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NOTE

Yes or no? How young French children combine gestures and speech to agree and refuse*

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ABSTRACT

The aim of the study presented here was to examine variations in the forms and functions of agreement and refusal messages – which can be solely gestural, solely verbal, or combined gestural and verbal – by thirty children aged 1;4, 2;0, and 3;0 (ten in each age group) observed at home during an interaction with their mother. The results showed that even though verbal forms were the predominant ones as a whole, gestural forms were carried over into the linguistic period, and for the youngest children, constituted the sole means of agreeing and refusing. They also showed that the most frequently expressed function was assertion.

INTRODUCTION

The purpose of this article was twofold: firstly, to bring to the fore a largely unexplored facet of communicative development in children, agreement and refusal messages, whether gestural, verbal, or combined gestural and verbal, and secondly, to find evidence of the emergence of pragmatic skills for producing these two types of messages.

The question–response format is one of the first means adults use to initiate a dialogue with a young child. By the middle of their second year, children start agreeing or refusing (Volterra & Antinucci, 1979) in response to questions from the adult, and in doing so, they quickly learn how to adapt to the partner's demands. Although traditional work on prelinguistic communication has focused on the child's first words, it has recently become obvious that gestures must be taken into account in the study of communicative development (Capirci, Iverson, Pizzuto & Volterra, 1996; Iverson & Goldin-Meadow, 1998; Goldin-Meadow, 2000; McNeill, 2000).

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There are two schools of thought concerning the role of gestures in the development of communication. In one view, gestures are seen as a transition mechanism implemented during the period when the child is learning to combine two words (Capirci *et al.*, 1996). In the other view, gestures – particularly conventional ones – are employed as a specific mode of communication throughout development, where they serve to qualify, reinforce, or even replace speech when talking is not possible. Some conventional gestures, such as pointing or nodding and head-shaking, are acquired prior to their verbal counterparts and are gradually combined with the vocal modality, first with vocalizations and then with words. Other gestures are learned at the same time as language and thus appear later as part of the repertoire of conventional gestures specific to the child's culture (Guidetti, 2002). Their study requires a pragmatic approach. If McNeill (1998: 26) was right in saying that 'conventional gestures add pragmatic effects by performing speech-act like functions', then a legitimate question is whether this theory – the speech act theory – might be applicable to non-linguistic behaviours and the prelinguistic period. Indeed, communicative development involves not only learning message content (vocalizations, gestures, words) or *forms*, but also and very quickly, acquiring their *functions*, that is, how those forms are employed in ways specific to different contexts and addressees, and how such and such an effect can be produced.

The purpose of the present study was to analyse the agreement and refusal forms young children use to fulfill the various functions of these two types of messages. Communicative functions will be analysed here in reference to speech act theory (Searle, 1979; Searle & Vanderveken, 1985; Vanderveken, 1990*a*, *b*). According to this theory, five types of acts can be achieved by speaking: assertives, directives, expressives, commissives, and declarations. Because of the status and minimal linguistic proficiency of the children under study here, only the first three speech acts were taken into account. Assertives engage the speaker regarding the truth of the statement he/she is making: the psychological state being expressed is a belief. With a directive, the speaker attempts to make the addressee do something. Expressives serve to express a psychological state.

Speech act theory was initially developed to describe the relationships between the forms and functions of linguistic utterances, but it can also be used to analyse behaviour that is not linguistic, notably, the conventional gestures that children produce during the prelinguistic period. However, this is only possible if gestures are viewed as genuine communicative acts that can be produced and understood separately (without being accompanied by language), and whose illocutionary force – what the act achieves – can equal that expressed by words. For instance, agreeing and refusing can be expressed gesturally by nodding or shaking one's head. In the French culture, there are approximately ten gestural forms for expressing refusal, including

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shaking one's finger and putting one's hand forward with the palm facing the addressee (Calbris & Montredon, 1986).

Agreeing and refusing are responses to propositions from another person, and as such, it is in effect the adult who determines the function of the young child's message. One can agree or refuse in order to express a point of view about the speaker's statement (e.g. *It's a nice day today. Yes/No*), or one can agree or refuse to indicate one's desires about what the other person does (e.g. *Do you want me to give you some yoghurt? Yes/No*), or finally, one can agree or disagree to express a psychological state (e.g. *Are you happy? Yes/No*). In the first case, the agreements or refusals are assertives, in the second they are directives, and in the third they are expressives.

This paper was aimed at showing how, by the end of their second year, children combine words or vocalizations with gestures to express agreement or refusal. Aside from the much-studied pointing gesture (Franco & Butterworth, 1996; Kelly, 2001; O'Neill & Topolovec, 2001; Kita, 2003), gestures of agreement and refusal are among the first to appear. They are important for monitoring interactions, and young children rely on them frequently. However, there are no systematic pragmatic studies that look into gestural and verbal agreements and refusals at the point in development when these messages are emerging or have just emerged. There are some minor references to agreement and refusal messages in studies on the development of negation. For example, Clark & Clark (1977: 348) found that the first expressions of negation are gestural, possibly combined with a single word. But most of the negation research deals solely with verbal forms of negation (see for example Tam & Stokes, 2001), the only exception being the early article by Jakobson (1972).

In the research pertaining more generally to communicative development in young children, including the pioneering work by Bates, Camaioni & Volterra (1975); Bates, Begnini, Bretherton, Camaioni & Volterra, 1979; recently pursued by Volterra, Caselli, Capirci & Pizzuto, 2004, agreement and refusal messages are mixed in with other gestural and verbal productions that do not have the same status or function. As the authors of this article stress themselves, the terminology employed to refer to the communicative behaviors of young children needs to be standardized. Their category called REPRESENTATIONAL GESTURES, for example (see also Iverson, Capirci & Caselli, 1994; and Capirci *et al.*, 1996), encompasses three subcategories that differ in status and function: PREDICATES, NOMINAL GESTURES, and CONVENTIONAL GESTURES. Predicates are used to describe the characteristics of an object or a situation, such as putting one's hands up in the air to mean *big* or shaking a hand to mean *too hot*. Nominal gestures, which are childish compositions that disappear with mastery of the language, serve as labels for objects or things in the environment; they are either action-imitating

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gestures like pretending to drink from a cup, or movement-imitating gestures like opening and closing the mouth to mean *fish*. Finally, conventional gestures (also called GESTURAL ROUTINES; Bates *et al.*, 1975) include nodding or shaking the head to say *yes* or *no*, putting one's first finger across the lips to say *be quiet*, or saying *good-bye* by waving a hand.

It seems important to examine these behaviours because they have been neglected so far in the study of communicative development, even though they are used frequently by children and may even be present before the corresponding lexicon is acquired. Along this line, a previous study (Guidetti, 2000) showed that in a situation purposely set up to induce agreement or refusal messages, the messages took on verbal, gestural, or combined forms, and performed at least two functions (assertive and directive). In that study, the responses of children aged 1;9 and 2;3 were 27% gestural, 21% combined, and 52% verbal, for all types of messages, acts, and age groups pooled. There were more gestural and combined responses for agreements than for refusals, while the opposite was found for verbal responses, where refusals outnumbered agreements. Note also that in this situation designed to trigger agreements and refusals accompanied by their corresponding conventional signs (head shaking and nodding, and verbal responses), about one fourth of the responses were other types of assertives consisting of labels used by the child to name or repeat the name of the toy or animal shown by the adult. In some cases the children's responses expressed irrelevance (*There's no dog*).

When gestural and verbal forms are found in conjunction with each other to express agreement or refusal, it is also interesting to examine the types of combinations used. Capirci *et al.* (1996) proposed classifying gesture/speech combinations into three categories: EQUIVALENT when the word and the gesture express redundant messages, COMPLEMENTARY when the word and the gesture together complete the message, and SUPPLEMENTARY when the gesture refers to an element that is semantically different from the word.

The present study was thus aimed specifically at showing that the forms used to express agreement and refusal vary with age (here, ages 1;4, 2;0, and 3;0) and with speech-act type (assertive, directive, or expressive). Another goal was to compare the results obtained in everyday settings with those obtained in a prearranged situation (Guidetti, 2000) and with older children. Verbal forms of agreement and refusal were expected to be the most common, followed by gestural forms alone, and finally, by combined forms. Among the joint gestural/verbal forms, equivalent ones should be the most frequent type (a *yes* or *no* gesture accompanied by a spoken *yes* or *no*). Finally, as noted in Guidetti (2002), messages expressing assertions were expected to be the most prevalent.

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METHOD

Participants

Three groups of children from Paris or the Poitou-Charentes region of France were observed. Each group was comprised of ten children (five girls and five boys). The youngest children were aged 1;4 (mean 1;4.25, *S.D.* 14 days). The second age group was made up of children aged 2;0 (mean 1;11.27, *S.D.* 23 days). The oldest children were aged 3;0 (mean 2;9.15, *S.D.* 10 days). All children came from a middle-class home and their native language was French. Recruiting was done by contacting pediatricians, day-care centres, and preschools (for the oldest children).

Materials

The children were observed in their homes as they interacted with their mothers in three everyday settings: meal or snack time, playing with their own familiar toys, and playing with unfamiliar toys brought by the observer. The settings were comparable to the ones used by Capirci *et al.* (1996). However, unlike these authors who used unfamiliar toys as a medium for symbolic activity, the unfamiliar toys chosen here could not be operated without the help of an adult, and for this reason, they acted as a support for mother–child interaction. The unfamiliar toys were a top, a sound-making tube, two mechanical toy animals, and a wheel that produced what looked like sparks when a button was pressed. The objects were presented in a closed box that was relatively difficult to open. The familiar toys included object-insertion toys, puzzles, books, and blocks.

Procedure

Each mother–child dyad was filmed for approximately 50 minutes in the three settings described above. Before the observation period, the experimenter put the camera on a tripod, set the lens at a wide angle, and left the room. Then the mothers were asked to interact and play with their child as they would normally do, but without leaving the filming area. At least 16 minutes were observed in each situation. The filming was interrupted and set up again in a new spot if the need arose (e.g. if the child moved to another room or location). Given the type of data collection and analyses conducted here, the observation time had to be quite long: because agreement and refusal gestures are produced in conjunction with or in place of speech, as stated above, it was desirable to create the most favourable conditions for observing the largest possible number of different messages that would fulfill various functions.

Coding and analysis

The videotapes were transcribed in full. Each tape was transcribed twice and coded twice. For each child, 15 minutes of interaction in each setting

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were selected. The first minute was never analysed, making a total of 45 minutes per child (15 for each of the three situations). No distinction was made in the analysis between the different settings.

Coding the forms. The coding of the agreement and refusal messages took into account the verbal, gestural, and combined gestural/verbal responses. The form of these messages was determined in the following manner. There were two categories of verbal forms: *yes* (*oui*) and *no* (*non*). The *yes* category also included *well yes* (*ben si*), *but yes* (*si*), *yeah* (*ouais*), and *okay* (*d'accord*). The verbal refusal category included responses that were more sophisticated than the simple *no*, such as *don't want to* (*veut pas*). As in the Guidetti study mentioned above (2000), responses called LABELS were noted; they occurred when the child agreed and named the object or action mentioned by the mother in the previous speech turn. For example, the mother said, *Do you want the apple?* and the child agreed by repeating *The apple*. Among the gesture-only responses, there were ones where the children nodded or shook their head, and ones where they refused by shaking their index finger or putting their palm forward (as if to say *stop*). Combined responses were a mixture of the above gestural and verbal forms.

Coding the types of gesture/speech combinations. The nature of the combinations was determined on the basis of the categories defined by Capirci *et al*. (1996). The equivalent category consists of redundant gesture/speech combinations where the gesture and the word refer to strictly the same referent and have exactly the same meaning (e.g. nodding the head accompanied by *yes*). The complementary category is composed of combinations where the gesture and the word refer to the same referent but one of the two elements brings in a nonredundant piece of information that disambiguates the referent (e.g. the mother proposes yoghurt for the child's snack, and the child answers *not yoghurt* and shakes his/her head). In this example, *yoghurt* represents a non-redundant element that distinguishes this type of combination from the preceding one. Finally, the supplementary category consists of gesture/speech combinations which refer to the same referent or to different referents, but where each element of the combination adds information to the other (e.g. nodding the head accompanied by *again*).

Coding the functions. The functions of the agreement and refusal messages were then determined using the communication act categories defined above. Each message was classified as an assertive, a directive, or an expressive. Assertives allow the speaker to state whether or not he/she thinks something is true; in other words, the child tells the adult how things are in the world (e.g. the child is playing with puzzle pieces, and the mother points to a piece and says, *What's that? Is it a pig?* The child replies by nodding). With directives, the speaker attempts to make the listener do something (e.g. the child is snacking, and the mother says *Do you want me to give you an apple?* The child agrees verbally). Expressives give information about the

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TABLE 1. *Mean length of utterance and mean number of agreement and refusal messages* (standard deviation in parentheses) *in each age group*

	MLU	NAR
Age 1;4	1·08 (0·5)	13·1 (20·49)
Age 2;0	1·7 (0·26)	66·0 (48·54)
Age 3;0	2·72 (0·69)	89·1 (37·11)

NAR = Mean Number of Agreement and Refusal messages (total).

psychological state of the speaker (e.g. a mother and child are playing together, and the mother says *Are you happy?* The child responds by nodding).

Validity of the coding. All videotapes were transcribed and coded separately by two trained coders. After the coding, any differences of opinion were analysed by a third coder, and the final classification chosen was the one given by the majority of the coders. The formula for calculating the agreement rate was the one used by Capirci *et al*. (1996, borrowed by these authors from Sears, Rau & Alpert, 1965; and Kratochwill & Wetzel, 1977), which consists in dividing twice the number of agreements by the total number of observations. A mean agreement rate of 81% (range 71 to 92%, depending on the subject) was obtained for the initial coding of all messages.

RESULTS

Before presenting a detailed analysis of the agreement and refusal messages observed, a few remarks on the children's speech are in order. The mean length of the utterances (MLU) produced by each age group is given in Table 1.

These data are consistent with the norms for these ages (Miller & Chapman, 1981). A one-way ANOVA with three levels (ages 1;4, 2;0, and 3;0) revealed a significant effect of age on MLU ($F(2,27) = 25·67$, $p < 0·00001$). *Post hoc* pairwise comparisons confirmed that each age group was significantly different from each of the others (Tukey HSD test, $p < 0·002$ or better).

For all categories and age groups pooled, a total of 1682 agreement and refusal messages were produced by the children. There were 131 for the 1;4 age group, 660 for the 2;0 age group, and 893 for the 3;0 age group.

First, a one-way ANOVA with three levels (ages 1;4, 2;0, and 3;0) was computed on the mean number of agreement and refusal messages (NAR) presented in Table 1. It yielded a significant effect of age ($F(2,27) = 10·96$, $p < 0·003$). *Post hoc* pairwise comparisons showed that the 1;4 age group was significantly different from each of the others (Tukey HSD test,

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TABLE 2. *Mean number of agreement and refusal messages in the three age groups* (standard deviation in parentheses)

	Agreement	Refusal
Age 1;4	7·5 (12·84)	5·6 (8·84)
Age 2;0	25·3 (27·92)	36·4 (2·48)
Age 3;0	61·4 (33·01)	26·1 (12·31)

$p < 0{\cdot}01$ or better). Thus, for all agreement and refusal messages taken together, it can be concluded that as the children grew older, they produced more and more agreement and refusal messages.

Ninety-five percent of the responses were 'ordinary' verbal, gestural, or combined responses (*yes* and/or nodding, *no* and/or head shaking). Only these responses were considered in the subsequent analyses. The discarded 5% of the responses were labels (see 'Coding the forms' for information on how the categories were coded) and gestural refusals made with a movement of the index finger or the hand.

The next analysis was conducted to find out whether there was a difference in the production of the two types of messages: agreement and refusal. The children's responses, divided into the two types of messages, are presented in Table 2.

The three age groups were compared on the mean number of agreement and refusal messages using a two-way ANOVA: (3) age × (2) message type. It yielded a significant effect of age ($F(2,27) = 10{\cdot}62$, $p < 0{\cdot}0003$), a significant effect of the type of message ($F(1,27) = 5{\cdot}08$, $p < 0{\cdot}032$) and a significant interaction between age and message type ($F(2,27) = 12{\cdot}82$, $p < 0{\cdot}0001$). *Post hoc* pairwise comparisons indicated that the 1;4 age group was significantly different from each of the others (Tukey HSD test, $p < 0{\cdot}01$ or better). Thus, it can be concluded that as the children grew older, they produced more agreement and refusal messages and that the children agreed more than they refused. In addition, as the children grew older, they produced more agreement messages; by contrast, the number of refusal messages dropped at age 3;0, the difference between the 2;0 and 3;0 age groups was non significant.

Concerning the different message forms, verbal-only responses represented 76% of all messages, gestural-only, 15·2%, and combined, 8·8%. But, solely gestural messages were the most common type for children age 1;4 (71·8% of all responses). They were still present at the other two ages but with much lower percentages (13·3% at age 2;0 and 8·4% at age 3;0). So we can see not only that verbal forms increased with age (naturally), but also that gesture-only and combined forms – granted in the minority – persisted, even among the older children.

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TABLE 3. *Mean number of agreement and refusal messages, by age group and message form* (standard deviation in parentheses)

	Agreement			Refusal		
	Gestural	Verbal	Combined	Gestural	Verbal	Combined
Age 1;4	4·9 (9·24)	0·3 (0·48)	2·3 (5·16)	4·5 (8·56)	0·8 (1·22)	0·3 (0·67)
Age 2;0	5·7 (13·27)	16·3 (16·75)	3·3 (4·73)	3·1 (4·6)	30·1 (16·85)	3·0 (3·01)
Age 3;0	5·3 (6·63)	52·6 (32·3)	3·1 (4·3)	2·2 (2·25)	21·6 (12·47)	1·8 (1·31)

A three-way (3) age × (2) message type × (3) message form ANOVA was conducted for all agreement and refusal messages presented in Table 3. All three factors had a significant effect. The interactions between age and message type and between age and message form were significant. The effects of the first two factors (age and message type) confirmed the preceding results: (1) the older the children, the more agreement and refusal messages they produced ($F(2,27) = 10·5$, $p < 0·0004$) and (2) overall, there were more agreements than refusals ($F(1,27) = 5·2$, $p < 0·03$). Concerning the message form effect ($F(2,54) = 39·69$, $p < 0·00$), verbal messages outnumbered gestural and combined ones. The interaction between age and message type also confirmed that agreement messages increased with age as refusal ones dropped at age 3;0. The interaction between age and message form showed not only that verbal forms increased with age (naturally), but also that gesture-only and combined forms – granted in the minority – persisted, even among the older children. Concerning the age effect, *post hoc* pairwise comparisons confirmed that the 1;4 age group was significantly different from each of the others (Tukey HSD test, $p < 0·01$ or better), but the difference between the 2;0 and 3;0 age groups was nonsignificant. Concerning the message form effect, *post hoc* pairwise comparisons showed that the number of verbal messages was significantly higher from each of the others (Tukey HSD test, $p < 0·0001$ or better).

Gesture/speech combinations were analysed in terms of the three categories defined above, i.e., equivalent, complementary, and supplementary. The results are presented in Table 4. As the numbers were very small, particularly in the 1;4 age group, nothing has been done statistically. We can see that equivalent combinations outnumbered the others although the 1;4 age group produced very few combinations of this type. Supplementary combinations were less common in the oldest children and complementary combinations were infrequent at all three ages.

The next step was to analyse the agreement and refusal messages by communicative function (assertive, directive, or expressive – see Table 5). Overall, assertive messages (85·5%) significantly outnumbered directive (13%) and expressive (1·5%) ones. For each message type (agreement or

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TABLE 4. *Number of combinations of each type* (%, with raw scores in parentheses)

		Age 1;4		Age 2;0		Age 3;0	
	Total	Agreement	Refusal	Agreement	Refusal	Agreement	Refusal
Equivalent	73·5 (64)	0 (0)	10 (1)	26·5 (10)	63·5 (24)	56·5 (22)	18 (7)
Complementary	15 (13)	20 (2)	10 (1)	0 (0)	5 (2)	2·5 (1)	18 (7)
Supplementary	11·5 (10)	60 (6)	0 (0)	0 (0)	5 (2)	0 (0)	5 (2)

TABLE 5. *Mean number of responses per subject in each functional category* (standard deviation in parentheses)

	Agreement			Refusal		
	Assertive	Directive	Expressive	Assertive	Directive	Expressive
Age 1;4	4·1 (7·72)	3·4 (5·33)	0 (0)	4·3 (8·57)	1·3 (1·05)	0 (0)
Age 2;0	19·4 (20·95)	4·4 (5·48)	1·5 (2·27)	29·8 (13·61)	5·3 (7·28)	0·1 (0·31)
Age 3;0	56·4 (30·38)	3·6 (4·35)	1 (1·41)	26·6 (11·32)	2·5 (1·9)	0·2 (0·63)

refusal), the results were processed using a three-way (3) age × (2) message type × (2) act ANOVA. Results for expressive messages were dropped because numbers were very small and because there were zero frequencies for some children. All three factors had a significant effect. The effects of the first two factors confirmed the preceding results: (1) the older the children the more agreement and refusal messages they produced ($F(2,27) = 10{\cdot}85$, $p < 0{\cdot}0003$), although the difference between the 2;0 and 3;0 age groups was nonsignificant as confirmed by *post hoc* pairwise comparisons (Tukey HSD test, $p < 0{\cdot}01$ or better for the differences between the 1;4 age group and the two older ones), and (2) overall, there were more agreements than refusals ($F(1,27) = 4{\cdot}84$, $p < 0{\cdot}03$). Concerning the effect of communicative act ($F(1,27) = 77{\cdot}39$, $p < 0{\cdot}000$), assertive messages significantly outnumbered directive ones. The interactions between age and message type ($F(2,27) = 12{\cdot}66$, $p < 0{\cdot}0001$), age and act ($F(2,27) = 20{\cdot}62$, $p < 0{\cdot}000004$) and act and message type were significant ($F(1,27) = 4{\cdot}26$, $p < 0{\cdot}04$), as was the three-way interaction between age, message type, and act ($F(2,27) = 14{\cdot}93$, $p < 0{\cdot}00004$). The age-by-message interaction indicated that as the children

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grew older, they used more and more agreement messages. The age-by-act interaction indicated that as the children grew older, they used more and more assertives. The act-by-message interaction showed that the assertive agreement messages were the more frequent.

DISCUSSION

Several interesting findings were obtained in this study. The first is that as the children grew older, they produced more and more agreement and refusal messages. This is a reflection of a natural developmental effect indicating that with age, children adapt increasingly well to adult dialogue and respond in a relevant manner to the question–response format adults establish with their young ones via child-directed speech. Although this finding may appear obvious, this is the first time, to my knowledge, that a simultaneously developmental and pragmatic approach – and hence one that considers not only the forms but also the functions of messages – has been applied to examine the gestural, verbal, and combined agreement and refusal messages produced by young children during the transition between the prelinguistic and linguistic periods.

The second finding is that, as a whole, agreements outnumbered refusals. This 'tendency to agree' with the adult, which was already observed by Guidetti (2000) in a prearranged interaction situation, is worth noting once again, particularly because the research on this issue at the age range observed here has dealt with refusal more often than with agreement (e.g. Volterra & Antinucci, 1979). This is also the first time, to my knowledge, that agreement and refusal messages have been studied jointly in a natural setting. Most research in this area has dealt with verbal forms of refusal, or has mentioned gestural forms mixed in with other (e.g. the representational category in Capirci *et al.*, 1996) that have totally different statuses and functions. Moreover, the tendency to agree noted here supports the observation made some time ago by Clark & Clark (1977: 513), that negative sentences appear later in development than affirmative ones. This topic will be taken up again below in our discussion of the predominance of assertions.

The third finding is that the most common modality for expressing agreement and refusal was speech, although gestural messages were more prevalent among the one-year-olds, and even persisted in the three-year-olds, an age when children are well into the linguistic period. This points out the necessity of taking conventional gestures into account in the study of the development of communication, especially for children under two, for whom the gestural modality appears to be essential for agreeing and refusing.

The results for the different speech acts confirmed the prevalence of assertives, followed by directives and finally expressives, as already

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observed for all conventional gestures between the ages of 1;4 and 3;0 (Guidetti, 2002). They also confirmed the hierarchy observed in adults by Payrato (1993) for conventional gestures in Catalan. In the situations examined here, requests and expressions of psychological states were rare. It seems that, above all, adult–child interactions provide a means for the young child to share beliefs about the state of the world by agreeing or refusing. Such assertions usually express agreement rather than disagreement with the adult. The functions observed here for agreements and refusals are indicative of the emergence of pragmatic skills by the beginning of the second year, and of the continuity of those skills between the prelinguistic and linguistic periods. The function analysis revealed the merits of using speech act theory to assess this question, and of adapting this theory to nonlinguistic behaviour as early as the prelinguistic period.

This brings us finally to the general functions of agreement and refusal gestures, their utility in communication, and the necessity of studying them. As Goldin-Meadow (2000: 231) stated, 'gesture can serve as an additional window to the mind of the developing child' and as McNeill (2000) stressed, gestures and speech should be seen as complementary modalities in a communicative system where the subject will use the one best suited to the situation.

In regards to development, two things are important here. Firstly, the results presented above show that for agreement and refusal, the gestural modality is operational before the verbal modality. In other words, some of the youngest children exhibited a gestural *yes* and *no* before they used the corresponding words. This gap appears to be bridged quite quickly, however, since the verbal modality already prevailed by the age of two. The fact that these two age groups were in fact only eight months apart suggests that this period represents a turning point in the development of the ability to agree and refuse. After that, development in this area seems to slow down, as shown here by the absence of significant differences between the two-year-olds and the three-year-olds. Secondly, regarding combinations of gestures and speech, it seems that when both modalities are used, it is to reinforce the message – redundant (equivalent) combinations were the most frequent type in all cases for children between the ages of 2;0 and 3;0.

In conclusion, if in the course of development 'words supplant gestures as a symbolic medium' (Namy & Waxman, 2002), it is nevertheless true that for agreement and refusal, the gestural modality is always present, continues to develop, and is used by children to reinforce or replace their verbal messages. If we hope to gain insight into communicative development in children, it is therefore essential that we take into account not only its verbal facet but also its nonverbal facet, which together 'codetermine the meaning of an utterance' (Kelly, 2001: 345) and enable the child to better assimilate the pragmatic aspects of a conversation.

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