

## THE ACQUISITION OF PERSON PRONOUNS IN FRENCH-SPEAKING CHILDREN \*

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Revised version received August 1986

The study reports data on the acquisition of person pronouns by 29 French-speaking children, aged between 18 and 30 months. The results show that this acquisition proceeds according to a regular developmental sequence, which parallels that found in research with English-speaking children. However, it appeared that the French-speaking children in this study learned the pronouns about 2-3 months later than had been reported for English-speaking children. The results are interpreted as giving evidence about the selective contribution of general developmental mechanisms and socio-cultural and linguistic factors to young children's learning of person pronouns.

### Introduction

Early use of the personal pronouns *I* and *you* by young children has intrigued developmental psychologists and psycholinguists for some time (Cooley 1908; Huxley 1970; Macnamara 1982; Strayer 1977; Zazzo 1948). This interest is due in part to the cognitive skills presumed to underlie pronoun use (Bates 1976; DeVilliers and DeVilliers 1974; Maratsos 1973), or the light it can throw on the relative contribution of environmental versus endogenous factors in linguistic development (Oshima-Takane 1985; Petitto 1983); in part it is due to the importance

\* This article is based on a master's thesis submitted by the first author to the Université du Québec à Montréal. This research was supported in part by a scholarship of the province of Quebec (F.C.A.C.) to the first author and a research grant to the second author.

The authors wish to express their gratitude to Andrée Pomerleau and Gérard Malcuit for reading a draft of the manuscript and contributing valuable comments. They also wish to thank the teachers of the daycare centers of the Université du Québec à Montréal, the Université de Montréal, and of the Saint-Edouard-, Soleil-, and Sourithèque nursery schools.

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of pronoun use in signaling the emergence of a concept of self (Fraiberg and Adelson 1973; Lewis and Brooks-Gunn 1979; Zazzo 1948) and to its role in diagnosing pathological language development (Estienne 1982; Fay and Schuler 1980).

While a fair amount of reliable data are available concerning pronoun acquisition in English-speaking children (Bloom et al. 1975), relatively little systematic information has been reported regarding French-speaking children (Gagné and Pagé 1981; Rondal and Brédard 1982). The purpose of the present study is to furnish such information and to compare this to similar data from English-speaking children. In fact, it may be expected that pronoun acquisition in French children would show some variation relative to that of English-speaking children due to differences in the surface structures of the two languages (Slobin 1973; Kail 1983). For example, English has no precise equivalent to the common French construction of extraposed pronoun forms (e.g., *'moi, j'aime les chats'*, etc., where a French speaker immediately gives herself away when using the equivalent pattern in English: 'Me, I like cats'). On the basis of Slobin's (1973) operating principles according to which children tend to pay particular attention to acoustically salient and isolable surface expressions, one might expect that this surface feature of French might facilitate the acquisition of at least the emphatic pronoun forms by French-speaking children. On the other hand, the non-emphatic pronoun forms should, and have in fact been observed to be more difficult in French than their English counterparts (Feider 1981) due to their sentence-internal position (e.g., *'je te l'ai déjà dit'* versus 'I already told you so').

The present study focuses on the initial stages in the acquisition of person pronouns in French-speaking children by testing a developmental hypothesis first proposed (and partially confirmed) by Charney (1980) in work with English-speaking children. The hypothesis predicts an acquisition sequence on the basis of a cognitive-pragmatic model of language development and proposes a sequence involving at least two successive levels: (1) the child comprehends the pronoun 'you' (and its variants) when it is addressed to her and is able to refer to herself as 'I' when commenting an action performed by herself or when viewing a photograph or mirror image of herself; (2) the child is able to comprehend 'I' produced by another and to produce the pronoun 'you' when addressing a conversational partner. Since this model appears to account for the bulk of the data collected to date on English-speaking children

(Bloom et al. 1975; Charney 1980; Clark 1978; Macnamara 1982; Strayer 1977), it will be interesting to examine pronoun acquisition in French children in the light of this model. Such data would allow certain inferences to be drawn concerning the relative role of linguistic as compared to general developmental factors in young children's acquisition of person pronouns.

Accordingly, the present study presents data on young French-speaking children's acquisition of first-and-second-person pronouns obtained in two standardized situations, similar to those used by Charney (1980), but taking care to evaluate both comprehension and production in equivalent contexts (Charney's production data came from spontaneous interactions, while here comprehension data were collected using an elicitation technique). In this way, it will be possible to test, in more rigorous a fashion, Charney's model of psycholinguistic development, while simultaneously furnishing some basic information concerning development of person pronouns in French-speaking children, i.e., chronological age and mean length of utterance in relation to the various levels of pronoun development.

## **Method**

### *Subjects*

The subjects were 29 middle-class children, 13 boys and 16 girls between 18 and 30 months ( $\bar{X}$  = 23 months). The children were contacted through various daycare centers located in middle income districts in the Greater Montreal area. All children came from monolingual French-speaking families.

### *Materials*

One polaroid camera, one 9 cm<sup>3</sup> block covered with 6 different pictures (a cat, a monkey, a bear, the experimenter, and photographs of the child and her parent); three small bowls filled with raisins; one Sony cassette recorder (model T-44) were used in the experiment.

### *Procedure*

In phase I of the study, the experimenter and a research assistant familiarized themselves with the children by playing and conversing with them informally during one or two free play periods. During this phase, the assistant wrote down 100 consecutive spontaneous utterances per child. This speech sample served to calculate MLU, used as an indicator of linguistic development.

In phase II, two standardized tasks were administered individually in a separate room, usually in the morning just after the parent had brought the child to the pre-school. The parent remained present throughout the experiment and acted as co-experimenter. In this way, a relaxed game-like atmosphere was created, in which the child cooperated spontaneously.

### *The experimental tasks*

#### *(1) Transfer of raisins (T.R.)*

In this task, the parent, the experimenter, and the child were seated in a circle on the floor. Each participant received a bowl of raisins and it was made clear to the child that each of them had their own bowl of raisins (an idea readily understood by all children).

Comprehension was assessed by means of a series of four questions, which were asked alternately by the parent and the experimenter, while taking a raisin out of either her own or the child's bowl, pretending not to be able to see, after having donned a blind-fold. Two questions were of the form '*Est-ce que c'est mon raisin?*' (Is this my raisin?) where the correct answer was 'yes' on one occasion, 'no' on the other. The two remaining questions were of the form '*Est-ce que c'est ton raisin?*' (Is this your raisin?), again with the correct answer being 'yes' once, and 'no' the other time. Each question was asked twice by the parent and three times by the experimenter, so that the probability of obtaining a correct score for anyone of the two pronouns by chance was  $p(5) = 0.0312$ .

Production was tested similarly, except that the questions were of the form '*À qui est ce raisin?*' (Whose raisin is this?), to which the child had to answer '*à moi*' (mine) or '*à toi*' (yours) depending on which bowl the raisin had been taken from.

#### *(2) Identifying photographs (I.P.)*

For this task, the child's and the parent's photo were taken just prior to the task and pasted onto the 9 cm<sup>3</sup> block, which already contained the four remaining pictures. As for the T.R. task, the experimenter and the parent took turns asking the child to identify the photographs, pointing either to their own or the child's picture.

Comprehension was assessed by means of two questions of the form: '*Est-ce moi?*' (Is this me?), with the correct response being 'yes' on one occasion, 'no' on the other, and two questions of the form: '*Est-ce toi?*' (Is that you?), again with the correct answer being 'yes' once, and 'no' the other time.

Production was assessed in a similar way, using four questions of the form: '*Qui est-ce?*' (Who is this?), alternately asked by the parent and the experimenter pointing to their own and the child's photo respectively. A correct pronoun production consisted in answering '*toi*' (you) or '*moi*' (me) respectively on the proper occasions. If the child answered by using her own name, as happened sometimes on this task, the question was reformulated as follows: '*C'est qui [child's name]?*' ([child's name], who is that?).

For both tasks, the eight questions were presented in a different random order to each child. Half the children received the T.R. task first, the other half the I.P. task.

### Scoring

Scoring consisted in attributing one point for each correct pronoun use. A pronoun was considered to have been used correctly, if the child responded appropriately on each of the five occasions the pronoun was tested. Separate pronouns scores were attributed for comprehension and production and for the two tasks. Total scores, thus, varied from 0 (no correct pronoun use) to 4 (both pronouns used, both in comprehension and in production), for each of the two tasks.

Scoring of the child's spontaneous utterances obtained in phase I of the study was analysed for mean length of utterance (*MLU*) following the procedure described by Brown (1973: 54). Adaptation to the French language did not pose any special difficulties. Interscorer agreement calculated between two independent judges was 98% following some practice.

### Results

Scalogram analysis using Green's (1956) index of consistency was used to evaluate the hypothesis of a developmental sequence in pronoun performance, stipulating a regular progression from an initial level (level 0) where children do not use or comprehend any pronominal forms to two intermediate levels where they comprehend a pronoun addressed to them ('*toi*' – level 1) and can use a pronoun when speaking of themselves ('*moi*' – level 2) to the more advanced levels where they give evidence of comprehending pronouns referring to the other ('*moi*' – level 3) and finally address others by using a pronoun productively (level 4). Given this theoretical acquisition sequence, the most direct way to test its validity on the basis of the results obtained is to subject the data to an order theoretic method of analysis. Such methods have, in fact, been used successfully in Piagetian research (Bart and Airasian 1974; Jackowitz and Watson 1980; Longeot 1964; Watson and Fisher 1977) to demonstrate the reliability of observed acquisition sequences with dichotomous data. Among the various methods available, Green's index of consistency has the advantage that it incorporates a test of statistical independence, while Guttman's reproducibility coefficient (*R*) is evaluated only by a simple threshold criterion ( $R > 0.90$ ). Green's index of consistency is obtained by the formula

$$I = \frac{Rep - Ri}{1 - Ri},$$

where *Ri* is the reproducibility coefficient expected if the items were independent of each other and hence not ordered in terms of a predictable sequence.

A summary of the results applying Green's scalogram analysis are shown in table 1. It can be seen that for the T.R. task the responses of 26 out of 29 children formed a perfect scale where the order of difficulty obtained corresponded precisely to the predicted sequence. Green's index of consistency for this task was 0.60 – well above Green's criterion value of 0.50. On the P.I. task, only 23 out of the 29 subjects scaled perfectly, and Green's index was only 0.52, still above criterion. Hence, on both tasks, the hypothesized acquisition sequence is supported by the data.

Table 1

Distribution of subjects scaled at five levels of pronoun development on two tasks, T.R. and P.I.: scalogram, number of exceptions, mean age and *MLU*-values associated with each level of pronoun development.

Level of pronoun development	Pronoun reference				Task					
	Child		Other		T.R.			I.P.		
	Comp 'toi'	Prod 'moi'	Comp 'moi'	Prod 'toi'	<i>N</i>	<i>CA</i>	<i>MLU</i>	<i>N</i>	<i>CA</i>	<i>MLU</i>
1	0	0	0	0	3	18.7	0.84	13	20.1	1.07
2	1	0	0	0	9	20.7	1.25	3	21.0	1.20
3	1	1	0	0	4	21.0	1.48	1	24.0	2.10
4	1	1	1	0	7	24.4	2.32	8	25.5	2.00
5	1	1	1	1	6	28.6	3.26	4	28.2	3.10
Total scaled										
T.R.	27	28	29	29	26					
I.P.	27	25	29	29	23					
Exceptions										
T.R.	2	1	0	0	3					
I.P.	2	4	0	0	6					

There were a total of 5 scale errors involving three subjects on the transfer task and 7 scale errors involving 6 subjects on the P.I. task. Nine of the 12 errors were first-order errors involving items in adjacent order of difficulty, the remaining three were second-order, where two more difficult items were passed with an easier item failed. Given the magnitude of *I*, the index of consistency, and the fact that these errors represent no more than roughly 7 percent of the total number of errors possible (5.7% for the transfer task and 8% on the identification task) in an array of  $29 \times (4-1) = 87$  independent observations, this number of errors can be considered quite tolerable. In fact, a closer look at the nature of these scale errors reveals that they are due to only two sources: (1) the use of the child's own name instead of the pronoun 'moi' - this was particularly evident in the picture identification task, where 5 of the 7 scale inversions of this type occurred; and (2) inattention (lack of responding) to comprehension questions involving 'toi', which accounted for the remaining 5 scale errors, of which two occurred on the picture task and three on the transfer task.

Table 1 also shows the mean ages and *MLU*-values associated with each of the five pronoun levels. It can be seen that corresponding to each advance in pronoun use, there is a regular progression in both age and *MLU*, particularly for the T.R. task. The relationships between these variables, are uniformly high and significant (table 2), lending additional support to the developmental validity of the five pronoun levels revealed by the scalogram analysis.

Finally, the data in table 1 indicate that there is a systematic performance lag between the two tasks. It appears that the children evidenced pronoun use at younger ages and lower *MLU*-values on the T.R. as compared to the P.I. task, particularly at

Table 2  
Intercorrelations between *MLU*, age and pronoun scores for two tasks (T.R. and P.I.).

	Age	Task T.R.	Task P.I.
<i>MLU</i>	0.92 <sup>a</sup>	0.84 <sup>a</sup>	0.84 <sup>a</sup>
Age		0.80 <sup>a</sup>	0.79 <sup>a</sup>
Task T.R.			0.84 <sup>a</sup>

<sup>a</sup>  $p < 0.001$ .

the first three pronoun levels. This difference is statically reliable ( $t(16) = 4.24$ ,  $p < 0.001$ ). At the two upper levels, this task difference disappears ( $t(11) = 1.91$ ,  $p = 0.08$ ).

## Discussion

The results substantiate the findings of previous research on acquisition sequences for person pronouns, extending them to a group of French-speaking children in Quebec. Taken together, these results indicate that by 29 months and at an *MLU* level of 3.2, the children have fully mastered 1st and 2nd person pronouns in both comprehension and production (level 5). This is somewhat earlier than the age levels reported in diary studies of French-speaking children. In fact, Grégoire (1947) reported productive use of first person pronouns between 22 and 29 months, of second person pronouns between 30 and 36 months. Zazzo (1948) also notes pronoun use around 24 months, but only in fixed expressions, while creative use does not appear before 32 months. Apparently, these diary reports provide somewhat conservative estimates of children's abilities, when compared to the data of the present study. This may be related to the method of data collection, which in the case of diary studies is restricted to the 'sample one happens to catch' (Huxley 1970). By examining a larger sample of children in standardized situations, it was possible to furnish more detailed information about the way 1st and 2nd person pronouns are acquired by French-speaking children and about age and psycholinguistic development (as measured by *MLU*) associated with each successive level of pronoun mastery.

Comparing our results to the data reported on English-speaking children we found somewhat later acquisition ages and higher *MLU*

levels. In fact, the literature on English-speaking children indicates that acquisition of first and second person pronouns is well established (corresponding to level 5) at 26–27 months and *MLU* of 2.5 (Bloom et al. 1975; Charney 1980; Strayer 1977). There is, thus, no support for the idea that the frequent use of extraposed ‘*moi*’ in French facilitates the acquisition of this particular pronoun as compared to English, where such use is not common. The fact that our subjects seemed to learn pronouns about two to three months later than do English-speaking children may be due to other differences in the surface structures for pronominal expressions in the two languages, i.e., the presence of gender marking in French possessives (*ma*, *mon*) versus a single surface form in English (you); the periphrastic form of possessive nominals (*à moi*, *à toi*) versus forms generated with a suffix (mine, yours) in English. Another way to explain the observed differences may be that our subjects were recruited from day-care centres, while those observed by Charney (1980) and Strayer (1977) had their mothers as primary caretakers. Since the frequency of dyadic interaction, particularly with adults who present the child with relevant speech role models is greatly reduced in day-care settings as compared to the home environment, it is likely that exposure to person pronouns would also be quite limited under those conditions. Further research is necessary to decide between these various interpretations and to identify the factors – linguistic and socio-cultural – determining the rate of pronoun acquisition in French- as compared to English-speaking children.

As to the role of socio-cognitive processes involved in the use of person pronouns, our data are compatible with the acquisition sequence postulated in Charney’s model (1980), which thus appears to have a certain generality, irrespective of the surface properties of individual languages. On the other hand, there may well be individual differences in children’s acquisition of person pronouns depending on the child’s interaction style (Nelson 1973). Such differences would best be detected by longitudinal case studies, such as Macnamara (1982) and Huxley (1970), while experimentally obtained data such as those presented here are better suited to provide information on communalities in language performance, which in turn might prove quite suggestive in the formulation of specific research questions to be explored with individual children.

It remains for us to discuss certain counterintuitive implications this model seems to have concerning the conceptual status of the child’s use

of the first person pronoun. In fact, it appears that children are able to use this pronoun when speaking about themselves, while being unaware of the fact that the parent also refers to herself, when saying 'I'. This paradox has been discussed in depth by Macnamara (1982), without finding a satisfactory solution. One might be tempted to appeal to psychodynamic mechanisms, which lead the child to identify with the parent and, when using language, to re-enact the role she has seen the parent play in speech events by using 'I' the same way. Only later will the child use conceptual thought in establishing the precise referential meaning of the term she has been using for some time, when speaking of herself or when being addressed by the adult. In other words, the early 'unconscious' use may be restricted to the speech role meaning of pronouns, with the full referential meaning becoming established only later (Strayer 1977).

Some independent evidence for this interpretation comes from our finding that children displayed more advanced pronoun abilities on the T.R. task as compared to the P.I. task, since the latter required the child to use referential meaning explicitly, while the former only required matching speech roles in a situation involving simple actions. A similar effect had already been noted by Charney (1980), who found that her youngest subjects were unable to complete a picture identification task, while being quite competent in comprehending pronouns in the context of simple actions, such as 'brush my/your hair', etc.

In conclusion, this study has shown a course of psycholinguistic development that paralleled that found for English children, pointing to certain universal features in the psycholinguistic process of pronoun acquisition. This is best interpreted as showing the importance of the socio-cognitive base underlying pronoun acquisition as opposed to earlier theoretical positions based on linguistic feature substitution and cognitive decentration (Clark 1978; DeVilliers and DeVilliers 1974). Future research should be addressed towards systematic comparisons of acquisition ages of English and French children in equivalent settings (e.g., Montreal day-care centers). Given the differences frequently observed in the age levels at which language-delayed children begin to use pronouns productively (Curtiss 1977; Fraiberg and Adelson 1973; Fay and Schuler 1980; Estienne 1982), it would be of interest to extend the present observations to children with various speech and language pathologies to see if these children acquire pronouns according to the same acquisition sequences documented here, and could thus

be assumed to function on the basis of similar socio-cognitive mechanisms as postulated in Charney's model for normally developing children.

## References

- Bart, W.M. and P.W. Airasian, 1974. Determination of the ordering among seven Piagetian tasks by an ordering theoretic method. *Journal of Educational Psychology* 66, 277–284.
- Bates, E. 1976. *Language and context: the acquisition of pragmatics*. New York: Academic Press.
- Bloom, L., P. Lighbown and L. Hood, 1975. Structure and variation in child language. Monograph of the Society for Research in Child Development, Vol. 40.
- Brown, R., 1973. *A first language: the early stages*. Cambridge, MA: Harvard University Press.
- Charney, R., 1980. Speech roles and the development of personal pronouns. *Journal of Child Language* 7, 509–528.
- Chiat, S., 1982. If I were you and you were me: the analysis of pronouns in a pronoun reversing child. *Journal of Child Language* 8, 75–91.
- Clark, E., 1978. 'From gesture to word: on the natural history of deixis in language acquisition'. In: J.S. Bruner and A. Garton (eds.), *Human growth and development*, Wolfson College Lectures. London: Oxford University Press.
- Cooley, C.H., 1980. A study of the early use of self-words by a child. *Psychological Review* 15, 339–357.
- Curtiss, S., 1977. *Genie: a psycholinguistic study of a modern-day 'wild child'*. New York: Wiley.
- DeVilliers, P.A. and J.G. DeVilliers, 1974. On this, that and the other: nonegocentrism in very young children. *Journal of Experimental Child Psychology* 18, 438–447.
- Dore, J., 1975. Holophrases, speech acts and language universals. *Journal of Child Language* 2, 1–20.
- Estienne, F., 1982. 'Retard de langage, dysphasie et audi-mutité'. In: J.A. Rondal (ed.), *Troubles du langage: diagnostic et rééducation*. Bruxelles: Mardaga.
- Fay, W.H. and A.L. Schuler, 1980. *Emerging language in autistic children*. Baltimore: University Press.
- Feider, H., 1981. 'Quelques traits du développement linguistique chez le jeune enfant francophone de Montréal'. In: G. Gagné and M. Pagé (eds.), *Études sur la langue des jeunes québécois*. Montréal: Presses de l'Université de Montréal.
- Fraiberg, S. and F. Adelson, 1973. Self-representation in language and play: Observations of blind children. *Psycho-Analytic Quarterly* 42, 539–562.
- Gagné, G. et M. Pagé (eds.), 1981. *Études sur la langue des jeunes québécois*. Montréal: Presses de l'Université de Montréal.
- Green, B.F., 1956. A method of scalogram analysis using summary statistics. *Psychometrika* 21, 79–88.
- Grégoire, A., 1947. *L'apprentissage du langage: la troisième année et les suivantes*. Paris: Droz.
- Huxley, R., 1970. 'The development of the correct use of subject personal pronouns in two children'. In: Flores d'Arcais and W.J.M. Levelt (eds.), *Advances in psycholinguistics*. Amsterdam: North-Holland.
- Jackowitz, E.R. and M.W. Watson, 1980. Development of object transformations in early pretend play. *Developmental Psychology* 16, 543–549.
- Kail, M., 1983. L'acquisition du langage repensée: les recherches interlangues. *L'Année Psychologique* 83, 225–258.

- Lewis, M. and J. Brooks-Gunn, 1979. *Social cognition and the acquisition of self*. New York: Plenum Press.
- Longeot, F., 1964. *Psychologie différentielle et théorie opératoire de l'intelligence*. Paris: Dunod.
- Macnamara, J., 1982. *Names for things*. Cambridge, MA: Bradford Press.
- Maratsos, M.P., 1973. Nongocentric communication abilities in preschool children. *Child Development* 44, 697-700.
- Nelson, K., 1973. Structure and strategy in learning to talk. *Monographs of the Society for Research in Child Development* 38 (1-2, Serial no. 149).
- Oshima-Takane, Y., 1985. Do children learn from speech not addressed to them? Paper presented at 1985 SRCDC Biennial Meeting, Toronto, April.
- Petitto, L., 1983. From gesture to symbol: the relationship between form and meaning in the acquisition of personal pronouns in American Sign Language. Unpublished doctoral dissertation, Harvard University.
- Rom, A. and R. Dgani, 1985. Acquiring case marked pronouns in Hebrew: the interaction of linguistic factors. *Journal of Child Language* 12, 61-77.
- Rondal, J.A. et S. Brédart, 1982. 'Langage oral: aspects développementaux'. In: J.A. Rondal (ed.), *Troubles du langage: diagnostic et rééducation*. Bruxelles: Mardaga.
- Schiff-Myers, N.B., 1983. From pronoun reversals to correct pronoun usage: a case study of a normally developing child. *Journal of Speech and Hearing Disorders* 48, 394-402.
- Shiple, E.F. and T.E. Shipley, 1969. Quaker children's use of thee: a relational analysis. *Journal of Verbal Learning and Verbal Behavior* 8, 112-117.
- Slobin, D.I., 1973. 'Cognitive prerequisites for the development of grammar'. In: C.A. Ferguson and D.I. Slobin (eds.), *Studies of child language development*. New York: Holt, Rinehart & Winston.
- Strayer, J., 1977. The development of personal pronouns in two-year-olds. Unpublished doctoral dissertation, Simon Fraser University.
- Watson, M.W. and K.W. Fisher, 1977. A developmental sequence of agent use in late infancy. *Child Development* 48, 828-836.
- Zazzo, R., 1948. Image du corps et conscience de soi. *Matériaux pour l'étude expérimentale de la conscience*. *Enfance, Psychologie, Pédagogie, Neuro-Psychiatrie, Sociologie* 1, 28-43.

L'étude porte sur l'acquisition des pronoms personnels chez 29 enfants francophones, âgés de 18 à 30 mois. Elle montre que cette acquisition se fait selon une séquence régulière qui est la même que celle déjà rapportée pour les enfants anglophones. Cependant, les enfants francophones semblent apprendre les pronoms environ 2-3 mois plus tard que les enfants anglophones. La discussion porte sur la contribution relative des mécanismes généraux de développement et des facteurs socioculturels et linguistiques dans l'acquisition du système des pronoms personnels.