# Intuitive Parenting Performance:
# The Embodied Encounter with Art

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## ABSTRACT

Intersubjectivity experiences established between adults and infants are partially determined by the particular ways in which adults are active in front of babies. An important amount of research focuses on the "musicality" of infant-directed speech (well-defined melodic contours, tonal and rhythm variations, etc.) and its role in linguistic enculturation. However, more recently, researchers have suggested that adults bring also a multimedia performance to infants. According to this, some scholars seem to find in that multimedia stimulation indicators of the genesis of the performing arts (as music and dance). In spite of these speculations, the way in which the parental performance is related to performing-art forms remains still unexplored. We analyze the adult performance using analytical categories and methodologies of analysis broadly validated in the fields music interpretation and dance movement. Microanalyses of adult-infant (7 months old) interactions are presented. The functional value of adult performances is discussed in relation to: (i) infant´s processes of aesthetic enculturation; (ii) adult´s hermeneutic processes of non-verbal interpretation and its effect in the infant; and (iii) the implications on the development of general cognitive skills, such as making sense up of non-propositional unities

## INTRODUCTION

### The musicality of Infant Directed Speech and the multimodal Babytalk

During the first year of the infant's life, he and the adult settle down the most primitive experiences of intersubjectivity between themselves on which the infant's communicative development will be based (Trevarthen, 1998). These experiences are sustained by *Intuitive Parenting*, a general and intuitive ability of adults to protect, feed, stimulate and teach culture features to their infants (Papoušek, 1996). The Infant Directed Speech (IDS) is one of best known aspects of Intuitive Parenting. Studies on IDS have (a) emphasized their "musicality" and (b) indicated that it is not a fixed form of speech but a flexible behavior, changing and adapting to infants' development throughout their first two years of life (Papoušek, M. 1996; Papoušek, H. 1996). Features that IDS displays during the first 6-7 months of life are focus of this paper.

At the beginning, IDS serves to catch and keep the baby's attention, offering him stimuli for responding. Immediately, a few weeks after the birth, it becomes into a powerful device to regulate both the emotional state and the behavior of the baby. *Melodicity* (understood as the voice's pitch modulation) of the IDS appears as one of its features clearly oriented to that goal: parents tend to use a set of five or six melodic prototypes that vary increasing or diminishing arousal and tension. There, "melody is the message". It conveys the speaker's intentions

and babies perceive some basic categorial messages: approval, prohibition, attention, comfort (Fernanld, 1989). Mothers tend to use higher-pitch, smooth and faltering voice. Sentences are short and repetitive, with clear pauses. Voice's pitch varies on clearly distinguishing and controlled melodic contours, and regular accents establish a stable calming rhythm. Using short words (1-2 syllables) and brief repetitive phrases promote a repetitive regulating meter (speech adopts a self-regulative metrical structure) around which melodic, dynamic and rhythmic variations are elaborated. Towards the 5 months, maternal speech changes to a mutual, more and more animated game: the voice is still high, but the expressions are longer, with more marked pauses among them and greater variety of melodic contours, rhythms and dynamic contrasts (Miall and Dissanayake, 2003).

As it was noticed by Trevarthen and Reddy (2007), about six month of the baby's life, not only the IDS adopts particular musical features but also babies exhibit an increasing talent in *Communicative Musicality* (Malloch, 2000; Malloch and Trevarthen, 2008). *Communicative Musicality* can be understood as a general ability to co-ordinate the rhythm and contour of motor and sound gesture (Malloch, 2002).

Some authors not only indicate the IDS musicality but also emphasize the connection of IDS with dance: Dissanayake (2000 to and b) considers that there are some precursors of performing arts (music and dance) in the early adult-infant interactions. She suggests that the speech modifications are only an aspect of its *elaboration* - dynamic, rythmic and crossmodal modelling - of the parental stimulation that includes not only the sounds but also the movements of the adult. Miall and Dissanayake (2003) calls *Babytalk* for vocal and kinetic performances of adults in front of the babies, which are typical at the halfway through the first year of the infant's life. They consider *Babytalk* as a privileged resource for unfolding the first dyadic psychological contact - or experiences of primary intersubjectivity.

Besides the regulative function of arousal and emotional states of the baby and intersubjective interaction of the IDS, several researchers (Papoušek, H, 1996; Fernald, 1989) emphasized its role in language acquisition.

### Performing arts and intuitive parenting

Concerning the musical characterizations of the IDS -traditional descriptions in terms of melodic contours, timbres, rhythms, etc., carried out in order to methodically characterize attributes of the sound signal such as pitch, intensity and duration- are not simply only a superficial comparison. The sonographic digital analyses of frequency, time and spectrum of the Papoušeks (1981), and the microanalyses reported by Stern *at al.* (1977), Papoušek, M. (1996) and Malloch (1999/2000) are clear signs of the fruitful results of this

approach. Nevertheless, these analyses make use of musicological theoretical bases that do not go beyond of providing the use of music notation and certain basic general concepts as descriptive tools of music without going deeper in more sophisticated musical insights. However, with regard to the interpretation of the role of movement in the adult performance, the theoretical descriptions are much more rudimentary. Although previous analyses have proposed to consider movement at the same level of relevance of sound -, they were limited to give brief descriptions of movement in terms of musical characteristics -such as rhythm or duration-, and some relationships with sound. The work of Miall and Dissanayake (2003), however, was pioneering in studying *Babytalk* with the aid of sophisticated concepts and tools coming from the studies in Arts. They investigated poetic resources in *Babytalk*, founding parallelisms, hyperboles, alliterations, assonance and rhymes, and episode organization with clear beginning or introduction, ending, and, sometimes, refrains or coda.

In synthesis, in spite of the hypothetic genetic bond between multimedia adult stimulation and performing arts, how parental performance is related to performing-art forms remains still unexplored, since parental performances have scarcely been tackled as art performances, using tools from the performing-art analysis. In order to overcome such a disadvantage, two of the most powerful tools of performing arts studies are used here, namely: (i) the conceptual frame of the Rudolf Laban's theory of expressive movement, for analysing the kinetic component of the adult performance, and *Babytalk*, and (ii) some methods from the field of the studies in expressive music performance, in order to describe the musically expressive features of such performance.

## Two powerful tools in performing arts studies

The first tool is the Laban-Bartenieff's Movement Analysis System. This system describes dance movements by using five categories (i) *Body*: body parts used in the observed movement; (ii) *Space*: concerns the relation of the body with the surrounding space. The kinesphere is the space limited by the points reached by the limbs without changing the body position. Three 'attitudes' of the body are possible in this space: *vertical* (up-down), *horizontal* (right-left) and *sagittal* (front-back). (iii) *Form*: understood in terms of the basic opening/closing opposition of breathing on vertical, horizontal and sagittal planes; in that way, three forms are obtained: *rising-descending*, *spreading-enclosing* and *advancing-retiring*; (iv) *Effort*: indicates the movement quality according to the attitude of dedication or fighting against space (*direct* vs. *flexible*), time (*sudden* vs. *sustained*) and weight (*strong* vs. *light*). While combining these factors eight basic types of *Effort* are obtained: (1) *pressing* (direct – sustained - strong), (2) *flicking* (flexible – sudden - light), (3) *wringing* (flexible – sustained - strong), (4) *dabbing* (direct – sudden - light), (5) *slashing* (flexible – sudden - strong), (6) *gliding* (direct – sustained - light), (7) *punching* (direct – sudden - strong), (8) *floating* (flexible – sustained - light); and finally (v) *Flow*: every movement may be *free* (it is difficult to stop it) or *bound* (it is easy to stop it). The five categories are usually summarized using the expression "*Shape and Effort*",

involving *Shape* for the first three categories and *Effort* for the other two (Laban, 1971; Newlove, 2007).

According to this theory, movements are not sequenced in a random way. On the contrary, sequences tend to obey to changes of only one attribute of the eight basic types (*Effort*), since changing two of them at the same time is difficult, and changing three of them together is almost impossible (such a change requires the expertise of a dancer). Therefore, there are both *possible* movement sequences (for example, *thrusting*, *pressing*, *gliding*, *floating* and *wringing*) and *impossible* movement sequences. A movement sequence is a *phrase* which is considered like a sort of melody (Laban, 1970). Consequently, in the field of the studies in dance, shape and effort are attributes of the movement that characterize its structure, dynamics and expression.

Finally, the theory also relates movement with emotion through feelings that are conveyed by the attribute of Effort. "In the human psyche, (…), there are also feelings which accompany efforts. It would be impossible to measure them objectively but they can be classified" (Newlove, 2007, p. 121). Briefly, according to Newlove (2007) every basic type of Effort is accompanied by a movement sensation (floating by suspended; pushing by dropping; gliding by elating; slashing by collapsing; dabbing by stimulating; wringing by relaxing; flicking by exciting; and pressing by sinking.)

Español (2007, 2008) applied the Laban's Movement Analysis System to the analysis of adult performance in interaction with 6-7 month old babies, founding that brief movement phrases could be detected (ranging between 5 to 50 sec), which are arranged in sequences making up scenes. They were variably sketched depending on the infant's behavior and the environmental contingencies. Thus, she speculated on possible cognitive benefit for the baby, in as much his segmentation skills are stimulated, encouraging him to the formation of holistic, non-propositional, meaningful units.

The second tool comes from the field of studies in expressive performance. The IDS has been studied analyzing and describing the parameters of its sound in terms of musical attributes -rhythm, melody, regular accent patterns (pulse), etc. - However, to study IDS as an expressive musical discourse, asks us to go beyond those superficial descriptions. Expressive music performance has been defined according to systematic patterns of parametric deviation (typically of timing, dynamics and articulations) from a norm (typically, the nominal values written down on the score). Therefore, detecting patterns of systematic deviation of the expressive parameters respect to some normative value is needed in order to approach IDS as an expressive musical discourse. After this, some speculations about their implications on the practiced meanings in the context of the dyadic interaction are required.

For example, adult-directed-speech normally does not adjust to an underlying pulse, nor exhibits regular rhythmical patterns. From that point of view, holding on to an underlying pulse and unfolding rhythmical pattern during the IDS can be considered as an expressive trait. This fact has been identified by numerous researchers (Papoušek, M. 1996, Malloch 1999/2000; Trevarthen 1999/2000). Nevertheless, Shifres (2007) studied the meaning of those expressive characteristics emerging from the particular context of the dyadic interaction.

Thus he observed that around the six months of life, adults hold on to an underlying pulse when an outer stimulus (a strong noise, a violent movement, etc. out of the dyad), puts at risk the intersubjective contact. On the contrary, the pulse becomes more flexible at moments at which the intersubjective interchange occurs without external interferences, and the infant's attention is clearly focused on the adult's performance. Then, Shifres suggested that adults resort to holding on to the underlying pulse in order to capture the infant's attention and to take the control of a situation threatened by external factors, calming the infant, *showing him* the frame of the adult care. The regularity of the pulse can become more flexible soon, and temporal deviations may emerge providing new meaning to the interchange. Thus, as well as the pulse may be understood as an expressive trait in a given context, its systematic relaxation -or the patterns of systematic deviation respect to that pulse-, may also be considered as an expressive characteristic in another particular context.

Independently, in the field of the studies in expressive music performance, *rubato* is defined as an expressive resource by which the rhythmical arrangement of the events tends to turn aside systematically (this is, according to structural and significant content of the composition) from corset imposed by the metrical structure, given by the score (Gabrielsson 1999, Shifres 2008). The expressive meaning of such a deviation emerges in the particular context of the communication and it is nourished both by the relation with the musical structure (like canonical value) and by the current context of the performance.

## AIMS

Following the line of Miall and Dissanayake (2003), this work examines a hypothesis of *artisticity* of the adult performance in dyadic interactions with 6-7 month old babies. For it, it is proposed to show that such performances may be characterized in terms of the categories used for studying expression in performative arts (particularly music and the dance). In order to reach such an objective a series of scenes of adult-6-7 month old infant interactions were analyzed according to (i) the Laban's Movement Analysis Model, and (ii) the procedure of analysis for dynamic and timing expressive patterns in music performance. Firstly, for methodological reasons, kinetic and sound components of the adult performance are described -as expressive attributes of this performance- separately. The analyses are focused on (i) *shape* and *effort* trait of the movement accompanying the adult speech; and (ii) timing and dynamics of the spoken speech. In the case of the sound component, some patterns of systematic deviation from normative aspects of the discourse (particularly phrasing and prosody) are intended to identify. Secondly, some aspects of the relationship between both components in the composition of multimedia performance are described.

## METHOD

Some adult-infant interaction scenes were taken from longitudinal research material where different dyads were weekly filmed in 30-minutes interactive sessions, during the first year of life (with the selected scenes corresponding to the 7th month). All sessions correspond to real contexts of interaction (at the baby's home, with the presence of familiar people and objects, etc.). This setting allows studying the role of those objects and peripheral circumstances in the interaction. Therefore, no sessions were run in laboratory. Otherwise, effects of the observer intrusion (particularly installation of cameras and film equipment) were minimized, in order to not affect the ecological validity of the samples.

Only the adult performance was focus of analysis. All of them were analysed regarding movement and sound. The full analysis of the complete material falls out of the scope of this paper (an important part of this was presented in another place). Only a few examples of this are presented here in order to show some expressive aspects of the adult performance as they can be analysed as music and dance.

### Sound Analysis

The analysis of the sound included two steps. Firstly, a normative dimension of the spoken discourse was identified. For that, the discourse was analyzed according to: (i) categories of analysis for classic musical form (Berry, 1986; Caplin, 1998) in order to identify the dimension normative for the discourse phrasing, and (ii) musical rhythm theories, particularly descriptive of the accentual aspect –prosodic- of the rhythmical patterning (Cooper & Meyer, 1960; Bernaldo de Quirós, 1955) in order to identify normative patterns for the rhythmical organization in the speech.

Secondly, patterns of systematic deviation of the performative attributes of timing (rubato) and sonority (dynamics) with respect to the nominal values identified in those analyses were extracted. For microstructural analyses of timing, IOI of successive vocal sounds of the adult were calculated and timing profiles were displayed from these values. In addition, in some cases IOI between accentuated events were identified, in order to search patterns of metrical regularity (pulses). Also a dynamic profile for each sequence was displayed from the loudness values. These analyses were assisted by a phonetic analyzer (Praat 4.5.16; Boersma & Weenink 2006). Results are showed in graphical form.

### Movement Analysis

Movement was analysed using the Laban-Bartenieff's Movement Analysis System. Movement categorizations were assisted by Anvil 4,0 -a video-annotation software developed by Michael Kipp (2004), which has been used previously for Laban analysis of movement in music performances (Campbell, Chagnon & Wanderley, 2005) and in adult-infant interactions (Español, 2007 and 2008). The software allows (i) to write down each one of the categories on a temporary line that exhibits in addition the video image synchronously, and (ii) the manipulation of the video reproduction velocity. The 5 categories of the Laban's system were included and several observations of the video were used for analyzing it according to each of them separately (*i.e.* firstly, the video was observed to analyze *body,* secondly, *space*, etc.), writing down the corresponding observation on the annotation bar (that displays a time bar according to the frames of the video). This analysis was run without listening to the sound track aiming that sound and linguistic components did not affect the observers' judgments. The analyses were run by independent judges who reach a complete agreement about some different judgments in *inter-raters* discussion. The observations were supervised by a

dancer and choreographer specialist in Laban's movement analysis system.

## Crossmodal *Compositional* Analysis

A meta-analysis of the data coming from the sound and movements analyses previously realized, was run in order to examine some aspects of the sound-movement composition.

# RESULTS

## Sound Analysis

For space reasons only two examples of *musical form* of the adult's discourse in the dyadic interaction are presented here whose performance is analysed with categories of the studies in expressive music performance

### *Phrasing and discourse*

As many authors have observed, IDS may be observed according to principles applicable to music compositions (for example the *repetition – variation* principle [Imberty, 2002]). Nevertheless, we could identify some fragments of speech organized according to more structured classical form principles. For example, during a game of "peek-a-boo", the adult said to Habib (a 7-month old baby), "(behind the shawl)

*Habib... Habib...*(appearing) *Here is Habib!* , (behind the shawl again) *Habibi, I don' t see you... Habibi, where are you?* , (appearing) *You are here!* … (and then it is possible to listen to) *noooo*" according to a typical *Classical Period* (Caplin 1998) as displayed in figure 1.a. A very similar patter appears in another scene with another dyad. This time the mother asks the baby give her a little cat puppet. She says: "*Could you give me it?...could you give me it? .… Could you give me ...the cat?; Hey, you....Hey, you.… Could you give me ...the cat? … Could you give me ...the c...*" as figure 1.b shows. This time, the structure can be interpreted as a *double sentence* (a sort of small binary form). Notice that although grouping structure are extremely similar, tension-relaxation and motivic relationships are slightly different. In *Period Form* consequent ends with the most cadential gesture and some post-cadential material (*coda*) appears after it. A *semi cadential* ending appears in the antecedent. In *Double Sentence Form*, the most stable point is reached at the end of the complete unit. Tension is increased throughout the repetitions at different levels. In *Period Form* both antecedent and consequent consist of a basic idea and a contrasting (different) idea. In *Double Sentence Form*, the motives following basic idea are fragmentations of it (not new ideas).
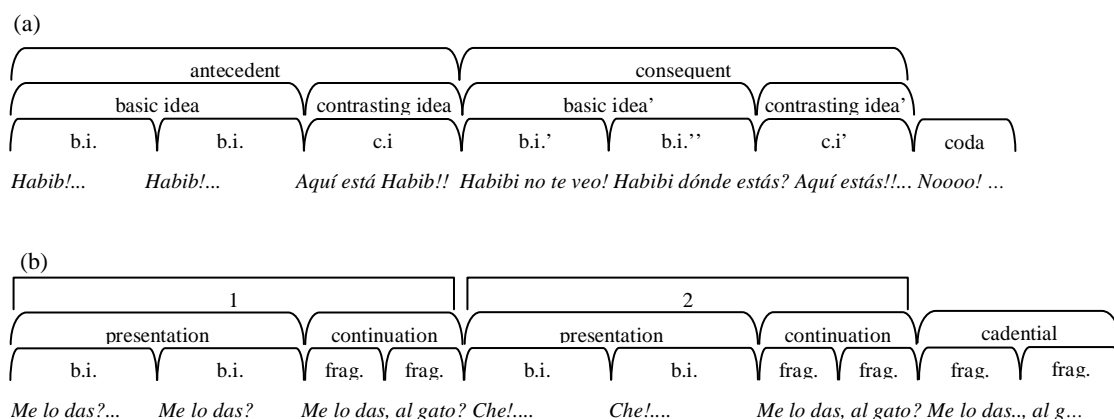


**Figure 1. Classical Musical-Form Analyses of two adult performances in dyadic interactions. (a)** *Period Form*; **(b)** *Double Sentence Form.* **In italics, adult's words of each phrase (in Spanish, see English translation in the text) are transcribed below. (b.i.:** *basic idea*; **c.i.:** *contrasting idea*; **frag.:** *fragmentation***).**

When analyzing timing of the sequence (a), measuring the duration of each unit (in sec.) it is possible to observe a lengthening of the contrasting ideas, mainly the second one, corresponding to a hierarchically more important end (figure 2.a). Like in the expressive music performance, the *ritardando* is marking very expressively the organization of the musical form. Notice in the figure 2.b that the lengthening is caused mainly by the lengthening of the pause, as a way of gaining greater tension before the final cadence (on the contrasting idea). Likewise, phrasing of the sequence (b) lengthens the

phrase endings in a similar way. Nevertheless the final cadential phrase is significantly longer, emphasizing the closure of the complete form (figure 2.c)

Concerning the analysis of the dynamics, the graphics of figure 3 indicate how the adults diminish the loudness of their voices in order to mark the end of the phrases. Comparing the two phrases it is possible to observe that *diminuendo* at the cadential units. As a result, as in the expressive music performance the ending phrase *ritardando* is accompanied by dynamic *diminuendo* (Todd 1992).
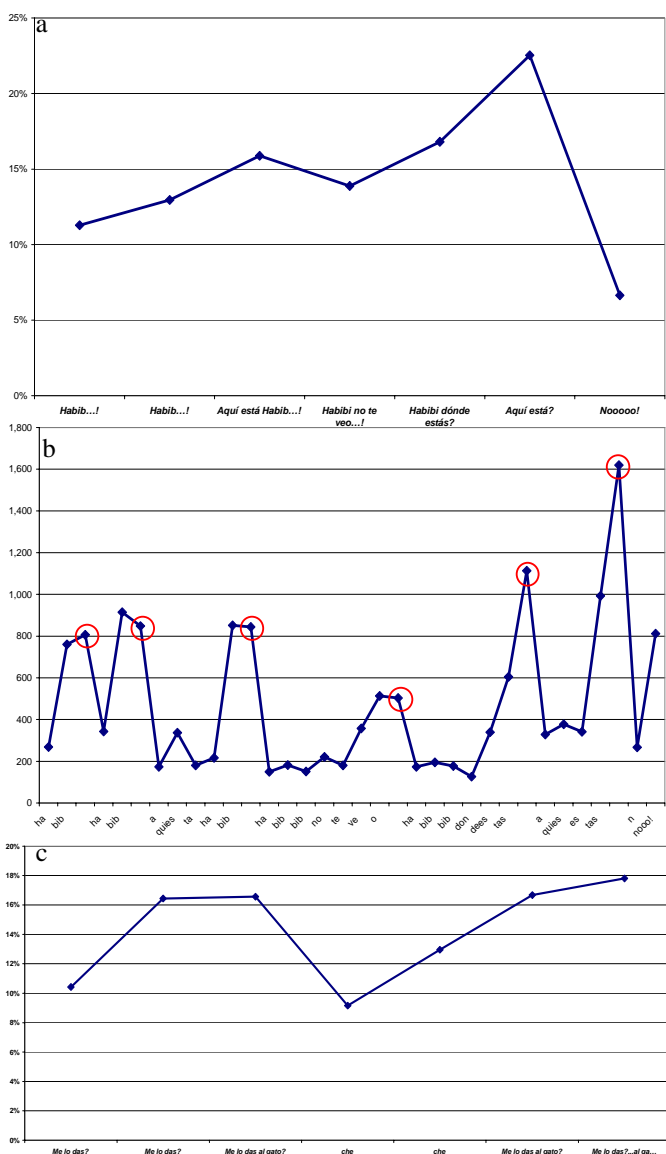
natural accentuation of the language at use. In the case of Spanish language, the pulse is syllabic, and there is an accented syllable in each word. Therefore, accent relationships may be identified for each word with a corresponding Greek rhythmical feet. Notice that the Cooper & Meyer's model, in spite of using the classical labels of the feet, does not involve the sounds' durations for organizing the feet. On the contrary, feet are interpreted as *hard-weak* rather than *long-short* relations (as in Aristoxenes or Saint Augustine [Bernaldo de Quirós, 1955]). Likewise, complex feet are interpreted by Cooper & Meyer as upper architectonic levels of the rhythmical structure, with simpler 2-3 event feet at lower levels. Figure 4 shows an analysis of rhythm patterns corresponding to the second scene of the previous paragraph (units were segmented according to pauses, see phrasing analysis above). A high proportion of *trochee* at the lowest architectural level is observed. Likewise, *iamb* predominates at the following architectural level.
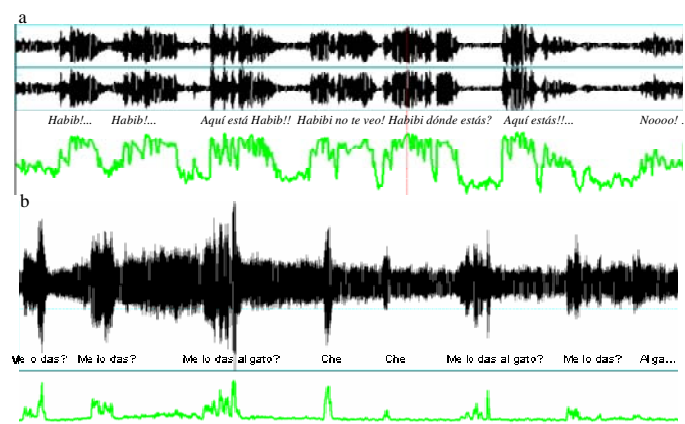


**Figure 3. Graphic analyses of dynamics: envelopes (in black) and "intensity" (in green). Texts in Spanish to appreciate syllable onsets (see English translation in the text)**

In order to analyze the *musically expressive* component of the statements, the relative sonority of each syllable necessary to provide an adequate, non expressive pronunciation of each accentual pattern was taken as a guideline to compare with real, *deviated* patterns (figure 4 also shows these patterns, as they are displayed by the software).



**Figure 4. Rhythmical (prosodic) analysis and graphic dynamics analysis. Texts in Spanish to appreciate syllables and accentual relations (see English translation in the text)**

This scene is particularly interesting since it is possible to see 5 repetitions of the same words: | Me lo das? | (*could you*



**Figure 2. Timing Analyses. Phrases duration (pannels a and c) and IOI (pannel b, red circles correspond to offset–onset interval between phrases –pauses-) Texts in Spanish to appreciate syllable onsets (see English translation in the text)**

### *Rhythm and prosody*

It is well known the fact that IDS has a more rhythmic quality than adult-directed-speech. However, is it possible to identify subtle timing and dynamics deviations of such rhythmical patterns that give to dyad members an expressive information to practice new meanings, in the same way that expressive music performance? In order to respond that question it is necessary to determine a normative dimension from which such deviations may happen. For defining it the analysis of the statements like they were part of an adult-direct-speech was run according to some usual theories of musical rhythm (Cooper & Meyer 1960, Bernaldo de Quirós 1955). These theories are pertinent to this rhythmical analysis since they are based on the Greek notion of rhythm, which links temporal arrangement of events in time with accent relations of the oral speech. Thus, it was considered as *normative* an intelligible prosody of the speech according to

*give me it?*) -. The first time the relative sonority of the syllables agrees the prosodic pattern (trochee and iamb, respectively for the two architectonic levels). Nevertheless, the second time, the *hard-weak* relation is inverted at the superior architectonic level as a *trochee* (figure 4). Certainly, we may be careful, since, as it is known, the *strong-weak* accents relations do not depend only on the sonority. In the following motif (/ *me lo das al gato?* |) - expressive deviations are more marked: both first architectonic levels have inverted the *strong-weak* relation. That is to say, trochee |*me lo*| appears with the two syllables of similar sonority; but |*ga to*| clearly shows a iamb pattern. On the other hand, in amphibrach, at the second architectonic level, the loudest syllable is |*al*| sounding like an anapest. Notably, a similar pattern is observed for the second | *me lo das al gato*? |, confirming it as a systematic expressive pattern (there is a small difference: here, the first trochee is clearly a iambic). Finally, the last | *me lo das*? | shows a remarkably similar pattern similar to the second one.

The effect of timing (agogic accents) in prosody was also analyzed. Two points must be considered here: (i) there is syllabic isochrony in Spanish, and (ii) deviations from that isochrony are the base for agogic accents of the rhythmic feet. Therefore "the louder, the longer, and the weaker, the shorter" will be the syllable." Thus, the first | *me lo das?* | keeps the long-short relations adequate for a trochee pattern (|*me-the*|) and for the *iambic* (at the upper architectonic level) (figure 5): |*me*| is longer than | *lo* / but in turn it is shorter (remarkably shorter) than | *das?* |. The second | *me lo das?* | (perhaps more firmly) emphasizes |*me*|, inverting the prosodic pattern. A similar pattern of timing deviation appears with the following repetition of the foot ($7^{th}$ unit). The idea that a pattern agrees the first time with the normative prosody, while it is expressively deviated the second time also appears concerning more complex patterns, like | *me lo das al gato*? | (notice the great lengthening of |*lo*|).
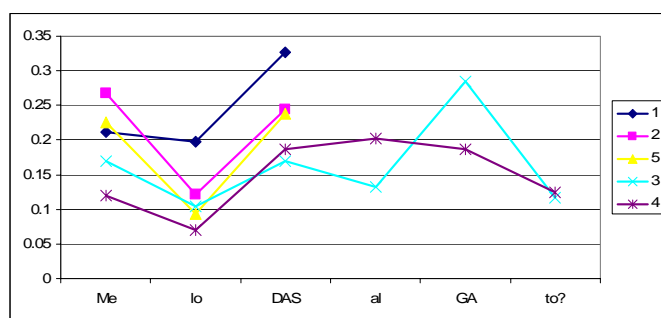


**Figure 5. Timing for the 5 times of |¿Me lo das?| (*could you give me it?*). Accented syllables in capital letters**

## Movement Analysis

### Phrases composition

Dance analysis categories allow to appreciate units of phrases in the organization of the adult's movement, as was said previously. Concerning traditional dances, ballet and even contemporary dance, the movements of dancers usually follow a pre-established plan - the choreography (which is more or less modifiable). Something similar takes place with movements involved either in games or in ritualized actions (i.e. "peek-a-boo") in early interactions. Here, adults can repeat pre-established movements in a "previously fashioned" sequence -like raising or lowering a blanket- several times with subtle variations. However, generally adults are creating this performance "on line", without pre-designed plans. Nevertheless, such a creation is neither unsystematic nor disorganized, but it is organized in phrases. How is this organization accomplished? The elaboration of "motives" throughout the repetition-variation form is one of the essential resources unconsciously and intuitively used by adults in creating their performances. Frequently, unintentional ordinary movements (i.e. to put or to remove a blanket) become the motif for a phrase. They are repeated, but never identically, but with changes in its form, duration or extent.

For example, an adult-infant interaction scene (1 min. 24 sec.) begins when adult removes a blanket from the baby's lap, who is sitting on his "baby-sit". Immediately, this action gives rise, by elaboration, to the first phrase of movement of the scene (23 sec.). Figure 6 shows movement annotations for this phrase. Repeated colored rectangles allow observing the movement categories that characterize the motif and its varied repetitions (elaborations). The complete phrase is created by "elaboration of a motif" elicited by an unintended ordinary movement. Thus, the complete sequence shows: (i) Initial movement of removing a blanket (3 sec.) with Effort (row 4) "*gliding*" (yellow) and Shape (row 3) "*retiring*" (red); (ii) elaborated repetition of the previous movement: "*gliding-floating*" (yellow-grey pattern) in terms of Effort and "*rising – advancing – descending - retiring*" (red – white – grey - yellow pattern) in terms of Shape, with Flow (row 5) alternating between *bound* and *free* (red-green); (iii) other two repetitions of the motif with variations of the Effort pattern ("*retiring – rising - descending*" and "*advancing – rising - descending*") and variable extent of *retiring* (iv) closure with simplified movements by (a) removing the object - characteristic element of both the motif and its elaborated repetitions (row 1 alternating yellow and red) and (b) simplification of the "*rising-descending*" pattern into the simpler "*advancing-retiring*" (row 3). The last "*advancing*" movement is the widest of the complete phrase, marking both the closest physical contact point between the dyad members, and the longest movement (until reaching the target). The recurrent "*retiring*" movement closes the phrase. The adult backs down and reaches the center of her kinesphere. The new phrase organization begins soon, in which the adult will change several elements: movement will run on the vertical dimension (instead of sagittal) with a "*gliding-dabbing*" Effort pattern and a "*rising-descending*" Shape pattern (instead of the "*advancing-retiring*" pattern).

In other occasions the motif is take from external stimuli. For example, in another part of the previous scene, the "baby-sit" -on which the infant was laid down- reclined itself two points more suddenly adopting a more horizontal position. This sort of fall elicited a very brief phrase (6 sec.). The baby-sit fall happened on the vertical plane, with *direct*, *sudden* and *strong* Effort (*punching*) and accentuated at the bottom. When it happened, the adult interrupts her movement, but soon, she gave a response to the baby, with a similar movement of the "baby-sit" but elaborating it by changing only one element: she moved the blanket two times with "*light, direct*

and *sudden*" Effort (*dubbing*) conserving the vertical plane; this time the movement is accentuated at the top (Figure 7). Then immediately, she moved - on the vertical plane- her head upwards-downwards. She made a quick elaboration of the unit: she drew back her arms with "gliding" and "floating" Effort, moving forward with two new and very smooth "*dubbing*" (like a smooth rocking) movements.
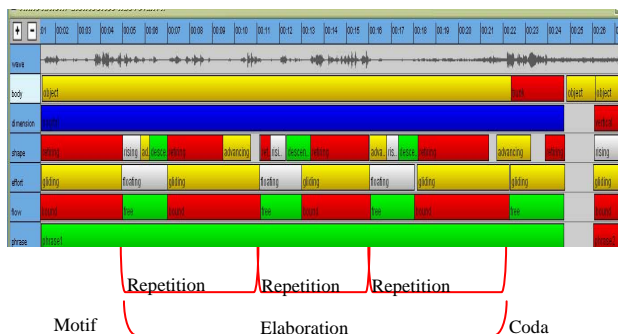


**Figure 6. Five cateogries of Movemente Analysis of the 23-sec sequence according to Laban's system (see explanation in the text)**

The phrase is closed in a point of calm or "*frozen*", at the goal of the previous movement, with permanent eye-contact in which the adult was probably checking the restored calm.

## Crossmodal *Compositional* Analysis

Data collected for the analyses of sound and movement are considered here in order to show an example of *crossmodal compositional* meta-analysis. Figure 8 shows an approximated transcription of the voice component in musical notation and a graphic pitch analysis. Cross notation was used for *like-singing* vocal emission (*Sprechgesang* style); square annotation was used for clearly spoken emissions.

Figure 8 (upper panel) shows the adult's movement sequence: (i) *rising* -the blanket-, (less than 1 sec.) (ii) *frozen* (2,50 sec.) and small movements at the top on the horizontal plane (1 sec.) (iii) *descending* -the blanket-, *advancing* -the trunk- towards the baby and *retiring* (approximately 3 sec. ). *Retiring* can be thought like equivalent to the musical cadence, a sort of "closing gesture" functioning as a punctuation mark. Next, the sequence is (i) *rising* -the blanket- again (1 sec.); (ii) movements at the top on the horizontal plane –with the blanket - and *frozen* (approx. 3 sec.; similar to previous sequence (ii) but inverted); and (iii) a more extended *descending* and *advancing* towards the baby reaching the greatest proximity between both (approx. 4 sec.). Interestingly, the widest voice register tessitura is reached in agreement with the largest movement, and the descending melodic contour (glissando) takes place simultaneously with the *descending* on the sagittal plane. Finally a more noticeable *retiring* (like a cadence) restores the position at the center from her kinesphere. This agrees with the most pronounced *ritardando*, giving a marked closure to the highest hierarchical level phrase (see the musical form analysis above).
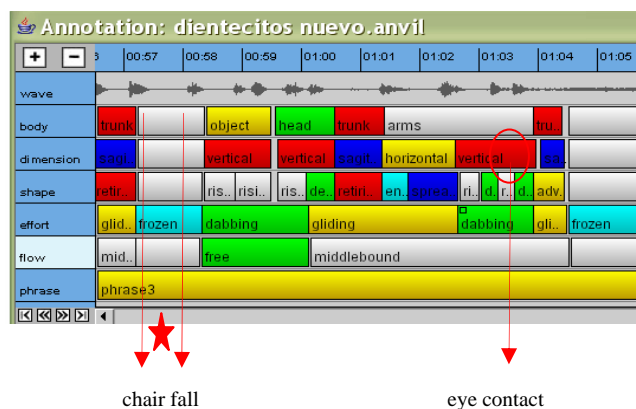


**Figure 7: Movement Analysis annotations according to Laban's system. Scene with external stimulus (see explanation in the text)**

The movement seems to be determined by the pre-established plan of the game ("peek-a-boo"), rather than by the online motivic elaboration of movement and the repetition variation structure (as was observed for other analyses). Like a dancer following a choreography, the adult can follow a pre-designed plan of movements, implicit in the sequences of the game. However, neither the number of repetitions of the "call" nor the expressive quality of the movements in relation to that phrasing (concerning to the extent of cadences and movements at the end of the phrases) are pre-established.

Graphic analyses permit appreciate that movement precedes the musical discourse, framing the scene. Once movement initiates the scene, sequences of movements and sounds, with matched segmentation, can be appreciated. The different hierarchic levels observed in the musical analysis (basic idea, contrasting idea, antecedent - consequent phrase, etc.) may be discerned in the analysis of the movement (figure 8). However, movement although precedes the voice. The *ritardando* at the end of musical phrase matches the greatest extent and duration of the *descending* and *advancing* movement. Also, notice that the melodic contour reaches at that point its highest pitch and the widest tessitura, matching the most ostensible movement. In summary, (i) the movements of "*rising*" anticipate the speech (functioning like "upbeat" of the words), taking place during the pauses (rests); (ii) the instances of "*frozen* at the top" and "horizontal movements at the top" match the basic idea and its repetition (the ascending of the vocal pitch; notice that voice remains more time at the high register in the consequent); and (iii) "*descending* and *advancing* " towards the baby match the contrasting idea and the descending of pitch, by jump and by glissando. When the consequent finishes, the baby takes the initiative. It caught the blanket and brought it to its mouth initiating the final *retiring* movement with a different Effort (*pressing*), and giving rise to the *coda*: the game has finished.
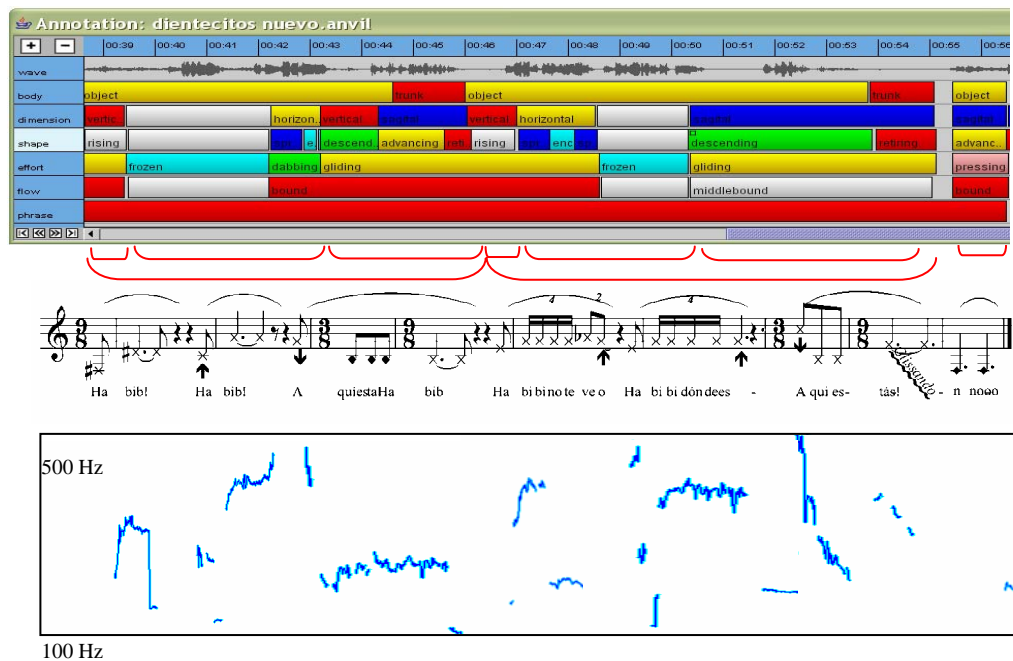
**Figure 8. Analyses of movement and sound of the "*peek-a-boo*" phrase. Upper panel shows the Anvil notation of the Laban analysis of movement. Central panel shows music notation transcription of the voice component, Lower panel, displays a graphic pitch analysis (proportion of the horizontal axe was modified in order to clarify the relationship with the score)**

## CONCLUSION

The collected data give support to a hypothesis of artisticity of the performance of adults in their interactions with 6-7 month infants and allow to advance in the study of the genetic bond between these and the performing arts experience in the adult life. This evidence shows that is possible to characterize the adult performance in terms of the categories used in the performing arts realm (music and the dance), indicating that:

(i) Adults use the timing as an expressive resource. The use of the dimension of the pauses and the gradients of *ritardandi* according to the structural hierarchy of the phrases, the handling of lengthenings and accelerations to contribute to tension- relaxation relationships and, consequently, to the cohesion of the discourse, are some of them. Moreover, "*rubati*" match variations in timing and dynamics (characterized by their *Shape* and *Effort*) of movements (more extended and marked movements marked).

(ii) Handling of loudness, which is also a frequent resource for expressive contrasts in the interaction, creating intimate or expansive atmospheres, exciting or calming moods characters, is also contributing to the coherence of the discourse. As in expressive music performance, calm is often identified with closure.

(iii) When adults adopt "repertoire pieces" from the cultural tradition (i.e. the "peek-a-boo") movements tend to capture the structure of the piece. Similarly, when the sound component is organized in terms of a structured musical form, movements match that musical structure (as in classical ballet, see Krumhansl & Schenck). Here, sound and movement also agree concerning the use of expressive resources for suggesting unit boundaries and accents, and pointing tension-relaxation relationships. For example, the longest sound ritardando match the largest movement. There, vocal pitch also matches the height of the movements in the space (see Martinez & Español in this symposium).

(iv) There are some musical ways of organizing the kinetic component that are analogue to those already identified for the IDS, such as the *repetition-variation form* (Rivière, 1986/2003). Our analyses show that not only the speech but also the movement of the adult (even though they are examined independently) is organized according to the repetition-variation form.

(v) As in music it is possible identify diverse ways of arrangement of the adult's movement phrases. For performances with original sources, composition seems to obey to a linear elaboration of motives (analogous to the "order schemes" in music [according to Imberty 1981]). On the contrary for performances based on traditional sources, the sequence of movements seem to be governed by a pre-designed plan showing a more sophisticated hierarchically elaborated structure corresponding to the structure of the piece of repertoire taken as source (often analogous to the "relation of order schemes" [Imberty, 1981]).

It is possible to appreciate that both the expressive resources systematically used in the *intuitive parenting* -like rubato, dynamic gradients- and the multimodal structure of the performance are analogous to those involving the performing arts. In performing art such resources intend both to involve the spectator in a more active way and during a longer time, and contribute to the practice of meaning of

certain contents. In the same way, in the early interactions, the same resources seem to be at the service of extending the attention and maintaining the contact. The use of the repetition-variation structure reinforces the infant's attending and constitutes a privileged way of infant stimulation (Rivière, 1986/2003). Vocal and kinetic component organization as a whole indicates an intuitive handling of the expressive resources of the arts as an adequate way for capturing the infant's attention, inviting him to attend as an spectator of her performance.

Additionally, the findings of this study suggest some functional value of adult's performances, with direct implications on:

(i) Making up non-propositional sense unities: The repetition-variation structure, ubiquitous in adult performances, help to shape and expose non-propositional units that control the infant's attention and encourages the cognitive activity of segmentation and recognition of such units. As the behaviour is repeated the baby can extract invariants and generate expectations. However, as the repetitions are varied, - neither identical nor absolutely unpredictable- certainty about what will happen does not exist. This type of uncertainty-based expectation (Dissanayake, 2001; Imberty 2002) is at the cross of intuitive parenting and performing arts. Our analyses show that, at least in the case in which the interaction is supported by a piece of traditional repertoire (for example a game), adults not only provide movement units and sound units, but also "holistic" performative sound-movement units for which the unity is achieved both throughout compositional elaboration and the use of expressive resources of the performative arts of the own culture (see below point iii)

(ii) Interpretation of stimuli (by non-verbal adult exegesis): Since every basic type of movement - according to *Effort* - entails particular feelings, while elaborating movement the adult is experiencing different feelings. The findings of mirror neurons and explanations about their functioning (Rizzolatti and Singaglia, 2006; Bråten, 2007), indicate that the movement activate brain zones involved in the accomplishment of the very movement. Seeing the other person's movement is, therefore, "to be moved". It is possible to assume that adult's movements not only lead her throughout different ways of feeling but also that invite the baby to a journey with similar felt experiences. When the movement phrase is elaborated from both an everyday movement and a repertoire piece, the adult leads the baby through varied feelings, inviting him to the emotional life and to the experience "of feeling with the other": movement elaboration is aimed to deepen the mutuality state between them. On the contrary, when the movement phrase comes from the *motívico* elaboration of a disruptive stimuli, which can modify the mood of the baby, the hermeneutic function emerges. For example: a sudden fall of the seat (that the baby feels in its own body), is a *vertical, descending* and *punching* (direct – sudden - strong) movement, conveying a *dropping* feeling. At the face of this event, the adult responds with a very similar –subtly different– movement: on the same vertical plane, use the complementary *rising* form, and dabbing (direct-sudden-light) *effort*. Notice that

*dabbing* differ from *punching* only concerning weight, but the conveyed feeling now is *stimulated*. Moreover, in the analyzed scene, adults repeat this movement, as the two times that the seat fell. In that way, the adult gives the baby a changed and elaborated repetition of the disruptive stimulus. Thus she is interpreting in a non-verbal manner the stimulus becoming it something more friendly.

(iii) Aesthetic enculturation: The expressive resources observed in the adult performance are similar to the expressive resources of artistic events in her culture (i.e. timing and dynamics) used in a very similar way. For example: the adult lengthens the endings of the phrases according to hierarchical grouping structure of the sequence is a very familiar manner, since that is the manner more present in expressive performance of tonal music in which such type of structure is strongly rooted. It is possible to think then, that as well as adults deliberately *transmit* characteristics of their culture by using games and musical repertoire of their cultural tradition, other characteristics of the culture are implicitly communicated through the use of certain expressive resources. Rubato, for example, is based on the primary ability of the infant to recognize, to join to and to predict isochronous patterns and to detect micro-deviations from them. Regarding this, the "work" that parents make during the early interactions may be understood as a way of "teaching" the expressive value that the culture has assigned to such micro-deviations. Each culture has its own repertoire of expressive resources for its performing arts. From this study it is possible to suggest that at least one cultural feature - the expressive manners of music performance - as part of the intuitive parenting, is opening the door to the infant to understand, to enjoy and to contemplate the art in his culture.

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