Dialogicity in diapers : attunement and misattunement at the nursery school

Dialogicity in diapers: Attunement and misattunement at the nursery school

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ABSTRACT

This chapter describes a systematic study of adult-child interactions at the nursery school in Italy and France. The research is based on the assumption that these interactions can play an important role in creating an inclusive educational context and ensuring children's well being in it. Within the framework of *communicative musicality* theory and drawing on video microanalysis, we focus on the interactions occurring during the main transition moments of the nursery everyday life: the welcome-separation and reunion phase at the beginning and the end of the school day. We identify and describe two profile of interaction respectively characterized by *attunement* and *misattunement*, and make a case of their dramatic difference in ensuring a "good enough" transition between the two main contexts of children's development, the home and the school.

KEY WORDS: Nursery school, interactions, transition moments, communicative musicality inclusion.

1 Introduction

Research over the last decades has mainly focused on transition moments in the nursery school

context by examining variables such as the age of the child, the typology of attachment (secure/insecure) that characterises the parent-child relationship, and the acclimatisation style and strategies promoted by staff (Sroufe 1983; Stamback 1983; Schaffer 1984). Most of these studies have referred to the theory of attachment (Bowlby 1973; Ainworth et al. 1978) adopting a dyadic approach to the analysis of the transition moments. Variables that have been under-investigated, or even ignored, include time, which assumes a fundamental role in the interactions observed at the nursery school. Time is relevant not only in terms of duration, but also as in terms of narrative succession of communicative events that are repeated, varied, concluded or suspended, displaying what Stern (1985) defined the "narrative profile of time". During welcome-separation and reunion moments appear to be structured according to a "narrative profile" (i.e. they display a beginning, a development and conclusion) that are marked by words, sentences, gestures, and movements expressed by specific modalities of prosody, pulse, narrativity, intensity, repetition, variation, tension and relaxation. All these aspects, related to what can be conceived of as "communicative musicality", shape the interaction and qualify its narrative profile as attuned[1] (Stern 1985) or misattuned (Pileri and Imberty 2015), depending on the textures of all the elements that characterises the exchange. We assume that these aspects qualify not only the interactions themselves, but also the quality of the care provided by an educational service.

Within this premise, the present study is inspired by, and conducted through, the theoretical thread of communicative musicality (Trevarthen and Molloch 1999), whose heuristic potential offers us an extraordinary pedagogical stimulus to identify patterns of attunement (and misattunement) that until now have not been taken enough into account when observing the

modalities that characterise the dialogical exchanges (see Weigand, 2009, 2010) occurring among children and the adults who take care of them at nursery school.

As Gratier and Trevarthen (2008) had it, the interactions at the nursery school are a "cultural space" of shared experience, created and shaped by all the partners involved in the interaction and negotiation, or re-negotiation of meaning. Using a videorecorded based observation is therefore a complex undertaking, as it has to take into account the polyphony of the communicative exchanges, the complex texture of interactions occurring in these contexts as well as the amplifying role of the camera and the researcher's own expert knowledge in making sense of the recorded events (Caronia 2015, 2018).

Notwithstanding the methodological challenge there is a psycho-pedagogical reason for undertaking this kind of investigation, it manly concerns the necessity to analyse the micro-details in which the a co-educational role of the nursery school is embodied in and enacted by the educators in and through their parental courses of action.

In France and Italy, pre-school services take care of very young children, from the age of 2 months in France, and 3 months in Italy. They have a dual role of providing education as well as parental/familial support: as described in several studies, this is essential in contemporary society where schools cope the more and with families displaying and enacting different cultural models of family as well as of parenting and caregiving. (Contini 2007, 2012; Gigli 2007, 2010). In terms of inclusion and integration of children with special educational needs and or having a migrant background, international research has clearly shown that early childhood services are significant contexts not only for children, but also for their parents and family members (Epstein 2009; Vanderbroeck 2010; Pourtois & Desmet 2015). Nursery school

is one of the first educational settings in which parents interact with each other and consolidate experiences of educational partnership, a place to weave relationships and to share one's parenting. The importance of a context where intercultural exchanges can take shape is especially relevant when the migration process has been particularly difficult, as in situations of forced migration, or when parents are far from their home country and must face the birth of a child with disabilities (Caldin 2012; Martinazzoli 2012).

Therefore, interactions must be detected and analysed both to understand their meanings and to activate a careful reflection that can create awareness and change, and promote harmonious and inclusive exchanges between children and caregivers and also between caregivers (parents and educational staff). This is possible only through the conscious and intentional use of communicative patterns that constitute the narrative profile of interactions.

2. Intersubjectivity in adult-child interaction: A dialogical perspective

In literature intersubjectivity is defined as the experience of inter-mental communication (Bruner 1996; Trevarthen 1998), and as shared understanding (Göncü 1993) that takes place between subjects during an interactive exchange. Intersubjectivity is foundational for the children's cognitive, social and emotional: the partners mutually attune and "adjust" to communicate with, and understand each other. This necessarily involves skills of understanding and represents the basis for subsequent development (Wertsch 1984). Newson and Newson (1975) argue that from infancy children are supported by intersubjectivity within social interactions. The mutual regulation processes, involved in early interactions between the child

and its care-givers, constitute not only the foundations of communicative and linguistic competence, but also of social and affective-emotional cognition (Stern 1987) which will influence subsequent developmental stages. Here lies the basis of the organisation of the first cores of childhood personality and of his/her future ability for regulation, self-regulation and social adaptation (Tronick 1998; Beebe and Lachman 2002; Lavelli 2007). The possibility of a mutual understanding-attunement between people cannot be attributed to a single subject involved in the exchange (Newson and Newson 1975; Rommetveit 1985), since changes in the perspective of each partner must be perceived and therefore understood from the other's perspective, hence the basis for communicative-linguistic development. Between caregiver and child a primitive form of conversation takes place, which Bateson (1975) defines as proto-conversation and which Schaffer (1977) considers a form of pseudo-dialogue. In other words, mother and child have a communicative exchange that Trevarthen (1978) connotes as "primary intersubjectivity" (pre-linguistic period), originating in the interaction from which the sharing of emotional-affective states emerges: for example, the presence or absence of a smile, of nearness, or the search for visual and physical contact, define the state of sharing or, on the contrary, of not sharing, among partners. This sharing will gradually become more and more intentional and will involve other partners, giving rise to triangular interactions (e.g. child-mother-father) and wider ones that we can define as polyphonic. The appearance of language leads to an evolutionary transformation due to the child's ability to symbolise, which makes it possible to share experiences, objects and events with other people, and is defined by Trevarthen and Hubley (1978) as secondary intersubjectivity. As shown by psychological studies on early interactive skills (Fivaz-Depeursinge and Corboz-Warnery 1999), the child has

the ability to interact with more partners at the same time. This study represents a crucial step in developmental psychology as it examines family processes from a systemic perspective.

Beatrice Beebe and Frank Lachmann, in the psychoanalytic field of Infant Research (2005), have elaborated a highly refined systemic model using video microanalysis, able to describe how the mind organises itself during an interaction. These studies continue the work begun by Daniel Stern (1998), and constitute an essential reference point for the intersubjective paradigm of communicative musicality that will be explored in the next paragraph.

3. The Paradigm of Communicative Musicality

Research into the origin and evolution of human intersubjectivity gave rise to a new current of research in the field of developmental psychology: "communicative musicality" a paradigm with an extraordinary potential for application in different areas of study. Colwyn Trevarthen defines communicative musicality as “the human capacity to communicate with their congeners interactively” (1999, pp. 157-213). Michel Imberty (2008, pp. 90-95) considers it as “the capacity to regulate emotions, affections but also behaviour over time, which favours individual and social exchanges”. It is a general competence that organises, regulates and controls all the temporal and social characteristics of the human being, marking the quality of exchanges between people and involving three interdependent dimensions that are fundamental in the co-construction of interactions: *pulsation, narrativity* and *quality*. We provide a definition of each of these dimensions.

Pulsation: To understand the concept of pulsation, we will take Martin Heidegger's *Being and*

Time (1927) as a starting point: conceiving the human being as inseparable from time, he had already intuited the relevance of temporality to human development. Research reveals that human temporality has its origins in rhythm and repetition, elements which are at the base of all interactions. The rhythmic construction is supported by a regular pulsation, a reference beat that regulates all interactions (relationships, conversations and games) between adult and child, and between peers. Maya Gratier (2001, 2008) has contributed significantly to the field of research on infant vocal interactions, demonstrating that the child communicates with the environment in an effective and subtle way, through a refined coordination of gestures and vocal temporal expressions shared with the adult. The observation of filmed adult-child conversations, viewed in slow motion, reveals how they are clearly organised on a rhythmic basis: very young children, including premature babies, seem capable of interacting with adults through their proto-narrative body and vocal expressiveness, which are the basis of communicative and linguistic development. Gestures, body movements, facial expressions and vocal sounds occur at particular moments of interaction, and it is possible to identify a pulsation which, in parallel with verbal language, helps the mutual transmission of meaning. In mother-child vocal exchanges the melodic contours of both partners are organised and re-modulated around the pulse: it is not an imitation of the child by the adult, or the contrary, but rather an active and original search for a harmonious tuning-in between the parts, in a dynamic pattern of repetition-waiting-variation, which Daniel Stern (1987) calls “affective attunement”. The rhythmic pulse allows us to anticipate the expressions of the other and facilitates the possibility of a harmonious attunement between partners through "mutual adjustments". Mother and child co-construct time in the dynamic interaction, using rhythmic pulsation to mutually anticipate

their vocal-gestural-motor expressions (Gratier 2001).

Narrativity: Michel Imberty (2005) defines narrativity as the manifestation of intentionality in the co-construction of a conversation that is characterised by a beginning, a development and a conclusion. Narrativity as a fundamental property of interactions, refers to the ability to relate to the temporality of the other and reciprocal "adjusting" (2005, p. 197), by feeling, understanding and anticipating it. The author states that in mother-child exchanges the primary content is made up of emotions and feelings that are expressed through a precise temporal form of tension-release, acceleration-deceleration, crescendo-decrescendo, etc. These are forms of time whose expression is amodal or transmodal, i.e. they can be displayed “through the voice, but also through movements and behaviours that involve the whole body” (Imberty 2008, p. 91).

Quality: The quality refers to interpersonal adjustments that concern the melodic contour or tension-release contour of a sequence of events. In the interactive behaviours of mothers and children, Gratier and Trevarthen (2008) have identified what they call “narrative episodes”, i.e. segments lasting 20-30 seconds that are sequentially organized in a narrative structure constituted of the following recognizable phases: introduction, development, crescendo, and conclusion or resolution. Participating in narrative sharing helps to create identity, meaning, and a feeling of continuity and stability. Through narrative articulations mother and child share a story and evoke a sense of community. The narrative form contains the certainty of proceeding towards a reassuring conclusion, and a tension conferred by its sense of time. The contrast deriving from the elements of security and tension, familiarity and novelty, and repetition and variation, constitutes the crucial force that stimulates child cognitive development since she or

he begins to experience fascination for the subjects of her or his sharing (2008, p. 113). In the proto-conversation mothers and children co-construct what Gratier and Trevarthen call "stories of intention" (2008, pp. 10-11): they anticipate the dynamic development of their shared expressive movements, through an extraordinary, precise and coordinated sense of time.

In a few words, according to a wide range of studies in developmental psychology, musicality and attunement are salient features of human communicative exchange. However and surprisingly enough, there are no studies investigating if and how such dimensions are performed within the nursery school context where the staff members are constantly entering into a relationship with children and parents through the use of their voices, accompanied by gestures, rhythms and movements. These aspects of communicative musicality are also influenced by cultural factors. It is therefore of paramount import to take them into account when the educational contexts are inhabited by individuals with different cultural backgrounds: their management impact on the inclusiveness of an educational service where interactions are constitutive of the context and its mission. In the sections we present data from a study aimed at describing how musicality and attunement are deployed by participants (parents, children and their educators) during two crucial moments of the nursery school everyday life: the welcome–separation at the beginning of the school day, and the reunion at the end of the day. A specific analytical attention is paid to the contributions of the educator and their greater or lesser orientation toward a dialogic structure of interaction (see Weigand, 2010).

4. Corpus and Methodology

The corpus of data includes 90 video sessions[2] collected during transition moments (i.e. the

welcome-separation phase and the reunion phase), and features 20 children in France and 20 children in Italy aged between 4 months and 2 years old, all observed with their parents and nursery school staff. In this chapter we will examine two examples of- respectively- attunement and misattunement.

Following an integrated approach (Saukko 2005), we propose a new method of data analysis of adult-child interactions [3] that integrates video microanalysis with data from two software programs (*PRAAT*[4] & *Acousmographe*[5]) processing. The aim is to identifying and describying the oversegmentation that shapes the intersubjective exchanges in these delicate moments of transition. This allows us to understand the aspects that may promote or limit a smooth transition of the child from home to school (and viceversa) as well as the inclusiveness of the setting as such. In the following paragraphs we analyse and discuss the variables involved in the delicate exchanges between children and adults, and their relevance in creating narrative profiles. u

We used video microanalysis [6] to analyse the interactions and characteristic patterns of communicative musicality, alongside checklists [7] completed by the nursery school staff who were involved in the video-analysis sessions. In line with the methodology of Infant Research, short-term sequences were recorded (3-5 minutes) by two cameras, onye of which was fixed.[8] The observation protocol included 2 observation sessions for each child-parent-educator, one in the reception-separation phase and one in the reunion phase. The sequences were viewed in slow motion, which made it possible to closely observe the events, identify and name the inter-subjective aspects, and attribute a meaning to what had been observed. The data collected from the videos were analysed both qualitatively and quantitatively.

The use of the *PRAAT* and *Acousmographe* software programs allowed to take the analysis one step further, in particular by identifying the vocal spectrogram and the acoustic-rhythmic events which characterise the narrative profile of the video observations.[9]

The *PRAAT* analyses vocal signals, carries out spectral analysis (fig. 1) and then offers a graphic representation of the significant parameters of speech: the pitch trend over time (pitch contour, fig. 2), the intensity trend (intensity contour, Fig. 3) and the formant sequence (formant contour). The pitch contour allows to see the presence of melodic profiles in speech, while the reading of the intensity contour, combined with the accents and the ratios between durations, gives an understanding of the rhythmic structure.

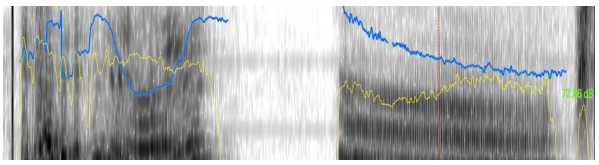

Fig. 1: Spectrogram of vocal fragment

Fig. 2: Pitch Contour (in blue)

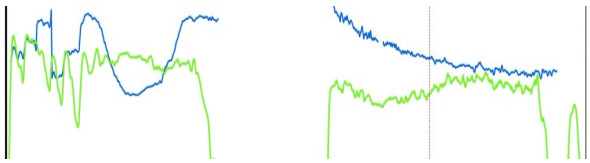

Fig. 3: Pitch Contour (in blue) and Intensity Contour (in green)

The *Acousmograp*he has been used to integrate the previous software. Like *PRAAT*, it performs spectral analysis; however, it is not able to automatically extrapolate the relevant parameters for reading the vocal signal, such as the pitch, intensity and formant contours. On the other hand, the *Acousmograph*e offers a more accurate graphic representation of the spectrum than that offered by *PRAAT*: while the latter considers a limited frequency band of 5,000 Hz, the *Acousmographe* can represent the entire range of audibility from 0 to 20,000 Hz. This makes it far more suitable for the analysis of sound events with a high amount of energy in the most acute regions, such as some phonemes of a material nature, more consonant than vocalic. Finally, the *Acousmograph*e also offers audio representation in wave form over time and is, therefore, particularly useful in identifying episodes of interaction displaying a narrative profile.

5. Analysis of narrative profiles: attunement and misattunement in interaction

In this section we are going to analyse and describe in detail the aspects that define the narrative profile of the interactions concerning two children, two mothers and two educators during reception-separation and reunion moments.

The first example shows patterns that structure a narrative profile of attunement, while the second reveals patterns of misattunement.

5.1. *The attunement profile of interaction: an illustration*

The following example presents the moment of reunion between a 10-month-old Tibetan baby girl with certified motor skill developmental delay, and her mother.[10] The educator (French, of Senegalese origin) is present.

Ex. 1

1. The mother, together with her 4-year-old son, enters the small area where her daughter has just woken up.
2. Mother and educator greet each other.
3. The mother immediately takes her daughter in her arms, kisses her, holds her tight, smiles and speaks to her in her native language.
4. The little girl smiles, stretches her arms towards her mother, embraces her.
5. The educator accompanies the reunion by saying: "Yes, your mummy is here! You're happy, aren't you?"
6. All three sit on the floor.
7. The mother is holding her daughter in her arms.
8. The educator is very close and facing the dyad.
9. An interactive game of repetitions, imitations and variations (vocal and gestural) starting from the educator and involving the child and the mother.
10. The conclusion is clear and marked by a descending, saying farewell vocal profile: "It went well today, all very well, see you tomorrow!"

As the description above shows, the interaction is marked by a clear narrative profile defined by a regular pulsation, punctuated by repetitions and modular variations characterised by turn taking (educator-child-mother) and moments of adjustment/attunement (child-mother-educator) in which the child also anticipates, varies and concludes the vocalisations of the educator. The mother repeats and reinforces the interactions, keeping eye-contact, smiling at the educator and at her daughter and maintaining close proximity to her partners in proxemics and physical contact, as can be seen from the following fine-grained analysis of the narrative profile.

Through the use of *Acousmographe*, we identified the episodes of interaction using a graphic representation in wave form of its main constitutive episodes: beginning, development and conclusion were searched for and their duration measured (fig. 4).

The whole session of example 1 is composed of 3 episodes (beginning, development, and conclusion) animated by the sound presence of the three subjects (mother, educator, child). The episodes all have the same duration, each lasting 11.5 seconds.

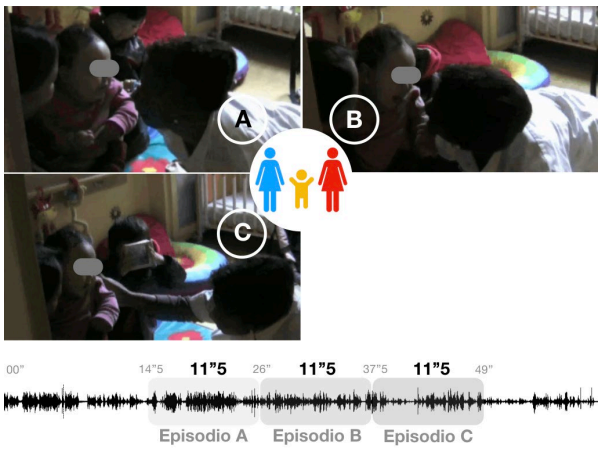

Fig. 4: Identification of the episodes and their duration

Episode A: The beginning

On the spectrogram (PRAAT) the sound presences of the three subjects in interaction are identified (fig. 5): the educator (blue), the mother (red) and the child (yellow). In fig. 6, the coloured backgrounds have been isolated to highlight the interactions.

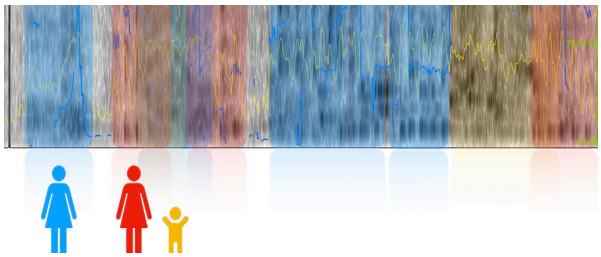

Fig. 5: Sound presences of the three subjects in interaction

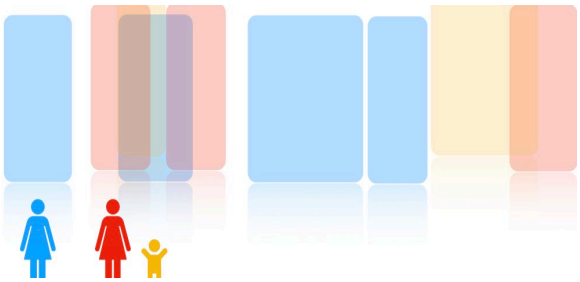

Fig. 6: Sound presences of the three subjects

The moments when the main sound events occur have been identified, the durations measured and the general rhythmic structure extracted (fig. 7).

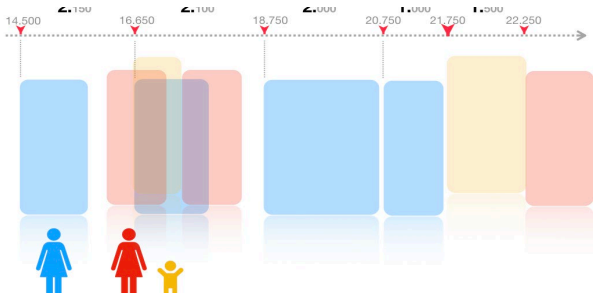

Fig. 7: General Rhythmic Structure

The educator appears to manage her four contributions according to regular time intervals lasting about 2 seconds. The educator uses an isochronous pulse to establish a regular rhythm, through which she interacts with the mother and child. While the mother accompanies the sequence with her own sound expressions (laughter), the child intervenes and alternates between the two adults in the sequence through adjustments and turn-taking her contributions are characterised by her own sound expressions (continuous sound accompanied by laughter), the last of which is about two seconds and determines the conclusion of the episode. A pattern emerges, which is also present in the following episodes. A regular sequence (isochronal), consisting of four sonorous and rhythmic contributions "modelled" by the educator, alternating with and accompanied by those of the mother, seems to stimulate the sound contributions of the child: she enters the interaction, and also shares the time anticipating and establishing the conclusion of the interaction.

Episode B: Development. The sound contributions of the three subjects involved in the interaction have been identified on the Acousmographe spectrogram (fig. 7). In fig. 8 only the

backgrounds are shown, to highlight the interactions between the subjects.

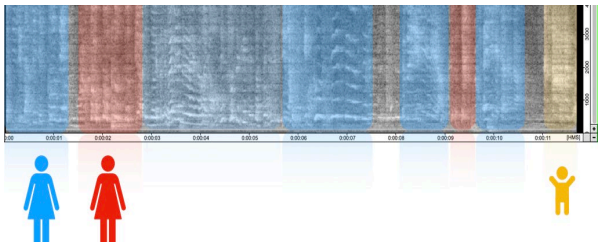

Fig. 7: Sound Contributions of the three subjects involved in the interaction

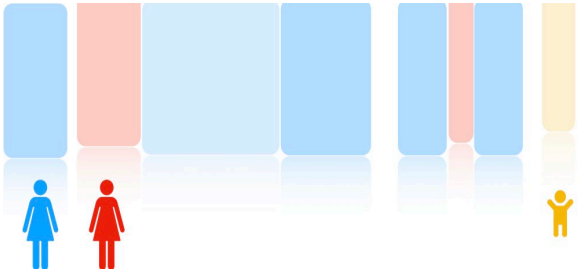

Fig 8: Sound Contributions

During the educator's second sound intervention, represented in light blue, she momentarily leaves the profile of three-way interaction to establish an occasional, confidential dialogue with the mother. This intervention has been excluded from the analysis.

The moments when the educator's contributions begin were identified and the time interval between them was measured, capturing the general rhythmic structure (fig. 9).

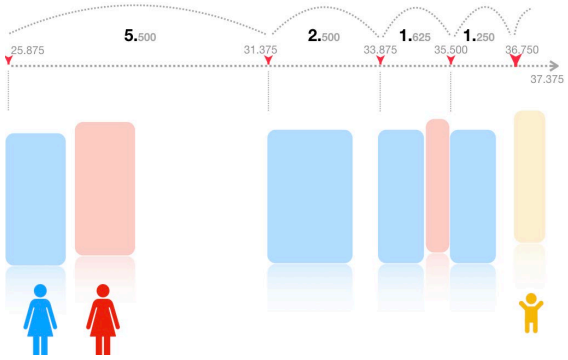

Fig. 9: General Rhythmic Structure

The educator's four contributions are presented at time intervals which become shorter and shorter (5'.500, 2.500, 1.625 and 1.250). She uses acceleration to build a precisely defined and recognisable rhythmic structure, through which to interact effectively with the mother and her child. While the educator intervenes, the child and her mother alternate with expressions of laughter engaging in turn taking, the child waits for her turn to intervene with her own expression of joy, and determines the conclusion of the episode.

The pattern is similar to the previous episode, although differences can be noted. The sequence cannot be considered regular because it is not isochronous, but it is nevertheless ordered, organised and coherent, because it is subject to acceleration. It is composed of four contributions "shaped" by the sound and rhythm of the educator, alternating with and accompanied by the contributions of the mother. This turn-taking format, stimulates the sound intervention of the child. It is the child who grasps the narrative profile of the interaction, enters timely in the unfolding of interaction displaying she shares the management of time and, once again, establishes the conclusion of the interaction.

Episode C: Conclusion. The spectrograms (*Acousmographe*, range 0-1200 Hz) show the sound contributions of the three subjects (fig. 10) and their mutual relationships (fig. 11): the educator is represented in blue, the mother in red and the child in yellow.

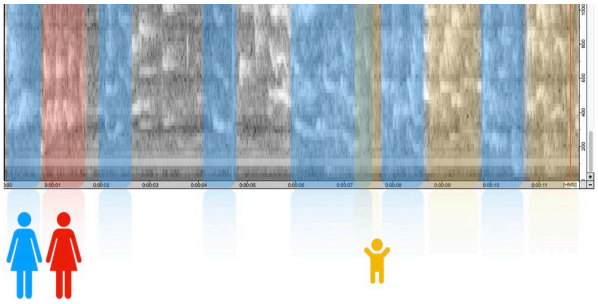

Fig. 10: Sound Contributions

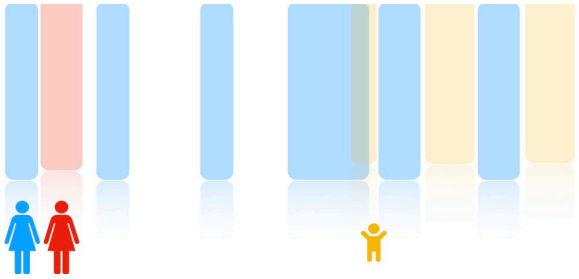

Fig. 11: Relationships

The beginnings of the educator's contributions were identified and the reciprocal temporal distance measured, in order to understand the general rhythmic structure (fig. 12).

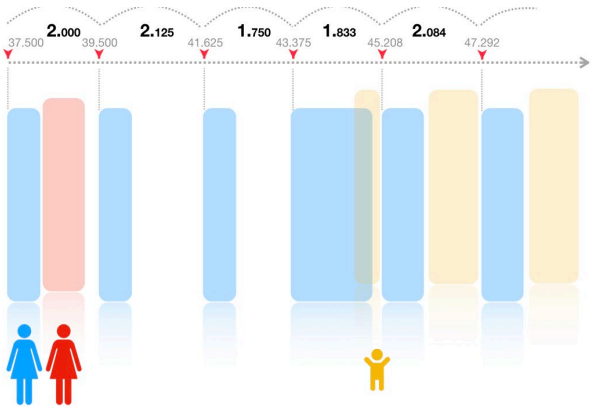

Fig. 12: General Rhythmic Structure

The educator's six contributions are arranged at regular intervals, lasting about 2 seconds. Once again the educator uses an isochronous pulse to build a regular rhythmic structure, very similar to that of the first episode, which allows her to start an interaction with the mother and the child. Here again we find the pattern identified in the previous episodes. Together with the rhythmic structure, the educator will model the melodic profile, the gestural profile and the texture of the sound to give life to an overall profile of interaction, which welcomes the contributions of the mother (turn taking) and stimulates the child's sound contributions. The little girl enters the interaction, capturing its narrative profile, shares the time and also establishes the conclusion.

The educator's rhythmic structure. For the reasons explained above, the rhythmic structure was extracted from the Acousmographe spectrogram. The accents produced by the phonemes were highlighted with yellow lines and the corresponding syllables added (fig. 13). A single pattern characterises the four contributions: the succession of two pulses/phonemes, with emphasis on the second.

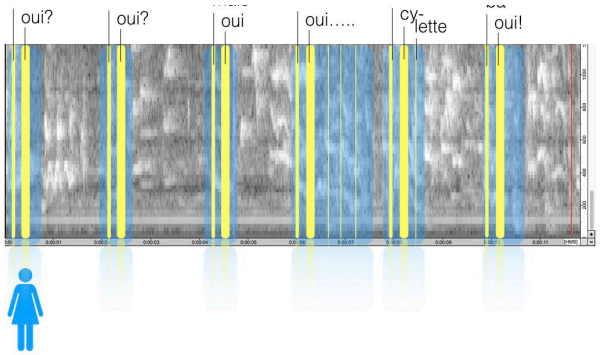

Fig. 13: Rhythmic Structure

The educator's melodic profile. The melodic profile was analysed using the Acousmographe. It was extracted qualitatively, by observing the fundamental frequency of each vocal expression and underlining it with thick light blue lines (fig. 14). Fig. 15 uses dotted lines to show the overall contour.

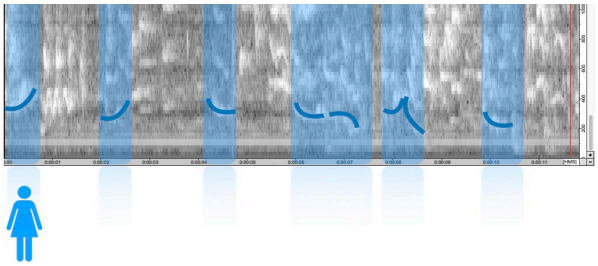

Fig. 14: Melodic Profile

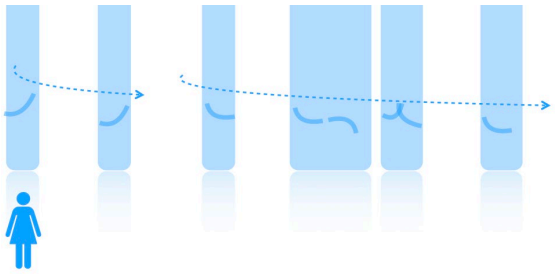

Fig. 15: Melodic Profile

The episode consists of six contributions. In the first and second contributions the profile is ascending. However, as the second intervention is placed in a less acute register than the first, the first and second intervention taken as a whole present a descending profile. In the following contributions the profile is clearly descending.

Structure and profile: The representation of the rhythmic structure has been superimposed on that of the melodic profile, and we observed the overall contour of the figure (fig. 16).

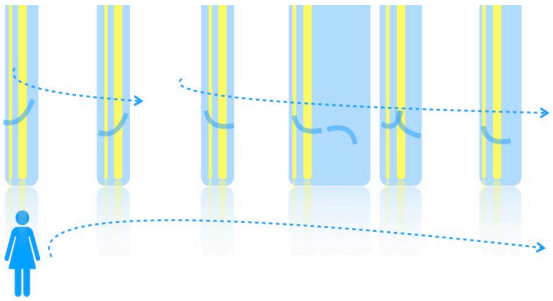

Fig. 16: Rhythmic Structure and Melodic Profile

The overall figure is rather homogeneous. The pitch contours are characterised by a globally descending contour, supported by a simple and constant rhythmic structure consisting of a two-pulse unit.

Gestural profile: Data from the video microanalysis are reported in qualitative terms: purple lines represent the degree of proximity between the educator and the child, while asterisks denote the presence of physical contact, on the occasions when the educator caresses the child (fig. 17). Compared to previous episodes, the educator keeps more distance from the child's face, yet still establishing physical contact through caresses. Her overall gestural profile assumes a greater level of separation, in comparison to the previous two episodes.

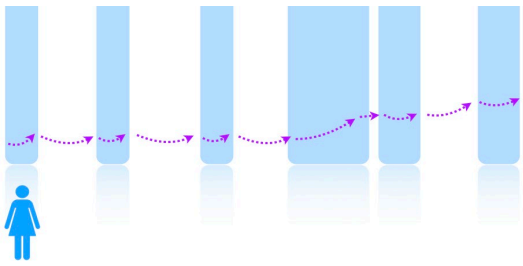

Fig. 17: Gestural Profile

Attunement profile: Data were collated in the attunement profile: general rhythmic structure, local rhythmic structure, melodic profile, and gestural profile (fig. 18). The educator builds a musical figure that could be labelled as "descending", through:

1. a general regular rhythmic structure based on isochronous pulsation;
2. a simple and repetitive local rhythmic structure based on double pulsation;

3. a descending melodic profile;
4. a gestural profile of "detachment", in line with the descending contour of the figure, and the role of the episode as the last in the series of three episodes.

This musical figure is able to stimulate a sound reaction from the child and determine the formation of a "climax" phase, characterised by the highest level of attunement between the educator, the mother and the child.

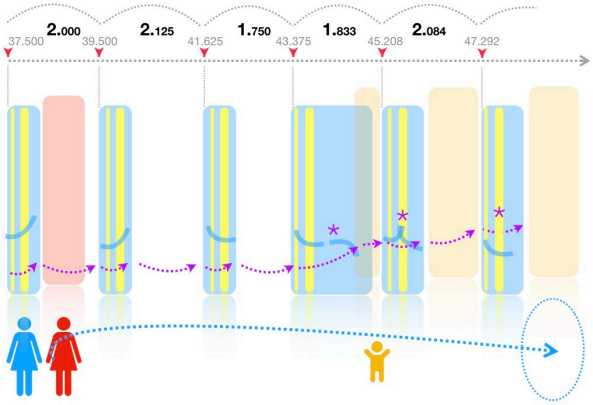

Fig. 18: Attunement Profile

Narrative profile of attunements of the entire session of example 1: The conclusions drawn from the analysis of each episode can be compared, in order to determine the attunement profile of the entire session (fig. 19).

The three episodes have different features but share some structural aspects:

1. they have the same duration, all lasting 11.5 seconds;
2. they are animated by the sound presence of all three interacting subjects: mother,

educator and child;

3. they have the same pattern of interaction: turn-taking between the mother and the educator, concluding with the child's intervention;
4. together, one after the other, they form a homogeneous and complete sequence of musical figures, as a "macro sound figure": ascending figure (first episode), ascending-descending asymmetrical figure (second episode), concluding descending figure (third episode).

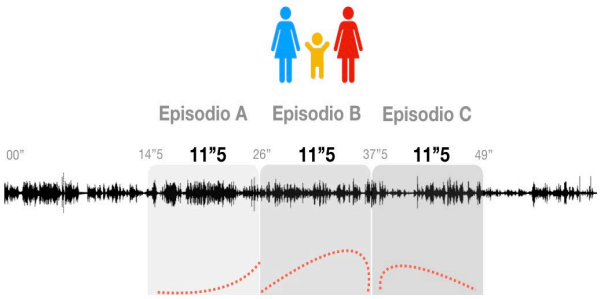

Fig. 19: Narrative Attunement Profiles of the Entire Session of example 1

5.2. The misattunement profile of interaction: An illustration

The second example reports the interaction occurring during the welcome-separation moment of an 18-month-old Indian boy with severe hearing impairment, along with his mother and a French educator.[11]

Ex. 2.

1. Mother and child enter the classroom.

2. The child immediately bends over on the floor to play.
3. The educator approaches the dyad.
4. The mother says that her child doesn’t feel good.
5. An exchange starts between the educator and the mother concerning the best way to contact her, if necessary.
6. After some linguistic misunderstanding they reach an agreement.
7. The mother says goodbye to her son while he still has turned his back to her, saying "bye, bye".
8. The mother lifts the child, he still has turned his back to her, and puts him in the arms of the educator.
9. The child starts to cry and the educator tells him: "It is me who will take you now and who will take care of you, your mother is going away and you will stay with me".
10. Meanwhile, the mother tries to clean her son's nose with a handkerchief.
11. The educator blocks the mother's hand while she is taking the handkerchief and says: "The nose is not a problem, it is better for you to go as quickly as possible".
12. The child continues to cry, with increasing intensity.
13. At the invitation of the educator, the mother quickly goes away, repeating "bye, bye" to her son.
14. The educator has the child, who continues to cry, in her arms. She remains in front of the gate until the mother leaves the school.
15. Once the mother has left, the child continues to cry. He is still in the arms of the

educator, but their bodies are distant.

16. The educator talks to him without looking at him, and tells him: "your mother has gone and you will stay at the nursery until 6.00 pm."

As it can be inferred from the description above, the interaction is characterised by patterns that highlight a mutual difficulty of attunement. The prosody of the educator is monotone, she tends to speak quickly, and the mother does not understand what is asked to her and struggles to adjust and attune with the educator.

There are vocal overlaps rather than turn taking, the rhythmic profile is irregular and no moments of attunement can be detected. During a rapid exchange between the mother and the educator, the child is playing on the floor and turns his back on his mother. He is not involved in the narrative unfolding of the interaction, nor is he accompanied/prepared by words, sentences or gestures that introduce the separation moment. The following fine-grained analysis illustrates the extent to which the narrative profile of the interaction is here characterized by misattunement. The episodes of interaction were identified using a graphic representation in wave form (*Acousmographe*): beginning, development and conclusion moments were searched for and their duration measured (fig. 20).

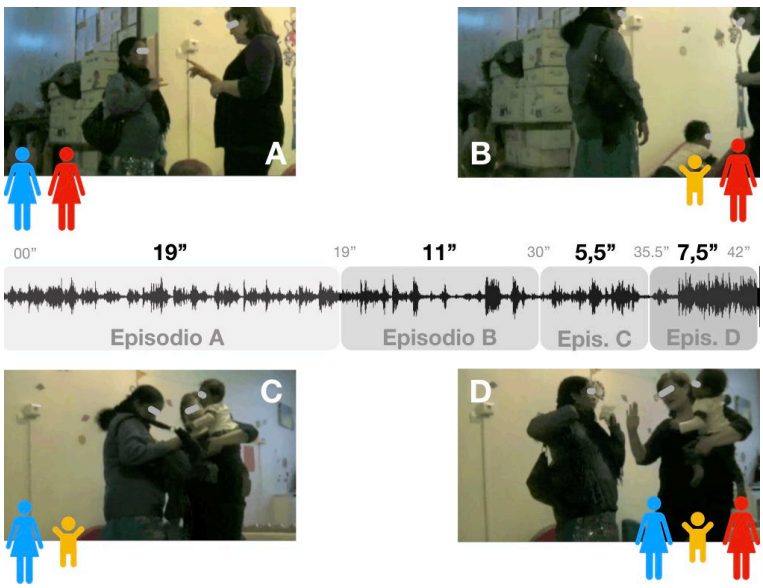

Fig. 20: Episodes and their Duration

The whole session of example 2 consists of 4 episodes, of different durations. The composition of the group which intervenes with vocal or gestural expressions varies in each episode.

In Episode A there are only two subjects: mother and educator. It lasts 19 seconds. Episode B also features two subjects, this time mother and child. It lasts 11 seconds. Episode C is 5,5 seconds, and involves the educator and the child. All three subjects participate in Episode D, although the mother has a marginal role. It lasts 7,5 seconds.

Unlike example 1, no rhythmic macro-structure could be captured as there was no structural relationship between the episode lengths. For the purposes of this chapter we analyse only episodes C and D, because they are the only ones that display the conditions allowing for the establishment of a triadic interaction among participants. However and as the examples show, these conditions (e.g. co-presence) are not necessarily exploited by participants to engage in a

triadic interaction.

Episode C: Development. The spectrogram (*PRAAT*) shows the sound contributions of two subjects: the educator in blue, and the child in yellow (fig. 21). The coloured backgrounds have been isolated to highlight the interactions (fig. 22), to attempt to detect a general rhythmic structure.

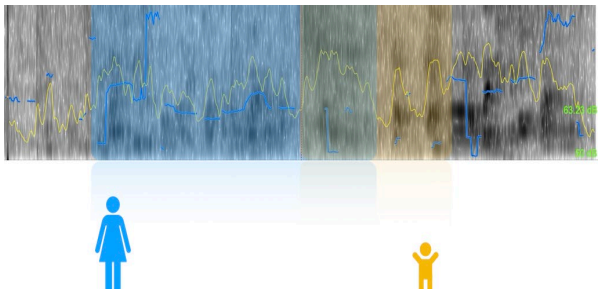

Fig. 21: Sound Contributions

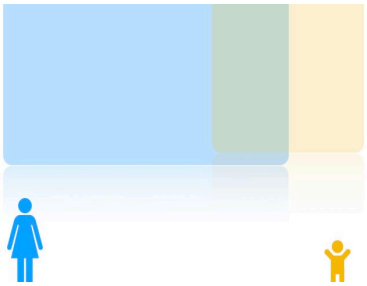

Fig. 22: Relationships

The educator's intervention has been superimposed on that of the child. Neither alternation nor interaction can be observed: instead, there is an absence of relationship. Furthermore, since it

is a single intervention rather than a sequence of contributions, no general rhythmic structure is generated. It should be remembered that, on the perceptive level, the listener only recognises a rhythmic structure from the third presentation of the sound event; in other words, a sequence of at least three pulses or events is required to create a general rhythmic structure.

Rhythmic structure: To analyse the local rhythmic structure we can observe the intensity contour, represented by a yellow line (PRAAT, fig. 23). Strong accents have been indicated with thick vertical yellow lines (fig. 24), and weak accents with thin vertical lines (fig. 25). Finally, the spectrogram has been eliminated, in order to show the rhythmic structure (fig. 26).

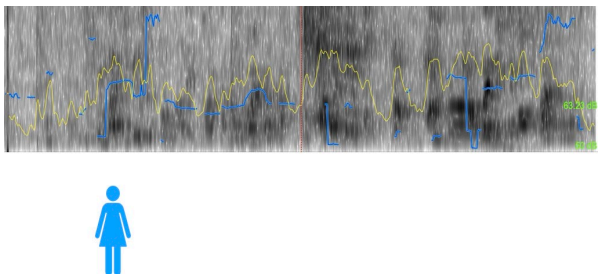

Fig. 23: Intensity Contour

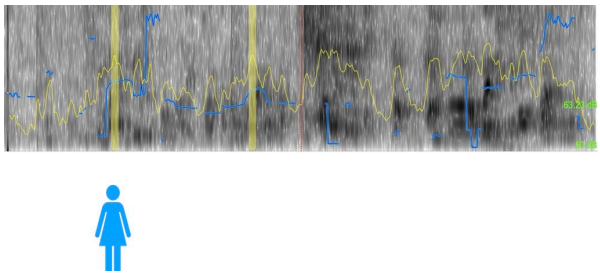

Fig. 24: Strong Accents

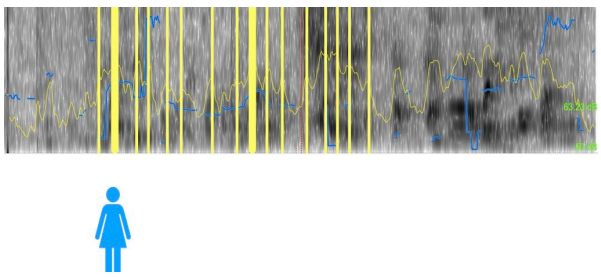

Fig. 25: Weak Accents

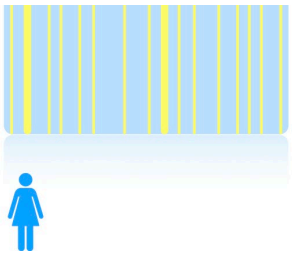

Fig. 26: Rhythmic Structure

The rhythmic structure consists of two contiguous series, each of which is composed of a long sequence of pulses (7-8 pulses/phonemes) placed at a close and regular distance, with an accent on the second pulse.

The educator's melodic profile: The melodic profile (PRAAT) is detected by observing the pitch contour (fig. 27), represented by a thin blue line (reinforced and thickened by the author to compensate for some inaccuracies of the software). The segments have been connected with curved lines to highlight the melodic profile (fig. 28).

The two adjoining series both have the same rhythmic structure and melodic profile: after a very brief upward movement, the contour gradually descends for the entire duration of the series.

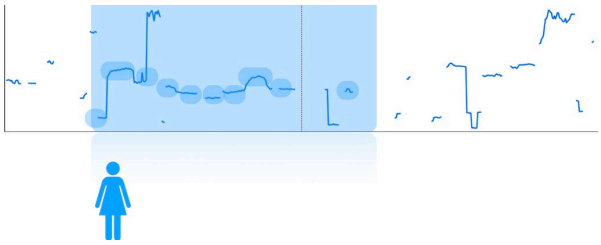

Fig. 27: Pitch Contour

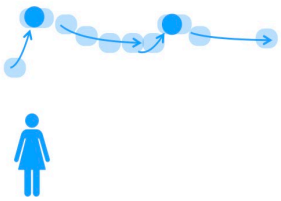

Fig. 28: Melodic Profile

Gestural profile: From the video microanalysis it is clear that the educator establishes a relationship of static, non-articulated proximity with her face when addressing the child. This relationship has been represented with a horizontal purple line (fig. 29).

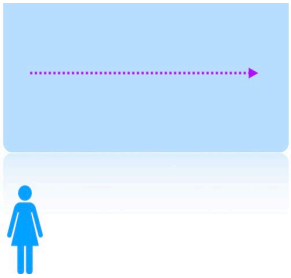

Fig. 29: Gestural Profile

Rhythmic Structure, Melodic and Gestural Profile: Finally, the graphic representations relating to the rhythmic structure, the melodic profile and the gestural profile have been superimposed, to cross-check information (fig. 30).

There is a single figure which appears twice in succession. It could be described as an "affirmative" figure, since at the beginning of the series a phoneme in an acute register with a strong accent is present, followed by a series of phonemes with a descending melodic contour and a weak accent.

The assertive character of the figure is further consolidated by the "horizontal" gestural profile, i.e. static and inarticulate.

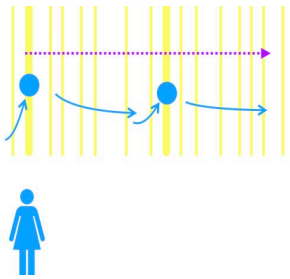

Fig. 30: Rhythmic Structure, Melodic and Gestural Profile

Episode D: Conclusion. The sound presences of the two interacting subjects have been identified on the spectrogram (*PRAAT*): the educator in blue, and the child in yellow (fig. 31). To search for a possible rhythmic structure, reciprocal relationships in time have been observed (fig. 32).

The educator's contributions overlap with the child's. Neither alternation nor interaction can be observed: once again, there is an absence of relationship.

Since there are only two contributions, no general rhythmic structure is generated in this episode.

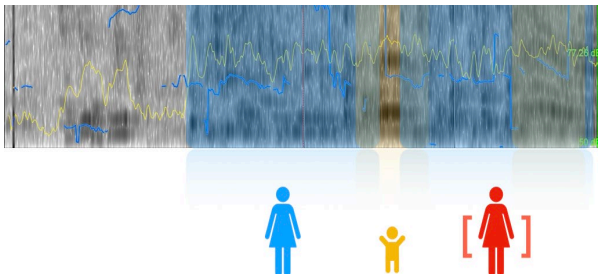

Fig. 31: Sound Contributions

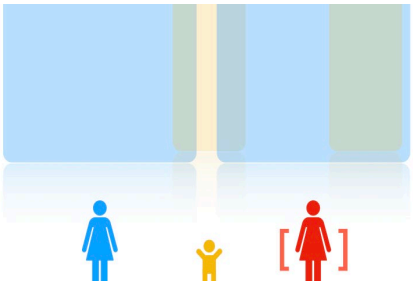

Fig. 32: Relationships

The educator's rhythmic structure: The local rhythmic structure has been analysed by observing the intensity contour, represented by a green line (PRAAT, fig. 33). The accents have been highlighted with vertical yellow lines (fig. 34).

Fig. 33: Intensity Contour

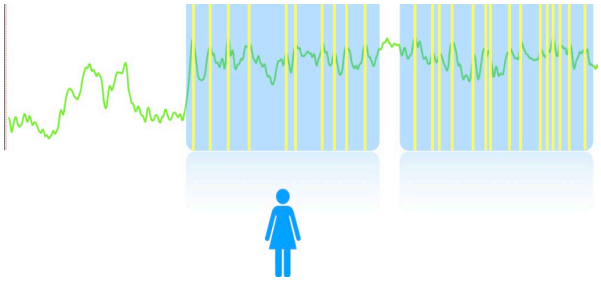

Fig. 34: Rhythmic Structure

The rhythmic structure consists of a tight pulse sequence, with the pulses all a short distance apart. There is no differentiation between strong and weak accents and the temporal distances from one pulse to the next are not constant, meaning that the structure is inarticulate and irregular.

The educator's melodic profile: The melodic profile was detected by observing the pitch contour, represented by a blue line (*PRAAT*, fig. 35). The line has been thickened to compensate for some software inaccuracies: due to the poor quality of the signal, it did not incorporate all the pitch contour variations evident when listening. The segments have been highlighted on a white background and the general melodic profile emphasised with continuous lines (fig. 36).

Segments with a descending melodic contour can be observed.

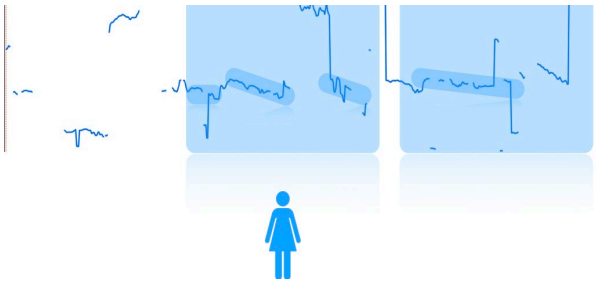

Fig. 35: Pitch Contour

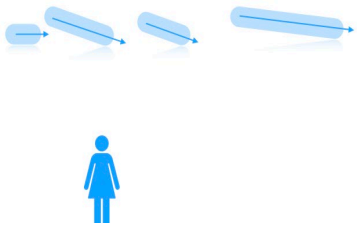

Fig. 36: Melodic Profile

Gestural profile (educator): The video micro-analysis shows that the educator does not seek out gestural interaction with the child. Their glances do not intersect and there is a large distance between their faces which remains constant or even increases, following the child's attempts to break free from the educator's embrace and reach his mother (fig. 37).

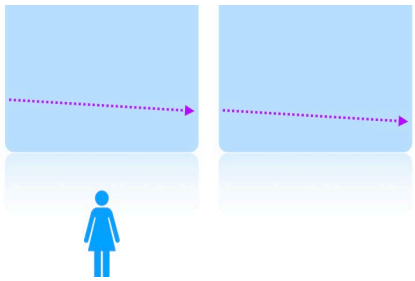

Fig. 37: Gestural Profile

Rhythmic structure, melodic and gestural profile: Finally, the graphic representations relating to the rhythmic structure, the melodic profile and the gestural profile have been superimposed, in order to cross-check the information (Fig. 38).

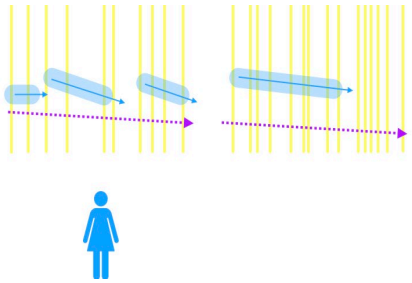

Fig. 38: Rhythmic Structure, Melodic and Gestural Profile

The overall narrative profile of interaction: It is not possible to capture a real sound figure. Instead, there is an inarticulate sequence of pulses/phonemes and an inarticulate gestural profile that outline a slightly descending horizontal (and therefore "static") contour.

From the observation of all four episodes of the sequence (the third and fourth of which have

been described here), it is clear that:

1. There is no interaction between the subjects involved: the attempts at interaction only involve two subjects at a time, relegating the third to a marginal role;
2. The educator's contributions either delineate figures which may be described as "affirmative", or do not delineate any completed sound figure;
3. The sequence of the educator's contributions (which are present in three episodes) does not construct any "macro sound figure" (39).

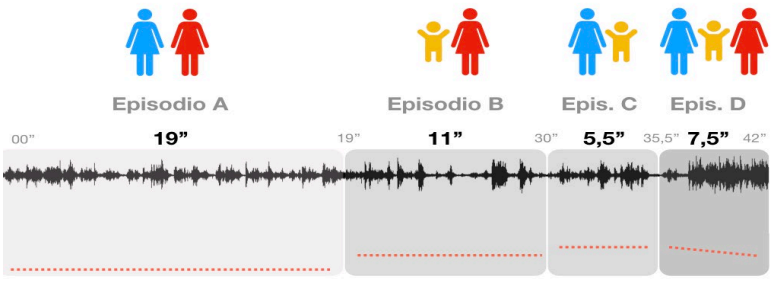

Fig. 39 Narrative profile of interaction in example 2

6. Discussion

As the examples have illustrate, thanks to the in-depth, fine-grained analysis made possible by *PRAAT* and *Acousmographe* - participants in triadic interaction during transition moments sometimes assume a mutual coordination that leads them to reach an intersubjectively

constructed and shared narrative profile of attunement. Like in a smooth dialogue, they enter the interaction exactly at the right moment reaching the other were she or he is (as if they anticipated the possible completion point of the previous turn,) and allowing the other to reach them. On the contrary, in interactions characterised by misattunement, the partners are unable to construct and share a smooth narrative profile, or to anticipate and adjust to the communicative intentions of the other.

The examples that we analysed are significant because they highlight how attunement, with its interpersonal adjustments of time, rhythm, intensity and form, is an essential process of co-construction of the intersubjective link between partners.

In the first example the narrative profile is regular. We can clearly identify the beginning, the development and the conclusion of each episode marked by narrativity, regular pulse, turn taking and "culmination phases" where the child, mother and educator reach the highest attunement level (fig. 18). Communicative aspects permeate and shape the profile of time which is clearly articulated by patterns that mark a beginning, a development and a conclusion to the transition moments.

In the second example, the narrative profile is peculiarly irregular (i.e. inarticulate rhythmic structure, melodic and gestural profiles, fig 38), and there are no culminating points indicating attunement between partners and the whole sequence is devoid of aspects that make the sequence of separation clear and predictable. We can detect gestural irregularities (being too fast or too slow, with little or no repetition, or little or too much variation), a lack of turn taking and time sharing, a monotonous and repetitive vocal prosody which may be expressed too quickly, or too many variations in rhythmic, melodic and intensity profile. The lack of aspects

of communicative musicality, which is evident in the second example, create a narrative profile characterised by variables that limit the possibility of mutual adjustment between partners.

7. Conclusions and Psycho-pedagogical Implications

As our study illustrates, interactions occurring during moments of the nursery everyday life as crucial as the welcome-separation and the reunion can unfold in very different ways. We identified two main formats: those which narrative unfolding is characterized by attunement and those that are characterized by misattunement. These different ways often correlate with larger schemata. Both parents and educators in our corpus display different overall behaviours during the transition moments and some patterns are routinely associated with signals of distress by children. This is particularly evident in the case of "misattuned" narrative profile and more generally in case of unfinished, absent or too-varied rituals which are not recognisable or predictable for the child. Variations characterised by an extremely hasty or more prolonged separation, by elements that interrupt the pulsation which gives structure and organisation to the temporal profile, or by missed or unheard salutations, may all negatively affect the separation. This can lead to interactions in which children display patterns of agitation, loss, tension, frustration and anxiety, which in some cases continue during the day.

Some parents, for instance, leave the nursery school quickly and without saying goodbye to the child, taking advantage of moments when they are busy playing, have moved away or have turned their back. On the other hand, some parents remain too long, making the phase preceding the separation confusing and too prolonged. In some of the recorded video sessions, parents

would take the child back in their arms after having already said goodbye. In these cases the conclusion of the ritual that precedes the moment of separation is slower, more of a "dance", but also more uncertain: if the parent who is almost outside the gate comes back, takes the child in their arms and says goodbye again, the separation profile is prolonged and more ambiguous. In all these cases, crying reactions and a sense of loss could be observed in the children.

In several observational sessions it became evident that some unsettled feelings of separation could be re-activated at the moment of reunion in the afternoon. When the parent arrives, we can see the same intensity of crying expressed by the children during the morning separation phase. This is a manifestation of what Bowlby (1973, 1988) defined as indifferent or avoidant behaviour: for example, the child does not look in the direction of the parent, continues with their activity, ignores the parent and remains at a distance, or demonstrates aggressive behaviour towards the parent (e.g. beating, pushing, pulling their hair, biting).[12]

These are moments of reunion in which there is a mutual difficulty in re-establishing attunement. It is often necessary for the nursery staff to intervene in the co-construction of a narrative profile that allows the partners to reconnect. On the other hand, the educators in our sample do not always appear to be able to shape the interaction and (re)orient it toward a narrative profile of attunement, i.e. a dialogical structure of interaction.

One finding which emerged from the comparative analysis was that the most complex interactions during transition moments concern children whose mothers and fathers have not yet fully acquired trust in the nursery school (dis-alliance), migrant mothers and fathers who do not speak French or Italian, mothers and fathers with a difficult migration history, and mothers and fathers of children with disabilities (especially autism). In these cases, intersubjective

exchanges are also difficult for nursery school staff (Pileri 2018). Furthermore, a *behaviour of distance* was observed towards these parents, which inevitably implies an effect on the children in the delicate transition between home and nursery school.

The outcomes demonstrate the relevance and the urgency of considering the attunement variables on a psycho-pedagogical level since they do not only affect the quality of the observed transition moments, but also the processes of acclimatisation, inclusion and integration, and the formation of an alliance between the nursery school and the family. This process of understanding has further implications for the involvement of care-givers (parents and educational staff) in training courses, to increase awareness of the issues discussed here and their vital importance in the creation of an inclusive educational context.

Acknowledgments

I would like to offer my sincere thanks to Prof. Letizia Caronia for her valuable methodological guidance during the writing of this chapter. Her scientific contribution has been fundamental, as has her direction of the Analysis of Dialogue and Conversation research group at the Department of Educational Sciences, University of Bologna, in which I have the honour of participating.

1. The term is used according to Daniel Stern's (1987) notion of affective attunement, later taken up and expanded by Michel Imberty as *accordage* (2000), which is more in line with the paradigm of communicative musicality.

2. The data analysed in the present paper are part of a larger corpus of 90 recorded video sessions of transition moments, collected by the author in several nursery schools in France and Italy from 2007-2018. The first survey was carried out by the author in Paris from 2008-2012. From 2012- 2019 additional research took place in Bologna and Treviso, and the investigation was further developed in in several nurseries and kindergartens, all with a significant presence of migrant children and parents.

3. The following analysis will focus on two selected sequences from a sub-sample consisting of 6 immigrant children with disabilities, 6 native-born children with disabilities, 6 immigrant children, and 6 native-born children.

4. *The PRAAT* is a tool developed by Paul Boersma and David Weenink of the University of Amsterdam, for the analysis of vocal spectrograms, speech and phonetics. PRAAT approach centered on language use in interaction has interesting similarities with Weigand's (2010) mixed game model and her core proposal of conceiving competence-in-perfomance as the standpoint of dialogue analysis.

5. The *Acousmographe*, developed at the French research institute INA/GRM, is a tool for the analysis and representation of any recorded sound phenomenon (amplitude – spectral analysis).

This is a reference to the work of Stern, Beebe, Cohen and Lachmann (1985; 2005; 2016), who focused on the study of primary relationships between mother and child using video microanalysis, a method that captures sequences of interactions moment by moment. A kind of "social microscope", it allows readers to see subtle details of interactions that are too fast and complex to be captured in real time by the naked eye.

6. The checklist for video microanalysis was designed to capture the following elements of interactions: visual engagement; smile; physical proximity; physical contact; vocal expression; vocal

repetitions; gestural and body expressions; gestural repetition; vocal variations; gestural variations; turn taking; time sharing; isochronous pulsation; crescendo; decrescendo; contingency/culmination points; narrativity. All these elements were detected and indicated in relation to their degree of presence or absence: absent = never detected during the interaction (numerical code = 0); little present = detected only for a few seconds of the interaction (numerical code = 1); fairly present = detected in several moments of the interaction even if of short duration (numeric code = 2); very present = detected for a significant duration or detectable more than once during the observation (numerical code = 3). External observers were also involved, in order to assess the degree of agreement between observers.

7. The *PRAAT* and *Acousmograph*e analysis was performed in 2018- 2019, in collaboration with Stefano Luca, Professor and researcher in Sound Design at the Department of Communication, IUSVE, Venice – Mestre (Italy).

8. The child was born in Tibet. Her mother joined her husband in France 6 months after her daughter was born. At the time of filming, the child was in a settling-in phase and had been attending the nursery for two months. The mother has family and friendship networks. She understands and speaks French and has a collaboration-alliance relationship with the nursery staff.

9. The child was born in India. At the time of the filming he had been attending the nursery for a month and the settling-in had been particularly difficult. The child cried a lot during separation, and also during the day. In the observed reunion phases, he showed difficulties in attuning with both parents, in particular with his mother. His mother did not have parental and friendship networks in France, and did not understand or speak French.

10. Infant Research (Beebe 2003), which makes reference to Bowlby's work, empirically evaluates attachment, caregiver-child separation, and observing what happens when they separate and reunite.

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