A bilingual child’s multimodal path into negation

Sandra Benazzo and Aliyah Morgenstern
Université Paris 8 / Université Sorbonne Nouvelle — Paris 3

The study of the expression of negation in longitudinal adult-child data is a privileged locus for a multimodal approach to language acquisition. In the case of bilingual language acquisition, the necessity to enter two languages at once might have an influence on the management of the visual-gestural and the auditory modalities. In order to tackle these issues, we analyze the longitudinal data of Antoine, a bilingual French/Italian child recorded separately once a month for an hour with his Italian mother and with his French father between the ages of 1;5 and 3;5.

Our analyses of all his multimodal utterances with negations show that Antoine has created efficient transitional systems during his developmental path both by combining modalities and by mixing his two native languages. The visual-gestural modality is a stable resource to rely on in all the types of linguistic environments Antoine experiences. His bilingual environment could be connected to the creation of his mixed verbal productions also addressed to both French speaking and Italian speaking interlocutors. Those two transitory creative systems are efficient elements of his communicative repertoire during an important period of his language development. Gesture might therefore have a compensatory function for that little boy. It is a wonderful resource to communicate efficiently in his specific environment during his multimodal, multilingual entry into language.

Keywords: bilingual acquisition, negation, multimodal constructions

This article presents the results of a case study on the gesture-speech relation in a bilingual child’s language development, focusing on the different means he uses to express negation over time, during his transition from the prelinguistic phase to the emergence and functional use of two languages.

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The expression of negation begins very early in infancy. Previous research on first language acquisition has highlighted a tight relation between actions, gestures and speech to express negation. As discussed by Spitz (1957) and Clark (1978), children's first negative constructions seem to take over from early gestures of rejection and avoidance. In parallel to this developmental observation, for Kendon (2002), in many cultures, gestures of negation are a progressive ritualization of spontaneous actions. In both cases, bodily reactions and actions are transformed into communicative gestures. Guidetti (2005) argues that gestures of agreement and refusal are the first symbolic gestures (aside from pointing) used by children. Andrén (2010) confirms that the head shake to express negation is the most frequent gesture (at the exception of pointing) in his Swedish acquisition corpus. The study of the expression of negation in longitudinal data of adult-child conversations is therefore a privileged locus for a multimodal approach to language acquisition. It is even more interesting in the case of bilingual children who deal with the plurisemiotic components (gestures, prosody, facial expressions, words) of two languages instead of one.

In the case of bilingual language acquisition, the necessity to enter two languages at once might have an influence on the management of the visual-gestural and the auditory modalities. On the one hand, the gestures used by bilingual children are derived from the two semiotic systems of their bilingual culture and could therefore be more diversified. On the other hand, exposure to two different languages often leads to the development of a strong and a weak language and to the production of code-mixed utterances: the synchronization of gestures and verbal production, the number of gestures used and the length of the “pre-linguistic” period in a bilingual child’s productions might be different from same-age monolingual children.\(^2\) There might also be quantitative and qualitative differences in the use of gesture and speech in the bilingual child’s strong language as opposed to the weak one. The study of simultaneous bilingual language acquisition allows the researcher to investigate not only the relation between two modalities over time (possible precocity of gestures over speech or complementary use of the two modalities to express negation), but also whether asymmetries in the linguistic development of two different languages have an impact on gesture production.

In order to tackle these issues, we analyze the longitudinal data of Antoine, a bilingual French/Italian child living in France, and recorded once a month for an hour with his Italian mother and once a month with his French father between the ages of 1;5 and 3;5 (Paris Corpus ANR-08COMM-02102 CoLaJE). Negation

\(^2\) In order to compare Antoine’s multimodal communication to other children’s modes of expression we use both previous literature on the same age range and our own studies conducted on the children of the Paris corpus (see other papers in this volume).
in French and Italian is expressed by a similar adverb (*non/no*) at the beginning of acquisition but the syntax of negative utterances used a little later on differs between the languages. The conventional gestures of negation used in the family in French and in Italian are identical (head shake from right to left or left to right for refusal, shoulder shrug with sometimes the use of the open extended arms with open hands upwards, use of the index upwards with lateral movement from right to left or left to right for prohibition).

In this exploratory paper, the path of the bilingual child’s early language development will be described with a focus on his expression of negation in different modalities. Through our qualitative and quantitative analyses of the child’s negative productions, the following questions will be investigated: To what extent does he resort to gestural means as opposed to verbal ones? To what extent does he combine the two modalities? Does exposure to two languages play a role in his modality preferences?

We first briefly review the main studies concerning the early use of gesture and speech in language acquisition on the one hand, and the main features of early simultaneous bilingual acquisition. We then present quantitative and qualitative analyses of Antoine’s multimodal path into negation and discuss his extended use of so-called “redundant” gesture and speech to express negation in parallel to various instances of code-mixing.

**Main issues**

*Children’s gestures*

Gestures, verbal productions, signs, gaze, facial expressions, postures, are all part of our socially learned, communicative system. Human beings, with all their representational skills, combine modalities in order to share meaning, to refer to present and absent entities and events, to express their projects, their desires and their inner feelings. “Utterance uses of visible bodily action” (Kendon, 2004, pp. 1–2) integrated with spoken expressions, form a tight partnership in adult interaction in which they can either alternate or be complementary. The roots of this partnership have been illustrated in a wealth of research in language acquisition, one of the first fields for which the role of gestures has been analyzed in depth.

Many studies on language development in L1 acquisition have highlighted the early use of gestures. It is well known that children usually develop *deictic* gestures in the prelinguistic period, such as pointing, giving and showing, to signal desire for a specific object or attention to it. However, some *symbolic* gestures with representational properties (for naming objects, states and qualities), including
CONVENTIONAL ones (like head shakes for refusal, head nods for agreement, palms up for ‘all-gone’, waving hands for ‘goodbye’, etc.), are also used quite early and can be produced before their verbal counterparts (cf. Acredolo & Goodwyn, 1988; Bates et al., 1979; Volterra et al., 2005). At the one-word stage, children tend to use either a gesture or a word to refer to something, not both, so that at this stage gestural utterances are comparable to vocal utterances (cf. Volterra et al., 2005). Then, in the case of the children who use gestures, there tends to be a period when a word is added to a corresponding gesture, before words express the children’s intended message on their own (Acredolo & Goodwyn, 1985).

The correlation found between the emergence and functioning of early symbolic gestures and early words supports the view that they are a manifestation of the same cognitive development. As Acredolo & Goodwyn (1988, p. 462) put it, the precocity of gestures over speech can be related to different factors: 1) the division of the ‘sound stream’ might be harder for infants than the division of the ‘action stream’ or 2) actions produced by the child are easier to interpret by adults than his or her vocal productions: in both cases, gestures represent an alternative means of expression until the linguistic means for the same function is available (and interpretable) and therefore serve to ease the infants into the symbolic function of language.

Gestures seem to play a crucial role also for the development of syntax. When they are combined with words, gestures are described as facilitating children’s access to first combinations. The study of Capirci et al. (1996) has looked specifically at the spontaneous production of unimodal (word + word, gesture + gesture) and cross-modal (word + gesture) combinations in children aged 1;4–1;8. The cross-modal combinations were classified as ‘equivalent’, when the same meaning is expressed by the gesture and the word, and ‘complementary’ (POINT flowers + word ‘flowers’) or ‘supplementary’ (NODDING + word ‘this’, ALL-GONE + word ‘water’), when each of the combined elements adds information to (or at least disambiguates) the other one. Given the robust presence of gesture-word combinations, which precede two word combinations in almost all children, they suggest that combining vocal and gestural elements represent a transitional device allowing the child to overcome linguistic limitations en route to the two-word stage.

Synchrony and asynchrony have been presented as important features in multimodal multi-element communication. Kelly (2011) has observed in her data how children’s interaction skills unfold from communications across a single modality (they use a single gesture or a single word) to multi-modal synchronized constructions (word + gesture are used to indicate different elements: for example a child

3. For example, 80% of the gestures observed by Acredolo & Goodwyn (1988) appear before the child reaches the 25-word stage.
might point at a cookie and produce her own name). Goldin-Meadow and her colleagues have thoroughly investigated productions of gesture-speech combinations and children’s comprehension at the one-word stage and beyond (Goldin-Meadow, 1999; Morford & Goldin-Meadow, 1992; Özçalışkan & Goldin-Meadow, 2005). They study how speech and gesture together progressively form an integrative system (Butcher & Goldin-Meadow, 2000) thus confirming that the ability to use two modalities (gesture + word) for two different elements precedes the onset of two-word speech.

**Gestures of negation**

The studies previously mentioned give an overview of the gesture-word relation in language development by taking into account a wide range of gestures. The main lines of such a development are partly confirmed and partly refined in the few studies that look more specifically at negation.

In particular, Guidetti (2000, 2005) provides precise information concerning the emergence and frequency of the use of gestures compared to words, by observing the expression of agreement and refusal in 30 French children aged 1;4, 2;0, and 3;0. Her studies suggest that gestures of agreement and refusal (nods and head shakes) are the first symbolic gestures used by children (outside pointing). More generally, gesture is more frequently used than speech in very young children (gesture only utterances were 71,8% at 1;4), but by the age of two years spoken utterances have taken the lead (the percentage of gestures decreases to 13,3% at 2;0, then 3,8% at 3;0).

Guidetti also notices the presence of the three types of cross-modal combinations described by Capirci et al. (1996). However, when both modalities are used it is mainly to reinforce the message, i.e., she found a majority of equivalent combinations. Interestingly enough, in Guidetti’s view, gestures do not correspond to mere transitional forms, as the gestural modality for refusal/agreement never disappears, but continues to develop to reinforce and replace verbal messages when necessary.

It is useful to underline that all studies also highlight a **striking individual variation** to the extent to which children resort to symbolic gestures and gesture-word combinations (Acredolo & Goodwyn, 1988; Guidetti, 2005; Capirci et al., 1996). Some children who enter the verbal modality precociously seem to use very few symbolic gestures outside pointing at first (see the analysis of Madeleine’s longitudinal data in Morgenstern, 2009). Such a variation is ascribed to the influence of different factors. On the one hand, symbolic gestures might be easier to process in comprehension and easier to produce than equivalent verbal expressions which might explain their early emergence in a lot of children; on the other hand, they
might be more or less exploited by the child according to social factors like parents’ input or response (which usually encourage verbal production) or the presence of siblings, which might induce a competition for parental attention. This point will be further developed in the discussion (section “Discussion and conclusions”).

Semantic values and pragmatic aspects of negation

The study of children’s acquisition of negation calls for a system of categorization based on the forms produced and the functions these fulfill in children’s utterances. Accordingly, the categorization of the various forms and functions of negation has preoccupied researchers studying the early markers of negation in acquisition. The first studies on the topic consisted of structural descriptions of negative markers used by children (cf. Bellugi, 1967). Soon thereafter, McNeill and McNeill (1968) turned the focus of analysis to the semantic content of these negative types. Bloom (1970) proposed a succinct model for the semantic values of negative markers; a model which was expanded by Choi (1988).

However, these models, although thorough in describing children’s development of negation in terms of the relation between syntax and semantics, did not incorporate socio-pragmatic factors undeniably present and central in children’s interactions. This was accomplished in part by Volterra and Antinucci’s study (1979), and completed by Pea’s (1980) all-encompassing investigation of the emergence of negation. The necessity for the advent of functional categories in children’s use of negation was first approached from a purely syntactic perspective, and then from a syntactic/semantic perspective before being considered by a more integrative model, which includes pre-verbal categories and takes into account gesture and other kinesic features of communication.

Volterra and Antinucci (1979) argue that a pragmatic aspect of negation is the most crucial in child development. They point out that it has been left out in well-known studies such as those by Klima and Bellugi (1966), Bellugi (1967), McNeill and McNeill (1968), and Bloom (1970), whose approach focuses on syntactic or semantic aspects. According to Volterra and Antinucci (op.cit.) the earliest uses of negation occur as operations on presuppositions. The children observed in their study (two Italian speaking, two English-speaking children) ranged from age 1;3 to 2;11, and were able to express negation based on four types of presuppositions. All four types appeared from the earliest sessions for all children. The four types of presuppositions can equally be translated into speech acts: A for Prohibition, or Imperative order in the negative, B for denial, C for refusal, and D for denial (D differs from B in that the former is necessarily a confirmation or disconfirmation in response to the adult’s question). Bates (1976) reproaches Volterra and Antinucci’s typology for its undue complexity, arguing that children’s actual expressive ability
at the one-word stage does not match the complexity expressed by these negation types (op.cit., p. 100). Volterra and Antinucci (1979) stress the pragmatic aspect at the heart of a child’s development of the use of negation, arguing that it enables the child to develop the distinction between his/her own and the other’s presuppositions, beyond the ability to deny affirmative presuppositions, thus contributing to the development of a theory of mind.

We will not review the numerous semantic categorizations proposed in the literature in this paper but only use the functions of negation that our team has coded in the Paris corpus: A: refusal/rejection/protest; B: negative assertion; C: epistemic negation; D: denial; E: non existence/absence; F: Prohibition. The early studies focused on verbal negation. One of the aims of our multimodal approach is to identify which functions are also expressed through gestures.

**Studies on language development in simultaneous bilingual acquisition**

In our case study, the child grows up in a French-Italian bilingual environment. This factor might also have an influence on the development of negative expressions.

One recurrent question about early phases of bilingual acquisition is whether simultaneous exposure to two languages influences the pattern of development so that it differs from the one observed in monolingual children. On this issue, the initial “unitary language system” hypothesis (Volterra & Taeschner, 1978), implying a late differentiation of the two linguistic systems, has been strongly criticized. These authors assumed a three stage bilingual development going from an initial phase during which the child has one lexical system including words from both languages (1 lexicon), followed by a phase when the two lexicons are distinguished but the same syntactic rules apply to both languages (= 2 lexicons but 1 syntactic system), before the child can differentiate two linguistic codes both for the lexicon and for the syntax.

There is by now a certain consensus according to which the child differentiates some of the specific features of each language very early. But the debate is about the extent to which there might be an interaction between the two developing languages: some authors defend a position whereby, for most features, bilingual development of each language is substantially similar to same-age monolingual children (Meisel, 1989; de Houwer, 1990), while others highlight the presence of interdependence between the two developing systems, giving way to delay/acceleration and transfer effects in specific syntactic domains and according to language combinations (Paradis & Genesee, 1996; Döpke, 2000).

Independently of such debates, even if the child is simultaneously exposed to two (or more) languages, balanced proficiency in each of them is relatively rare.
The development of each of the two languages can vary dramatically according to the child’s environment (language of each care-giver, country of residence), the language combinations, input amount and consistency, context of exposure, (Byalistok, 2001). As a consequence, the child quite often has a strong and a weak language (dominance effect), as in our case. However, there seems to be no significant delay on lexicon development as long as both languages are considered (Petitto et al. 2001), nor in the rate of morpho-syntactic development, at least in the strong language (Genesee & Nicoladis, 2009).

A specific feature of 2L1 acquisition is also the presence of code-mixing, i.e., the use of elements (phonological, lexical, morpho-syntactic) from the two languages in the same utterance or stretch of conversation, a phenomenon also common to adult bilinguals. While instances of intra-sentential code-mixing in bilingual children were once considered as a sign of incompetence or confusion, it is by now clear that code-mixing is a typical phenomenon of bilingual acquisition which reveals a specific competence in both languages. In fact, while code-switching, children usually avoid linguistically illicit constructions, by respecting structural rules like the equivalence constraint (code-switches occurring at points in discourse where juxtaposition of \(L_a\) and \(L_b\) elements does not violate a syntactic rule of each language) and the free morpheme constraint (avoid mixing verbal inflections from \(L_a\) with \(L_b\) lexical verbs), as adults do (cf. Genesee 2002). Violations of both constraints are attested (as in No
va, I aime pas maman, I like pas strawberries; cf. Paradis, Nicoladis, & Genesee, 2000), but considered as relatively rare.\(^4\)

Another way of avoiding incompatibilities between languages is to use nonce borrowing. In this case a lexical item of the donor language is syntactically, morphologically and (possibly) phonetically integrated into the recipient language as in the following example taken from Genesee (2002, pp.182–183): Yesterday I went to the centre d’achat (‘shopping centre’).

The amount of code-mixing also depends on several factors (input, context sensitivity, pragmatic and symbolic functions, etc.), but quite often it serves to fill in gaps in lexicon and grammar: children actually seem to mix more and produce nonces when they use their less proficient/weak language, in which they lack translational equivalents. Note that this function of gap filling resembles the compensatory function of gestures to overcome linguistic limitations that we have already mentioned.

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\(^4\) The examples for negation, taken from Paradis, Nicoladis, & Genesee (2000), are produced by French-English bilingual children (aged between 2;0 and 3;6). In their study, the overall percentage of utterances violating structural constraints seems to be less than 18%.
On the whole there is a rich body of literature on early bilingualism, but only few studies focus on the use of gestures in children who acquire two languages simultaneously (and none deals specifically with gesture and negation in bilingual children).

The available research on this topic tries to determine if the different proficiency of the bilingual child in the two languages also implies a different use of gesture. Following this perspective, Nicoladis, Mayberry, and Genesee (1999) investigate the relationship between gesture and language development in English-French bilingual children (5 subjects, age range 2;0 to 3;6, all first-borns with no siblings) to determine whether the production of gestures of different types (emblems, deictic gestures, iconic gestures and beats) is related to cognitive or to linguistic development: in the former case, the child is expected to gesture equally in both languages, while in the latter case she would produce more gestures in her stronger language.

Their results show an overall low proportion of gestures with no speech (only 18.7% at 2;0, then decreasing values for older ages till 8.8% at 3;6), which recalls the percentage found for gesture-only negation in Guidetti (2005) at the same age range. More importantly, the authors found that children were globally not prone to gesture more with one language as compared with the other. A difference was however noticeable concerning the different types of gestures analysed: more precisely, the production of iconic and beat gestures seems to be related to language development measured in terms of MLU (they were attested only or earlier in the strong language), while no such correlation was found for deictic points, emblems and give-gestures, i.e., for the gestures that have been noted in children before they begin to speak. Note that they also observed a great variability, pointing to the need to confirm such tendencies with larger populations:

Of particular note, these 5 children demonstrated great variability in rate of gesture production and rate of production of French and English utterances. Also, the children varied in the relative development of their proficiency of their two languages (Nicoladis, Mayberry, & Genesee, 1999, p. 525).

These results are taken up again and refined almost ten years after in Nicoladis (2007), who provides a literature review on the available evidence for a possible link between (adult and child) bilinguals’ degree of knowledge of one language and their gesture production. Taking as a starting point the different function of gestures (communicative: help the listener to decode the message; cognitive: help the speaker to encode the message), she discusses the relevance of two contradictory hypotheses: on the one hand, bilinguals could gesture more in their weaker language, either because gesture can compensate for their poor speaking abilities or
because using the weak language implies a higher cognitive load (accessing words or conceptualizing the message); on the other hand, they could gesture more in their stronger language because they try to convey more complex messages.

The results of her comparison are rather inconclusive:

[…] no clear pattern of a link between language proficiency and gesture has been observed across studies, probably because gestures rarely compensate for weak language proficiency, functioning instead to facilitate speech production in both first and second language use (Nicoladis, 2007, p. 441).

However, even if no significant difference of gesture frequency was detectable in the studies comparing the child’s production in her weak and strong language, she also noticed that bilingual children seem to gesture more than monolinguals: this feature is interpreted as related to the fact that bilinguals have more choices in how to word their message than monolinguals: “the greater choices of potential verbal packaging could lead to a higher rate of gestures as bilinguals search for how to package the message” (2007, p. 449). This point will be taken up again in the discussion (section “Discussion and conclusions”).

Data, methodology, and first observations

Data and methodology

Our study is based on the longitudinal data of a bilingual child, Antoine, who has a French father and an Italian mother. He was filmed from the age of 1;05 to 3;06 by author 1 (native Italian) in the Italian sessions (interactions with his Italian mother) and author 2 (native French) in the French sessions (interactions with French father) between 2009 and 2011. We recorded him in each language for an hour a month and tried to plan the two sessions in French and Italian as closely as possible every month. The little boy has an older brother who is three years older than himself and a dog. They live in the center of Paris. Both parents are academics and they both speak Italian and French fluently. Antoine’s older brother is bilingual and was also sometimes present. French is Antoine’s strong language and Italian is his weak language. Language dominance relates to the amount of French input in his daily environment. The input at daycare is exclusively in French and his father and older brother speak to him mostly in French. His mother speaks Italian to him and his brother (whose Italian at five years old was quite fluent) but code switches when the father is present. However, Italian is also present through telephone conversations with his Italian grandparents, regular holidays in Italy, visits of friends and family. According to his parents, Antoine’s daily input is around 25 to 30% in
Italian with great variability since his mother spends her whole week-ends with her children but works in a university in the south of France and is therefore absent about two days a week.

The entire data is spontaneous; we added no experimental design. For this study, we used one session in Italian and one session in French every six months as shown in Table 1.

Table 1. Data used for the study

<table>
<thead>
<tr>
<th>Age</th>
<th>Dominant Language in the session</th>
<th>Main interlocutor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1;05,21</td>
<td>Italian</td>
<td>Mother</td>
</tr>
<tr>
<td>1;06,04</td>
<td>French</td>
<td>Father</td>
</tr>
<tr>
<td>2;00,23</td>
<td>French</td>
<td>Nanny and Father</td>
</tr>
<tr>
<td>2;01,08</td>
<td>Italian</td>
<td>Mother</td>
</tr>
<tr>
<td>2;06,23</td>
<td>Italian</td>
<td>Mother</td>
</tr>
<tr>
<td>2;06,28</td>
<td>French</td>
<td>Father</td>
</tr>
<tr>
<td>3;00,00</td>
<td>French</td>
<td>Father</td>
</tr>
<tr>
<td>3;00,24</td>
<td>Italian</td>
<td>Mother</td>
</tr>
<tr>
<td>3;06,21</td>
<td>Italian</td>
<td>Mother</td>
</tr>
<tr>
<td>3;07,22</td>
<td>French</td>
<td>Father</td>
</tr>
</tbody>
</table>

An excel sheet was used to code negative functions (refusal/rejection, non existence/absence, denial, negative assertion, epistemic negation and prohibition) according to their forms in three modalities:

1. actions (such as pushing away an object);
2. symbolic conventional gestures (head shake for refusal, shoulder shrug and extended arms + palms up for epistemic negation or non-existence (as in Kendon’s 'Palm Lateral', corresponding to open hands supine with lateral movement).
3. speech in the two languages: for example in French non, pas, y a plus, rien …; in Italian: no, non, più, niente … (equivalent to ‘no’, ‘don’t’, ‘not anymore’, ‘nothing’), as well as lexical negation such as Fr. arrête It. basta (meaning ‘stop it’).

The expression of agreement and requests were also coded for comparative reasons.

The sessions in Italian were first coded by author 1 and the sessions in French by author 2. The two authors then discussed all the coding sheets and no disagreement was found but finer details were added. The coding was based on the coders’ interpretation of the forms in context. Spoken utterances, Actions and Gestures
<table>
<thead>
<tr>
<th>Session</th>
<th>Timing</th>
<th>Location</th>
<th>Previous context</th>
<th>Context</th>
<th>Verbal action</th>
<th>Gesture</th>
<th>Subs. context</th>
<th>FUNCTION</th>
<th>MODALITY</th>
<th>Structure</th>
<th>Place in dialogue</th>
<th>Place</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>200,23</td>
<td>39:25</td>
<td>CHI</td>
<td>Nanny offers dessert</td>
<td>Nanny looks for other dessert</td>
<td>Pushes dessert away</td>
<td>Head shake</td>
<td></td>
<td>Action+</td>
<td>Gesture+</td>
<td>Verbal</td>
<td>isolated</td>
<td>isolated</td>
<td>response</td>
</tr>
<tr>
<td>200,23</td>
<td>35:30</td>
<td>CHI</td>
<td>Nanny asks if he is going to watch the Aristocrats</td>
<td>obs asks if he is going to watch another movie</td>
<td>Head shake</td>
<td></td>
<td></td>
<td>isolated</td>
<td>Gesture</td>
<td>isolated</td>
<td>response</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
were only coded if in context they could be interpreted as negations. All head shakes coded for instance were all interpreted as gestural equivalents to the particle ‘no’ or to a whole negative utterance. The distinction between form and meaning is useful since we know that in the Paris data, a very energetic and repetitive version of the head shake is used in monologue by one of the children in the study, Théophile, when he is excited and having fun at 1;10 but not expressing negation (Morgenstern et. al in preparation). Antoine never used the head shake in the sessions we coded for other functions than conventionalized negation.

Note that in both French and Italian, gestural negations seem to be expressed with the same forms (head shakes, Open Hand Prone gestures of rejection, shoulder shrugs for epistemic negations, cf. Kendon, 2004). Italian interactions are sometimes defined as ‘gesture-prominent’ (Kendon, 1995, for adult interactions in Naples and other parts of Southern Italy) and Antoine could have been exposed to the enhanced gestural input described by Capirci et al. (1996) and Iverson et al. (2008) when they refer to the adult Italian input. However, we have not noticed a particularly rich use of gestures by his Italian mother compared to the other mothers in the Paris corpus.

Quantitative results

On the whole we have analyzed 10 sessions of Antoine’s longitudinal data in which he uses a total of 174 negative productions, either through action, gesture or speech. Table 3 summarizes the number of negations the child uses per session.

Table 3. Number of negations per session

<table>
<thead>
<tr>
<th>Age</th>
<th>Dominant Language In the session</th>
<th>Nb of negative productions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1;05,21</td>
<td>Italian</td>
<td>3</td>
</tr>
<tr>
<td>1;06,04</td>
<td>French</td>
<td>7</td>
</tr>
<tr>
<td>2;00,23</td>
<td>French</td>
<td>18</td>
</tr>
<tr>
<td>2;01,08</td>
<td>Italian</td>
<td>11</td>
</tr>
<tr>
<td>2;06,23</td>
<td>Italian</td>
<td>16</td>
</tr>
<tr>
<td>2;06,28</td>
<td>French</td>
<td>22</td>
</tr>
<tr>
<td>3;00,00</td>
<td>French</td>
<td>16</td>
</tr>
<tr>
<td>3;00,24</td>
<td>Italian</td>
<td>13</td>
</tr>
<tr>
<td>3;06,21</td>
<td>Italian</td>
<td>28</td>
</tr>
<tr>
<td>3;07,22</td>
<td>French</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>174</td>
</tr>
</tbody>
</table>
As far as the functions of negative productions are concerned, independently of their modality, there is a clear predominance of refusal throughout the data. During the first sessions, Antoine only uses refusals. He adds non existence and epistemic negation at 2;0. Negative assertions and one prohibition (directed towards the dog) are used as of 2;06. At 3;06, negative productions are quite diversified and refusals represent only 40% of all negations.

Graph 1 gives an overview of the forms Antoine used over time to express negative functions, according to his age (from 1;5 to 3;6) and to the language of the session (French when he interacts with his father and Italian with his mother).

Graph 1. Forms used for negative functions over time in the French and Italian sessions

The darker bars correspond to the visual modality (dark grey for symbolic gestures; grey for negative actions), which is dominant in the first period. The striped bars (starting from 2;0–2;6) represent the cross modal combinations: vertical stripes [Gesture + Speech], diagonal stripes [Action + Speech]. The white bars correspond to the verbal expression of negation (either in French or Italian, put together) not accompanied by gestures / actions, which slowly replace negative gestures and action over time.

We note that there is a long transitional period from the visual to the spoken modality between 2;0 and 2;6 when cross modal combinations are quite frequent, before the spoken modality becomes dominant. We also observe a high number of spoken negations at 2;6 during the French session (Antoine develops his strong language), while we find a sort of regression at the same period in the Italian session (his weak language): during his interactions with Italian-speaking
interlocutors, Antoine code switches to French or accompanies his Italian negative utterances with Gestures. As we have seen in the literature review (Guidetti, 2005), and in the Paris Corpus (Morgenstern et al., in preparation; Beaupoil, 2011) the spoken modality already usually prevails between 20 and 24 months. Antoine’s predominant use of gestures of negation therefore seems to extend longer than the other children previously studied.

Long reliance on the visual modality & multimodal combinations

The following graph represents the proportion of the visual and spoken modality used to express negation (note that this time the French and Italian sessions are fused together).

[Graph 2. Proportion of gestures in the visual and spoken modalities]

With respect to previous literature, Antoine’s development presents two peculiar features. First, in comparison to Guidetti’s study, Antoine relies longer than other children on the visual modality. His turning point to verbal modality is between 2;0 and 2;6, (according to the distinction of strong / weak language), while verbal modality already prevails at 2;0 for the monolingual children observed in Guidetti (2005). Secondly, most cross-modal combinations produced by Antoine are redundant (i.e., word and gesture express the same negative function), not complementary nor supplementary. These results suggest that their presence is not related to the transition to the 2-word stage as in the data analyzed by Capirci et al. (1996).

Multimodal combinations & language mixing in negative contexts

In relation to his bilingualism and how Antoine might concentrate on sharing his productions with all his interlocutors in all linguistic situations, we focused on Antoine’s bilingual productions in negative contexts.
The following graph represents his French production (light grey bars) and his Italian production (darker grey bars) separately.

Graph 3. Percentage of French, Italian and code-mixed negative verbal productions according to Antoine’s age

The checkered bars corresponds to the case of language mixing, including one-word utterances made of lexical inventions such as « manon » at 2;0 (but no), which cannot be identified as either Italian or French, and grammatical code-mixing, like “pas nonna” at 2;6 (Fr. not It. grandma) or “pas dai” at 2;6 (Fr. not It. give), all the utterances being composed of items taken from both languages. Note that the construction of code-mixed utterances needs a certain amount of lexical development in each language.

These mixed constructions for negation can be put on a par with other expressions which cannot be identified as either French or Italian, such as “elà” + pointing for requests (attested at 2;0, which phonetically could correspond both to Fr. ‘et là / est là?’ or It. ‘è là / è là, i’and there / it’s there’) or “kokosê” + pointing (attested at 2;6), a formula for asking “what is this?”, a blending of Italian (che cos’è?) and French (qu’est-ce que c’est?), which are frequently produced during the same age range. In both cases, the child’s mixed constructions seem to serve as transitional expressions between the two languages. Note that code mixing stops for negation after 2;6, but continues in utterances without negation till the end of the observation period (for ex. “fatto male (it) où (fr)?” at 3;0 meaning ‘where did you hurt yourself?; ‘come si fa a (it) uvrire (fr) questo (it)?” at 3;6 meaning ‘how do you open this?’). This issue will be developed in the discussion.

We will now turn to a qualitative analysis of examples from each session to examine Antoine’s pathway into negation.
Antoine’s pathway into negation

*Antoine (1;5–1;6): An actional-gestural system*

At 1;5–1;6, Antoine produces very few words. He uses speech to designate or call family members and his dog: “maman” (mummy); “papa” (daddy); “Tara” (the name of their dog). There are no occurrences of spoken negations, nor of spoken agreements and requests. His expressive system is gestural rather than verbal and the only symbolic expression of negation used at that age is the head shake. But he also expresses rejection by using bodily actions: Turning away from objects or pushing them away, resisting when his father tries to keep him away from his brother’s toy.

By this time, he has developed a convenient and clear gestural system for three functions (refusal, agreement and request): he nods and shakes his head in order to accept or refuse the adult’s offers; he makes requests by extending his arm and hand, or by pointing. These gestures are sometimes accompanied by vocalizations. The following extract illustrates Antoine’s gestural system at work.

Example (1) — Antoine 1;5

*His mother offers him a cookie without speaking by extending her arm.*

CHI: mm

shakes his head twice, medium amplitude.

MOT: no? no.

MOT: un peu d’eau? c’est ça? (some water? is that it?)

CHI makes an emphatic gesture, shaking his head vigorously, which involves his whole body.

CHI extends his arm out and says “m”

MOT: e adesso vuoi il biscotto (now you want the cookie).

During this whole scene, Antoine’s brother speaks very loudly in the background. Antoine has developed a system that is adequate for Italian and French (his mother actually switches from French to Italian in this extract) and solves the problem of being understood in an environment invaded by his brother’s voice. The head shake (two rotations from right to left without excessive amplitude) he uses in combination with a vocalization expresses refusal. His mother immediately understands that water is required first. Antoine’s production is therefore quite efficient.
Antoine 2;0–2;1: the predominance of the gestural modality

At 2;0, Antoine enters the spoken modality essentially in French. He labels objects by using a lot of onomatopoeia and produces a series of frozen expressions, like evoilà (there we go), elà (multifunctional: and here), encore de l’eau (more water), veux de l’eau (want water), many of which allow him to verbalize requests.

However, he still acts his rejections by pushing food or objects away, turning away from activities he does not want to perform, and the gestural modality is still predominant for negation. There are numerous head shakes to express refusal both in the Italian and French sessions, and one shoulder shrug in isolation to express epistemic negation, although some differences have been observed in his use of gesture in combination with speech between the two sessions. In the French session, 50% of his negation gestures are used in isolation, and 50% are combined with speech, either Fr. “non” (no) or the mixed production “ma non” (but no). In the Italian session, 10% of the negation gestures are produced in isolation and the others are combined with speech: either It. “no” and Fr.“non” (no) + head shake to express refusal or Fr.“epala” (is not here) to express an object’s absence which is combined with an epistemic gesture performed with extended arms and Open Hands Up. This is different to what Andrèn (this volume) found: in his data only 15% of head shakes were in isolation, and at this precise age the children in his study were therefore performing the gesture with speech.

In comparison with the preceding recordings, Antoine’s production shows both the emergence of different items to express negation verbally (non, no, code mixed manon, epalà), although it is almost never used without an accompanying gesture, and a diversification on the use of negation gestures: he continues to use the head shake to express refusal, but also produces various types of epistemic gestures involving the shoulders and the arms.

The following example illustrates his combined use of speech, gestures and code mixing “ma (Italian) non (French)” but no). Note also that agreement is still only expressed by the gesture of nodding.

Example (2) — Antoine 2;0 FR

Antoine has just finished his main course served by his nanny (NAN).
ALI is the investigator filming the scene.
NAN: bravo Antoine bravo! (Hurray Antoine, Hurray!)
CHI: avo! (hurray!)
laughs
ALI: bravo! (hurray!)
CHI: elà!

turns towards Aliyah and the fridge and points to the fridge.
A bilingual child’s multimodal path into negation

Antoine 2;06: a weak and a strong language

At 2;06, speech becomes dominant in French. Antoine seems to be much more eager to enter the spoken modality: he uses more types of predicates to describe events (\([\text{etõbe}] \text{has fallen}\), \([\text{etarive}] \text{has arrived}\)) and nouns preceded by fillers to label objects (\([a]\text{bagarre} \text{(a fight)}\), \([e]\text{tunnel} \text{(a tunnel)}\), \([a]\text{compote} \text{(apple sauce)}\)). He also frequently repeats the adult’s speech, which was not the case in the preceding sessions. In the French session, the only gesture of negation used is a head shake to refuse his father’s cuddle, while he produces a variety of negative verbal expressions: “\(\text{y’a plus}\)” (\(\text{no more}\)), “\(\text{non}\)” (\(\text{no}\)), “\(\text{pas + adjective or noun}\)”, “\(\text{arrête}\)” (\(\text{stop}\))，“\(\text{pati la lune}\)” (\(\text{gone the moon}\)). Note that by this time he also expresses agreement verbally with Fr. ‘\(\text{oui}\)’, Fr. ‘\(\text{ouais}\)’ and It. ‘\(\text{si}\)’. However, for requests he produces a unique mixed formula in the two languages: ‘\(\text{kokosé} \text{(what’s that)}\).

In the following extract with his French-speaking father, the child only uses the verbal modality.

Example (3) — Antoine 2;06 FR

\[
\begin{align*}
\text{CHI:} & \quad \text{la lune!} \quad \text{(the moon!)} \\
\text{FAT:} & \quad \text{tu vois la lune?} \quad \text{(you see the moon?)} \\
\text{CHI:} & \quad \text{oui} \quad \text{(yes)}
\end{align*}
\]
In Antoine’s verbal negations, the functions used are negative assertion (non, encore meaning “it hasn’t gone, it’s still here”) and absence (voit plus meaning “we can’t see it anymore”). His language production in Italian is clearly less developed. More precisely, when he interacts with his Italian Mother, Antoine produces only nouns and adjectives in Italian (no verbal predicates attested), while for more complex utterances he either resorts to French (code-switching to his dominant language) or produces mixed utterances. As for negation, in the Italian session Antoine continues to produce negative actions to protest and reject, gestures alone and modality mixing by combining gesture and speech. Besides the head shake, he also uses his index to warn the dog not to come near him while he is eating a cookie.

By contrast with the previous example, his verbal production in the Italian sequences contains several code-mixed constructions like the utterance “pas nonna” in the ex. (4), with the French negative “pas” and the Italian word for “grandmother”, which is moreover accompanied by a head shake.

Example (4) — Antoine 2;06 IT

<table>
<thead>
<tr>
<th>MOT:</th>
<th>chi sei tu?</th>
<th>(who are you?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI:</td>
<td>[e ma]!</td>
<td>(is me!)</td>
</tr>
<tr>
<td>MOT:</td>
<td>c’est moi</td>
<td>(it’s me)</td>
</tr>
<tr>
<td>CHI:</td>
<td>xx la nonna!</td>
<td>(xx grand ma!)</td>
</tr>
<tr>
<td>MOT:</td>
<td>era il nonno si</td>
<td>(it was grand dad yes)</td>
</tr>
<tr>
<td>CHI:</td>
<td>pas nonna</td>
<td>(Fr. not + lt. grandma)</td>
</tr>
<tr>
<td>MOT:</td>
<td>non la nonna no</td>
<td>(not grandma no)</td>
</tr>
</tbody>
</table>

In the next example, he also uses code-mixing during his interactions with his Italian mother. His first refusal is in Italian (no è mio = no it’s mine) and it is accompanied by a negative action. Two turns later, he uses a mixed utterance, once again with the French negative « pas » and a frozen form of the verb give in Italian (“dai” give — 2nd person singular).
Example (5) — Antoine 2;06 IT

MOT: è un altro cavallo ma è tuo? (it’s another horse but is it yours?)
CHI: è tuo (just repeats) (it’s yours)
MOT: è tuo o è mio? (is it yours or mine?)
CHI: no è mio (no it’s mine)

Negative action: turns away from his mother

MOT: dallo alla mamma (give it to mummy)
CHI: no (no)

MOT: Ben, non me lo dai? (so you’re not giving it to me?)
CHI: no, pas dai! (It. no, Fr. Not + It. Give — 2nd p.s.)

Here again, Antoine mixes Italian and French and creates an interesting combination using a negative structure [PAS + frozen conjugated verb] which does not exist in any of the two target adult languages. Whenever he needs to communicate a complex event in his weak language, Italian, he either resorts to gesture or to French.

Antoine 3:0

At 3:0, Antoine’s use of French and Italian is more balanced. He can express certain concepts in both languages and is constructing a double repertoire, although in the Italian sessions he still might code-switch to French or produce code-mixed utterances for complex constructions (for ex. It. fatto male Fr. où? Where did you hurt yourself?).

Gestures are not combined with speech anymore but are used as an alternative to the spoken modality when for example the mouth is busy because he is eating. In some sequences, he first expresses negation only verbally, then seems to re-formulate it only gesturally, as in the following example.

Example (6) — Antoine 3:0 IT

MOT: vuoi il sapone? (do you want the soap?)
MOT: non lo mangi eh! Lo mangi o no? (you don’t eat it! are you going to eat it or not?)
MOT: Guardami negli occhi. Lo mangi? (look into my eyes. Are you going to eat it?)
CHI: no (no)
MOT: no? (no?)
CHI: shakes his head

When he wants to negate, the gestural modality is still a good alternative to speech, especially when speech is hampered by another activity, but speech + gesture
combinations are no longer used. The only gesture used is the head shake. The variety of negations in his verbal productions is getting richer both in French and in Italian: in addition to Fr. ‘non’ and ‘pas’, or to It. ‘no’, we find constructions with Fr. ‘rien’ / It. ‘niente’ (*nothing*) and Fr. ‘plus’ / It. ‘più’ (*not anymore*). Note that no code-mixed utterances are attested for negation at that age. This seems to occur six to twelve months later than in the children previously studied in the literature (in particular, Andrèn, this volume).

**Antoine 3;6**

At 3;06, Antoine is much more at ease in the verbal modality in his two languages but his phonological system is still incomplete both in French and in Italian. In addition, he still produces a lot of code-mixing in his weaker language, as in It. *la mia maestra è grondata* (my teacher yelled at me) with nonce borrowing from French *gronder* (“grondata” being composed of the French verb “gronder” with an Italian conjugation, the Italian past participle would be *sgridata* from the verb *sgridare*) or the mixed utterance *fatto di* (It.) *bêtises avec Carmen* (Fr.) (I was naughty with Carmen), although none in negative utterances.

Gestures are practically no longer used to negate except when he is eating. But punctuating co-verbal gestures (such as “beat gestures”, cf. McNeill, 1992) start to emerge. This is in line with previous findings according to which beats develop with increasing MLU and varying stress patterns (Nicoladis, Mayberry, & Genesee, 1999; Mayberry & Nicoladis, 2000).

At the end of our data, speech in Italian and French has therefore become his dominant modality. Conventional gestures are only used sporadically for agreement or requests.

**Discussion and conclusions**

Antoine’s data presents various characteristics that seem to be linked to 1) a specific use of conventional gestures in child data and 2) his specific linguistic and social environment.

**Use of conventional negative gestures**

A large majority of gestures of negation in the data are head shakes (85%). They were all used either in isolation as a kinesic equivalent of the particle “no” or in combination to the words It. “no” /Fr. “non” or to short negative spoken utterances. Unlike Kendon’s observations of adult head shakes (2002), Antoine’s use
of the conventionalized gesture has a limited range of meanings and is executed with only slight variations (one or two rotations of the head to the right or to the left with small amplitude or larger amplitude, speed does not vary a lot). The execution of the gesture seems to exhibit a lack of fine motoric control at first since the movement lacks precision. When the child starts combining head shakes with speech, it is synchronous with the negative particle. At the end of the data, it is only used in isolation when he is eating and his mouth is busy.

Complex multi layering of meaning does not seem to be present as in adult productions and the gesture is always executed in complementation to speech (or rather at first, speech in complementation to gesture). Antoine seems to produce the gestures and spoken words as a multimodal construction in which each element cannot be separated from the whole and is not controlled independently, which is not the case in adult co-verbal use of gestures. Gesture and speech are co-participant to the integrative meaning of the child’s productions. A change in facial expression has not been noticed during Antoine’s productions of the head shake.

We also coded one occurrence of a prohibition gesture addressed to the dog at 2;06 which was combined with “no” to forbid him to get out of his basket, and some occurrences of epistemic gestures: in isolation at 2;0 in the French session to express absence of knowledge, and in combination with speech at 2;1 in the Italian session while saying in French “e pas là” (is not here) to express absence.

At the end of the data, Antoine has abandoned the use of gestures in combination with speech and his spoken utterance seems to take on the communicative power on its own (except when his mouth is busy). However, he starts using other co-verbal gestures in a much more controlled way and could be at the beginning of a new phase in his use of gesture.

Our longitudinal analysis reveals that all conventional gestures of negation used (only head shakes) refusal at the beginning of the observation period. Antoine then produces gestural epistemic negations as of 2;0 (shoulder shrug and open arms palms up open hands). At 2;06, Antoine produces a prohibition gesture to prevent the dog from moving away from his basket his index rotating laterally from right to left. Each type of gesture is therefore monofunctional in his production, which is quite different from that of adults (see Kendon 2002 for several functions of the head shake, and Kendon 2004 for functions of manual negation gestures and “presentation” gestures where these actions are used to create layered meanings).
Long reliance on the visual modality and on equivalent cross-modal combinations

Antoine seems to rely on the gestural modality for a more extended period than other children studied in the literature and he uses cross-modal combinations for six to 12 months longer. Both features might be explained by the interplay of different factors. First, the social factor pointed out by Acredolo & Goodwyn (1988), which includes parents’ (positive) response to the child’s gesture and the potential competition for parental attention induced by the presence of siblings:

after all it takes two to communicate, and if a parent fails to interpret correctly the child’s gesture, then the nonverbal behavior is quite likely to be abandoned as ineffective … this may be particularly likely in the case of a later-born child who has to compete with other children for parental attention (Acredolo & Goodwyn, 1988, pp. 462–463).

According to these authors, the presence of siblings should reduce parental attention to gestures and thus discourage their production by the later-born child, but competition for parental attention seems to produce the opposite result in our case. In fact, Antoine has a very talkative older brother whose presence leaves no auditory space for his first linguistic productions. We had to make an arrangement with his family in order not to have his brother at home while filming most of the time, otherwise it was very difficult to perceive Antoine’s linguistic productions, since his brother often intervened during their parents’ interactions with their younger son. The following example illustrates both the continuous interventions of Michel (asking repeatedly ‘Why?’) while the mother is reading a book to Antoine, leaving him no chance to produce verbally even when invited to do so (MOT to Antoine: ‘What does Edgar say? Say it yourself’), and Antoine’s use of gesture to get his mother’s attention.

Example 7 — Antoine 2;01 IT

MOT is on the couch with Antoine, they are looking at a picture book on the Aristocats.

MIC, his older brother, is on the floor in front of them.

MOT: O’Malley vuole liberare i gattini (It. O’Malley wants to free the kittens)

ma Edgar non vuole che siano liberati. (but Edgar doesn’t want them to be free)

MIC: perché? (It. why?)

MOT: ben perché li vuole spedire a Timbuctu (It. because he wants to send them to Timbuctu)

MIC: perché? (It. why?)
As a younger sibling, Antoine’s linguistic development matches the results of comparisons made in previous studies between first and second-born children. First-borns are shown to have an advantage as far as the development of the formal linguistic system is concerned (lexicon, morphology and syntax) probably because of more time spent in one to one interactions with their care-giver. Second-born children are more likely to have an advantage in the development of communicative and pragmatic skills thanks to a larger amount of overheard speech (Oshima-Takane et al., 1996) and to interactions with a larger variety of partners (Bernicot & Roux, 1998).

It is also useful to underline that Antoine’s linguistic production is phonetically very approximate and difficult to understand for a long time. This might be in line with the observations according to which bilingual children can be delayed in their phonological inventories (Oller & Jarmulowitz, 2007). At the end of the data at 3;6, his French phonological system is still lacking a number of phonemes, which compared to the children in the Paris corpus is quite late (Morgenstern et al., 2013). Given the ‘noisy’ environment he lives in and the low intelligibility of his spoken productions, gestures might have developed a reinforcement function for efficient communication, allowing Antoine to overcome his linguistic limitations. The following quotation by Capirci et al. applies perfectly to Antoine’s situation:
The redundancy provided by representational gestures in equivalent combinations may function to reinforce the child’s intended message and seems to help the child who is both vocally uncertain and still moderately unintelligible to ensure that her message is understood (Capirci et al., 1996, p. 668).

However, his propensity to rely on gestures might also have been encouraged by an additional factor, namely input processing in a bilingual environment. Exposure to two languages implies dealing with linguistic forms varying in two codes for the same function. Even if there seems to be no specific delay in lexicon development when child production in both languages is considered, as we have seen, it takes some time for the bilingual child to elaborate equivalents in French and Italian. He has had a more limited exposure to each language than French and Italian monolinguals and his vocabulary and syntax are more limited in each language at this point of his language development (cf. Pearson et al., 1997). By contrast, the symbolic gestures analyzed in this study represent stable forms, shared in both the Italian and the French input, accessible to all his interlocutors whatever the situation might be, and therefore they might have been easier to adopt and difficult to abandon. As mentioned by Nicoladis (2007), we found no specific advantage for gestures to compensate for lack of vocabulary in his weaker language, Italian, as opposed to his dominant language, French. However, gestures seem to be quite a useful resource to give more pragmatic strength to his negations and might also be a convenient semiotic device to package his opposition:

Gestures only rarely serve a compensatory function for bilinguals’ weak language proficiency. Instead, gestures might more commonly function to lighten the cognitive load of choosing among possible ways to package a message and / or accessing words (as has been found for monolinguals) (Nicoladis, 2007, p. 451).

Interestingly, the code-mixed utterances (and nonces) found for negation cover the same period where cross-modal combinations are most frequent, namely between 2;0 and 2;6, although the former are less numerous than the latter. If some sequences lead us to think that the gestural modality is exploited like an effective means of communication, understood by everybody independently of the French / Italian language environment, the same logic seems to apply to constructions like manon for negation and elà or kakosé for requests: the child invents several constructions that initially bridge the gap of linguistic differences between the two languages and are comprehensible in both cases. Actually, aside from no / non, the child seems to have no other pairs of French/Italian translational equivalents till 2;6, at least in the analyzed films. The resourcefulness Antoine has developed during that transitional period to compensate for the relative delay in his linguistic productivity in Italian and French, and for the advantage his brother seems to have in the auditory space (Michel speaks more and louder than his younger brother)
seems to be consistent with the effects of birth order observed by previous studies. Indeed, Antoine might have increased pragmatic ability (Hoff, 2006) and has developed interesting communicative skills as he resorts to two creative strategies: the use of gestures and of code-mixing in order to make his message highly accessible to all his interlocutors in all linguistic situations as well as in a loud environment, especially when he is in competition with his older brother (making his utterances not only audible but visible).

Transitional systems

At the beginning of his multimodal and multilingual path into negation, Antoine negates with actions and gestures. The visual modality decreases over time. Spoken negations in French start at 2;0 and become predominant as of 2;06, spoken negations in Italian, his weaker language also begin at 2;0 but are rare and slowly increase until they become quantitatively close to the French ones at 3;06. We find combinations of modalities mostly at 2;0 and 2;06 and code mixing at 2;0 and 2;06 as well.

We have presented two strategies in Antoine’s data that could be defined as transitional systems. Antoine relies on gestures, i.e., the visual modality relatively longer and more frequently than the other children studied in our project and in the literature who stop using equivalent word + gesture constructions around 2;0 (Morgenstern et al., in preparation).

The bilingual environment of Antoine’s home could be considered as not being linguistically constant since his mother and father each speak to him mostly in their respective native language, and sometimes code-switch. Further, his bilingual home is quite different from his monolingual daycare, so he continually needs to code-switch and adjust to his linguistic environment. But gestures are a stable element for negations since they are the same in French and Italian. There is moreover some competition for the auditory space since his older brother Michel talks loud and a lot.

Gesture might therefore have a compensatory function for this little boy as it attracts positive responses from both his parents. It is a wonderful resource to communicate efficiently in his specific environment during his multimodal, multilingual entry into language.

Interestingly enough, when he does enter the verbal modality, he is quite creative in his code-mixing of Italian and French as if he also found a way to construct some instances of a mixed language that could be understood under all circumstances (at least the ones he experiences in his daily life) as with gesture. The correlation between multi-modal and code-mixed utterances seems important to us, as it shows how the child resorts at the same time to different modalities and to items
from different languages to reinforce communication in all conditions, before he can use each of them in a separate way.

Antoine has therefore created efficient transitional systems during his developmental path both by combining modalities and by mixing his two native languages. In the case of this bilingual little boy, the necessity to enter two languages at once might have an influence on the management of the visual-gestural modality, which is a stable resource to rely on in all the types of linguistic environments Antoine experiences. Antoine’s bilingual environment could be connected to the creation of his mixed verbal productions also addressed to both French speaking and Italian speaking interlocutors. Those two creative transitional systems are transitory but they are efficient elements of his communicative repertoire during an important period of his multimodal and bilingual language development. Other studies of bilingual children would of course be needed in order to confirm whether bilingualism does correlate with a lengthened use of gestures and coincide with the use of code mixing in order to serve as complementary transitional systems into the mastery of bilingual communication.

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A bilingual child’s multimodal path into negation


Authors’ addresses

Sandra Benazzo
Université Paris 8
UFR Sciences du langage
2 rue de la Liberté
93526 Saint-Denis
France
sandra.benazzo@gmail.com

Aliyah Morgenstern
Université Sorbonne Nouvelle — Paris 3
Institut du monde anglophone
5 rue de l’Ecole de médecine
75006 Paris
France
aliyah.morgenstern@gmail.com

About the authors

Sandra Benazzo has recently been appointed as Professor at the University Paris 8, where she teaches topics related to the acquisition and teaching of French as a second/foreign language and bilingualism, after having been associate Professor at the University of Lille 3 for many years. Since 2010 she is Co-Editor of the journal Language Interaction Acquisition. Her research
focuses on different aspects of the development of bilingual and second language varieties by applying a functionalist perspective.

Aliyah Morgenstern is currently Professor at the University Sorbonne Nouvelle — Paris 3 where she teaches English linguistics and language acquisition. She has published books and papers on language acquisition using socio-pragmatic, constructionist and functionalist perspectives on spontaneous longitudinal data. She directs research projects on children’s linguistic development. She works in collaboration with a team of young linguists, psychologists and speech therapists who analyze children’s prosody, gestures, phonology, morpho-syntax and discourse with a multimodal approach to child language.