

THE EARLY ACQUISITION OF PROSODY IN BILINGUALS' WEAKER LANGUAGE

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ABSTRACT

This study reports preliminary data on the acquisition of prosody in French, the weaker language of two Korean-French bilinguals. More specifically, it looks for prosodic correlates of semantic categories in two-word utterances spoken in French by these bilingual children. The results suggest that two differentiated prosodic systems emerge quite early and rapidly in young bilinguals. By age 3 and within a 9-month regular contact with French, the prosodic competence of our bilingual children in French, their weaker language, obviously displayed native-like similarities with that of a control French monolingual child. These results are discussed in relation to the current debate: one vs. two systems in young bilinguals?

1. INTRODUCTION

Several studies have classified two-word utterances according to either semantic or grammatical criteria [1]. This body of research has favored a semantic approach rather than a syntactic one [2], [3]. But the former approach has received some criticism [4] due to the ambiguous status of some types of two-word utterances. Other studies, such as Halliday's [5], have been devoted to intonation, but they mainly concern the first words children acquire in their mother tongue.

The present paper will analyse the prosodic patterns of two-word utterances in a monolingual and two bilingual children, using two prosodic parameters: duration and F0 contours. According to Martin [6], in any linguistic system, two a priori independent structures are at work: an intonational structure and a syntactic one. The former seems to be associated to the latter in systematic ways. Following Martin's hypothesis, we will focus on this particular association within two-word utterances. We will argue that the intonational structure of such utterances can be mastered quite early and within a short time span in young bilinguals, even in their weaker language. The paper will thus raise two major questions:

- 1) Are there prosodic correlates of semantic categories in the two-word utterances of Korean-French children when they speak French?
- 2) Are similar correlates found in the speech of a monolingual French-speaking child?

We will conclude that Korean-French bilingual children master a native-like prosodic competence in French, their weaker language, and that they do so quite early.

2. METHOD

2.1. Subjects.

Two Korean born children came in Paris with their parents at the age of 3 months. They were raised in a monolingual

Korean family and their parents decided that their children would attend French school from age 2;6 on. From that time on, they spoke French at school and Korean at home. At the beginning of our data gathering, their ages were respectively 3;0 and 3;3 and French was their weaker language (a 6 to 9-month regular contact with French).

The French child used as a control in the study was born in Paris and is monolingual (age 2;2 when we started collecting our data).

2.2. Procedure and linguistic materials

The data come from these two Korean bilingual children and a French child, all speaking French. Each recording was carried out in the family milieu and lasted about one hour. Only spontaneous utterances --answers or explanations-- were selected for further analysis. Other utterances such as imitations or echoe answers were not taken into account. The conversations between the experimenter (first author) and the child typically involved questions such as: "what's this", "tell me what you see in the book", etc.

The mean lengths of utterance (MLU) for each of the three children were respectively 2.1 words (French F-JH, age 2;2), 1.83 (Korean K-GH, age 3;0) and 2.69 (Korean K-DY, age 3;3), with a global MLU of 2.16 words. As can be seen in Figure 1, the length of these utterances vary from 1 to 4 words and over. But one will notice that two-word utterances globally represent the highest percentage among all utterance types.

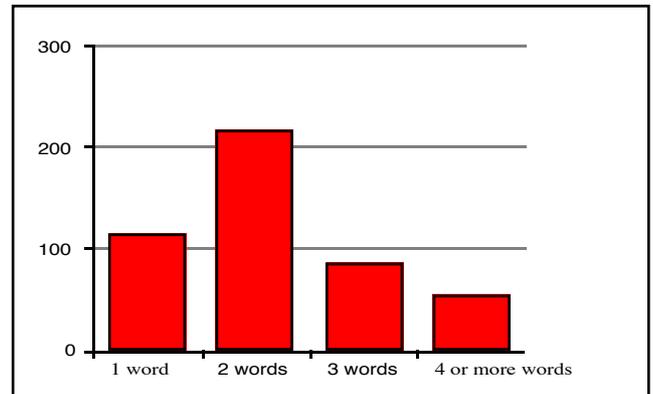


Figure 1. Number of occurrences of four types of utterances: one-word, two-word, three-word and four or more-word utterances. The data for the three children are pooled (N=496 utterances).

Clearly two-word utterances are the most frequent utterance type in these children, when age differences are ignored. Moreover they made up the most frequent type in each of the three children. This is the main reason why two-

word utterances were selected in the present study. These globally amount to 261 out of a total number of 496 utterances (53%): 110 (43%) by the French control, 19 (52%) by K-GH and 132 (63%) by K-DY.

3. DATA ANALYSIS

The selected data (261 two-word utterances) were analysed in two different ways: they were semantically and prosodically categorized.

3.1. Semantic categorization

A categorization of these two-word utterances was undertaken along lines borrowed from the semantic approach [2] and [3]. Six categories were selected:

- category 1(C1): agent-action
- category 2(C2): demonstrator-entity
- category 3(C3): agent-object
- category 4(C4): entity-attribute
- category 5(C5): action-object
- category 6(C6): action-localization

The experimenter classified the utterances according to those categories and two independent French judges confirmed the experimenter's classification.

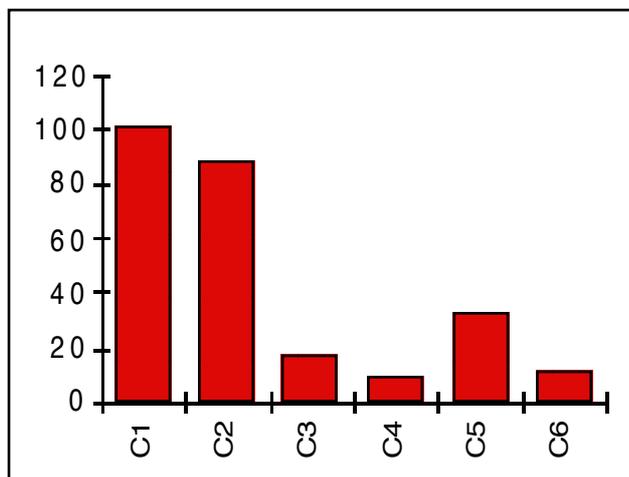


Figure 2. Number of occurrences of two-word utterances according to their semantic categorization (total N=261): six categories.

This table shows that categories 1 and 2 are by far the most frequently used by the children: C1 and C2 combined amount to 63% of the total number of utterances.

3.2. Prosodic categorization

A prosodic analysis of the utterances was undertaken using "Signalys", a speech processing and analysing program. An analysis of two prosodic parameters was carried out: the fundamental frequency F0 and the duration of each of the two items of our two-word utterances. This procedure allowed invariant patterns to emerge and enabled a categorization of the utterances into three specific prosodic patterns.

Categorization procedure

The utterances could first be divided into two subparts, according to the presence or absence of a pause between the two words (the median duration of these inter-word pauses was 100 ms):

- **with an inter-word pause**, two prosodic patterns emerged (P1 and P2):

<u>first word</u>	<u>second word</u>
P1: rising F0 contour	falling F0 contour
P2: falling F0 contour	flat or slightly falling F0 contour

- **with no inter-word pause**, a single pattern emerged:

<u>first word</u>	<u>second word</u>
P3: rising F0 contour	falling F0 contour

Description and distribution of the three patterns

The associations that were found are (C1 had to be split into two sub-categories):

P1: C1', C2, C5, C6

P2: C1"

P3: C3, C4

The corresponding distribution of patterns is shown in the next figure.

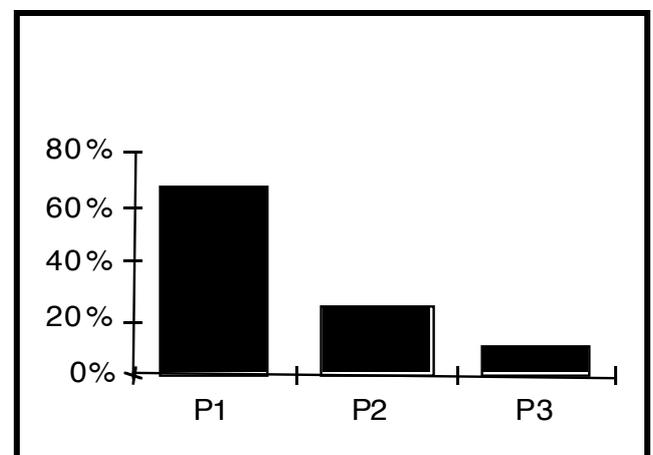


Figure 3. Percentage of two-word utterances according to their prosodic categorization (total N=261): three patterns.

This figure indicates that pattern 1 (P1) is the most widely used by our children (67%).

We will now examine how the 6 semantic categories and the 3 prosodic patterns are associated (section 4.1).

4. RESULTS

4.1. Prosodic correlates of semantic categories

A parallel examination of both the six semantic categories and the three prosodic parameters revealed a strong association between them:

all categories were uniquely associated with a particular pattern, except C1 which was partly associated with P1 and P2: C1' and C1" subcategories were then devised. The following associations thus appeared:

- C1', C2, C5 and C6 are clearly associated with a P1 prosodic pattern

- C1" is closely associated with P2

- C3 and C4 are associated with P3

These associations are presented in Table 1.

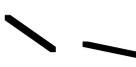
patterns	P 1	P 2	P 3
prosodic patterns			
sub-categories	C1', C2, C5, C6	C1''	C3, C4

Table 1. Global prosodic correlates of semantic categories.

The following figure shows how these patterns are distributed in our monolingual (French F) and bilingual (Korean K) children.

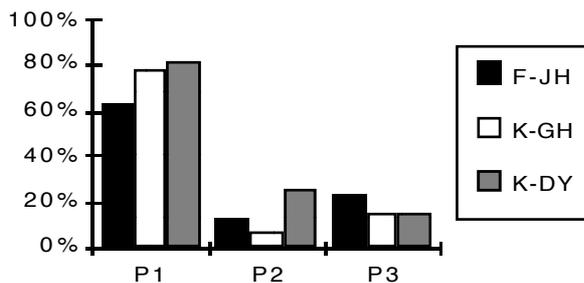


Figure 4. Distribution of prosodic patterns in the French (F) and Korean (K) children (total N=261).

4. 2. Similarities between our bilingual and monolingual children in French

4.2.1. A comparison of word durations

Globally (three children across all 6 categories), the average duration of the second word in two-word utterances (520ms) is longer than that of the first one (320ms). An independent t-test showed that this difference is significant: $t(40)=19,5$; $p<.0001$.

This difference (independent t-test) holds for the two bilingual children taken as a whole: $t(26)=17,5$; $p<.0001$ as well as for the monolingual child: $t(12)=9,6$; $p<.0001$.

No significant difference was found between the three children as regards the duration of the FIRST word (across the 6 categories). An ANOVA (repeated measures) showed that this difference across items was not significant: $F(2,12)=1,99$ ($p>.10$).

Moreover no significant difference was found between the three children as regards the duration of the SECOND word (across the 6 categories). An ANOVA (repeated measures) revealed that this difference was not significant: $F(2,12)=2,26$ ($p>.10$).

4.2.2. A comparison of the slopes of word intonation contours

- a between-subjects comparison:

Here we deal with the slope of each word intonation contour and not with F0 because each child has his own F0 characteristics. For example, K-GH's F0 varies between 250 and 450 Hz, whereas K-DY's does not exceed 350 Hz. To take this factor into account, we measured the slope using quarter tones instead of raw F0.

The results show that there is no difference between the three subjects, as regards the slope for the first word: an ANOVA (repeated measures) shows no effect of this factor: $F(2,12)=.77$, n.s.

As regards the slope of the second word, a similar result was obtained: $F(2,12)=.33$, n.s.

- a between-patterns comparison:

A comparison of the slopes associated with the first and the second word was computed taking the pattern type as a main factor. A single-factor ANOVA was conducted on the first word: $F(2,24)=38,11$; $p<.0001$, revealing a highly significant effect of this factor. A post-hoc analysis (PLSD Fisher) revealed that this effect is mainly due to differences between patterns 1 and 2 on the one hand, and between patterns 2 and 3 on the other hand.

But a similar ANOVA, conducted on the second word, did not reveal any differences: $F(2,24)=2,06$; $p>.10$.

In sum, the between-subjects comparison shows that no differences in slope could be found among the three children for both the first and the second element of their two-word utterances, suggesting that our bilingual children didn't differ from the control French monolingual child as regards their prosodic competence in French, their weaker language.

The between-patterns comparison shows that the same specific prosodic patterns are mastered by both bilingual and monolingual speakers.

5. CONCLUSION

The main aim of the paper was to show that specific prosodic patterns could be closely associated with particular semantic properties of two-word utterances in monolingual as well as in bilingual children aged from 2;2 to 3;3. It was also found that these specific prosodic patterns are equally mastered by both our monolingual and bilingual speakers, even though their weaker language is concerned (a mere 9-month regular contact with French). A third result showed that there was no difference between our bilingual and monolingual children in terms of prosodic patterns both for the first and the second element of spontaneous two-word utterances.

Taken altogether these preliminary results seem relevant in the "one vs. two systems" debate. In a recent study involving two-word utterances by young English-Spanish bilinguals, Deuchar and Quay [7] found evidence for "the appearance of two differentiated morpho-syntactic systems". But they did not raise this question in relation to prosody. The present results suggest that two differentiated prosodic systems also emerge quite early and rapidly (that is within a relatively short and regular contact with the weaker language).

Although the prosodic competence of our bilingual children in French, their weaker language, obviously displayed native-like similarities, more data implying younger and older children are necessary to further investigate this issue.

REFERENCES

- [1] Bloom, L, 1973, *One word at a time*. The Hague: Mouton.
- [2] Bowerman, M, 1973, *Early syntactic development: a cross-linguistic study with special reference to Finnish*, Cambridge University Press.
- [3] Brown, R, 1973, *A first language: the early stages*. Cambridge, Mass: Harvard University Press.
- [4] Howe, C. J, 1976, The meaning of the two-word utterances in the speech of young children, *Journal of Child Language*, 1976, 3, 29-47.
- [5] Halliday, M. A. K, 1976, *Learning how to mean; explorations in the development of language*.
- [6] Martin, Ph 1980, Pour une théorie de l'intonation: de l'acoustique à la sémantique, *Etudes Linguistiques*, XXV, 235-271.
- [7] Deuchar, M & Quay, S, 1998, One vs. two systems in early bilingual syntax: Two versions of the question *Bilingualism: Language and Cognition*, 1 (3), 231-243.