though no significant correlations are observed between the mother's educational level and the mother-child quality interaction, it is possible that attending a day nursery benefits the mother pursuing an education, and this, later, making it more likely for her to get better paying jobs, which could have positive repercussions on the mother-child bonding quality, from the stress reduction and the improvement on quality life. Longitudinal studies are necessary, with samples of similar characteristics, in order to verify these hypotheses.

Even the differences found in the interaction quality of the groups of dyads, evaluated with and without day nursery attendance, are statistically significant, and the effect size of these differences is medium, the samples are small, so, new studies are required with larger size samples for their confirmation.

On the other hand, the analysis done inside the group with day nursery organized according to the starting age of the child, before or after 6 months old, is relevant. In these analyses it is possible to see a higher quality bonding in the dyads starting attendance after the children become 6 months old, showing higher "sensitivity" and "cooperativeness" on their cognitive and affective aspects, than the group of dyads with children entering the day nursery before the children are 6 months old. There are, also, lower averages for the mothers on "controlling" and "unresponsive", and for the children on “difficult”, “passive” and

“compulsive”. Of these differences, the statistically significant are total maternal “sensitivity” and “sensitivity” on the cognitive aspects, just like total “cooperativeness” on children, an on the cognitive and affective items. These differences show high effect sizes for the total maternal “sensitivity”, total infant “cooperativeness” and infant cooperativeness on the affective aspects of the interaction. The remainder significant differences (maternal sensitivity on cognitive aspects, and infant cooperativeness on cognitive aspects, as well), show medium effect sizes. It is important to highlight, also, that interaction quality in the dyads with children entering day nurseries before 6 months old is located in the intervention rank, which requires psychoeducational support.

Starting attendance at a day nursery before the children become 6 months old with days of 8 to 10 hours, leaves little room for the daily space and time for mother-child contact and daily interaction, obstructing, probably, this event, the forming of an adequate bonding. This way, starting attendance after being 6 months old allows for an initial time of getting to know each other and exchange in the dyad, and a greater neurological maturation in the child, that could benefit the bonding quality and promote better conditions to face the separation that implies attending a day nursery.

The slightly higher score on the “controlling” describer of mothers with children attending a day nursery, compared to the mothers of non-attending children, could be explained by the demands of necessary order and structure for the daily chores needed to prepare a little child attending a care center. Complying with schedules, which, generally are complementary to the mother’s daily job, probably, makes it necessary to put pressure on the child, and in this sense, produces a greater activation and directivity in the interaction, leaving less room for the child’s needs. The mothers of the group without a day nursery, in a greater percentage are at home all day, or have part-time jobs, making it unnecessary to create rigid structures of activities, this way, without producing an excessive control of the interactions with their children. This allows, also, for the understanding of the mother-child interaction as a part of survival adaptation strategies, where postnatal legislation, financial

liabilities and the stress of being in a single-parent family could explain the errors in the interaction quality as a part of an adaptation process to a difficult reality.

In terms of the variables associated to the mother, such as stress and depressive symptomatology, no significant differences were found, as it was expected, since the mothers in both groups showed similar means in these variables. This signals that for children to attend day nurseries in Chile does not contribute to improve these aspects in the mother.

It is relevant to highlight the high scores in stress and depression on the part of the mothers, showing both groups of dyads maternal stress levels that place them over the 60 percentile and means over the cut-off point on depression. This alerts about the influence of the family constitution and the context on maternal mental health, which is consistent with the studies reviewed in relation to single parenting and low-income, and their consequences (Bastos, Casaca, Nunes & Pereirinha, 2009; Cooper, McLanahan, Meadows & Brooks-Gunn, 2009; Lara-Cinisomo, Griffin, Daugherty, 2009).

Just like previous studies show (Belsky, 1984; Bowlby, 1969; Coppola et al., 2006; Stern, 1997; Pelchat et al., 2003), it is possible to see how contextual conditions and maternal depressive symptomatology are related, in turn, with the quality of the mother-child interaction, showing the dyads of the study means that indicate the need for some type of intervention in both groups. This way, belonging to a low-income, single-parent family with the mother in charge could generate a vulnerable condition for the dyad (Casady, et al., 2001).

In terms of the child's psychomotor development, differences were found among the groups, as it was expected, having the children attending day nurseries higher means in the communication, fine motor, problem solving and socio-individual areas. When considering the starting age variable in children attending a day nursery, the ones who started after becoming 6 months old show significantly higher scores than the ones who started earlier.

These results show a positive effect when the child attends a day nursery on his psychomotor development, but they alert about the importance of the starting age, diminishing the benefit when it happens before the child is 6 months old, and increasing it when attendance starts after the child has reached this age.

Even though starting attendance at a day nursery does not favor the quality of the mother-child interaction, the attendance plus an early start, before the child has become 6 months old, lowers the bonding quality. These results promote reflecting on the need for support programs different from day nurseries for the first 6 months in the life of a baby, in vulnerable families, and the results contribute to the discussion in Chile on the extension of the maternal postnatal period from 84 days since the birth of the baby, to 6 months.

Another important aspect in the findings of this study is the need to review the variables considered to evaluate support programs for early childhood in vulnerable population in Chile. Usually, a child's psychomotor development has been considered as an indicator of the program's results, but this study's findings show that an adequate psychomotor development not necessarily implies an adequate quality in the mother-child bond. On the other hand, the bonding quality with the primary caregiver during the child's first year of life is a good predictor, consistently associated to secure attachment patterns and favorable emotional, social and cognitive development (Ward & Carlson, 1995; Coppola, Vaughn, Cassibba, Constantini, 2006; Friedman & Boyle, 2008; Smith & Pederson, 1988; Isabella, 1993; Van Ijzendoorn & Wolf, 1997; Landry, Smith, Swank, & Miller-Loncar, 2000; Kivijarvi, Raiha, Virtanen, Lertola, Piha, 2004).

The influence of the child's gender on the mother-child bonding quality was also considered, and even though the studies reviewed state a greater interaction quality among mothers and their daughters, since they share gender and strategies of emotional regulation (Feldman, 2003), these differences are not seen, since the dyads show very similar scores on *sensitivity* and *cooperativeness,* both describers associated to the adequate aspects of the interaction. The differences by gender that the study shows are focused on the lacking aspects of the interaction between mothers and their children.

It is possible to observe in the maternal interactive behavior a predominance of *sensitivity* followed by *unresponsiveness* and *control* in both groups of infants, but higher scores on *control* with male infants, and also, higher on *unresponsiveness* with female infants. On infants, complementarily with the mothers, males vary in the interaction between *cooperativeness*, *compulsivity* and *difficult* conducts*, and females* between *cooperative* and *passive* behaviors*.* This indicates that when mothers are not able to adequately read and interpret their children's signals and act in a consistent manner to receive their needs, they show hostility with the male infants and a self-centered conduct with the female infants, failing in a differential way according to the child's gender. The same takes place from the children's perspective when they don't show *cooperative* behaviors in the interaction with their mothers. Males complain and reject the proposal, or they become tense and make an effort to please the mother, and females inactively tolerate the interactive proposal of the mother.

In terms of the hypothesis stated in this study, as it was expected, significant differences were found between female and male infants, the boys showing significantly higher scores than the girls in the *difficult* describer*,* with a medium effect size, and the girls having significantly higher scores than the boys in the *passive* describer, with a medium effect size, as well. In relation to the complementariness of the mothers' describers, they show the highest scores in the *control* describer with male infants, and *unresponsive* with female infants, but these differences are not statistically significant. Even though it is possible to see the complementariness of the describers shown by the mothers and their children, and in this sense the confirmation of mutual influence inside the dyad, the statistically significant difference is in the children's behavior, and not in the mothers' behavior.

The correlations observed among the describers for the mothers and the children, also, indicate complementariness inside the dyads, and it is possible to see high and positive correlations, especially, between maternal *sensitivity* and infant *cooperativeness* in both groups. The describers *control* for the mothers and *difficult* for the infants, show positive

correlations in both groups, as well, but with the male infants the *compulsive* describer shows, also, a positive and significant correlation not observed with the girls. This could show child gender differences as an answer to maternal *control* in the dyads of the study, while it is possible to observe *compulsive* and *difficult* conducts with the male infants, and with the female infants only *difficult* responses associated with conducts expressing control on the part of the mother. The compulsive conducts in the boys indicates tension, little spontaneity and a child's effort to accommodate himself to the mother, which refers to an effort to overregulate his emotions, probably looking to reduce the mother's hostility and to have more pleasant interactions. It is surprising that this correlation is not seen in the girls, who when faced with maternal *control*, which is expressed less frequently in the dyads with female infants, they become *difficult.*

If we consider the hypotheses explaining the gender differences in the mother-infant exchange, from the maternal difficulties to identify herself with a child of a different sex (Tychey et al., 2006), it is possible to hypothesize that mothers who don't have the daily presence of the father of the child to raise him, and neither may count on his support as a partner, could transfer many of the conflicts generated by the separation to the relation with a male infant. Following this line, the presence of greater *control* on the part of the mother with the male infants, which means hostility or anger, could be explained from the feelings the mother has for the child's father that could be projected on the infant who has the father's gender, and probably, some of his physical characteristics. There is a need for mixed studies that consider, besides the quantitative evaluations of the mother-infant interaction quality, qualitative evaluations of the meanings the mothers have about the children, the father's perception and the separation, in order to check these hypotheses.

In order to deepen the findings of the study, new investigations are necessary. They should explore the differences of infant gender in the quality of the mother-child interactions, considering nuclear families, since this would allow us to dimension if the differences of

gender found are something particular to single-parent families with the mother in charge, or a more general aspect of Chilean, low-income level mother-child dyads.

The third part of this investigation considered, as well, cultural variables, and compared Chilean and German single-parent families, looking for differences in the quality of the mother-child interaction and the child's development. With the background information gathered in the previous studies, in relation to the influence of day nursery attendance in these variables, dyads were compared without attending care centers.

Although high levels of risk in the quality of mother-infant interactions in both groups were expected, as well as a subsequent intervention, higher percentages are observed in the German group, with an 80.5% of the dyads in the *risk* or *inept inadequate* categories. This percentage contrasts with the results of the Chilean group, where a 45% of the dyads are located in some of these categories.

The above mentioned is concordant with the association between single-parenting in poverty and mother-child low bonding quality (Murray, Sinclair, Ducournau & Turner, 1999; Rodríguez, 2006; Figueredo, Costa, Pacheco & Pais, 2009), but also with the idea that this is not a causal relation, for there are families with these characteristics that do present an adequate bonding (Egeland & Sroufe, 1981; Guillén, 2007).

The maternal depressive symptomatology did not throw differences between the groups, as expected, as both groups obtained high average scores, over the cut-off points defined for each country. The high scores in this variable match previous studies, which associate single-parenting in poverty and maternal depression (Bastos, Casaca, Nunes & Pereirinha, 2009; Lara-Cinisomo, Griffin & Daugherty, 2009).

Regarding the interaction specific describers, Chilean mothers show significantly higher scores in *total sensitivity* and *sensitivity in the affective aspects,* and complementarily, the Chilean children obtained higher scores in *total cooperativeness* and *affective*

cooperativeness. As expected, significant differences between the groups in the cognitive sensitivity and cooperativeness aspects were not found.

The German mothers obtained significantly higher scores in *control*, indicating an open or hidden hostility in the interaction with the child, which probably reflects the high levels of stress they face in their upbringing. When trying to explain these results, the existence or lack of a family network could constitute a protective factor in the Chilean group, whereas it could be a risk factor in the German group, considering Chilean studies that show that the insertion of a single-parent family into an extended family constitutes an affective and economic way of supporting the mother (Cerruttti & Binstock, 2009). In this sense, the fact that the majority of the German mothers live alone with their children and do not count with a direct support network on a day-to-day basis, could explain the low interactional quality in the group studied.

As a complement to the higher *mother control* observed in German dyads, the children in this group show higher scores in *compulsivity,* and even though these differences do not prove to be statistically significant, they do indicate the infant's effort to regulate maternal hostility. Considering both, the young age of the German children in the study and the statements developed by Crittenden (2002), it is probable that the response of these children to the hostile interaction of the mother is divided in two types: *difficult* behaviors, that explicitly show displeasure, and *compulsive*, which hides the real emotions. It should be taken into consideration that the falsifying of emotions requires a higher level of neurological development in the child (Crittenden & DiLalla, 1988), and that the mean age of the German children is 5 months old.

Regarding the infant psychomotor development, and just as expected, the German children obtain significantly higher scores than the Chilean ones in *communication, problem solving* and *fine motor development.* Considering the studies that show a positive association between the mother's schooling and infant psychomotor development (Lira, 1994; Schonaut,

Rojas & Kaempffer, 2005). These results may be explained by the higher educational level of the German mothers, a 29% over 13 years of formal education, in contrast with the Chilean mothers, where none of them counts with more than 13 years of formal education.

As to the personal/social area development, the absence of significant differences could be explained by the extension of the family network in the groups. A 56% of the German dyads present families formed of only mother and infant, whereas the family constitution in the Chilean dyads shows that 80.2% include 5 or more people, thus, favoring the acquirement of social skills. This background matches the family characterization of independent and interdependent cultures stated in previous studies, having a small family group for the first ones, and an extended family group for the latter ones (Keller, Abels, Lamm, Yovsi, Voelker & Lakhani, 2005).

In the case of the cultural variables, the Chilean mothers show higher scores in interdependence and higher tightness in family norms than the German ones, which is consistent with the consideration of Chile as a collective culture, associated to the construction of the interdependent self (Hofstede, 1980).

The higher tightness in family norms in Chilean mothers can be explained from the criteria considered by Chan, Gelfand, Triandis & Tzeng (1996), as determining the tightness or looseness in group norms. They state that the immediate and concrete family coexistence implies interpersonal contact and interdependence, thus, requiring a greater number of norms and regulations in order to protect both, harmony and intimacy. Therefore, the fact that Chilean mothers and their children are part of more numerous families than the German mothers, would imply a greater need for norms to regulate the behavior at home.

In terms of the limitations of the investigation, the first one is the lack of national representation of the samples, since the study in Chile is only with residents from Santiago's peripheral -low-income- communities, and in Germany, families from the outskirts of Heidelberg. Considering the differences observed in both countries in various cities, it is

possible that the results would vary if the families' residence would also vary. This way, the traits associated with independence and interdependence in the construction of the self would change, as well, from one city to another in each country, associating how life is experienced in capital cities or large ones in general, to a greater independence, and life in smaller cities, greater interdependence.

A second limitation present in the Chilean-German study is related with the age difference in children, the German ones being younger than the Chilean ones. Even though this difference was controlled in the statistical analysis, it would have been desirable to have equivalent ages in both groups. It's also a limitation, in relation to parenting and culture variables, that only vulnerable population was evaluated. It is possible that the cultural variables would be better represented in a middle class and nuclear family constitution population.

The sample sizes also are a limitation, being desirable the evaluation of a greater number of families for more reliable findings in the various studies done.

For future investigations, it would be interesting to consider nuclear families to evaluate the effects of attending a day nursery and the cultural differences between Chile and Germany, gathering information on the most frequent family constitution in both countries.

Considering that in the Chilean study the child's age acts as a good predictor of the mother-child interaction quality, it would be quite useful to do longitudinal studies on the quality of the dyads' interaction with and without attendance to a day nursery, in order to deepen the studies.

Taking into consideration how relevant was the starting age at a day nursery in Chile, it would be very valuable to investigate bonding quality and child's development in larger groups of children with different starting ages, which would offer better possibilities of extrapolation of the results onto the general population.

Finally, it would also be a contribution that future evaluations of national programs directed at supporting early childhood in vulnerable populations, would consider measuring

the mother-child or caregiver-child bonding quality, and not only the child's psychomotor development, which reflects, mostly, cognitive development, but not the child's mental health.

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Annex 1

Reliability Analysis of Scales by Cronbach´s α

Cultural variables: BMQC

	Germany General Population α	Chile General Population A	Germany Sample n=41 α	Chile Sample n=80 α
SRIS	.85	.75	.74	.71
TLS-S	.63	.68	.61	.63
TLS-F	.68	.71	.65	.62
SCS Independence	.71	.66	.64	.63
SCS Interdependence	.68	.69	.62	.67

Maternal Estrés: PSI

	Germany α	Chile α
Parental Distress	.85	.86
Parent-Child Dysfuctional Interacción	.82	.75
Difficult Child	.75	.75
Total Stress	.87	.86

Maternal depressive symptoms: EPDS

	Germany A	Chile α
Total EDPS	.82	.84

Annex 2

Interaction quality predictors in Chilean groups with and without attendance to day nursery. Linear regression analysis, using the variables selection method stepwise

	Dependent variable	Predictors	R^2	R^2 Change	β	F
Mother	Total sensitivity	Child age	.20	.19	.45	19.676***
	Affec. sensitivity.	Starting attendan. age	.13	.11-	.35	11.205**
	Cogni. Sensitivity	Child age.	.23	.21	.47	22.583***
	Controlling	Child age	.06	.05	-.25	5.477*
	No responsive.	Starting attendan. Age	.05	.04	-.24	4.662*
Infant	Total cooperativity.	Child age	.25	.24	.50	26.270***
	Affec.cooperativity	Child age	.15	.14	.39	14.140***
	Cognit. Cooperativit.	Child age	.28	.26-	.48	15.074***
		Mat. Educ. Level			.20	
	Compulsive	Child age	.07	.06	-.27	6.392*
	Difficult	Child gender	.07	.06	.26	5.945*
	Passive	Child gender	.10	.09	-.31	8.651**

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

Annex 3

Infant development predictors in Chilean groups with and without attendance to day nursery. Linear regression analysis, using the variables selection method stepwise

	Dependent variable	Predictors	R^2	R^2 Change	β	F
ASQ	Communication	Day Nursery Attend.	.19	.16	.53	5.94**
		Starting Attend. Age			.28	
		Overtime Attendance			-.24	
	Gross Motor	Child Age	.09	.08	.29	7.63**
	Fine Motor	Day Nursery Attend.	.27	.25	.60	14.40***
		Starting Attend. Age			.29	
	Problem Solving	Day Nursery Attend.	.27	.26	.60	14.62***
		Starting Attend. Age			.37	
	Personal Social	Day Nursery Attend.	.18	.16	.485	8.44***
		Starting Attend. Age			.321	

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

Annex 4

Infant Development in Chilean groups with and without attendance to day nursery: (ANOVAs).

		With day nursery attendance **N = 40**	**Without day nursery attendance** **N = 40**			
		Mean (SD)	Mean (SD)	F(df)	η^2p	Power
Infant development	Communication	.30(1.11)	-.34 (1.09)	6.44 (1-74)*	.08	.71
	Gross motor	-.12 (.82)	-.32 (1.06)	.919 (1-74)	.01	.15
	Fine motor	-.26 (-.24)	-1.37 (-1.40)	18.58 (1-74)***	.20	.98
	Probl. Solving	.06 (.86)	-1.10 (1.57)	17.212 (1-74)***	.18	.98
	Personal social	.22 (.87)	-.47 (1.05)	10.02 (1-74)**	.03	.11

Infant Development inside the Chilean group, with day nursery attendance, according to starting age (<6 months old and >6 months old). (ANOVAs).

		Attendance at a day nursery < 6m old **N = 15**	**Attendance at a day nursery >6m old** **N = 25**			
		Mean (SD)	Mean (SD)	F(df)	η^2p	Power
Infant development	Communication	.30(1.15)	.31 (1.0)	.002 (1-34)	.00	.05
	Gross motor	-.15(.86)	-.08 (.78)	.42 (1-34)	.00	.04
	Fine motor	-.49(1.02)	-.08 (.64)	1.61 (1-34)	.04	.23
	Probl. Solving	-.34 (1.01)	.30(.59)	4.53 (1-34)*	.12	.54
	Personal social	-.24 (1.05)	.46 (.67)	4.34 (1-34)*	.11	.53

η^2p = partial eta square = effect size. (.01= small, .05= medium, .1=large)

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

Erklärung gemäß § 8 Abs. 1 Buchst. b) und c) der Promotionsordnung der Fakultät für Verhaltens- und Empirische Kulturwissenschaften

Promotionsausschuss der Fakultät für Verhaltens- und Empirische Kulturwissenschaften
der Ruprecht-Karls-Universität Heidelberg
Doctoral Committee of the Faculty of Behavioural and Cultural Studies, of Heidelberg University

Erklärung gemäß § 8 Abs. 1 Buchst. b) der Promotionsordnung der Universität Heidelberg
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