

Relación entre atención compartida madre-hijo, sensibilidad materna y expresión emocional gestual infantil

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Recibido, junio 1/2017

Concepto de evaluación, julio 24/2017

Aceptado, septiembre 26/2017

Referencia: Muñoz Londoño, E. & Farkas, C. (2018). Relación entre atención compartida madre-hijo(a), sensibilidad materna y expresión emocional gestual infantil. *Acta colombiana de Psicología*, 21(2), 144-155. doi: <http://www.dx.doi.org/10.14718/ACP.2018.21.2.7>

Resumen

La atención compartida se refiere a episodios en los que el niño y su cuidador están enfocados intencionalmente en algún objeto o actividad, presentando intercambios físicos y emocionales. En este estudio se describió la atención compartida considerando las dimensiones de nivel de compromiso y tono emocional, y se analizó su relación con la sensibilidad materna y la intensidad de la expresión emocional gestual de niños de un año de edad. La muestra estuvo compuesta por 12 díadas madre-hijo, donde se consideró como criterios de inclusión que los niños tuvieran entre 12 y 14 meses de edad, que fueran hijos únicos, que vivieran con ambos padres, y que asistieran a sala cuna. Los instrumentos utilizados fueron la Evaluación de Atención Compartida, la Evaluación de la Expresión Emocional Gestual del Niño y la Escala de Sensibilidad del Adulto. Los resultados evidencian episodios de atención compartida en díadas madre-hijo al año de edad, además de una relación significativa entre atención compartida con el nivel de compromiso y la sensibilidad materna.

Palabras clave: atención compartida, expresión emocional gestual, interacción madre-niño, sensibilidad materna.

Relationship between mother-child shared attention, maternal sensitivity and infant emotional gestural expression

Abstract

Shared attention refers to episodes through which a child and his or her caretaker are intentionally focused on some object or activity while engaging in physical and emotional exchange. This study describes shared attention bearing in mind levels of commitment and emotional tone, and it analyzes associated relationships with maternal sensitivity and the intensity of emotional expression in one-year-old children. The sample includes 12 mother-child dyads with the following inclusion criteria: only children, of ages between 12 and 14 months, living with both parents and attending a nursery. The instruments used were the Shared Attention Assessment, the Children's Emotional Expressions Assessment, and the Adult Sensitivity Scale (ASS). Results show episodes of shared attention between mother-child dyads at one year of age. A significant relationship between shared attention, levels of commitment, and maternal sensitivity was also found.

Key words: shared attention, emotional gesture expression, mother-child interactions, maternal sensitivity.

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Research article supported by the National Fund for Scientific and Technological Development (FONDECYT No. 1110087, 1141118 and 1160110)

Relação entre atenção compartilhada mãe-filho, sensibilidade materna e expressão emocional gestual infantil

Resumo

A atenção compartilhada refere-se a episódios nos quais a criança e seu cuidador estão focados intencionalmente em algum objeto ou atividade, apresentando trocas físicas e emocionais. Neste estudo, a atenção compartilhada foi descrita considerando as dimensões de nível de compromisso e tom emocional, e foi analisada sua relação com a sensibilidade materna e com a intensidade da expressão emocional gestual de crianças de um ano de idade. A amostra estava composta por 12 duplas mãe-filho, cujos critérios de inclusão eram que as crianças tivessem entre 12 e 14 meses de idade, que fossem filhos únicos, que vivessem com ambos os pais e que frequentassem o berçário. Os instrumentos utilizados foram a Avaliação de Atenção Compartilhada, a Avaliação da Expressão Emocional Gestual da Criança e a Escala de Sensibilidade do Adulto. Os resultados evidenciam episódios de atenção compartilhada em duplas mãe-filho com um ano de idade, além de uma relação significativa entre atenção compartilhada com o nível de compromisso e a sensibilidade materna.

Palavras-chave: atenção compartilhada, expressão emocional gestual, interação mãe-criança, sensibilidade materna.

INTRODUCTION

Interactions between a child and his or her mother set the stage for the development of shared attention, which refers to episodes in which a child and a significant caregiver (usually his or her mother) are mutually focused on an object or situation (Mundy, & Sigman, 2006; Tomasello, & Todd, 1983). During this episode, the child or mother makes a proposal of exchange to his or her partner through the interaction (typically by making eye contact and then returning to the activity at hand). This latter aspect is essential when found in the child, as this shows that he or she is aware of the interaction in which he or she is taking part. Thus, shared attention implies that both participants engaging in a physical and affective interaction are intentionally attending to an object or situation (Adamson, & Bakeman, 1991; Trevarthen, & Hubley, 1978).

These interactions are gradually evolving; in the first months of life, a child focuses his or her interests exclusively on his or her mother, forming a dyadic system, but as the child grows, he or she begins to show an interest in objects and in the world in general, leading to a change in his or her relationship to a triad system. Rather, attention is shared between the child, the mother and a given object or situation (Baron Cohen, 1994; De Groote, Roeyers, & Striano, 2007). From six to nine months, an intermediate stage referred to as passive interaction occurs where the mother and child share objects, but this does not entail an awareness of the mother's independence (Bakeman, & Adamson, 1984; Butterworth, 2004). Between nine and 12 months of age (prelinguistic stage), children coordinate their attention between themselves, another person and an object or situation, and a recognition of intentions

emerges (Baron Cohen, 1995); Finally, at approximately 12 months, shared attention in the child is consolidated (Acosta, 1996, Adamson & McArthur, 1995, Baron Cohen, 1994, Trevarthen, 1998). Thus, this study analyzes episodes of shared attention observed in one-year-old children, as according to the literature, acquisition is consolidated by this age.

Several studies have pointed to the importance of shared attention for child development. First, it is associated with the acquisition of cognitive abilities such as the understanding that others have goals, intentions and attentional states, i.e., secondary intersubjectivity (Adamson & McArthur, 1995; Martínez, 2010; Trevarthen, 1998). Such skills allow children to intensify their participation in shared attention episodes and to develop their own representations of the world (Stern, 1997). In addition, shared attention is central to the development of theory of mind, whereby the child understands the behaviors of others by attributing intentionality and internal states to them (e.g., thoughts and emotions) (Baron Cohen, 1994, 1995). It also promotes the development of gestural communication (Aravena et al., 2008; Galeote, Checa, Serrano, & Rey, 2004; Mundy et al., 2007; Tomasello, & Farrar, 1986).

The results of the few investigations carried out on the Chilean population show the relevance of shared attention to the child, showing a positive correlation between the communicative development of children and shared attention (Aravena et al., 2008) and the importance of maternal mechanisms for the introduction and reorientation of the child's attention to maintain and coordinate shared attention in the dyad (Mendive, Bornstein, & Sebastian, 2013).

The limited evidence gleaned from Chilean research reveals a need to study shared attention in this population

with the aim of contributing to the theoretical progress on the subject and to characterize the formation of episodes of shared attention between mother and child in the Chilean context.

The evaluation of shared attention is typically conducted in contexts of free play, as most studies show that these are the best contexts from which to observe, evaluate and analyze shared attention between a mother and her child, as interaction routines that are similar to those of daily life arise under such conditions (Mas, 2003). However, its operationalization differs based on the focus of study and on conceptualizations of the construct. While some codifications focus exclusively on the child's abilities, others focus on the mother's abilities or on the dyad process (Sadurní, & Pérez, 2008), and others focus on the child, mother and object (Bakeman, & Adamson, 1984; Camaioni, Aureli, Bellagamba, & Fogel, 2003). The manipulation of objects and forms of play that a child engages in with his or her mother have also been studied (Dixon, & Smith, 2003; Zelazo, & Kearley, 1980) in addition to a child and mother's abilities to represent primary and secondary interactions (Mas, & Añaños, 2010; Sadurní, & Pérez, 2008) and rhythms during interaction in observing the initiation and completion of episodes of shared attention (Aravena et al., 2008; Mendive, 2009; Mundy et al., 2007).

The present study focuses on interactions that occur between a mother and her child in consideration of two dimensions of such interactions: (a) *levels of dyad commitment*, defined as moments in which participants share with one another and with the object or activity while interacting intentionally, and (b) *emotional tone*, which alludes to the emotional expressions of each participant based on affective exchanges observed according to body language, facial expressions and vocal tones (Valloton, 2004).

Maternal sensitivity and gestural emotional expressions of the child are relevant variables of shared attention, as in reference to such episodes it is important to consider the rhythms, initiations, responses (or lack thereof) observed in the dyad. Thus, maternal sensitivity implies that the mother perceives and responds appropriately to her child's cues during interactions. In turn, signals transmitted by the child are mainly expressed through gestures due to the child's young age, and the expression of gestures allows the child to express his or her emotional states during shared attention episodes in relation to objects and / or situations in which he or she interacts with the mother.

Maternal sensitivity is understood by Crittenden (2005) as a dyadic construct corresponding to any pattern of behavior deployed by the adult that reassures the infant and that increases his or her comfort while responding to his or her

cues. A sensitive adult is considered to be one who detects, interprets, and responds appropriately and contingently to the child's cues (Ainsworth, Blehar, Waters, & Wall, 1978).

Maternal sensitivity has been related to the development of shared attention (Ainsworth, et al., 1978; Bigelow et al., 2009; DeWolff, & van IJzendoorn, 1997; Meins, 1997; Van den Boom, 1994). Thus, mothers with adequate sensitivity adapt their interactive behaviors and focus on the child's needs, allowing the child to focus on interactions during episodes of shared attention (Fein, & Fryer, 1995; Fiese, 1990). In addition, these interactions promote more episodes of shared attention, which favors learning, language development and symbolization in the child's first years of life (Bigelow, MacLean, & Proctor, 2004; Kochanska & Askan, 2004; Marfo, 1990).

The emotional expression of the child is understood as a child's capacity to express internal states (needs, moods, motivations, and emotions) and as his or her intentions to interact with others in a physical and / or facial manner (Gosselin, Kirouac, & Doré, 1995; Tronick, 1989; Zajonc 1989). From an early age and during the first year of life, communication between the child and mother occurs nonverbally (Lebovici, 1983). Thus, children intentionally use gestures or signals to communicate. Rather, they use body language and gestures to express their needs, sensations and feelings to their caregivers (Farkas, 2007). In this way, the mother allows the child to act as a conversation partner and not just as a recipient (Acosta, 1996).

The gestural expression of emotions plays an important role in the regulation of social interactions, allowing those involved to evaluate the emotional states of others and to adjust their behaviors to match expectations (Gosselin, et al., 1995; Petit, 2009) and to inspire certain responses from the contact person (Hendler, Kielmanowicz, Reingold, & Rotman, 2012). The expression of emotions in children features individual differences that affect the ways in which children interact with their mothers (Lebovici, 1983). Significant differences in levels of irritability and responsiveness to consolation, in motor activity, in reactivity to stimuli, and in the clarity of signals used to make the child's needs known (Brazelton, & Cramer, 1993; Hendler et al. 2012) influence the intensity of emotional expression in the child.

From the above, the objectives of this study are: (a) to describe the shared attention of mother-child dyads when children are one year old and (b) to analyze the relationship between the shared attention of mother-baby dyads and maternal sensitivity and the intensity of gestural emotional expressions in the child.

METHOD

Design

An exploratory, cross-sectional, descriptive and correlational design was applied via a quantitative methodology. The design employed is cross-sectional, because it performs a single measurement in time that, in turn, describes the shared attention of the mother-child dyad at one year of age in terms of levels of commitment and emotional tone, and it correlates with the mother's sensitivity and with the intensity of emotional expressions of the child.

Participants

The sample included 12 mother-child dyads selected through the intentional non-probabilistic sampling of a larger longitudinal study. As selection criteria, children who participated a) were between 12 and 14 months of age, b) were only children, c) lived with both parents, d) attended a nursery in Santiago, Chile, and e) had been admitted to a nursery at six months or older. These selection criteria were used to ensure the homogeneity of the sample and to control the presence of other factors affecting the variables under study.

Thus, the 12 mother-child dyads included children of between 12 and 14 months of age ($M = 12.42$, $SD = 0.669$), of whom 50% were boys and 50% were girls. The mean age of the mothers was 28.08 years ($SD = 5.728$, ranging between 19 and 35 years) and the mothers were distributed across three sensitivity categories (50% high sensitivity, 33.3% moderate sensitivity and 16.7% low sensitivity). In addition, an equal number of families of high, moderate and low socioeconomic status (NSE) was studied as measured by the ESOMAR index, which considers educational and occupational levels (33.3% each for low, medium and high).

Instruments

Shared Attention Assessment. To evaluate this variable, conditions involving free play between the mother-child dyad were observed and recorded over a period of five minutes. The encoding of shared attention was divided into two dimensions as proposed by Vallotton (2004). The first refers to the "level of commitment," which is divided into 5 levels: *total shared commitment* (coded as 4) occurs when both mother-child members are intentionally engaged in the task or activity and with the other member of the dyad; *partial shared commitment* (coded as 3) occurs when both members of the dyad are engaged in an activity while at the same time they do not engage in the same activity; *passive commitment* (coded as 2) occurs when one member of the

dyad observes the other; *no partial commitment* (coded as 1) occurs when both members of the dyad attend to their own activities; and *no commitment* (coded as 0) occurs when one or both members of the dyad fully withdraw or are distracted by something other than the free play activity.

The second dimension, "emotional tone," is primarily judged through the use of facial expressions, tones of voice, and body language. For this classification, the basic emotional tones proposed by Vallotton (2004) are taken as a reference: *positive* emotional tone, whereby a dyad member is smiling and the tone of voice used is kind; body language may include applause or animated gestures toward the other; *neutral* emotional tone, which denotes the use of a "flat" facial expression whereby the subject does not smile but is not irritated or frowning and speaks in a monotonous tone; and *negative* emotional tone whereby a dyad member is irritable, annoyed, bored or scared as evidenced by the appearance of pursed lips, frowning and a furrowed brows and by the use of an unfriendly tone of voice. From these three emotional tones, six levels of emotional tone were created for the dyad: *positive synchrony* (coded as 5), whereby both members of the dyad exhibit a positive emotional tone; *positive partial synchrony* (coded as 4), whereby one member of the dyad presents a positive emotional tone while the other presents a neutral emotional tone; *neutral synchrony* (coded as 3), whereby both members of the dyad present a neutral emotional tone; *partial negative synchrony* (coded as 2), whereby one member of the dyad presents a negative emotional tone while the other presents a neutral emotional tone; *negative synchrony* (coded as 1), whereby both members of the dyad present a negative emotional tone; and *asynchrony* (coded as 0), whereby one member of the dyad presents a positive emotional tone while the other presents a negative emotional tone.

ELAN software was used for the segmentation of shared attention videos, and the videos were coded into segments of three seconds, as research results show that shared attention in a dyad occurs when three continuous seconds of the same activity have passed (Tomasello & Farrar, 1986, Vallotton, 2004). For each 3-second segment, a score was assigned on commitment levels (0-4 points) and emotional tones (0-5 points). Coding was performed by an encoder; inter-rater reliability was measured by a second expert coder based on 30% of the segments, obtaining a reliability level of 95% for commitment and of 100% for emotional tone (child, adult, and dyad).

Adult Sensitivity Scale (Santelices et al., 2012). This assessment involved the videotaping of 5-minute free play interactions between the adults and children. An evaluation rubric of 19 items that refer to the mothers' sensitive behaviors towards the children was used. From the score

assigned to each indicator, three scales were obtained: (1) the *Scale of Empathic Response* refers to adults' capacities to recognize children's signals by interpreting them and responding to their demands; according to (2) the *Playful Interaction Scale*, the adult can relate to the child while taking into account their initiatives and by incorporating them into a game; and (3) the *Emotional Expression Scale* refers to an adult who manifests and exhibits a warm attitude towards the needs and emotions of the child. In addition, it classifies the adult into categories of low, adequate or high sensitivity. The instrument shows adequate levels of inter-rater agreement (Cohen's Kappa of .62). An adequate level of reliability was obtained with a Cronbach's alpha coefficient of 0.93 achieved for a sample of 99 dyads of caretakers and instructional staff interacting with 10- and 33-month-old children (Santelices et al., 2012). For a sample of 104 mothers interacting with children aged 10-15 months, a reliability level of .88 has been achieved (Farkas et al., 2015). For the 12 dyad samples examined in this study, a reliability level of .92 was achieved (Cronbach's alpha).

Children's Emotional Expressions Assessment (Farkas, Santelices, & Himmel, 2011). This scale evaluates children's gestures occurring in situations involving the expression of emotions. Based on four age-appropriate tasks, the first two are rewarding for the child (success task) and the next two involve a frustrating activity (failure task). In turn, pleasant and unpleasant emotions are elicited in the child. The whole situation is recorded and later encoded. The coding records gestures involved in the expression of pleasant and unpleasant emotions according to a guideline designed for this purpose and that echoes the approaches of Ekman, Friesen and Hager (2002); Tracy and Matsumoto (2008); and Wallbott (1998). For each child, the most intense expressions of pleasure and displeasure are selected, and each is coded according to the presence or absence of 54 (a) facial gestures of the forehead (e.g., FA1 horizontal wrinkles); eyebrows (e.g., FB1 raised eyebrows); eyes (e.g., FC4 both eyes closed); and mouth (FD4 smile with closed mouth); and (b) body (including trunk (e.g., CA1 expanded chest) positioning, head movements (e.g., CB1 head tilted to the side), shoulder positions (e.g., CD1 raised shoulders), arm positioning and movements (e.g., CE3 raised arms, CG1 opening movements), and hand positioning and movements (e.g., CF1 hands in a fist, CH1 clapping). Based on this coding, intensity scores were obtained for facial (0-5 pts), body (0-8 pts) and total (sum of the previous two, 1-13 pts) gestures, where higher scores denote more intense expressions. The inter-rater reliability of the instrument was evaluated from correlations between six coders and a master code with indicators of .87 to .96 found for facial

gestures and of .95 to .98 found for body gestures (Muzard, Kwon, Espinosa, Vallotton & Farkas, 2017).

Procedure

The videotapes used in this study correspond to secondary data derived from a larger longitudinal study that analyzes the relationship between children's emotional expressions in response to parental skills (e.g., the sensitivity and mental capacities of caretakers) and educational personnel with children of 12 and 30 months of age. This study initially established contact with different nurseries in the city of Santiago, requesting their authorization to participate. Dyads that met the inclusion criteria were then invited, the study objectives were presented, their rights as participants were explained, and a letter of consent was requested. The mothers completed a sociodemographic questionnaire and then five minutes of free play with their children were filmed. The children performed four tasks in the presence of their mothers for the evaluation of their emotional expressions. All filming took place at the nursery that the children attended. The dyads participating in this study correspond to 13% of the original sample and were selected through intentional sampling.

Data analysis

For the first objective of the study (the description of the dyads shared attention), frequency analyses of two dimensions were performed: levels of commitment (5 categories) and emotional tone (6 categories). For these analyses, total segments were considered (1,183 segments out of 1,200, lasting three seconds each, where 1.4% of the total segments corresponded to lost segments, due to positions or framing that did not allow for proper coding), as well as descriptions of the dyads. In addition, the duration of the episodes of shared commitment was analyzed, as this accounts for dyad capacities to sustain attention in a shared and continuous manner.

To analyze the second objective (determining relationships between shared attention in the dyads and maternal sensitivity and the intensity of children's gestural expressions), the median was calculated for levels of commitment and emotional tones. As the scales used are ordinal, the distance between the values is not known, and the distribution of the dyads among the categories is asymmetric; therefore, the use of medians rather than means is advised (Sullivan & Artino, 2013). Once this was done, it was found that all of the dyads obtained the same median in terms of emotional tone, preventing an analysis of other variables. Therefore, for the subsequent analyses, only the level of commitment was taken into account. A correlational

analysis (Kendall’s Tau-b) was performed to analyze the relationship between levels of commitment and maternal sensitivity variables (total score and the three scales) and the intensity of the children’s emotional expressions (total score for emotional expressions of pleasure and displeasure). Finally, a hierarchical regression analysis was performed to analyze the percentage of variance explained by the level of commitment of the dyad in consideration of maternal sensitivity and infant emotional expressions and while controlling for the NSE of the dyad, as this variable influences maternal sensitivity (Farkas et al., 2015, Santelices et al., 2015) and children’s emotional gestural expressions (Muzard et al., 2017).

RESULTS

The results of this study are shown below where outcomes of the descriptive analyses of the shared attention of the dyad are reported in consideration of levels of commitment and emotional tone. Subsequently, the results of correlational analyses performed between the level of commitment of the dyad, maternal sensitivity levels and children’s emotional expressions are presented. Finally, the regression analysis performed to analyze the percentage of variance explained by variables of the mother and child for levels of commitment in the dyad is reviewed.

Dyad’s shared attention descriptive analysis

Regarding the five levels evaluated in the "level of commitment" dimension, the results show that *passive commitment* was the most frequent (42.1% of the segments) followed by *partial shared commitment* (25.8% of the segments). On the other hand, if it is recognized that *total shared commitment* is the level most similar to the definition of shared attention, it obtains a frequency of 19.9% among the segments analyzed (see Table 1).

Table 1.

Frequency distribution of commitment level

Level of commitment	Frequency	Percentage
No commitment	25	2.1
No partial commitment	119	10.1
Passive commitment	498	42.1
Partial shared commitment	305	25.8
Total shared commitment	236	19.9
Total	1183	100.0

Note: the analysis is presented based on the total segments analyzed on the 12 dyads

Regarding levels of *total shared commitment*, the duration of these episodes was analyzed to account for the capacities of the dyad to sustain its attention continuously. This period ranged from three to 75 seconds (1 to 25 continuous segments). It was observed that the highest frequency (18.4%) corresponded to episodes of six seconds (see Figure 1).

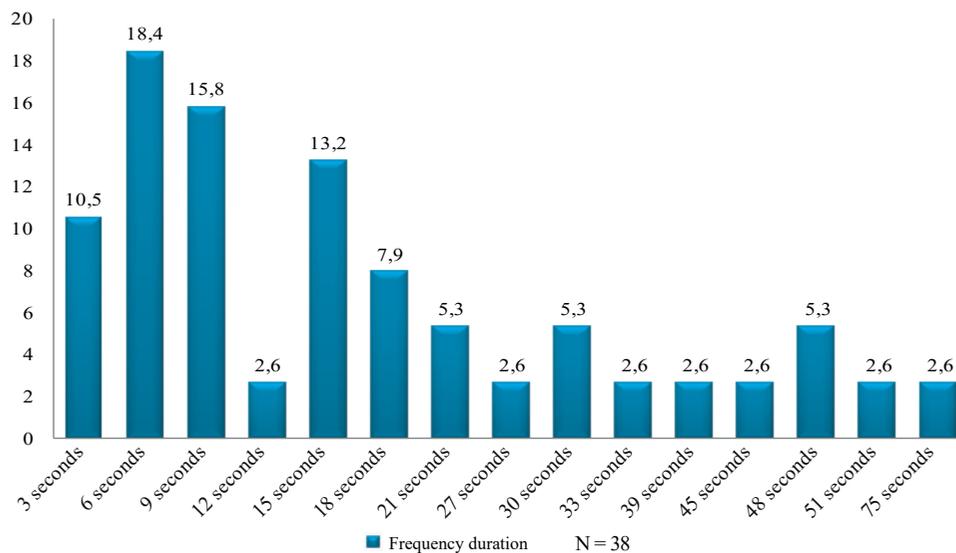


Figure 1. Frequency of duration of total shared commitment level

Table 2.
Distribution of child's and mother's emotional tone

Emotional tone	Child		Mother	
	Frequency	Percentage	Frequency	Percentage
Negative	13	1.2	2	.2
Neutral	944	84.1	903	75.8
Positive	166	14.8	286	24.0
Total	1123	100.0	1191	100.0

Note: the analysis is presented based on the total segments analyzed for the 12 dyads

Regarding "emotional tone," it was observed that for both children and mothers a neutral emotional tone predominated (84.1% of the children and 75.8% of the mothers) followed by a positive emotional tone (14.8% of the children and 24% of the mothers). In addition, positive emotional tones were found relatively more frequently among the mothers than among the children (see Table 2). Finally, the results show that the emotional tones found most commonly in the dyad are *neutral synchrony* (70.9% of the segments) followed by *positive partial synchrony* (17.9%) (see Table 3).

Table 3.
Distribution of dyad's emotional tone

Emotional tone	Frequency	Percentage
Asynchrony	1	0.1
Negative synchrony	1	0.1
Negative partial synchrony	14	1.3
Neutral synchrony	794	70.9
Positive partial synchrony	201	17.9
Positive synchrony	109	9.7
Total	1120	100.0

Note: For dyads' emotional tone 1120 segments are considered

Of the 12 dyads evaluated, in nine of them a predominant tendency toward *passive commitment* was observed, followed by *partial* and *total shared* commitment (see Figure 2). This reveals a common pattern regarding the frequency of the three most predominant levels of engagement during interaction. As for emotional tones, a predominance of *neutral synchrony* was observed in nine dyads followed by *positive partial* and *positive synchrony* (See Figure 3). Finally, seven dyads exhibited common patterns for both levels of commitment (exhibiting *passive commitment* followed by *partial* and *total shared* commitment) and for emotional tone (presenting *neutral synchrony* followed by *positive partial* and *positive synchrony* (shared attention).

Correlational Analysis of Levels of Dyad Commitment, Maternal Sensitivity and Gestural Emotional Expression

1. A significant correlation between total maternal sensitivity and levels of dyad commitment ($r_b = .611, p = .014$) was found, indicating that higher levels of maternal sensitivity are associated with higher levels of dyad commitment specifically with *partial* and *total shared* commitment. Regarding the scales, a higher score for *playful interaction* correlated significantly with higher levels of commitment ($r_b = .688, p = .008$) and *emotional expression* ($r_b = .508, p = .046$). No significant correlations between levels of dyad commitment and the intensity of gestural expressions of pleasure and displeasure were found (see Table 4).

Table 4.
Correlations between dyads' commitment level, maternal sensitivity and infants' gestural expression

	Dyad's commitment level	
	Correlation coefficient (rb)	Sig.
<i>Maternal sensitivity</i>		
Empathic answer scale	.363	.152
Ludic interaction scale	.688**	.008
Emotional expression scale	.508*	.046
Maternal sensitivity total score	.611*	.014
<i>Infant's gestural expression</i>		
Total intensity pleasure expression	.422	.115
Total intensity frustration expression	.043	.871

Note: ** $p \leq .01$, * $p \leq .05$

Regression analysis for levels of dyad commitment

To analyze the percentage of variance explained by variables for the mother and child considered in this study, a hierarchical regression analysis on levels of commitment was performed. First, the NSE of the dyad was used as

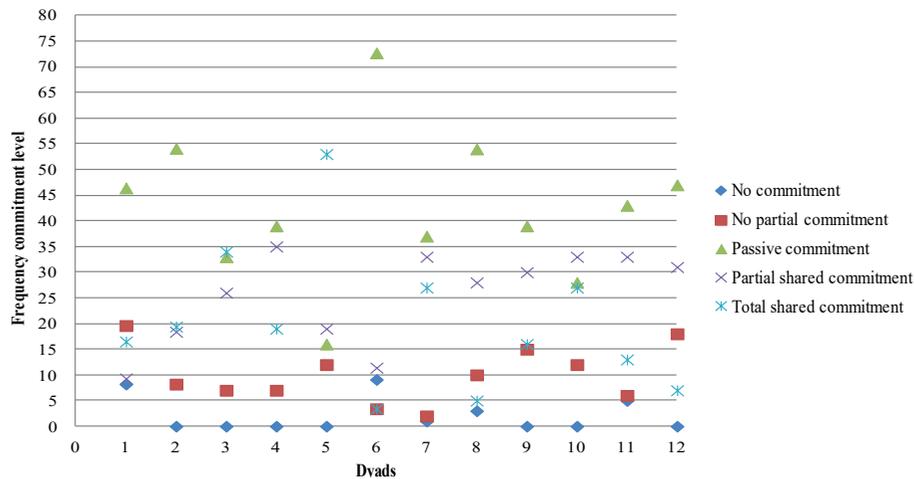


Figure 2. Frequency dispersion of dyads' commitment level

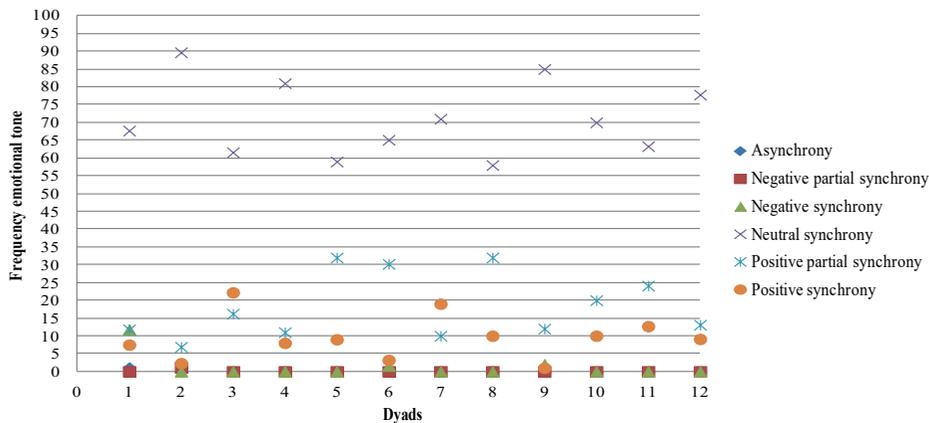


Figure 3. Frequency dispersion of dyads' emotional tone

a control variable followed by the total sensitivity score (model 1) and the intensity of expressions of pleasure and frustration observed in the children (model 2).

Regarding levels of dyad commitment, maternal sensitivity was found to be the only significant predictor

($\beta = .932, t = 3,051, p = .014$), accounting for 49.6% of the variance (see Table 5 model 1) after controlling for NSE. The intensity of the children's expressions of pleasure and frustration was not found to be a significant predictor. Model 1 was the only significant model found ($F = 4.888, p = .037$).

Table 5.

Hierarchical regression for dyad's commitment level, considering maternal sensitivity and infant's gestural expression

	Model 1			Model 2		
	B	SE B	β	B	SE B	β
Constant	.056	.820		-1.891	1.274	
SES	-.358	.242	-.453	-.541	.251	-.684~
Total sensitivity	1.381	.453	.932*	2.244	.700	1.515*
Child's intensity of pleasure expression				-.319	.215	-.566
Child's intensity of frustration expression				.213	.125	.400
R2		.521			.684	
Change on R2		.496*			.163	
F		4.888*			3.788~	

Note: * $p < .05$ ~ $p < .09$

DISCUSSION

Given the importance of studying situations that occur in interactions between mothers and their children during the first year of life and taking into account dyad characteristics that influence interactions, the present study contributes to the development of knowledge concerning the relationship between shared dyad attention and maternal sensitivity and children's emotional gestural expressions, which are theoretically related but have not been related in previous investigations. The research results show the feasibility of studying shared attention through two dimensions (levels of commitment and emotional tone), making it possible to operationalize and clarify the concept of shared attention. The descriptive results of this study show that the passive engagement and emotional tone of neutral synchrony are most frequently exhibited by dyads during engagement in free play. Levels corresponding to quality of shared attention, i.e., total shared commitment and positive synchrony in emotional tone were found to be less frequent, although they were present in agreement with research suggesting that cognitive skills necessary for shared attention already exist at 12 months (Butterworth, 2004; Trevarthen, 1998).

From the observations made, children were mainly engaged in relationships with objects rather than with their mothers, forming a dyadic system (subject-object or subject-situation) while the mothers acted as participants who observed their children's interactions and who encouraged episodes of shared attention. This result is consistent with studies showing that playful interactions require the presence of another who initiates and facilitates space for the child to develop and self-regulate his or her interactions (Winnicott, 1971). At the same time, the fact that an adult during interaction constantly introduces objects into the child's play tends to prevent the development of shared attention (Gamer & Landry, 1994; Mas & Añaños, 2010). Shared attention episodes were not present during the interactions observed, which was expected because at one year of age, a child's attention fluctuates between exploring the environment and engaging in episodes of shared attention with his or her mother. Subsequently and gradually, the child develops the capacity to participate in more shared attention scenarios (Richards & Casey, 1992; Richards & Turner, 2001).

Another result related to the duration of episodes of *total shared commitment* as evidenced by the short duration of the episodes is related to the child's stage of development. The younger a child is, the shorter interactive episodes are. As the child grows, the duration of episodes of shared attention increases, which in turn enhances the development of other skills (e.g., concentration and regulation), as this engages

the child in sustained attention (Richards & Casey, 1992; Richards & Turner, 2001).

Our results on the frequency of each level of shared attention contribute to existing research, as they reveal a common distribution pattern across nine of the analyzed dyads. A predominance of the *passive commitment* level followed by *partial shared* and *total shared commitment* was found at the engagement level, and for emotional tone, a predominance of *neutral synchrony* followed by *positive partial* and *positive synchrony* was found. This shows that the presence of passive commitment is typically accompanied by neutral synchrony while partial and total shared commitment are accompanied by partial positive or positive synchrony. This indicates that within each game sequence, a set of rhythms is quickly established and recognized by each participant with periods, durations, sharing and emotional tones present. This allows participants to learn from reciprocal interactions (Stern, 1997).

Regarding the relationship between shared dyad attention and maternal sensitivity and gestural emotional expressions of infants, the results reveal a significant relationship between shared attention and specifically between levels of commitment and maternal sensitivity but not with the intensity of infants' emotional expressions. In other words, mothers who exhibited more sensitivity were more attentive to exchanges that occurred with their children and with objects and situations, contributing to the fact that episodes of shared attention occurred more frequently as evidenced by previous research results (Bigelow et al., 2009; Coppola, Vaughn, Cassibba, & Costantini, 2006; Fein, & Fryer, 1995; Fiese, 1990). Sensitivity is a relevant maternal competence, and through its relationship with shared dyad attention, it contributes to a child's development at the biological, psychological and emotional levels (Ainsworth, et al., 1978; Meins, 1997; Stern, 1997).

Our lack of results on children's emotional expressions may be attributed to the young age of the children studied, and such expressions may be observed at older ages. Alternatively, this variable may be more closely related to the dimension of dyad emotional tone, an aspect that could not be considered in our analyses. Future studies of larger samples and of children of different ages will help address this issue.

This study presents limitations. The small sample examined and resulting variability observed in terms of shared dyad attention prevented consideration of emotional tone dimensions in the correlational analyses, and so the results should be interpreted with caution. Future studies on this topic should consider larger samples of children of different ages and should contemplate other variables that may influence shared attention such as language used during

interactions, personality characteristics and the mental health of the mother, among other variables.

Notwithstanding these limitations, the results obtained are interesting in that they show how shared attention in Chilean dyads manifests and the feasibility of studying this through its operationalization in the dimensions of commitment and emotional tone. Such relationships with maternal sensitivity contribute to competences that can be developed through clinical interventions involving children from an early age, which will positively influence the development of mother-child shared attention, a variable that is of considerable relevance to the future cognitive and emotional development of the infant.

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