Bilingual Education: Social Psychological Consequences

BILINGUAL EDUCATION:

SOCIAL PSYCHOLOGICAL CONSEQUENCES

by

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A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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Montreal

July 1974

Abstract

The present research was designed to assess the effects of bilingual education on the social development of elementary school children. Three groups of children were tested--all were native speakers of English: one group attended English schools with English-speaking teachers (Control); one attended English schools with French-speaking teachers (Immersion); and the third group attended French schools with French-speaking teachers (French). The children's communication skills were evaluated in terms of sensitivity and effectiveness in two different situations. As well, the children were evaluated using two other tasks which manipulated perceptual and ethnolinguistic cues.

In the communication situation the French and Immersion groups were more differentially sensitive to their listeners than were the Control children; but they were neither more nor less effective as communicators than the monolingual children. In addition, the bilingual groups did not differ from the monolingual group in terms of role-taking--either in the perceptual task or in the social task. The bilingual children did, however, perceive themselves in a different way from the monolingual children. The results were discussed in terms of the impact of bilingual education on the children's social sensitivity to others.

Résumé

Cette recherche a été conçue afin d'évaluer les effets de l'éducation bilingue sur le développement social des enfants au niveau élémentaire. Trois groupes d'enfants furent évalués--tous ayant l'anglais comme langue maternelle; un groupe fréquentait les écoles anglaises avec des professeurs de langue anglaise (Groupe Contrôle); un groupe fréquentait les écoles anglaises avec des professeurs de langue française (Immersion); un troisième groupe fréquentait les écoles françaises avec des professeurs de langue française (Français). L'aptitude à communiquer des enfants fut évaluée en termes de sensibilité et efficacité selon deux situations différentes. De plus, les enfants furent évalués au moyen de deux autres tâches qui manipulaient les variables perceptuelles et ethnolinguistiques.

Dans la situation de communication, les deux groupes bilingues, Français et Immersion, étaient plus sensibles à leurs auditeurs que le groupe Contrôle; mais ils étaient ni plus ni moins efficaces comme communicateurs que le groupe monolingue. De plus, les groupes bilingues n'étaient pas différents du groupe monolingue dans les tâches perceptuelles et ethnolinguistiques. Cependant, les enfants bilingues se perçevaient d'une façon différente des enfants monolingues. Les résultats furent interprétés en termes de l'impact que l'éducation bilingue peut avoir sur la sensibilité des enfants envers les autres.

Acknowledgements

I would like to thank Drs. M. Bruck, D.M. Taylor, M.C. Corballis, W.E. Lambert, and especially G.R. Tucker for their advice during the course of this research. I would particularly like to thank Drs. Tucker and Lambert for their constant support and encouragement. I would also like to acknowledge the cooperation of the Protestant School Board of Greater Montreal, La Commission des Ecoles Catholiques de Montréal, as well as that of the principals, teachers, parents and children who participated in the studies. The research was supported by grants from the Canada Council and the Defense Research Board to W.E. Lambert and G.R. Tucker and by a National Research Council postgraduate scholarship to the author.

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Illustration

In the greater Montreal community an increasing number of elementary school children are enrolling in so-called "immersion programs". In its most common Canadian version, immersion education consists of native English-speaking children attending schools where the language of instruction is French. In most cases only the teacher speaks French; all of the children speak English as a native language and the school administration is conducted in English. The purpose of this type of education is to provide a school environment which will foster and facilitate the acquisition of a second language. There are other varieties of immersion. These include situations in which English-speaking children attend all-French schools and French-speaking children attend all-English schools.[1] The latter two varieties of immersion might be called total immersion, whereas the first mentioned variety might be called partial immersion.

In a country like Canada where there is a very large immigrant population, immersion education is indeed very common since immigrant children who must attend either French or English schools often possess little fluency in either of these languages at the start. Thus, immersion programs --which might be regarded as an exciting and innovative approach to second language learning for English and French Canadians--constitute a fact of life for many new Canadians.

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1. On the island of Montreal there are two major school boards, La Commission des Ecoles Catholiques de Montréal (CECM) which serves mainly the French-speaking population and the Protestant School Board of Greater Montreal which serves mainly the English-speaking population.

Undoubtedly, one consequence of immersion education for the participating students is greater mastery of a second language than they would achieve by following conventional second-language courses (Lambert & Tucker, 1972). But are there other consequences? The purpose of the present investigation is to explore the possible consequences of such programs on children in terms of social development. For example, one might expect children in early immersion programs to acquire certain social skills that others attending traditional native-language programs do not. In particular, children placed in a social setting where they can neither make themselves understood nor understand their teachers (in the case of partial-immersion programs) or their peers as well (in the case of total-immersion programs) might become more socially sensitive. This sensitivity may be especially evident in verbal communication. On the other hand, it is also possible that this type of situation would produce children who are poor in verbal communication and in other types of social situations because they are not allowed to communicate freely in their native language. Possible reasons for expecting an increase in sensitivity will be described later.

First, a review of the relevant research related to bilingualism and cognition, developmental bilingualism and bilingual education will be presented followed by a rationale for the current research and a number of specific hypotheses.

Bilingualism and Cognition

In 1939, Leopold suggested that bilingual children have a different rate of cognitive development than monolingual children. On the basis of his observational data, Leopold speculated that bilingual children learn to dissociate the phonetic aspects from the semantic aspects of words at an earlier age than monolingual children.

Worrall's South Africa Study

Recently, Ianco-Worrall (1972) has offered empirical support for Leopold's speculation. She compared bilingual and monolingual children, ranging in age from 4 years, 6 months to 7 years, 9 months, on a word-preference test. This test consisted of a series of three-word sets. Each set was made up of a reference word and two other words; one, phonetically similar to the reference word, and one semantically similar (for example, CAP: CAN . HAT). Each child was asked to select the word that he thought was more similar to the reference word. Ianco-Worrall found that more bilingual children chose the semantically-similar word, HAT in this case, than the phonetically-similar word, CAN. The monolinguals, on the other hand, more consistently chose the phonetically-similar word. This differential preference was evident only for the younger children; there was no difference in preference pattern between the older bilingual and monolingual groups. They all consistently chose the semantically-similar word. These results suggest that bilingual children are precocious in their preference for the semantic aspects of words, but that ultimately monolinguals perform equivalently.

In a second part of her research, Ianco-Worrall investigated the development of word-referent dissociation in monolingual and bilingual children.

Word-referent dissociation refers to the realization that words are, in principle, arbitrary labels for environmental referents, and that there is nothing absolute in word-referent pairings. In other words, a tree could be called dog as easily as tree. In order to test this, children were asked if, for example, a cow could, in principle, be called dog. In another part of the experiment they were asked questions of the sort "Why is a dog called dog?". Finally, they were asked to play a game in which they were to imagine, for example, that a cow is called pen, and vice versa. Subsequently, they were asked "Does the cow give milk?" (while holding up the pen), and "Can you write with the pen?" (while holding up the cow). This latter technique was developed by Vygotsky (1962).

Worrall found that the majority of her monolingual subjects reported that object names could not be interchanged even in principle, while the majority of her bilingual subjects agreed that, in principle, they could be. This finding suggests that bilingual children develop an earlier appreciation of the symbolic nature of words than do monolingual children.

For the question "Why is a dog called dog?", the explanations for both the monolingual and bilingual subjects were of the sort "because it barks...". Worrall called this type of answer "explanation by attributes".

For the question "Can you write with the pen?", there were no differences between the bilinguals and the monolinguals. These findings lend support to the notion of a distinction between linguistic competence and linguistic performance proposed by Noam Chomsky (1957). Stated simply, linguistic competence is an idealized and implicit set of rules used by a speaker to generate language. Linguistic performance is the actual realization of this rule system in some overt, behavioral form. The upper limit

of performance is established by competence levels. However, an individual's performance often falls short of the level established by his competence because of the interplay of other concomitant psychological factors such as memory, fatigue and attention. In the context of Ianco-Worrall's results, it may be said that the bilingual and monolingual subjects had attained different stages of competence when the bilinguals agreed that in principle words can be interchanged whereas monolinguals denied this possibility. By virtue of the lack of difference between the two groups on the third part of the experiment, however, there seemed to be no performance differences. From another point of view one might argue that the more sophisticated linguistic competence demonstrated by the bilingual children in the word-referent dissociation task was not manifest at a performance level since the way they used their language in the third part of the experiment was not different from that of the monolinguals. The monolinguals and bilinguals may have performed similarly because there were certain environmental constraints or task requirements which masked any underlying difference in competence. In theory, being bilingual could alter the competence level of one's native language or the performance level, or both. What is being suggested here is that, on the basis of Ianco-Worrall's results, being bilingual does affect one's competence ~~in the native~~ language, but, that there are also other psychological factors (memory and attention, for example) unaffected by the experience of being bilingual which minimize the behavioral manifestation of these underlying differences. This may be particularly true in more natural multi-dimensional situations where these non-affected factors will be more numerous, such as in unstructured play situations.

Peal and Lambert's Montreal Study

Peal and Lambert (1962) investigated the consequences of bilinguality on the more general aspects of cognitive development. They administered a battery of standardized tests to 164, 10-year-old, middle class children. All children were French Canadian and English was their second language. All children were 'balanced bilinguals'. A 'balanced bilingual' is generally regarded as someone whose proficiency in his second language equals that in his native language on a number of linguistic dimensions or on a number of performance tasks. The linguistic dimensions usually include such skills as speaking, writing, listening or reading (Macnamara, 1969). The tasks may include such tests as the Stoop test, word-association test, all of which were used by Peal and Lambert.

Their test battery included the Lavoie-Laurendeau Group Test of General Intelligence, Raven's Progressive Matrices and the Thurstone Primary Mental Abilities Test (PMAT). The bilinguals were compared to a group of monolingual children equated in terms of socioeconomic status (SES) and other pertinent factors. The bilinguals scored significantly higher than the monolinguals on the Raven's Progressive Matrices, the Lavoie-Laurendeau verbal and non-verbal subtests, the verbal meaning subtest of the PMAT and many of the other non-verbal subtests of the PMAT (such as Space, Figure-Grouping, Perception and Number).

Why might bilinguals perform better than monolinguals on some of these tests? Peal and Lambert offered three possibilities. First of all, bilinguals may have a greater tendency to take cognizance of the general properties of environmental events without reliance on their linguistic symbols. This may result from their having two symbols for each referent.

Secondly, bilinguals may develop greater 'cognitive flexibility' supposedly as a consequence of switching from one language to another or, more generally, from one symbol system to another. Thirdly, bilingual superiority may result from a possible wider range of experiences that might accompany a bilingual upbringing, such as exposure to another culture and a different set of social norms.

A factor analysis of their data yielded a greater number of independent factors for the bilingual group than for the monolingual group. Peal and Lambert leaned toward the possibility that bilinguals have greater cognitive flexibility than monolinguals and, thus, that they have access to a greater number of independent cognitive abilities in problem-solving situations.

Balkan's Switzerland Study

More recently, the possibility that bilinguals possess greater cognitive flexibility than monolinguals has been investigated by Balkan (1970) in Switzerland. He compared groups of French-English bilinguals with a group of monolinguals, aged 11 to 16 years. Both experimental group and control group were comparable in terms of socioeconomic status. There were two groups of bilinguals, "bilingues tardifs" and "bilingues initiaux". The former group were children who had become bilingual after four years of age while the latter group had become bilingual before the age of four. All of the bilinguals were balanced. Balkan administered the "Batterie d'aptitudes scolares collective" to his subjects. This battery consists of seven subtests: (1) dominos, a measure of general intelligence or "g"; (2) nuances and (3) synonymes transformés, measures of verbal aptitude; (4) divisions, a measure of numeric aptitude; (5) histoires, a measure of verbal flexibility;

(6) figures cachées, a measure of non-verbal or perceptual flexibility and (7) dates, a measure of general reasoning or R (Thurstone, 1938).

The three groups were equivalent on the dominos test which is an appropriate control for general intelligence. However, both bilingual groups, the bilingues tardifs and bilingues initiaux, scored significantly higher than the monolinguals on all of the other subtests, except for the two measures of verbal ability, nuances and synonymes transformés. The bilinguals performed significantly poorer than the monolinguals on the nuances test, and there was no difference between the groups on the synonymes transformés test. It is difficult to account for the findings on these two measures of verbal ability. It might simply indicate a vocabulary deficit attributable to the division of one's language-learning time between two languages. Both the nuances and the synonymes tests appear to require a minimum vocabulary for average performance. However, the bilinguals gave more associations in each of their two languages than did the monolinguals in their one on the word-association test, a measure of bilingual balance, thereby indicating that the bilinguals did not have a vocabulary deficit.

Thus, we again see evidence of superior general reasoning for a group of bilinguals as indicated by their superiority on the dates subtest. As well, the bilinguals' superiority on the histoires and figures cachées subtests suggests a greater ability to uncover underlying dimensions of complex stimulus arrays whether they be verbal, as in the histoires test, or perceptual, as in the figures subtest. These findings corroborate similar conclusions reached by Ben-Zeev (1972) using a different stimulus array; namely, a matrix of cylinders.

Ben-Zeev's Israel-New York Study

Ben-Zeev hypothesized that bilingualism accelerates general cognitive development, and specifically that it advances the onset of concrete operational thinking. She also hypothesized that bilingualism enhances the child's ability to analyze syntax.

Her sample consisted of two groups of balanced Hebrew-English bilinguals, one from Israel and one from the U.S.A. There was a monolingual English control group from the USA and a monolingual Hebrew control group from Israel. The children ranged in age from 5 years, 4 months, to 8 years, 6 months. By sampling accident the Hebrew control group tended to be younger than the other groups of children, both experimental and control, and they also tended to come from families of less affluent, although nonetheless "desirable" socioeconomic milieux.

She administered the following tests (1) Verbal Transformations Test (Warren & Warren, 1966); (2) symbol substitution test; (3) Paradigmatic Word Association Test; (4) Morphological Generalization Test; (5) Transposition Test (Bruner & Kenney, 1966) and (6) Raven's Progressive Matrices (1965). Tests (1) and (2) were used to measure 'verbal flexibility'; tests (3) and (4) to measure 'understanding of syntactic form'; tests (5) and (6) to measure logical operations.

In the area of verbal flexibility there was evidence that the bilinguals possessed greater skill at verbal, auditory reorganization than the monolinguals. This suggestion arose from their performance on the Verbal Transformations Test. In this test one word at a time was repeated continually by means of a tape loop, and the subject was asked to report what he heard. The two words that were chosen as stimuli were nonsensical in both Hebrew

and English and the phonetic structure of each word was consonant with both languages. In this task, the subject typically reports that the original word loses its meaning. Once this happens, he starts to hear words which are not really on the tape. The bilinguals heard a greater total number of words than the monolinguals and a greater number of different forms of the original word. As well, they heard the first word change earlier than the monolinguals and they reported more forms during the first 30 seconds. This was interpreted as greater perceptual, cognitive flexibility on the part of the bilinguals as they abandoned meaningless or de-semanticized stimuli and searched for new, meaningful ones.

With regard to 'an understanding of syntactic form', there were no between-group differences on the Morphological Generalization Test, whereas the bilinguals were vastly superior to the monolinguals on the Symbol Substitution Test. The former test requires the subject to generalize morphological rules by supplying appropriate inflections to a series of nonsense words used in varying contexts (e.g., "Here is a wug. Here are two _____."). The latter test is the same as Part 3 of the Ianco-Worrall study in which the names of objects were interchanged and the child was asked a number of questions about each object. The discrepancy between Ianco-Worrall's finding of no difference and Ben-Zeev's finding of superiority for the bilingual group is very puzzling and difficult to explain. Together the results from the Morphological Generalization Test and the Symbol Substitution Test suggest that bilingualism does not seem to affect the learning of ordinary grammar but instead results in an earlier breakdown of the "word magic" phenomenon or, in other words, an earlier realization that words are arbitrary labels for environmental referents. It is

questionable whether either of the tasks used by Ben-Zeev are really related to syntax and, consequently, whether her conclusions are valid.

On the Transposition Task the bilinguals were superior to the monolinguals in specifying the dimensions underlying a visual array. On the Raven's Progressive Matrices there was no significant difference in terms of correct responding between the bilinguals and the monolinguals but the bilinguals approached the task in a more analytic, systematic way. These findings led Ben-Zeev to conclude that bilingualism contributes to the advancement of concrete-operational thinking where verbal stimuli are involved but that it is not in itself sufficient to induce the onset of this stage of thinking in relation to non-verbal material.

In summary, Ben-Zeev comments:

> "The bilinguals' seek out the underlying dimensions in the patterns they confront. The patterns they seek out are primarily linguistic, but the same process also operates when visual patterns are confronted, as in the ability to seek out and name the dimensions involved in the Transposition Test. Having been confronted in early life with a verbal environment of unusual complexity in which the underlying order is difficult to discover because there are two orders, not one, the bilinguals seem to have developed compensatory mechanisms for seeking out that order. These mechanisms have become a cognitive trait and so they apply more broadly than to the original audio-verbal situation. The breadth of subject matter or situations for which this trait functions need further investigation." (1972, p. 208)

Cummins and Gulutsan's Western Canada Study

In an unpublished study, Cummins & Gulutsan (1973) investigated the effects of bilinguality on memory, reasoning and divergent thinking. They were also interested in whether the bilingual's preference for or proficiency in verbal as opposed to non-verbal, or imagistic, thinking is affected by his having two linguistic systems with which to organize thought processes. The latter question arises from Paivio's dual-processing theory of cognition (1971). Thus, both verbal and non-verbal forms of the memory, reasoning and divergent thinking tests were administered to a group of French-English bilinguals and to English monolinguals in grade 6. Using a variety of procedures, such as word association, subjective self-rating and teacher ratings they classified the bilinguals as either balanced or non-balanced. The following tests were administered to the bilinguals and monolinguals: (1) memory tests, a) free recall for separate lists of abstract and concrete words and b) a paired-associated recall test, again with separate lists of abstract and concrete words; (2) reasoning tests, three subtests (nos. 1, 2 and 4) of the Kuhlman-Finch Intelligence Test; these subtests include verbal and spatial abilities; (3) divergent thinking, a) Guilford Uses Test (1967), a measure of verbal divergence and b) Wallach and Kogan's Patterns Test (1965), a measure of non-verbal divergence.

Both bilingual groups performed significantly better than the monolingual group on the verbal-ability and general-reasoning subtests of the Kuhlmann-Finch Test. These results offer general confirmation of the findings by Peal and Lambert of superior concept formation, or general reasoning abilities, and superior verbal ability for bilinguals. The bilinguals were also significantly superior on the Originality part of the verbal test of

divergence. The monolinguals performed significantly better than the bilinguals on free recall for abstract words.

The finding of greater originality on the verbal test of divergent thinking should be interpreted cautiously as indicative of greater creativity for the bilinguals since other measures derived from both the verbal and non-verbal tests of divergence failed to show any differences between the groups.

The results were equivocal with regard to the bilingual's relative reliance on verbal or imagistic modes of cognitive processing. First of all, it is questionable whether the lists of abstract and concrete words that Cummins and Gulutsan prepared for the memory tests were adequate insofar as there was no difference, for either group, on free recall and on paired-associate recall with the abstract and concrete lists. In general, one would expect the concrete words to be recalled better than the abstract words (Paivio, 1971), by monolinguals and bilinguals alike. Secondly, the results from the Patterns and reasoning tests are inconsistent. For example, the monolingual group performed better than the bilingual group on the spatial abilities subtest of the Kuhlmann-Finch and on the fluency part of the Patterns test (the fluency measure is the number of proposed representations for each item). However, there was no difference in performance between the groups on the originality measure of the Patterns test. Thus, it is difficult to come to any definite conclusions about differential use of verbal and non-verbal coding systems by the two groups of subjects. Nevertheless, the bilinguals did exhibit greater verbal ability and greater reasoning ability than the monolinguals.

Cummins and Gulutsan also found significant differences between

the balanced and non-balanced bilinguals, in favor of the balanced group on measures of general reasoning, Uses' fluency (the number of different uses suggested), Uses' flexibility (the range of uses suggested), and Uses' originality. In other words, level of proficiency in the second language seems to affect the magnitude of difference in performance between bilinguals and monolinguals on some measures.

In summary, when we consider the data available from recent research it seems clear that bilinguality can offer an individual advantages above and beyond that of the ability to use two languages. The picture that emerges is one of greater flexibility for the bilingual. This flexibility is characterized by a greater number of independent mental abilities (Peal & Lambert, 1962), greater facility at uncovering the underlying dimensions of a stimulus array (Ben-Zeev, 1972; Balkan, 1970) and a greater willingness to change one's strategy in order to maintain meaningfulness (Ben-Zeev, 1972). The ability to uncover implicit stimulus dimensions seems to be part of a more general facility at concept formation (Peal & Lambert, 1962; Cummins & Gulutsan, 1973) that in turn may result from the bilingual's greater tendency to attend to the semantic aspects of words than to their phonetic aspects (Leopold, 1939; Worrall, 1972; Ben-Zeev, 1972) and an appreciation that, at least in principle, words are arbitrary labels for external referents.

Developmental Bilingualism

The research discussed in the preceding section dealt with bilinguals who have at least functional competence in their second language. This section will discuss studies concerned with children who are in the process of becoming bilingual.

The earliest investigations of developmental bilingualism were usually anecdotal. For example, in 1913 Ronjat reported the observations that he made of his son who was learning French and German simultaneously. He made two major observations. First, he reported that both languages were initially mixed in his son's speech. In other words, there was no systematic recognition or separation of the two languages. Secondly, he observed that one or the other language was dominant at various stages in his son's development. Thus, the language of the mother was dominant for several months when his son first started to talk. Two years later, French, the father's language, assumed dominance. Very similar results have been reported by Leopold (1939-1949). In both of these families, the father spoke one language to the child; the mother, another.

More recently, Swain (1972) has conducted a careful, systematic study of pre-school-aged children, who were raised from birth in bilingual homes. She was trying to discover whether children who learn two languages simultaneously perform similarly to the child learning each language separately, or whether bilingual development differs qualitatively from monolingual development. She gathered speech samples from her subjects by having them act as interpreters between two adults, each of whom the child was led to believe spoke only one language, French or English. In this way Swain was able to gather both English and French-language samples from the same subjects in a relatively natural setting.

Using these data, Swain investigated the acquisition of specific grammatical structures (e.g., the use of the interrogative) which she compared with the acquisition of these same structures in the speech of monolingual control children. She concluded that bilingual acquisition follows

essentially the same developmental pattern as monolingual acquisition.

The study by Swain is an example of some very important relatively recent research that studies bilingualism in the broader context of language learning in general. Other contributions of this sort have been made by Dato (1970), Kessler (1971) and Ravem (1968). An understanding of the acquisition of language by the monolingual child may be helpful in understanding better the mechanisms and effects of bilingual acquisition.

There is growing interest in those bilinguals who acquire their second language after their native language is fully developed (see Dulay & Burt, 1972, for a review). This group includes children and adults alike. Learning a second language then may differ from learning it together with one's native language. Some language-learning strategies used by adults who are acquiring a second language have been delineated by Lance (1969) Richards (1971), Selinker (1971) and George (1972). Similar studies with children have been done by Valette (1964), Ravem (1968) and Dato (1970). This type of bilingual, in fact, is the focus of interest in the present research-- elementary school children with a fully-developed first-language system who were becoming bilingual in a school setting. This will be described in greater detail later.

Bilingual Education

Although no one appears to doubt that learning two languages is possible and, judging by the number of "natural bilinguals" in the world, relatively easy, there are grave doubts about the success of learning a second language in school. As Macnamara (1973) points out "Language is a peculiar embarrassment to the teacher, because outside school, children seem to learn a language without any difficulty whereas in school, with

the aid of teachers their progress is halting and unsatisfactory", in most cases. While this conclusion is probably true in general, it fails to take into account the difference in time spent on language in school and outside the school. Besides, school may prove particularly useful in teaching the formal aspects of language, such as reading and writing, which might not be learned without school instruction.

Macnamara (1966) presents an extensive review of the bilingual-education programs that had been conducted until 1966. Bilingual education may include any school program whose objective is to produce children with functional linguistic competence in a second language. Functional linguistic competence may mean communicative competence in the target language so that the student may interact socially or conduct business effectively in the language, or it may mean mastery of the formal aspects of the target language, such as reading and writing. The most outstanding feature of most of the bilingual projects reviewed by Macnamara was their relative lack of success; not only did the children apparently not learn the target language adequately, but they seemed to suffer deficits in their native language skills and in intellectual functioning generally. There has been a tendency to attribute the failure of bilingual education to the limited, intellectual capacity of school children. Many evaluators in the past have made the implicit assumption that children have a certain limited amount of cognitive energy, that is fully required in a monolingual environment. Thus, the assumption proceeds, dividing cognitive energy between two different languages results in deficits to one or the other or both languages and possibly to general reasoning faculties. Biological and intellectual factors are undoubtedly important when considering second-language learning (Penfield

& Roberts, 1959; Lenneberg, 1967), but there are other factors to consider which are not as subject to the limitations of quantity that intellectual capacities are often thought to be. For example, the role of the psychological components of learning, such as attitudes and motivation, have been investigated by Gardner and Lambert (1972) and found to be influential in second-language learning. As well, one cannot ignore the social aspects of second-language learning, such as the general societal support for learning and maintaining a second language (Spolsky, 1974).

The failure of bilingual education programs often reflects more on the structure of such programs than on the feasibility of learning a second language in school per se. In particular, it has been suggested that learning a second language is essentially the same as learning one's native language (Tucker & d'Anglejan, 1970; Swain, 1972). Thus, the failure of second-language teaching is probably due, in part, to its failure to exploit the similarities between first and second-language learning processes (Tucker & d'Anglejan, 1970). Until relatively recently little effort has been expended in developing second-language teaching programs or techniques that reflect processes that we have all experienced in learning our native language. Of course, part of the difficulty resides in our ignorance of what these processes really are. Although we may not understand all of the cognitive concomitants of first-language acquisition, we do know one major environmental concomitant; namely, personal interaction in which verbal communication is vital. In the school setting, there has been insufficient emphasis put on the communicative aspects of second-language learning. The development of grammatical and phonetic competence have traditionally been the goals of foreign-language teaching.

In an attempt to create a situation in the school which was as analogous as possible to the environment that accompanies first-language acquisition, the St. Lambert Elementary School, near Montreal, initiated in 1965 a program of French-immersion education. Starting from Kindergarten, children whose native language was English were given course instruction in this program via French. For the first two years of school all course instruction was given in French by native French-speaking teachers. Beginning in grade 2, an English Language Arts program was introduced for two 35 minute periods daily. Gradually more and more English-language instruction was introduced until by grade 7, the final year of the program, instruction was divided approximately equally between French and English.

In June of each year children participating in this program were given a battery of tests to assess their scholastic and intellectual development. The findings indicated that the children performed at the same level as conventionally-educated, monolingual English children both academically and intellectually. Their English-language skills were equivalent to those of monolingual English peers and, at the same time, their French-language skills were better than those of children taught via traditional second-language courses.

This particular program has been so successful that approximately 40% of all eligible kindergarten pupils within the jurisdiction of the school board enrolled in similar immersion programs during the school year 1973-1974. In addition, similar programs have been set up in at least 14 schools on the island of Montreal under the jurisdiction of a different school board.

Current Research

Thus, there are a large number of children in the Montreal area who are becoming bilingual, to some degree, in school. It is surprising to the casual observer how calmly and quickly children appear to adjust to immersion programs. Nevertheless, one cannot ignore the challenge these children face by participating in such programs. Not only is there the linguistic challenge of mastering a second language, but there is also a socio-psychological challenge in the sense of being unable to communicate fully with their teachers. There is another group of elementary school children in Montreal for whom these challenges are even greater; namely, English-speaking children who attend French schools where their classmates as well as their teachers speak French. This was the group referred to as the 'total immersion' group in the first section of this introduction.

In programs modelled on the St. Lambert project, only the teacher is a native speaker of French so that the child always has the option of communicating with his peers in English, an option not generally available to children in total-immersion. In 1972-1973, 5.6% of the entire English school population in Quebec was enrolled in all-French schools while 1.9% of the entire French school population was enrolled in all-English schools. This comprises a full 35,420 elementary and secondary school students (Montreal Star, 1974). In 1973-1974, approximately 7% of the elementary school population of the Protestant School Board of Greater Montreal was enrolled in early immersion programs.

What effects might one expect such an educational program to have on the participating children? From a purely linguistic point of view these children could be viewed as facing a linguistic conflict in the sense of

having to coordinate two interdependent linguistic systems, French and English. According to Ronjat (1913) and to Leopold (1949), it was the resolution of linguistic interdependence that produced the cognitive enhancement that they noted in their children. Ben-Zeev (1972) has also argued that the resolution of conflict between two different linguistic systems was the main factor contributing to the advanced cognitive development demonstrated by her bilingual subjects. There also exists limited evidence from non-language related research to support the notion that cognitive conflict enhances cognitive development (Smedslund, 1961a,b; Inhelder & Sinclair, 1967). On these bases, therefore, one might expect the children in immersion programs to be more cognitively mature.

From a social psychological point of view, it has been shown that social perception develops with age (see Taguiri, 1968, for a review); that is, as children grow older they learn to judge more accurately emotions expressed either through facial features (Gates, 1923) or vocal ones (Dimitrovsky and Blau, 1964, see Davitz). Furthermore, Allport (1924) and Guilford (1929) suggested that children could be trained to improve their ability to recognize emotional expresssions. Although these findings were disputed by Jenness (1932), more recent research by Davitz (1964) supports the Allport-Guilford suggestion.

Very little research has been done to date on social perception in children as it relates to communication. That was the main focus of interest in the current investigation. Presumably, to communicate effectively one must be perceptive of and sensitive to the characteristics and needs of one's listener (e.g., being cognizant of the listener's age, intelligence, sex, language skills, and so on). The point here is that children who are

educated in French classes may develop heightened perceptual sensitivity. Support for this possibility comes from a consideration of the theories of Piaget (1971) and Vygotsky (1967).

The main index of development for both Piaget and Vygotsky--either cognitive or social--is egocentrism. Egocentrism is part of a more general cognitive style characterized by the child's preoccupation with single aspects of his environment to the exclusion of other, relevant details. The classic example of egocentrism, or centration as it more generally applies to cognitive development, is the young child's erroneous conclusion that when you pour liquid from one beaker into a second which is narrower but taller than the first that the second contains more liquid than the first. Such a conclusion is reached presumably because the child attends to the increased height of the second beaker but ignores its reduced diameter.

In a social context, egocentrism has most often been investigated by studying children's speech. Egocentric speech, as opposed to social speech (Vygotsky) or non-egocentric speech (Piaget), is defined as speech which is addressed more to the speaker himself than to the listener and therefore is non-communicative. As the child develops cognitively he becomes increasingly sensitive to and increasingly competent to handle more details in a given situation. At the same time, socially, he begins to differentiate between himself and the other, and becomes increasingly able to take the role of another. Such skills would seem to be essential for effective social interaction in general and effective communication in particular.

Vygotsky claims that when children are confronted by social

situations in which they believe they will not be understood by others they are prompted to make their speech more social or informative and less egocentric. To test this hypothesis, he had children interact with deaf-mute children or with children who spoke a foreign language. In both cases, he found that their index of egocentric speech was considerably less than it was when they interacted with other Russian-speaking children who had no physical handicaps. Similarly, English-speaking children who are exposed to a French-speaking teacher may become more sensitive to the demands of their listener as a result of their own communicational experiences in school. Because they are unable to communicate fully with their teachers in school--at least initially--they may become better able to take the role of others who are also experiencing communication difficulties.

Unlike Vygotsky, Piaget does not believe that language per se can affect development. He maintains that the level of the child's language competence is regulated by the level of his basic cognitive development. At the same time, Piaget claims that children's speech, which is characteristically egocentric or private at early ages, becomes more social and informative as a result of extensive social interaction with his peers. It is not entirely clear from Piaget's descriptions exactly what characterizes this peer interaction which he emphasizes as the stimulant to social development. Nevertheless, if the social milieu which characterizes French-immersion education is the sort Piaget has in mind, then his line of thought would also suggest that bilingual education could actually have a positive influence on the development of social skills, in particular, skills related to communication.

One might also expect that the child in a French immersion program

who is prevented from using his customary linguistic skills may compensate by attending more closely to other cues, such as facial expression, physical posture, tone of voice, etc. This need to develop compensatory strategies may produce children who are generally more sensitive to others than are children educated in their native language in the way Piaget says older children become more aware of and responsive to situational details. Thus, if one considers the linguistic situation faced by children in French immersion from a more general communicational point of view, then Piaget's theory does not entirely preclude an interaction between language development and general cognitive development.

Further evidence for the influence of social experience on basic social skills comes from the research of Hollos & Cowan (1973). They studied three groups of Norwegian children from three different settings--a farm community, a village and a town. According to the authors, the main difference between the three samples, from a social point of view, was the amount of verbal and social interaction between the children and their parents or their peers. The town children engaged in the most verbal, social interaction and the farm children the least. The children were tested on a number of measures of conservation, classification and role-taking à la Piaget. Although the farm children scored as well as the other two groups on the tests of logical operations, they scored significantly lower on the role-taking tasks.

The dissociation which Hollos and Cowan found between logical operations and social skills led them to propose two separate cognitive factors, a separate one related to each type of skill. Rubin (1973), however, argued for a single underlying factor which encompasses skills related

to both social tasks, such as role-taking, and logical or spatial tasks, such as conservation.

In summary, then, there is evidence that experience with and the ultimate coordination of two linguistic systems may result in cognitive enhancement (Ronjat, Leopold, Ben-Zeev); that experiencing communication difficulty causes children to become more sensitive to others and possibly to be better able to take the role of another (Piaget, Vygotsky). Furthermore, social experiences as well as stimulating social development may stimulate non-social development (Hollos & Cowan); however, this point has been disputed by Rubin.

The current research was particularly concerned with the development of social skills as reflected in communication. Thus, it was hypothesized that children in French-immersion programs would be more sensitive to a listener than would monolingual children. The possibility that the bilingual experience might make the children generally poor communicators could not be ruled out, however. In fact, the primary concern of parents and educators alike is that immersion education might have harmful effects on the children's native language development.

All testing was done in English, the children's native language, since it was felt at the outset that if different social skills develop from this experience they may, in fact, reflect basic underlying cognitive differences which should therefore manifest themselves even in the child's use of his native language, and not be restricted to his French-language behavior. Samples of children from kindergarten to grade 2 were tested in order to trace the development of differences in communication skills, if any.

To test the generalizability of any effects which might be revealed, a non-verbal test of perceptual skills was included (see Study 3). A modified version of Piaget's "Three Mountains Test", referred to as the Perspectives Test, was used. This test measures sensitivity which is in part social, but is primarily perceptual. According to the findings of Hollos and Cowan one would not necessarily expect any transfer from a social situation to a non-social, perceptual situation. On the other hand, Rubin's findings would lead one to expect a transfer from one type of task to the other.

The experimental group included: 1) children who attended all-French schools, where teachers and most pupils were native-French speakers, as well as 2) children who attended English schools where French was spoken only by the teachers. No research conducted to date has examined the cognitive consequences of attendance in all-French schools. It was expected that any social psychological effects would be more pronounced in the former situation than in the latter.

In summary, it was expected: 1) that children who become bilingual through immersion-type learning experiences would be more socially sensitive than a control group of monolingually-educated children, 2) that this social sensitivity would be revealed in communication tasks; 3) that the effects, if any, would be more pronounced in the totally-immersed than in the partially-immersed experimental children; and 4) that the effects might generalize to other non-social forms of behavior.

The Sample

Three groups of children were tested, two experimental and one control. The control group consisted of native-English speaking children living on the island of Montreal and attending English-language elementary schools under the jurisdiction of the Protestant School Board of Greater Montreal (PSBGM). A description of the actual schools will follow. The children in the experimental groups were also native-English speakers. The Immersion group comprised children attending schools within the PSBGM which offered a "French-Immersion Program". In these programs all course instruction in Kindergarten and Grade 1 is given in French. Starting in Grade 2 an English Language Arts course is taught for 30 minutes a day; otherwise, all other Grade 2 courses are taught in French. From Grade 3 on more and more English instruction is introduced until by Grade 7, the final year of the elementary program, approximately one half of the course instruction is given in English. The French experimental group comprised children who attended French elementary schools under the jurisdiction of the Commission des Ecoles Catholiques de Montréal (CECM). For the French group the majority of students and all teachers were native-French speakers; and, of course, all instruction was in French.

Children were selected from Kindergarten, Grade 1 and Grade 2 to participate in the investigation. The average age of subjects from each grade was 5.74, 6.60 and 7.55 years, respectively. An attempt was made to choose an equal number of boys and girls in each grade and each language group although this proved difficult to achieve within the schools selected for study. Table 1 presents the sample size and the ratio of boys and girls for each grade by sex and language-experience group.

Table 1

Sample Size

	K		1		2		
	Boys	Girls	Boys	Girls	Boys	Girls	Sub-total by Language Group
French	3	7	4	6	8	4	32
Immersion	6	5	6	6	5	6	34
Control	5	7	6	4	8	7	37
Sub-total by Grade	33		32		38		

The unequal number of children in each subgroup reflects the difficulty in finding children within the schools selected who met the following criteria: 1) coming from monolingual, English families (which meant that both mother and father had to be native-English speakers) and 2) having attended the same kind of school program from Kindergarten on (which meant that any who had switched during the course of their education were excluded).

The Schools

The children in the Immersion group all attended the same school which offers both an immersion program and a conventional English-language program. The children in the Control group were selected from two schools as were those in the French group. All five schools were located within a half mile of one another in a suburban area of Montreal. They were selected to be as comparable as possible in terms of socioeconomic milieu. To get information concerning SES, questionnaires were sent to the pupils' parents asking for their occupation. Not all questionnaires were returned even with repeated requests. However, since the return-rate was fairly high, 72% for the Control group and 84% for the two experimental groups, the results are probably representative of the entire samples. Working from the questionnaires, each occupation was given a value according to Blishen's socioeconomic index (1967) and an average socioeconomic rating was calculated for each school/language group. The resulting values were: French group, 5.7; Immersion group, 5.4; and Control group, 5.2.

Time of Testing

The testing took place between December, 1972, and December, 1973. In the first two weeks of December, 1972, Studies 1,2, and 3 were conducted with children in Kindergarten, Grade 1 and Grade 2. In June, 1973, Study 3 was repeated with the same children, and Study 4 was introduced using the subjects in Grade 1 and Grade 2. In December, 1973, Study 3 was repeated a second time with the same subjects, who had advanced to Grades 1, 2, and 3. Study 4 was also repeated with the Grade 2 sample, who were now in Grade 3, and with a new group of students from Grades 4 and 5.

Testers

Each test was administered by the writer or by one of three other testers who differed from session to session. Each, however, was a female psychology major from McGill University. Each person tested approximately an equal number of children from each grade and Language-Experience subgroup. This was done to counterbalance any experimenter effects. Pre-testing was conducted before each test session to insure standarization of procedures.

Control Testing

In December, 1972, the Peabody Picture Vocabulary Test (PPVT) and the Raven's Progressive Matrices (RPM), colored version, were administered. The PPVT was given individually using standardized procedures and the RPM was administered to small subgroups of four children each. These tests were included to assure comparability of the groups in terms of verbal and non-verbal IQ.

Each subject's score on the PPVT was converted to an IQ equivalent. Because of the particular characteristics of the population on which the RPM had originally been standardized (Scottish children tested in 1948) the standardized scores were not used. Instead the raw scores were analyzed. Table 2 presents the mean IQ-equivalent scores for the PPVT, the mean raw scores for the RPM, and the average age of the children in each group.

Results

Three separate two-way analyses of variance were performed on the data. The independent variables were Language Experience (Control, Immersion, French) and Grade (Kindergarten, Grade 1 and Grade 2). See Appendix A1 for a summary of these analyses.

PPVT: Although there were no significant main effects or interactions for the PPVT data, there are several noteworthy differences that deserve comment. First, there was a seven-point difference between the Control group and the Immersion group in Kindergarten. This difference has vanished by Grade 1, but increased to almost 16 points by Grade 2. One explanation for the initial difference is the possible unreliability of test results for children this young. The question of reliability at the Kindergarten level arises again in Study 3. Notwithstanding the statistical

Table 2

Summary of Mean Scores on PPVT, RPM and Age for each Language-Experience by Grade Group.

(A)

Peabody Picture Vocabulary Test

	K	1	2
French	109.10	110.60	115.67
Immersion	113.73	111.50	104.00
Control	106.42	110.50	119.80

(B)

Ravens Progressive Matrices

	K	1	2
French	15.40	19.80	23.42
Immersion	18.64	19.58	21.18
Control	18.67	19.50	22.33

(C)

Age

	K	1	2
French	5.72	6.71	7.67
Immersion	5.72	6.58	7.45
Control	5.78	6.52	7.52

results, these differences are too large to ignore completely in any interpretation of the studies that follow

RPM: There were no statistically significant differences between Language groups on this measure ($F = .12$; $df = 2, 94$; $p = .88$). There was a significant grade effect, with the older children scoring higher than the younger children ($F = 7.15$; $df = 2, 94$; $p = .001$). There was no significant interaction between Language Experience and Grade.

Age There were no significant differences between the Language groups at any grade level (See Table 2C). There was, obviously, a main grade effect ($F = 209.$; $df = 2, 94$; $p < .001$).

In summary, there is evidence, although not statistically significant, that the Immersion group performed more poorly than the Control group on the vocabulary test, while the French group performed intermediate to the other groups. In one sense this result may not be surprising insofar as the Immersion children have had virtually no formal English language instruction, except for their English Language Arts Class in Grade 2. This explanation is not entirely satisfactory since the same condition applies to the French group and yet their performance compared more favourably with the Control's. On the RPM, a test of non-verbal reasoning ability, all three groups performed at comparable levels. Thus, it seems that the three groups of children were comparable on non-verbal reasoning at the time of the first testing. The performance of the two experimental groups on the PPVT suggests that they are not more intelligent than the Control group and any differences in their favour in experimental testing cannot be attributed to this factor.

STUDY 1: Game Explanation

Test Materials

To assess the differential sensitivity of a speaker to a listener, a task used by Flavell et al. (1968) was adopted. In this task the child is required to communicate information about how a game is played to two listeners who differ in terms of the information available to them. One listener is blindfolded and cannot see the pieces of the game that the speaker is talking about; and, therefore, relies solely on what the speaker says in order to understand the game. The other listener can see the game in front of him; and, thus, can supplement the speaker's verbal description of the game with what he sees. Flavell found that as children grow older they are more likely to tailor their messages to the requirements of their listener. This developmental change is presumed to result from improved role-taking skills.

The game used in this study consisted of the following pieces: a plastic cup, two small plastic model cars, one green and one yellow, a plastic 1-inch square die, and an 8" x 14" paper playing board. As well, there was a cloth hood which could be worn by the listener in the blindfold condition. On the surface of the playing board were a series of 1" colored stripes running perpendicular to the long axis of the board. The colors appeared in a regular sequence along the board: red, blue, yellow, red, blue, yellow, red and blue. The faces of the die were also colored. Two of the faces were red; two were blue; one was yellow and one was black.

The game is played by two people, in the following way: one of the players hides a car in each fist out of view of the other player. The other player then selects the one he wants. To start, the cars are placed

on the table in front of the first stripe, a red one. One of the players puts the die in the cup, shakes it and tosses it out. He then moves his car to the first band on the board that is the same color as the upward face of the die. For example, if red turns up, the player moves his car to the first red stripe. If black turns up on the die, the player loses his turn since there are no black stripes on the board. The players alternate turns. Whoever reaches the last stripe, a blue one, first, is the winner.

Test Administration

The subject (S) was seated at a table beside the experimenter (E). The S was told that he was going to play a game with E and that he should pay very careful attention while E taught him the game so that he in turn could play it with a friend of his who would soon be brought into the room. Then E explained the game to S, non-verbally where possible. In other words, E and S played the game with E taking the lead and using gestures to show how the game was to be played. If it seemed that the black face of the die was not going to appear naturally, then E rigged one of his tosses so that it would, insuring that this particular rule was demonstrated. After the demonstration E and S played another complete game to insure that the S understood all the rules. Any mistakes or hesitations on S's part were cleared up.

Then the first listener, the sighted listener (SL), was brought into the room after having been instructed not to say anything to his friend until E told him it was all right to do so. This was done to minimize interaction between individual Ss and their particular listeners. When SL was seated at the table, both children were told to sit on their hands. The S

in particular was told that he could not touch any of the pieces in front of him while he was explaining the game to the listener (L). This procedure was followed to maximize verbal communication. The S was told to tell L as much about the game as he could so that L would be able to play it with him after the instructions. After S finished his explanation, the S and L were allowed to play a game by themselves. Again, if S made any mistakes or seemed hesitant on any points they were clarified for him by E; this happened only rarely.

Listener 1 then left the room and listener 2, the blindfolded listener (BL), was escorted to the table. The blindfold was put over L's head outside the room so that he was escorted blindfolded into the room. He had been given the same instructions as SL. The procedure this time was identical to the sighted-condition. After S explained the game to BL, the blindfold was removed and the two children played the game. Then both were sent back to their classrooms.

S's explanations to the SL and BL were tape recorded on a Uher 5000, 4-track recorder at 3 3/4 ips. The order of testing was identical for all Ss with the SL always appearing before the BL. This order was maintained because it was felt that S would better understand the game and be completely relaxed if the sighted listener came first.

The tapes were transcribed later by two of the Es.

Results

A full description of all dependent measures analyzed in this study will be given, followed by a presentation and brief interpretation of the statistical treatment of each.

Transcription of the tapes The original tape recordings were transcribed

for purposes of data analysis. The two transcribers were told to write exactly what they heard, punctuating the material as they would dictation, and to indicate long pauses with a dotted line. Normal pauses were to be marked with a period to indicate the end of the utterance. If a section of the recording were difficult to understand, both transcribers listened to that portion and agreed on an interpretation. This was rarely necessary since the general quality of recording was excellent. Then the transcriptions were coded so that the S's name, grade and group would not be indicated on the transcript. All subsequent analyses were done blind.

Dependent Measures

1. Completeness of Communication

To assess completeness of each game description, a simple count was made of the number of rules, the number of materials and the amount of extra information mentioned by each S. This analysis was designed to assess thoroughness rather than effectiveness of communication. Table 3 presents the rules, materials and extra information that relate to the game. There were six rules, six materials and five pieces of extra information. These 17 items covered almost all information that the children gave.

A rule was defined as any information which pertained to the playing of the game; material referred to the physical pieces or objects of the game. Furthermore, the material had to be stated explicitly enough to demonstrate that the child viewed it as a piece of the game (e.g., there is a cup; there is a board; there are colors on the die.). In general, this meant that the material could not be embedded in a rule. For example, the utterance "Now you put the dice in that little, purple cup over there and you shake it around..." implies the existence of a die and a cup, but the

Table 3

Rules

1. Each player gets a car for his "man"
2. Put the die in the cup
3. Shake the die or the cup
4. Move your man to the color indicated by the die
5. If black turns up on the die, you lose your turn
6. Whoever gets to the last stripe wins

Materials

1. There is a playing board
2. There are colors on the board
3. There is a die
4. There are colors on the die
5. There is a cup
6. There are 2 toy cars

Extra

1. There is no black stripe on the board
2. The colors are red, blue and yellow
3. The end stripe is blue
4. Players alternate turns
5. To start, you put car at beginning of the board

existence of these items was not expressed explicitly. Therefore, S would not get credit for them as materials, although he would be given two points for mentioning the two rules "Put the dice in the cup" and "shake the dice or cup". In scoring the rules, no attempt was made to evaluate them in terms of goodness of expression.

The category 'extra information' included items which were felt not to be integral to an understanding of the game and which were mentioned less often than the rules and materials by the children.

It should be repeated that all scoring was done blind by one scorer. The protocols were marked twice by the same scorer at about a two-week interval. The reliability was so obviously high that it was felt unnecessary to compute a formal reliability coefficient.

2. Elaboration of Communication

Insofar as elaboration usually promotes effective communication it was felt that some measure of elaboration or redundancy should be calculated. A priori it seemed reasonable that elaboration would most likely be used to describe the game materials so that subsequent explication of the game rules would be more comprehensible to the listener, particularly the blindfolded one. An index related to the number of elaborated rules might then represent the speaker's relative sensitivity to the communication needs of his blindfolded listener. This analysis was restricted to the blindfolded condition because it was felt that no judgment about elaboration of rules could be made in the sighted-condition since the most conservative assumption is that the children could understand almost all rules if the game itself were visible. However, in the case where the game is not visible, some rules may be difficult to understand unless the speaker

provides appropriate elaboration.

Three scores were devised: 1) the number of elaborated rules; 2) the number of non-elaborated rules; and 3) ratio of elaborated rules to total rules.

For a rule to be scored as 'elaborated' the S was required to have described all of the materials related to that rule earlier in his explanation. For example, in order for the rule "shake the die" to be scored as elaborated, S must previously have mentioned that there was a die. On the other hand, if S gave a rule, but did not mention the related materials, that rule was scored as non-elaborated. In a sense, the number of non-elaborated rules used by S is a measure of the number of presuppositions that he made when explaining the rules of the game.

The ratio of elaborated to total rules was desirable to control for possible differences in the total number of rules described by individual Ss

3. Linguistic Analysis

Finally, a series of linguistic measures were taken for each S: the number of utterances, mean length of utterance, and grammatical complexity of each utterance.

Two scorers, working from the written transcriptions, were told to divide each protocol into 'utterances'. An utterance was defined as a segment of the transcript which represented a separate thought or idea. Thus, an utterance might or might not be a complete, correct grammatical unit The scorers were told to use the pauses and punctuations which they had written during the original transcription to help them. After both scorers had marked all protocols, the results were compared. Where a

disparity existed, agreement was reached about the boundaries of the utterance in question.

The average length of utterance was calculated for each protocol by dividing the total number of words in the protocol by the total number of utterances.

After the protocols had been segmented into utterances, each rater assigned each utterance to one or more of the following categories: simple, coordinate, subordinate, relative, predicate, adjectival, false start or attention getter:

a) Simple: utterances made up of a single sentence or thought. For example, "You put it in that little purple cup."

b) Coordinate: included utterances made up of two clauses which were conjoined by the following conjunctions: and, but, so or because. For example, "Put the die in the cup and shake it". If these conjunctions occurred at the beginning of an utterance made up of a single clause, they were not counted as coordinate. For example, "And you choose one of those cars".

c) Subordinate: utterances containing a subordinate clause introduced by when, while, where or if. For example, "If you get black, you lose your turn".

d) Relative: utterances containing relative clauses. For example, "There's this dice that you have to put in the cup".

e) Predicate: utterances with predicate complements introduced by that, how, where, what, why, etc. For example, "This is how you play the game".

f) Adjectival: utterances with relative clause introduced by whoever, whenever, or whatever For example, "Whoever gets to the end first wins".

g) False Starts: included incompleted utterances which had been discontinued by S in favor of a different, complete utterance. This category may represent a self-correction technique. For example, "Then you have....If you get black you have to stay where you are".

h) Attention getter. included utterances or single words (such as first or O.K.) that did not contain information about the game, but seemed to direct or attract the listener's attention. For example, "Robert, first you put the dice in the cup". Use of the listener's name and use of directives such as first were counted here. The conjunction then and the interjection eh were not counted here.

Statistical Analysis

1. Completeness of Communication (rules, materials and extra information) A separate analysis of variance (unweighted means solution for unequal n) was performed on each dependent measure (rules, materials and extra information). In each case the independent variables were Language Experience (French, Immersion, Control), Grade (Kindergarten, 1,2). Sex of Speaker (Male, Female), and Condition of Listener (Sighted, Blindfolded). The last variable involved repeated measures. A summary for each of these analyses is

presented in Appendices A2, A3 and A4.

Rules. The only significant main effect to emerge from this analysis was a grade effect ($F = 5.28$; $df = 2, 85$; $p = .006$). The children in Grade 2 gave more rules than did the children in either of the earlier grades (see Table 4). There was no significant difference among the language groups nor between the boys and girls. Nor was there a difference in the average number of rules which the Ss told the blindfolded or the sighted listeners.

There was a significant Grade X Listener X Sex interaction ($F = 3.51$; $df = 2, 85$; $p = .03$). This interaction is not very meaningful or relevant and so will not be discussed further

There were no other significant interactions. In particular, the interaction between Language Experience X Condition of Listener was not significant ($F = .41$; $df = 2, 85$; $p = .67$).

Materials An Analysis of Variance summary appears in Appendix A3. There was a main effect due to the Condition of the Listener ($F = 30.8$, $df = 1, 85$; $p < .001$). The children gave more information about materials to the blindfolded listener ($\bar{X} = 1.12$) than to the sighted listener ($\bar{X} = .27$). See Table 5D.

There were no other main effects significant at the .05 level. However, the Grade effect was marginally significant ($F = 2.54$; $df = 2, 85$; $p = .08$). This suggests that the older children related more information about the materials than did the younger children. See Table 5.

The Language Experience X Listener interaction was significant ($F = 3.13$; $df = 2, 85$; $p = .05$). From an inspection of Table 5E it is evident that the French Ss showed the largest differentiation between the

Table 4

Rules*

(A) Language Group		(B) Grade		(C) Sex of Subject	
French	4.07	K	3.61	Male	3.99
Immersion	4.16	1	3.96	Female	4.02
Control	3.79	2	4.45		
	p = .35		p = .006		p = .90

(D)

Listener	
Sighted	3.96
Blindfolded	4.05
	p = .65

(E)

Language Group X Listener Condition

	Sighted	Blindfolded
French	3.99	4.15
Immersion	4.06	4.25
Control	3.82	3.75
		p = .67

* Maximum score = 6

Table 5

Materials*

(A) Language Group		(B) Grade		(C) Sex of Subject	
French	.93	K	.44	Male	.67
Immersion	.67	1	.69	Female	.73
Control	.48	2	.97		
	p = .17		p = .11		p = .76

(D) Listener	
Sighted	.27
Blindfolded	1.12
	p<.001

(E)

Language Group X Listener Condition

	Sighted	Blindfolded
French	.32	1.53
Immersion	.29	1.08
Control	.21	.75
		p = .05

* Maximum score = 6

sighted and blindfolded listeners followed by the Immersion group and, finally, the Control group which showed the least differentiation. There were no other significant interactions.

Extra Information A summary of the analysis of variance appears as Appendix A4. There was a main effect due to Language Experience ($F = 3.61$; $df = 2, 85$; $p = .03$). The Immersion group transmitted the greatest amount of extra information ($\bar{X} = 1.46$) followed by the Control group ($\bar{X} = 1.29$), and then the French group ($\bar{X} = .95$). There were no other significant main effects or interactions.

Interpretation

Overall, there was a tendency for the older children to convey more information of all types to their listeners. In fact, the Ss' performance may have reached an asymptote by Grade 2 since by that age they were giving, on the average, 4 to 5 of the 6 possible rules. A breakdown of which rules are given most frequently is presented as Appendix A5.

The main focus of interest in this study was the children's differential reaction to the needs of their listeners. Thus, although there was virtually no accommodation to their listeners in terms of number of rules ($\bar{X}$ sighted = 4.0; $\bar{X}$ blindfolded = 4.1) there was quite a dramatic accommodation when it comes to information about materials ($\bar{X}$ sighted = .29; $\bar{X}$ blindfolded = 1.12). It should also be pointed out that even the best performance here was not very good when one considers that the children gave on the average only 1 out of 6 pieces of information about the materials, even to the blindfolded listener. Possibly the children felt that this kind of information can be conveyed adequately by giving the rules. Despite their poor performance, the observed pattern of differentiation

Table 6

Extra Information

(A) Language Group		(B) Grade		(C) Sex of Subject	
French	.95	K	1.02	Male	1.34
Immersion	1.46	1	1.26	Female	1.13
Control	1.29	2	1.42		
	$p = .03$		$p = .11$		$p = .19$

(D)

Listener	
Sighted	1.22
Blindfolded	1.25
	$p = .65$

(E)

Language Group X Listener Condition

	Sighted	Blindfolded
French	.95	.96
Immersion	1.53	1.39
Control	1.17	1.42
		$p = .16$

seems reasonable. When explaining a game to either a sighted or a blindfolded listener one might be expected to go into more detail about materials to a blindfolded listener since the materials are not evident for him whereas they are for a sighted listener. In the case of the rules, they are not evident to either the blindfolded or sighted listener. The needs of both listeners are equivalent in this respect. Consequently, the distinguishing need here is the blindfolded listener's need to be told about the physical features of the game.

Thus, the interaction between Language Experience X Listener is crucial for the materials analysis since it indicates differential group sensitivity to listener needs. The finding that the French group showed the greatest differentiation with the Control group showing the least is consistent with the expectation outlined at the start. It is interesting that the degree of differentiation varies directly with the extent of immersion in a second language.

2. Elaboration of Communication

Three separate, three-way analyses of variance were performed on the scores for elaborated rules, non-elaborated rules, and elaboration ratio. The independent variables were Language Experience, Grade and Sex of Speaker. Summaries of these analyses of variance are presented as Appendices A6 to A8.

There were no significant main effects or interactions of any importance for the three analyses. The Language Experience X Sex interaction was significant in all analyses, indicating that the boys in the French group gave more elaborated rules, fewer non-elaborated rules and had a higher ratio of elaboration than did the girls. The reverse situation occurred in the

Immersion group and there was no difference between boys and girls on the three measures for the Control Group. It is difficult to interpret this interaction in any meaningful way.

Interpretation

The results from these analyses are rather surprising in view of the results just discussed. Because the French and Immersion groups had conveyed more material information to the blindfolded listener than did the Control group, and because there was no difference in the number of rules given by each group to either listener, it was expected that the French and Immersion groups would have higher elaborated-rule scores and higher elaboration ratios. This expectation was based on the supposition that they would give information about game materials that went with the rules they described. However, the results of this analysis suggest that this was not so. On the contrary, the extra material information that the French and Immersion groups do provide is not correlated with their description of the rules. This is in effect what the findings from the elaboration ratio indicate. This, in turn, suggests a distinction between the children's perception of the requirements of the communication situation and their actual verbal performance in response to their perceptions. More specifically, the suggestion here is that while the two experimental groups, and in particular the French group, were more perceptive of the differential needs of the two listeners (that is, they gave the blindfolded listener more material information) they did not necessarily express this perception of differential need in a more elaborated, overt, verbal form. In other words, there may be linguistic constraints on the experimental children's use of their language that are similar to those of the Control children, and that, apparently,

cause these two groups to perform similarly, at least at an overt, verbal level.

The following analyses of grammatical complexity were undertaken to pursue this distinction further.

3. Linguistic Analysis

First there will be a presentation of the statistical analysis of number of utterances and mean length of utterance, followed by the results of the grammatical complexity analyses (that is, the categorization of the utterances into simple, coordinate, subordinate, etc.).

Separate analyses of variance were performed on the "number of utterances" and "mean length of utterance" scores.

A summary of these analyses is presented as Appendices A9 and A10. The independent variables were Language Experience, Grade, Sex of Speaker and Condition of Listener with repeated measures on the last variable.

In the analysis of the number of utterances, there was a significant main effect due to Listener ($F = 13.24$; $df = 1, 89$; $p < .01$). The children used more utterances in describing the game to blindfolded listeners ($\bar{X} = 6.45$) than to sighted listeners ($\bar{X} = 5.38$). As well, the Grade effect was marginally significant ($F = 2.55$; $df = 2, 89$; $p = .08$) with the Grade 2 children using more utterances ($\bar{X} = 6.62$) than either the Grade 1 group ($\bar{X} = 5.58$) or the Kindergarten group ($\bar{X} = 5.28$). There were no other significant main effects or interactions. A breakdown of the mean scores on number of utterances and mean length of utterances by Language Group, Grade, Sex of Speaker and Condition of Listener is presented in Table 7A and B, respectively.

In the analysis of mean length of utterance, there were no significant main effects or interactions.

The analysis of types of utterances consisted of eight separate

Table 7

(A) Number of Utterances

Language Group		Grade	
French	5.53	Kindergarten	5.28
Immersion	6.43	Grade 1	5.85
Control	5.79	Grade 2	6.62
	$p = .31$		$p = .08$
Sex of Subject		**Listener**	
Male	6.24	Sighted	5.38
Female	5.59	Blindfolded	6.45
	$p = .18$		$p < .005$

(B) Mean Length of Utterance

Language Group		Grade	
French	9	Kindergarten	9.81
Immersion	9.69	Grade 1	9.46
Control	10.0	Grade 2	9.86
	$p = .51$		$p = .66$
Sex of Subject		**Listener**	
Male	9.59	Sighted	9.57
Female	9.83	Blindfolded	9.85
	$p = .54$		$p = .24$

four-way analyses of variance. The main variables were Language Experience, Grade, Sex of Speaker and Condition of Listener. A summary of these analyses is presented as Appendices A11 to A18.

There was only one significant Language Experience Effect and that was for predicate utterances. The Immersion group used the greatest number ($\bar{X}$ = .39) while the French and Control groups used fewer and an approximately equal number ($\bar{X}_F$ = .14; $\bar{X}_C$ = .13). See Table 8.4.

The Language Experience X Listener interaction for subordinate utterances was significant with the Control group showing the largest increase from the sighted to the blindfolded condition ($\bar{X}_s$ = 1.60, $\bar{X}_b$ = 3.24). The only other main effects that were significant at the .05 level were the Listener main effect for simple and subordinate utterances and a main Grade effect for relative clauses. There were no significant main effects or interactions in the false starts and attention getter analyses.

Interpretation

It is apparent from the lack of group differences in the above analyses that the children from the three school backgrounds used language in basically similar manners. This corroborates the findings from the preceding analyses on elaboration of communication. Thus, it does not seem that immersing children in schools where a 'foreign language' is the medium of instruction has any major structural effects on their language. These findings support those of Lambert and Tucker (1972) and Edwards and Casserly (1973) on children in other early immersion programs and those of Swain (1972) on children growing up bilingual. At the same time, by providing information about English children who are attending all-French schools they suggest that there is a similar lack of detrimental effect on native language skills even

Table 8

Summary of Linguistic Analysis (in Mean Scores)

	Type of Utterance							
	Simple	Coordinate	Subordinate	Relative	Predicate	Attention Getting	Adjectival	False Starts
French	2.27	.64	2.19	.21	.14*	.51	.60	.91
Immersion	2.06	.74	2.96	.31	.39	.66	.37	.84
Control	2.03	.95	2.42	.22	.13	.64	.42	.67
Kindergarten	1.92	.60	2.28	.09*	.16	.58	.47	.74
Grade 1	1.88	.86	2.34	.34	.25	.64	.39	.72
Grade 2	2.56	.88	2.94	.31	.25	.59	.52	.97
Male	2.23	.77	2.66	.19	.29	.70	.48	.82
Female	2.01	.79	2.38	.31	.15	.51	.44	.80
Sighted	1.86	.70	2.15*	.25	.20	.62	.44	.76
Blindfolded	2.38	.86	2.89	.24	.24	.58	.48	.85

*$p<.05$

in a total immersion situation. Perhaps more dramatic differences might result from immersing children in a total French-speaking environment, such as would occur if the children were to live in Quebec City or in a rural French-Canadian community

On the other hand, there are indications from the first analysis that a child who is being educated in a second language develops a sensitivity to the needs of his listeners. These children who have themselves experienced considerable frustration communicating, give some indication that they empathize with others who are experiencing similar difficulties.

Study 2: Abstract Designs

Test Materials

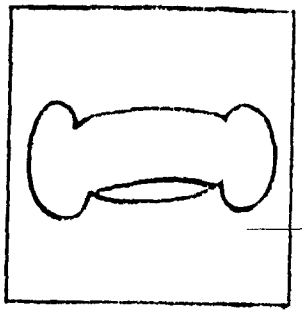
The abstract designs task has been used extensively in recent research. It is most commonly associated with Glucksberg and his associates (e.g., Glucksberg, 1966; Glucksberg & Krauss, 1967; Krauss & Glucksberg, 1969a, 1969b). In this task, a child is asked to describe individually a series of abstract designs to a listener, who is separated from him by an opaque screen, so that the listener will be able to select from a larger set each design as described. Glucksberg and Krauss have found that children communicate more accurately as they grow older. This increased communication competence seems to reflect an improved ability to select items from one's verbal repertoire which best satisfy the requirements of the listener (Krauss & Glucksberg, 1969b; Krauss & Vivekananthan, 1968). In other words, a good communicator, to make his messages appropriate, must be sensitive to the needs of his listeners or perhaps to be able to take the role of his listener.

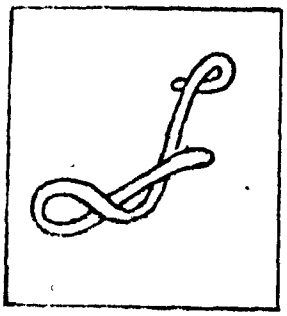
The "game" involves two players. Each player has a set of 6 wooden blocks which measure 2½" X 2½" X 2½". There is a hole drilled through the center of each block so that it can be stacked on a 15" high peg. On the vertical face of each block there is an abstract design. This design appears on all four vertical faces of that block, but in different orientations (upside down, sideways, etc.). Both players' blocks are identical. (Figure 1)

In addition to the six test blocks, each player in the present study had a set of five practice blocks. Again, each player's set was identical. Three of the practice blocks had drawings of common objects on their sides; namely, a car, a dog and a man. The other two practice blocks had abstract forms similar to those on the test blocks.

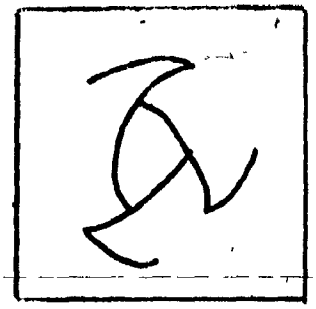
Figure 1

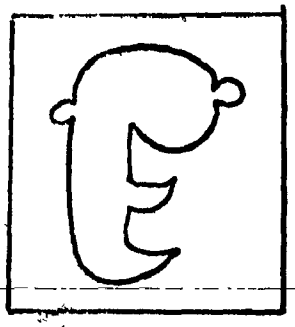
Practice Designs

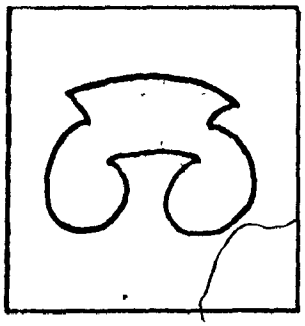


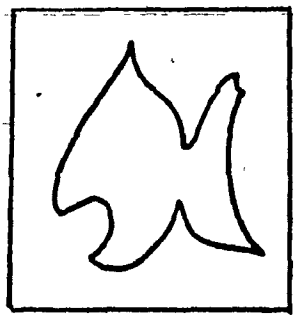


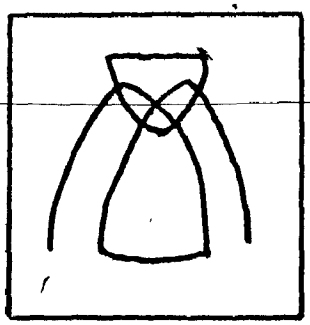
Test Designs

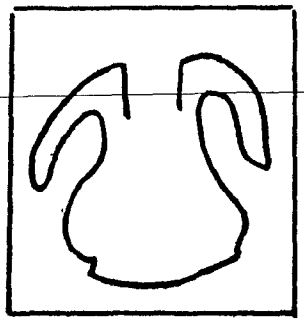












Test Administration

In this task, as in the Game Explanation task, there was a Speaker and a Listener. In every case, the S was the speaker and E acted as the listener. The S and E were seated on opposite sides of a table. They were separated from one another's view by means of a cardboard screen.

To start, the S was told that the object of the game was to build two identical stacks of blocks. He was told to select one block at a time from his set and to describe it to the E in such a way that E could select the same block from his set and stack it on his peg. The S was to proceed until he had stacked and described all of his blocks. The E was able to see the top of the S's peg over the screen so that he could write down, for later scoring, the order in which S actually stacked his blocks. This also allowed E to stack his blocks in the same order as S. The S was not aware that E could see. When the S and E compared piles every S thought they had succeeded in describing the blocks to E by virtue of the identical ordering.

The sequence of communication between E and S during the task was always the same; namely, E would start by asking S to choose a block; once this was done E asked S "What does it look like?"; after the S's response, E tried to solicit more information by asking S "Why does it look like that?" This sequence was repeated when E said "What else does it look like?". The cycle continued until S said that he could say no more.

The S was given pre-training with the practice blocks which had drawings of common objects before he played the game with the test blocks. The procedure for the practice trials was the same as that outlined above for the test blocks. Virtually all of the children performed successfully on this part of the practice session. Then the S was given pre-training

with the two abstract-form blocks. For this practice session, the S described the forms in complete view of E. This was done to give the S practice in describing abstract designs with the help of E. The E offered an alternative for every description that S gave to demonstrate that each design could look like more than one thing. When E was satisfied that S understood the principles and object of the game completely they proceeded to the test blocks.

Results

Transcription of the tapes

All of the children's verbal descriptions of the abstract designs were transcribed from the tapes by two people who were told to punctuate the descriptions as they would dictation. An example of a complete episode for one subject appears as Appendix A19.

Dependent Measures

1. Accuracy Scores To obtain a measure of how accurately each child described the blocks, a sample of his protocol for each block was type-written on a sheet of paper. Instead of using the child's entire description for a given block, a sample was taken by selecting the first description that the child gave in response to the first two questions outlined above (see Appendix A20 for a sample). A sample was taken for each of the six blocks. There were no identifying marks on these transcriptions. The first description given by the child was selected, instead of all of them or later ones, because it was felt that the child's first attempt to describe each block would contain the most information.

Each protocol was given to four different undergraduate psychology

majors at McGill University, and each undergraduate received four different protocols to rate. A picture of the design was also included with the protocols. The raters were told to read one description at a time and to indicate on their answer sheet which design they felt went with that description. The raters were told that after they had made a selection for a particular description they could not return to that description later, nor were they allowed to read later descriptions until they had finished with the preceding ones. After making a selection for each description they were asked to rate how confident they were that their selection had been correct. The ratings ranged from one to five, with 1 indicating "no confidence at all" and 5 indicating "complete confidence".

A subject was given 1 point for each design that was matched correctly with its description by the raters. Thus, for each design there was a maximum accuracy score of 4 and for each set of six blocks there was a maximum total accuracy score of 24.

2. Confidence Ratings The average confidence rating for each subject was calculated by adding the confidence values given by all four raters and dividing by the total number of judgments, this was usually 24. However, in a number of cases the rater failed to make a judgment or misused the scale so the total was less than 24.

3. Feedback Score The child's entire description was used to calculate this score which was designed to reflect the child's responsiveness to the experimenter's question "What else does it look like?" The scoring proceeded as follows: if, in response to this question, the child gave a completely new response he was given a score of 3; if he gave a modified version of a previous description he was given a score of 2; if

he repeated a previous description he was given a score of 1; if he could not or did not give any more information of any kind he was given a score of 0. The scoring was done independently by two judges. When there was disagreement over the scoring of an item, agreement was reached by discussion of that item. The S's score on a particular design could exceed a score of 3 if the child continued to give the E more information as he asked for it. The child himself, as has already been pointed out, terminated communication about each design. An average score based on all six designs was calculated for each subject.

Statistical Analysis

Three separate analyses of variance (unweighted means solution for unequal n) were performed on the data. The independent variables were Language Experience, Grade and Sex of child. A summary of these analyses appears as Appendices A21 to A23.

There was no significant difference between the Language groups on any of the scores (Accuracy: $F = .43$; $p > .05$, Confidence: $F = .07$; $p > .05$; Recommunication: $F = 1.48$; $p > .05$). The main effect due to Grade was significant at the .06 level for the accuracy scores and the confidence ratings ($F_{acc} = 2.82$; $df = 2, 89$; $F_{con} = 2.77$, $df = 2, 89$). The older children communicated more accurately than the younger children (see Table 9) and this was reflected by increased confidence ratings for the older children. As well, the older children were more responsive to the questioning of E. They provided more new information when asked for it. Table 9 presents a summary of these scores.

There was also a significant sex difference on the confidence scores ($F = 4.2$; $df = 2, 89$; $p = .04$). The girls received higher con-

Table 9

Mean Accuracy Score, Confidence Rating and Feedback Score by Language Group and Grade

Language Group

	Accuracy	Confidence	Feedback
F	18.78	3.38	.97
I	17.91	3.39	1.13
C	17.83	3.34	1.27
	(p = .65)	(p = .92)	(p = .23)

Grade

K	16.81	3.21	.91
1	18.91	3.37	1.05
2	19.52	3.51	1.41
	(p = .06)*	(p = .06)*	(p = .01)**

fidence ratings ($\bar{X}$ = 3.48) than did the boys ($\bar{X}$ = 3.26). This finding is difficult to interpret in view of the lack of sex differences on the accuracy and recommunication scores.

Interpretation

These findings corroborate the previous data insofar as they indicate a lack of difference between children educated in their native language and those educated in a second language in their verbal performance in this communication situation. The finding of no group differences on the feedback score suggests that there was no difference between the groups in responsiveness to the verbal demands of a listener. This pattern of results seems different from the differential sensitivity which the groups seemed to demonstrate in the Game Explanation Task. This is not particularly surprising perhaps if one considers that the need expressed in this study is not nearly so explicit as that expressed in the Game Explanation. The need is not explicit in the sense that because the children are trying to describe unusual geometric shapes which have no actual referent in the environment, they may be unfamiliar or uncertain about what is really called for to describe the designs successfully. In the case of the Game Explanation Task, on the other hand, all children are used to talking about and playing games. Thus, the skills or linguistic items demanded in that situation may already exist in the child's repertoire, whereas they may not in the case of the Abstract Designs situation. This may be one of the linguistic constraints, referred to in Study 1, that are common to both the control group and the experimental groups.

Study 3: Perspectives

Test Materials

A modified version of "The Three Mountains Experiment" (Piaget & Inhelder, 1956) was used to assess non-verbal role-taking skills. In the original version of the task, children are presented a three-dimensional model of three mountains. They are asked to identify the view which would be perceived by a doll who is placed at different locations around the model. On the basis of their results, Piaget and Inhelder postulated that there were three stages in the development of this skill. At stage 1, emerging between four and seven years of age, the children usually attributed their own perspective to the doll (egocentric stage). During stage 2, between seven and eight years of age, the children started to become aware of perspectives which were different from their own. Thus, they no longer relied exclusively on an egocentric perspective. However, cognitively, they were not sufficiently mature to be able to select the correct one. During the third stage, between nine and ten years of age, the children consistently chose the correct perspective.

For the current experiment the display consisted of a dark green sheet of cardboard measuring 20" by 20". Two black lines drawn perpendicular to one another on the surface of the cardboard divided its area into equal-sized quadrants. A bottle was placed in the center of quadrant 1; a plastic drinking cup was placed in the center of quadrant 3 and a rubber ball was placed in quadrant 4 so that all objects could be seen from any perspective.

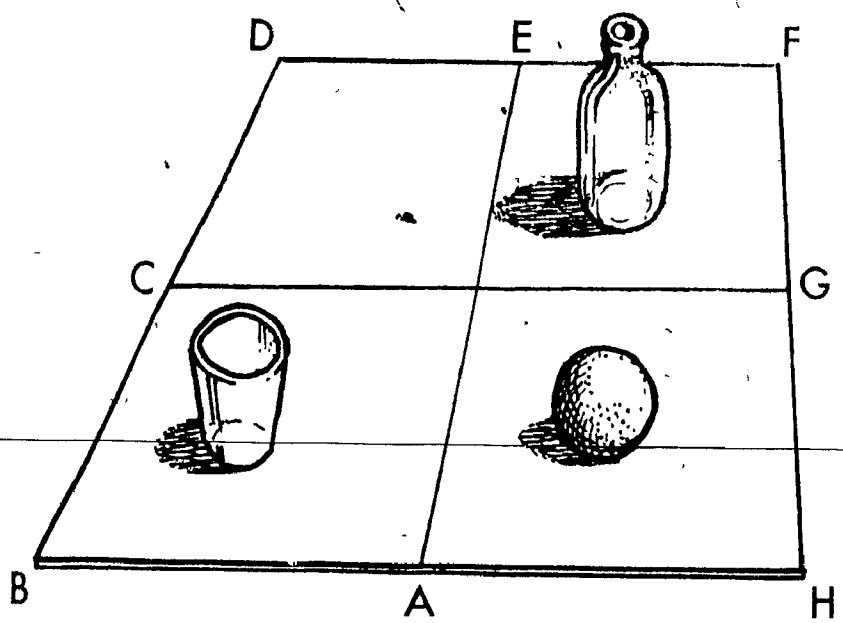
There were 10 color photographs representing various views of the display. The views depicted in the photographs were those from posi-

tions A to H inclusive (see Illustration 1) as well as two additional views I and J, which were contrived. That is to say, they could not have been photographed from the display as it was presented to the subject. View I was the same as view C except that the cup and ball were interchanged so that the cup was at the same depth as the bottle and the ball was closer to side BD. This view was included in order to present a front/back distortion of two of the objects in view C. View J was the same as view G except that the bottle was placed on the left front, instead of the right front as it is in the display, and the ball and cup were placed on the right, instead of on the left; the correct front-back relationship of these objects was preserved. This photograph was included to represent a right-left distortion of the objects in view G. These perspectives had been designed by Laurendeau and Pinard (1970). Finally, there was a ~~small wooden doll approximately 1½" tall. This doll was supposed to re-~~ present the "person" who had taken photographs A to J.

Test Administration

During the first part of the test, the child was seated at position A. The E was seated to his right or left at approximately position H or B. The child was told that he was going to play a game in which he was to pretend that the little doll in front of him had taken some photographs of the things that were on the cardboard. The object of the game was for him to try to figure out what the photograph looked like when taken from different places around the display. There was one practice trial to demonstrate what was intended. ~~For~~ this trial, the doll was placed at position A so that its view was the same as the child's. The child was asked to decide if the doll had taken photograph A or H which were placed to S's

Illustration 1



left and right, respectively. View H was given as an alternative because it preserved the basic left/right and front/back relationships of the correct photograph (A) but depicted a different perspective of these relationships. Thus, it was considered to be sufficiently difficult for illustrative purposes. If the S chose the correct picture he was asked to explain his choice. If S failed to use the concepts of left/right and front/back in his explanation, E repeated the S's explanation including the omitted concepts where appropriate. If S made an incorrect choice, he was corrected and asked to explain the correction. In the four or five cases where this was necessary, the Ss quickly recognized their mistake when it was pointed out and they were able to explain the correct choice satisfactorily.

After this practice, the test trials began. The S remained seated at position A and the doll was moved to position G. This time five photographs were placed in front of S. For trial 1, the five possibilities were H, A, J, G, and C, placed in that order from the S's left to his right. Alternative A represents the egocentrically-incorrect choice; alternative G represents the correct and, therefore, non-egocentric choice, alternative H represents the view that S would see if he leaned toward the doll. alternative C is totally incorrect in that both the left/right and front/back relationships of this picture are wrong; alternative J represents a partially correct choice in that the front/back relationship of the objects in this photograph and the correct one are the same whereas the left/right relationship is the reverse of the correct positioning. Thus, alternatives G, J, and H were all incorrect even though they are non-egocentric choices in the sense that they do not represent the S's own immedi-

ate viewpoint. A similar rationale was used to compose the choices for trials 2 and 3. The S was not told whether he was correct on the test trials.

After trial 1, S was asked to move to position E directly opposite his present location. This step was included to demonstrate to the child that as he changed positions his view of the objects would also change. After he had moved to his new position, S was asked if the things "looked the same" as they did when he was sitting on the other side. All Ss reported that they looked different and gave their reasons for saying so. Trials 2 and 3 were then administered. For trial 2 the doll was placed at position B and again the S had to select from among five photographs that one which he thought represented what the doll saw. The alternatives were B, E, D, F, and A, arranged from S's right to his left. The S remained seated at position E for trial 3 for which the doll was placed at position C. The same procedure as above was repeated with the alternatives being I, C, G, E and D. This ended the testing.

The child's responses were classified as: 1) correct and therefore non-egocentric, 2) incorrect because they were egocentric; or 3) incorrect but non-egocentric. The alternatives for each of the three test trials were classified as follows.

Test 1

H	incorrect, non-egocentric
A	egocentric
I	incorrect, non-egocentric
G	correct, non-egocentric
C	incorrect, non-egocentric

Test 2

B	correct, non-egocentric
E	egocentric
D	incorrect, non-egocentric
F	incorrect, non-egocentric
A	incorrect, non-egocentric

Test 3

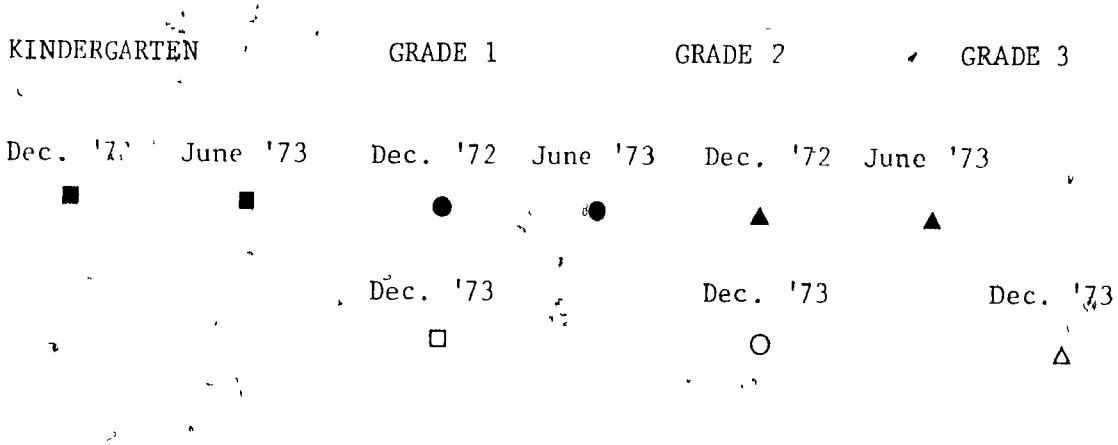
I	incorrect, non-egocentric
C	correct, non-egocentric
G	incorrect, non-egocentric
E	egocentric
D	incorrect, non-egocentric

Dates of Testing

This test was administered to each child three times--once in December 1972; once in June 1973; and again in December 1973. This provided results extending from early Kindergarten to early Grade 3, with measures at six month intervals. The results are longitudinal insofar as the children in each grade were tested at three time periods. On the other hand, owing to the fact that there were different children in each grade, the results are cross-sectional. Thus, the first question to arise is whether the differences in performance across grades are reliable. The December, 1973, testing gives a measure of the reliability of the results by providing data that overlap with two of the earlier groups; namely, the December, 1972, Grade 1 and 2 groups (see Illustration 2).

Illustration 2

Dates of Testing



□ ■ = original Kindergarten group

○ ● = original Grade 1 group

△ ▲ = original Grade 2 group

Results

To test reliability, a series of Bonferoni t-tests were applied comparing the Grade 1 and 2 results from December, 1972, with those from December, 1973. A summary of these tests, broken down for each category of response, is presented in Table 10. It is evident from these tests that the results from the two December test sessions--one with the original Grade 1, Control group and one with the Grade 1, Control group who were the original Kindergarten, Control group were significantly different for both the Egocentric category ($t = 3.53$; $df = 6, 140$; $p < .01$) and the Correct, non-egocentric category ($t = 3.63$; $df = 6, 140$; $p < .01$).[1] The original Grade 2, Control group and the follow-up Grade 2 group were not significantly different from one another on either the Egocentric category ($t = 2.72$; $df = 6, 140$, $p < .05$) or the Correct, non-egocentric category ($t = 2.92$; $df = 6, 140$; $p < .05$). None of the other comparisons were ~~significant. Nor were any comparisons in the non-egocentric, incorrect~~ category significant.

Thus, the performance profiles presented in Figures 2 (Egocentric) and 3 (Correct, non-egocentric) are statistically reliable for the French and Immersion groups, but may be unreliable for the Control group. A comparison of the original Grade 1, Control group in December, 1972, and in June, 1973, with the follow-up Grade 1 group and follow-up Grade 2 group, respectively, suggests that the Grade 1, Control Group was performing at an unusually poor level. It follows then that the graph for the original Grade 1 group should be lowered in Figure 2 and raised in Figure 3. Further consideration of the results will have to take this unreliability into consideration.

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1. A p value of approximately .01 is required for significance on a Bonferoni test if six comparisons are made, as was done in this study. (Dunn, 1961)

Table 10

Summary of Bonferoni t-tests

A) Egocentric, incorrect responses: December '72/December '73

		t-value	p-value
French	Grade 1	.88	>.05
	Grade 2	.66	>.05
Immersion	Grade 1	2.51	<.10
	Grade 2	.31	<.05
Control	Grade 1	3.53	<.01
	Grade 2	2.72	<.05

B) Correct, non-egocentric responses: December '72/December '73

		t-value	p-value
French	Grade 1	1.17	>.05
	Grade 2	.63	>.05
Immersion	Grade 1	1.71	>.05
	Grade 2	.25	>.05
Control	Grade 1	3.63	<.01
	Grade 2	2.92	<.05

C) Incorrect, non-egocentric responses: December '72/December '73

		t-value	p-value
French	Grade 1	0.00	>.05
	Grade 2	.17	>.15
Immersion	Grade 1	1.88	>.05
	Grade 2	.17	>.05
Control	Grade 1	1.04	>.05
	Grade 2	.67	>.05

A retrospective review of the literature revealed that others working with this task have found similarly unsystematic trends from kindergarten to Grade 3 and that older age groups than this are needed to produce clear-cut patterns (Fishbein, Lewis & Kieffer, 1972. Shantz & Watson, 1971).

Three separate three-way analyses of variance were performed on the results from each of the response categories outlined above. The independent variables were Language Experience, Grade and Time of Testing (December, 1972; June, 1973; December, 1973) The levels of the Grade variable were Kindergarten, Grade 1 and Grade 2 as of the start of the research. However, since the research extended over a full year, the original grades had advanced to the next grade level by the time of the third testing. For example, the Kindergarten level includes results from a Grade 1 testing. This overlap does not destroy the age progression and, therefore, reference to this variable will be in terms of their original grade level. A summary of the analyses of variance is given in Appendices A24 to A26. Each analysis will be discussed in turn.

Egocentric, incorrect responses

The only significant effect in this analysis was a Grade effect ($F = 3.17$; $df = 2, 70$; $p = .04$). See Figure 2. The Grade 2 children made fewer egocentric choices ($\bar{X} = 1.64$) than did either the Kindergarten ($\bar{X} = 1.86$) or Grade 1 children ($\bar{X} = 2.20$). This finding is consistent with the data reported by Piaget and Inhelder (1956).

It is difficult to come to any conclusions concerning differences in performance between groups because of the unreliability of the results, and in particular, of the Grade 1, Control group. However, if one accepts the hypothetical curve for this group shown in Figure 2, there are signs that the

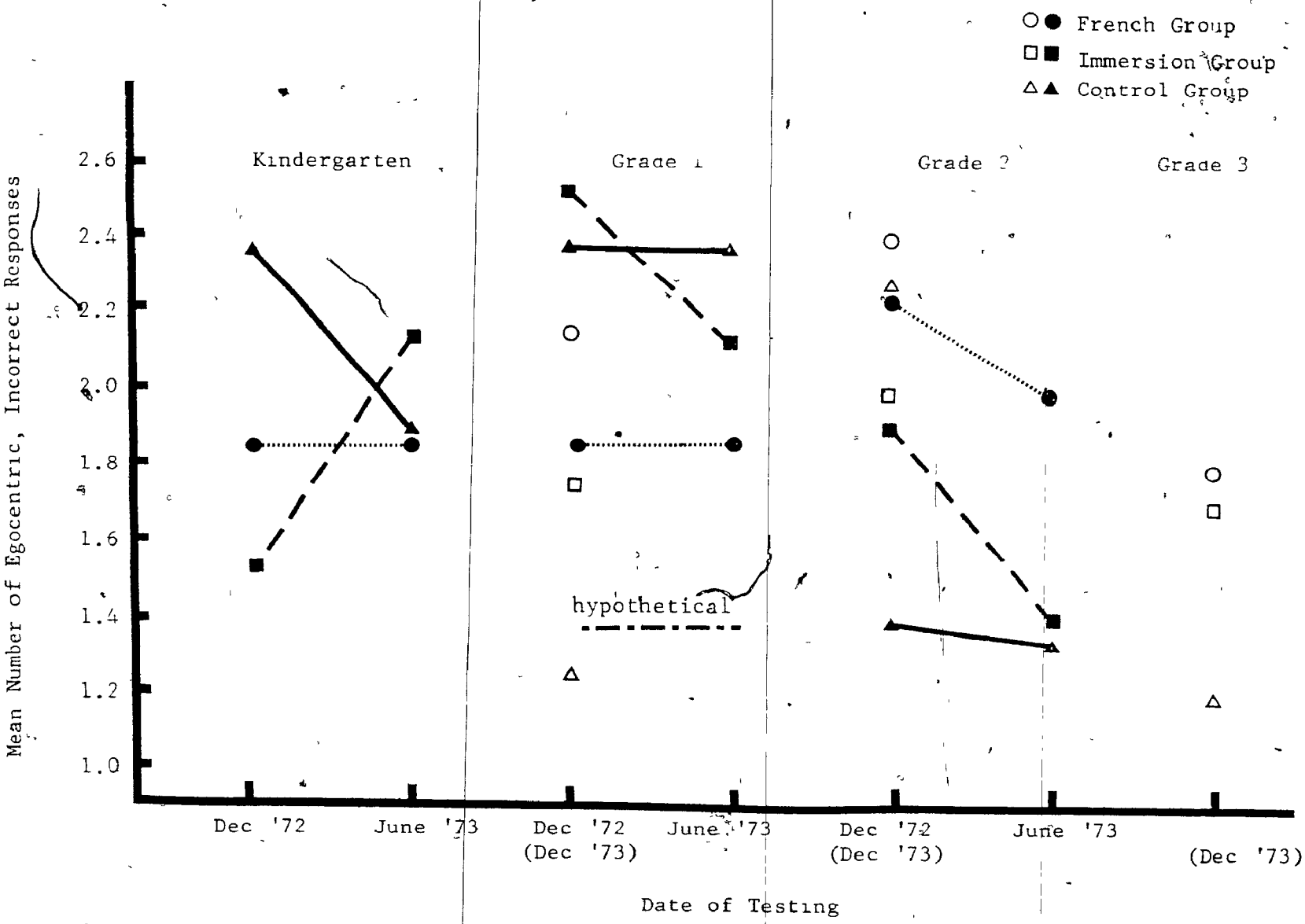

Figure 2. Mean Number of Egocentric, Incorrect Responses

(The open symbols ○ □ △ represent the reliability check)

Control group made fewer egocentric choices than the French and Immersion groups as early as Grade 1 and certainly by Grade 2. These differences persisted into early Grade 3. This interpretation should be made with caution because of the lack of a statistically significant interaction among Language Experience, Grade and Time of Testing and the unreliability of the data from the Grade 1, Control group.

In summary, the findings seem to be generally incoherent. Such disorder has been reported by others working with this task. For example, Fishbein, Lewis and Keiffer (1972) reported that there was "no systematic relationship holding between the first- and third-grade children" (p. 26). Shantz and Watson (1971) failed to find any age differences in their samples which included children from pre-school to Grade 1. Thus, it seems that a fairly wide age range must be sampled before reliable improvements with age are noticeable, and, even then, the data are not necessarily systematic.

The large variation among the three groups in December of the Kindergarten year is puzzling. The fact that their subsequent performance did not seem to reflect these initial differences suggests that the December-Kindergarten results are simply unreliable. Remember also that the question of reliability of results with children in early Kindergarten arose in conjunction with the findings on the Peabody Picture Vocabulary Test.

Correct, non-egocentric responses

The only significant main effect in the analysis of correct responses was the Grade effect ($F = 4.24$; $df = 2, 70$, $p = .02$). See Figure 3. The Grade 3 children made more correct choices ($\bar{X} = .92$) than did either the Grade 1 children ($\bar{X} = .35$) or the Kindergarten children ($\bar{X} = .50$). This

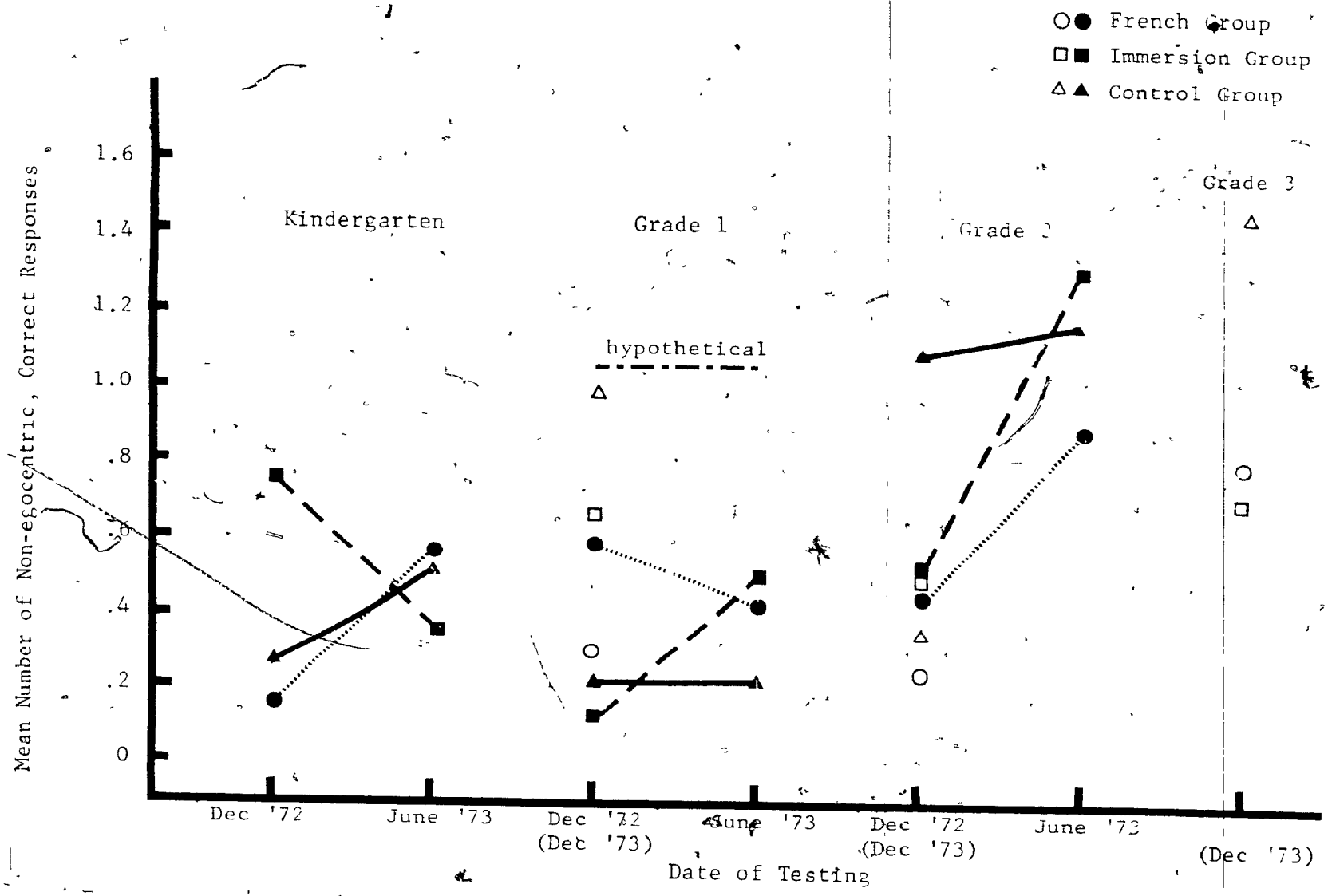

Figure 3. Mean Number of Non-egocentric, Correct Responses

(The open symbols ○ □ △ represent the reliability check)

finding complements the reduction in number of egocentric, incorrect choices reported above.

Again the lack of any other significant main effects or interactions makes it difficult to come to any conclusions concerning group differences. Nevertheless, if one accepts the hypothetical curve in Figure 3, as proposed earlier, there are again indications that by Grade 1 the Control children were performing better than the two experimental groups, and in particular, than the French group. If the line representing chance performance is taken as a frame of reference, it is evident from Figure 3 that the Control group was performing above chance by Grade 1; but that the two experimental groups did not exceed chance level until late in Grade 2. Again, this interpretation of the data can be considered only in the light of the unreliability of the Control group and the lack of statistical significance for this interaction.

As was noted in the previous analysis, there was large variation in performance among the groups in December of Kindergarten. Again, however, these initial differences do not seem to be predictive of subsequent performance.

Incorrect, non-egocentric responses

There were no significant main effects or interactions in the analysis of incorrect, but non-egocentric responses (see Figure 4). It is worth pointing out that the children were responding below chance level at all times. This suggests that there is no intermediate stage between egocentric and correct responding when the children choose the incorrect, although non-egocentric alternatives. If such a stage existed, one would expect an increase in the frequency of selecting the incorrect, non-egocentric

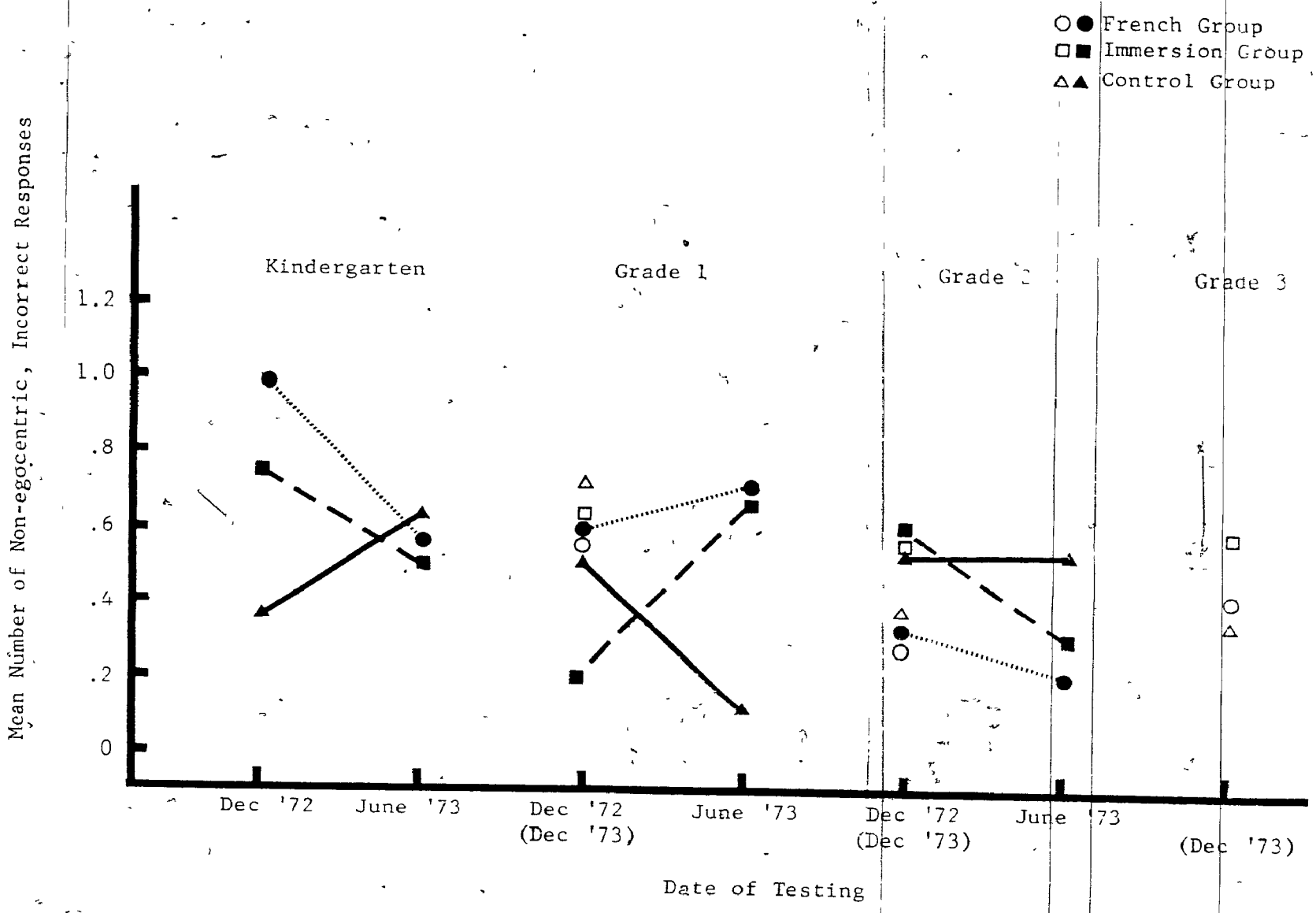

Figure 4. Mean Number of Non-egocentric, Incorrect Responses

(The open symbols represent the reliability check)

alternatives. Such was not, however, the case.

Interpretation

As was expected, there was a significant decrease in egocentric, incorrect responding from Kindergarten to Grade 3 together with an increase in correct, non-egocentric responding. These results corroborated those of Piaget and Inhelder (1956). This decline in egocentric errors was complemented by correct responding rather than by an intermediary stage of non-egocentric, but incorrect, responding.

In terms of between-group differences there were no statistically significant effects. This may be due partly to the unreliability of the performance of the Control group. But, it seems as well that performance on this type of task is inherently unsystematic in the pre-and early school years (Fishbein, Lewis & Keiffer, 1972; Shantz & Watson, 1971). Consequently, only general trends can be described with any degree of confidence, allowing only the conservative interpretation that the school-language experiences of these three groups of children did not seem to influence differentially their ability to perform this task.

Study 4: Ethnocentrism--Part 1

Introduction

While the most striking outcome of Studies 1, 2 and 3 was the similarities among the three groups despite their relatively different school and language experiences, there was a suggestion in Study 1 that the French group were relatively more socially sensitive than the other two groups. Although Study 1 represented a task which was social in nature, successful performance also required linguistic skills. It was argued that while the French and Immersion children might reasonably be expected to develop differential social competence as a result of their school experience there was no evidence in these data, or in related data (see Lambert & Tucker's evaluation of English-language skills in The Bilingual Education of Children, 1972), of any linguistic differences in their native language. Consequently, it was decided to pursue the social consequences of immersion schooling in a different and more direct way. With this aim in mind, it seemed appropriate to assess these children in terms of ethnocentrism.

This line of thinking suggested two questions. First, do members of the French and Immersion groups perceive themselves to be less similar to their own ethnic group (English Canadian) and perhaps more similar to the French Canadian ethnic group whose language they are learning than do the control group? Secondly, and perhaps consequently, are the French and Immersion groups better able to take the role of a French Canadian, and thereby, reveal that they are more sensitive to them? Lambert & Tucker (1972) have reported that children in the St. Lambert project were more favorably disposed toward French Canadians. This was determined by asking the children to rate French Canadians on a number of different personality

traits using a semantic-differential scale.

A technique developed by Middleton, Tajfel & Johnson (1970) was used to assess how similar the children in this study perceived themselves to be to French Canadians, and to examine how well they could assume the role of a French Canadian. Essentially their technique involves a "kiddies' version" of a standard 20-point rating scale. They found that older children had more positive feelings towards their own country than did younger children, and at the same time that they were better able to appreciate that people from other parts of the world held the same feelings about their own native countries. For example, Germans prefer Germany; Frenchmen prefer France, etc. Similar findings have been reported by Piaget and Weil (1951). Thus, this technique seemed eminently suitable for the purposes of this study.

Test Materials

Five different ethnic groups were represented in this study: English Canadians (EC), Americans (Am), French Canadians (FC), European French (EF) and Brazilians (Br). Each ethnic group was introduced through the use of two dolls, one male and one female, making a total of ten dolls. The four Canadian dolls were included to assess the children's degree of identification with the two major ethnic groups in Canada. Inclusion of the American and European-French groups made it possible to determine whether the children's identity was based on national, political or linguistic dimensions or some combination of these; and whether young Canadian children identify with two powerful and well-known cultures. The Brazilian dolls were included so that some light might be thrown on children's perceptions of an ethnic group about which they know little (Lambert &

Klineberg, 1967). When questioned informally, the young children in the present study (those in Grades 1 and 2) knew little, if anything, about Brazil and Brazilians. They were, however, quite familiar with France and the United States and, of course, with English and French Canadians.

The dolls were made of unpainted, wooden blocks measuring 2" X 2" X 4". There were ten blocks to a set, one boy doll and one girl doll for each of the five ethnic groups. A picture of a child's face cut from a children's book was pasted on one face of each block. Five different boy and five different girl faces were selected. A name and ethnic label (e.g., "ROBERT, ENGLISH CANADIAN") were affixed to each block below the face. Because there were four testers there were four sets of blocks. A particular face could be given one of four different names depending upon the composition of the set. Names and ethnicity were counterbalanced with faces to control for possible facial preferences that the children might express. For example, a particular face would sometimes be labelled Robert (English Canadian), John (American), Pierre (French Canadian) or Paulo (Brazilian). Since there were five different ethnic groups and only four sets of dolls complete counterbalancing was not possible. The first names assigned to the dolls were ethnically appropriate and specific (e.g., Robert was always English Candian).

In addition to the dolls, there was a measuring device which consisted of a 40" long cardboard strip numbered from 1 to 20, in 2" intervals. Position 1 was labelled with a smiling face to indicate "liking"; position 20 was labelled with a frowning face to indicate "disliking"; and position 10 was labelled with a neutral face to indicate "indifference". The facial labels were included to assist the children in their ratings of the dolls. On the reverse side of the cardboard strip the labels were changed to "SAME" at position 1, "DIFFERENT" at position 20, with no label at position 10.

The intervening numbering was the same as on the front side.

There was a set of four plastic fruits that were used to instruct the children in the use of the rating scale.

Test Administration

The procedure outlined here is essentially the same as that used by Middleton et al (1970). Each child was seated at a desk with the cardboard strip placed so that position 1 was closest to him. The child was instructed in the use of the scale and the meaning of the faces as labels. For practice, he was asked to indicate how much he liked each of the various fruits by placing each in turn at an appropriate position on the scale. After each rating, the child was questioned to assess his understanding of the scale. Each set of fruits included one the child would probably not like (an onion or a lemon) and others which he would probably like (an apple). This helped to ensure that the child would use all extremities of the scale. When the E was confident that the child fully understood the scale and its use, the next part of the test was administered.

The child was shown the ten dolls, and was trained to read their names and ethnic labels. Training continued until the E was confident that the child was completely familiar with all of the dolls. The child was asked to select one doll at a time and to indicate how much he would like that doll "as a friend" by placing it at an appropriate point along the scale. He was initially asked to choose the one he would most like as a "best friend". Then he was prompted by "And who's next?". He was reminded in advance that he did not have to be friends with all the dolls, and in such cases he should place that particular doll toward the far end of the scale and the frowning face. Thus, all ten dolls were rated on the attraction

scale. Then the child was told to pretend that he was a French Canadian and to rate again all of the dolls from the point of view of a French Canadian child. During this rating session, the child was reminded several times that he was pretending to be French Canadian and not himself. Thus all ten dolls were rated in terms of attraction from a French Canadian's point of view.

Finally, the child was told that he was now going to do something different. The scale was turned over and the subject was told that he was now going to be himself again and that he was to rate each doll in terms of how similar or dissimilar he thought it was to him. He was told that the closer he placed the doll toward himself the more similar that doll was to him, and that the farther away he placed it the more different it was from him. While making these ratings, the child was reminded that he was rating the dolls in terms of similarity-dissimilarity rather than liking-disliking.

Most of the children had no difficulty with the requirements of this task. The testing lasted about 30 minutes.

Results

Three separate five-way analyses of variance were performed on the data. The independent variables were Language Experience (French, Immersion, Control), Grade (Grade 1, Grade 2), Sex of Respondent (Male, Female), Ethnicity of Doll (EC, Am, FC, FF, Br) and Sex of Doll (Male, Female). There were repeated measures on the last two variables. The analyses were performed separately on the two parts of the task in which the children selected friends--once for themselves and once taking the role of a French Canadian--and on the results for the task in which they gave similarity

ratings. As well, there was a final analysis of variance comparing the results from the two parts in which the children selected a friend. A summary of the first three analyses is presented in Appendices A27 to A29

Selection of a Friend

Before discussing these results in detail, it is necessary to point out that in general, these children perceived themselves as English Canadian. This is evident from their similarity ratings. See Table 12. Remember that a low rating here indicates a high degree of perceived similarity while a high rating indicates low perceived similarity (or a high degree of dissimilarity).

The most important point to be made from the analysis of the "Selection of a Friend" data is the difference in liking expressed by the children for the different ethnic groups when asked to select a friend for themselves as opposed to when they were asked to take the role of a French Canadian. It had been conjectured in the introduction that as a result of their special circumstances in school the two experimental groups, French and Immersion, might be better able to take the role of a French Canadian. It is evident from Table 11B that members of all three groups reported that they would be most likely to choose a French Canadian as a friend when they were playing the French Canadian role even though they were most likely to choose an English Canadian as their own friend (see Table 11A). The Ethnic Group X Task interaction was significant (F = 13.74, df = 4, 216, $p < .001$).

Although neither of the Language Experience X Ethnic Groups interactions was signficiant (Selection of a Friend for Self F = .61, df = 8, 216;

Table 11

Mean Attraction Ratings When Selecting a Friend

	(A) For Self			(B) For FC Role		
	French	Immersion	Control	French	Immersion	Control
EC	7.07	6.35	6.41	7.24	8.01	7.83
Am	7.26	8.38	7.01	7.53	8.83	7.91
FC	8.54	8.98	9.66	5.76	5.07	3.96
EF	7.56	9.23	10.07	5.49	6.91	8.01
Br	8.65	9.48	9.74	8.42	10.18	9.41
	p = .76			p = .50		

A low rating indicates strong attraction (maximum rating = 20).

(C)

Selection of a Friend

For Self **

		Sex of Doll	
		Male	Female
Sex of Subject	Male	5.54	11.50
	Female	10.86	5.35

**p = .0003

IIC con't

Selection of a Friend

For FC Role **

Sex of Subject	Sex of Doll: Male	Sex of Doll: Female
Male	5.34	9.68
Female	9.12	5.33

**p<.001

$p > .05$; Selection of a Friend for FC: $F = .9$, $df = 8, 216$; $p > .05$) some patterns may be seen in Tables 10A and 10B that are nevertheless noteworthy.

First of all, it is interesting to note the degree of differentiation which the children made between linguistic and national characteristics according to the role that they themselves are playing. In order to clarify how much each group was differentiating among the dolls in each task, a series of tests of simple effects (Winer, 1971) were performed, one for each Language group in each role, making a total of six tests. A summary of these results is presented in Appendix A30 The French group did not demonstrate significant differentiation among the dolls either when selecting a friend for themselves ($F = .05$; $df = 4, 114$; $p > .05$) or when selecting a friend while pretending to be a French Canadian ($F = 1.49$; $df = 4, 94$; $p > .05$). The Immersion group did not differentiate significantly among the dolls when selecting a friend for themselves ($F = 1.95$; $df = 4, 114$; $p > .05$), but they did differentiate when assuming the role of French Canadian ($F = 4.01$; $df = 4, 94$; $p < .05$). In particular, they discriminated between the French Canadian doll and Brazilian doll ($Q = 5.16$; $df = 5, 94$; $p < .05$).[1]

The Control group differentiated both when selecting for themselves ($F = 3.44$; $df = 4, 114$; $p < .05$) and when pretending to be French Canadian ($F = 4.26$; $df = 4, 94$; $p < .05$). When selecting a friend for themselves, the Control group differentiated between the French Canadian and the European French doll ($Q = 3.98$, $df = 4, 114$; $p < .05$). When taking the role of a

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1. Newman-Keuls Multiple-comparisons Tests; Winer, 1971.

French Canadian they differentiated between the French Canadian doll and all other dolls, namely, the European French doll ($Q = 3.91$, $df = 4, 94$, $p < .05$), the English Canadian doll ($Q = 4.09$, $df = 4, 94$, $p < .05$), the American doll ($Q = 4.09$, $df = 3, 94$; $p < .05$) and the Brazilian doll ($Q = 5.51$, $df = 5, 94$, $p < .05$). Thus, the Control group was much more discriminating when playing the role of a French Canadian than when being themselves. They even differentiated between the French Canadian and European French dolls, both of whom speak the same language as the S in the role of French Canadian and, therefore, might be expected to be rated as similar. They did not make a corresponding differentiation between the English Canadian and American dolls when selecting for themselves. The general rules that they seem to be using when selecting a friend for themselves (for example, do not discriminate between different national groups who speak your language) were not the same as the rules they seemed to attribute to a French Canadian (that is, differentiate between yourself and all other groups represented here). The French and Immersion groups, on the other hand, seemed to reciprocate more fully in their role-playing by using, or appearing to use, the same principles of selection for a French Canadian as they themselves used.

Secondly, the members of all three groups demonstrated greater in-group attraction when selecting for a French Canadian than when selecting for themselves. Compare the means for the French Canadian doll in the French Canadian role ($\bar{X}_I = 5.76$, $\bar{X}_I = 5.07$, $\bar{X}_C = 3.96$) to the means for the English Canadian doll in the Self condition ($\bar{X}_F = 7.07$, $\bar{X}_I = 6.35$; $\bar{X}_C = 6.41$). This is tantamount to the child's saying that a French Canadian is more likely to be attracted to his group than I am to my group. The Control

group, in particular, demonstrated the strongest in group attraction for the French Canadian role. This degree of attraction seems "unrealistic" if one compares this group's attraction to their own group ($\bar{X}$ = 6.41), with their attraction to the French Canadian doll in the French Canadian role ($\bar{X}$ = 3.96). Over-attribution of in-group attraction may result from a lack of experience with that group and a resultant stereotyping of their members as in-group oriented.

Thirdly, and finally, the children from all three groups tended to assume that a French Canadian would be more attracted to an English Canadian than they themselves would be to a French Canadian. Their ratings of attraction for a French Canadian in the Self condition were as follows: French group $\bar{X}$ = 8.54; Immersion group $\bar{X}$ = 8.98; Control group $\bar{X}$ = 9.66, while their ratings for an English Canadian in the French Canadian role were: French group $\bar{X}$ = 7.24; Immersion group $\bar{X}$ = 8.01; Control group $\bar{X}$ = 7.83. This really appears to be a form of ethnocentrism insofar as one is implicitly saying here that "you will like my group more than I will like your group because my group is more likeable". This might be called second-order ethnocentrism. First-order ethnocentrism occurs when the respondent reports that a French Canadian, for example, would like an English Canadian as a friend more than a French Canadian. While all of the groups demonstrate this tendency to some extent, the Control group did so more than the other two groups; 40.5% of the Control group showed this effect, while 37.5% of the French groups and 34.5% of the Immersion group did.

Finally, there was a very strong same-sex preference in selecting a friend both for oneself (F = 68.44; df = 1, 54; $p < .001$) and for a French Canadian (F = 48.75; df = 1, 54; $p < .001$). The average ratings are presented in Table 11C.

Similarity Ratings

The children, as was pointed out earlier, saw themselves as most similar to the English Canadian doll, followed by the American doll, then the French Canadian, European French and Brazilian dolls in decreasing order (F = 10.96, df = 4, 216; p < .001). The mean ratings are presented in Table 12A. As well, there was a strong same-sex similarity (F = 92.9; df = 1, 54; p < .001). The boys saw themselves as more similar to the male dolls ($\bar{X}$ = 6.22) than to the female dolls ($\bar{X}$ = 13.19), whereas the girls saw themselves as more similar to the female dolls ($\bar{X}$ = 7.02) than to the male dolls ($\bar{X}$ = 12.8). These two findings considered together indicate that the children used both ethnicity and sex as dimensions of similarity.

There was a tendency for the French group to see themselves as more similar to all of the ethnic groups than did either the Immersion or Control group (F = 3.18; df = 2, 54; p = .06). The mean similarity ratings are presented in Table 12C. One would have expected that the French children would see themselves as more similar to the two French dolls than the Control or Immersion group. Inspection of Table 11B indicates however, that the French group saw themselves as more similar even to the Brazilian dolls, an ethnic group they knew virtually nothing about.

Although the Language Experience X Ethnic Group interaction was only marginally significant (F = 1.78; df = 8, 216; p = .08) several interesting tendencies emerged from these ratings (see Table 12B). First, the children in the Control group, relative to the other two groups, perceived themselves as the most similar to the English Canadian doll ($\bar{X}_C$ = 5.99; $\bar{X}_I$ = 8.30; $\bar{X}_F$ = 7.99). Conversely, the children in the Control

Table 12

(A) Similarity Ratings for all Language Groups Combined

EC	7.43
Am	8.91
FC	10.03
EF	10.86
Br	11.81

**p .001

A low rating indicates high similarity (maximum rating = 20).

(B) Similarity Ratings -- Language Group x Ethnic Group

	French Immersion	Control	
EC	7.99	8.30	5.99
Am	7.95	9.34	9.43
FC	8.85	11.18	10.07
EF	8.24	11.52	12.83
Br	10.76	12.60	12.05

p = .08

(C) Similarity Ratings for each Language Group

French Immersion	8.76
Control	10.59
	10.07

p = .06

group saw themselves as least similar to the two French dolls ($\bar{X}_{FC}$ = 10.07; $\bar{X}_{EF}$ = 12.83). The French group on the other hand, saw themselves as the most similar to the two French dolls ($\bar{X}_{FC}$ = 8.85, $\bar{X}_{FF}$ = 8.24). This was not unexpected in view of their extensive interaction with French children of their own age. The Immersion children rated themselves intermediate to the French and Control groups on similarity to the European French dolls ($\bar{X}$ = 11.52) and least similar to the French Canadian dolls ($\bar{X}$ = 11.18). Finally, as noted earlier, the French group perceived more similarity between themselves and the Brazilian dolls than did the other two groups. Thus, it appears that the French group generally had a more open view of foreign groups, seeing greater similarities between themselves and other ethnic groups.

There was a significant Grade X Ethnic Group interaction (F = 3.68; df = 4, 216, p = .006) which is shown in Figure 5. The data suggest that the children in Grade 2 had a more highly differentiated perception of themselves than did the Grade 1 children. Thus, at the Grade 2 level the children saw themselves as more similar to the English-speaking dolls (English Canadian and American) and less similar to the non-English speaking dolls than did the children at the Grade 1 level.

There were no other significant effects or interactions.

Interpretation

The main purpose of this experiment was to determine whether the three groups of children would exhibit differential role-taking abilities. In particular, it was expected that the French and possibly the Immersion children, as a result of their educational experiences, might demonstrate less ethnocentrism in their role-playing than would the Control children. However, the findings indicate that all three groups were most likely to

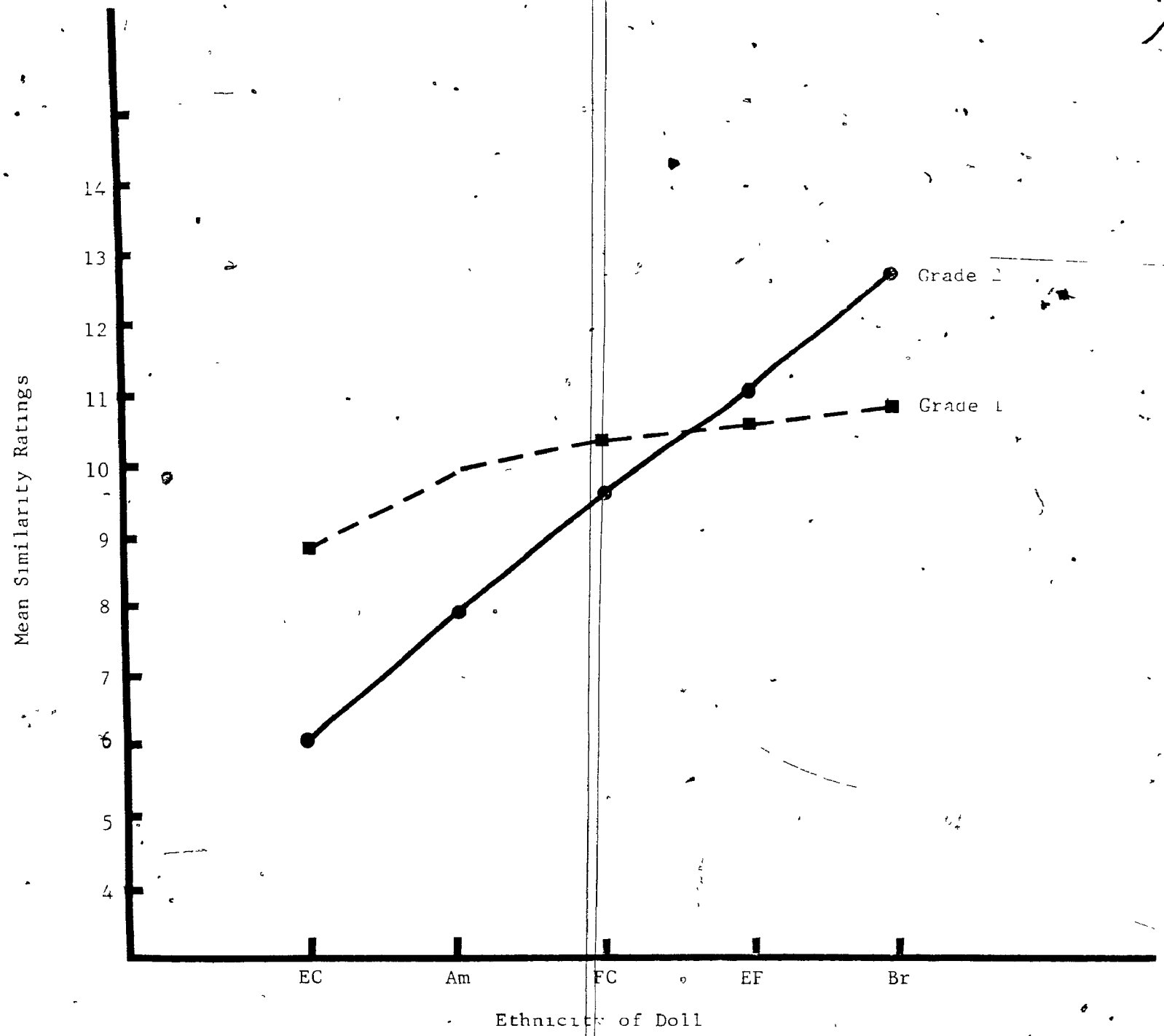

Figure 1. Mean Similarity Ratings for Grades 1 and 2

select a French Canadian for "best friend" from among the five ethnic groups represented when playing the role of French Canadian. In fact, it was noted that all the children showed more in-group attraction when playing the role of French Canadian than when selecting a friend for themselves. The Control group was particularly enthusiastic in this respect; they showed the strongest in-group attraction in the French Canadian role. The tendency to attribute stronger attraction to members of another group than to members of one's own group may result from lack of experience with the other group and stereotypes of the members as very in-group oriented.

One possible explanation for a lack of differential role-taking skills among the three groups is that the "French Canadian" group was a generally liked ethnic group insofar as all three groups of children placed them on the "liked" half of the scale when rating each doll as a potential friend ($\bar{X}_F$ = 8.54; $\bar{X}_I$ = 8.98; $\bar{X}_C$ = 9.66). Middleton et al found that children at all age groups, ranging from 7 to 11 years, were able to take the role of a liked or neutral ethnic group but that the children, especially the younger ones, found it more difficult to take the role of a disliked than a liked or neutral group. Differences in role-taking skills might become evident only in a situation where disliked roles are involved.

There was also evidence that the Control group was less reciprocal in its role-playing than either the French or Immersion groups. Evidence for this possiblity comes from the Control group's tendency to differentiate between more ethnic groups when playing the role of French Canadian than when selecting for one's self. The French and Immersion groups seemed to be using the same principles of selection in both situations.

There was a general tendency for the children to assume that a

French Canadian would like an English Canadian more than they themselves, as English Canadian, would like a French Canadian as a friend. This effect was termed second-order ethnocentrism.

In another sense, the French group exhibited less ethnocentrism than the other two groups in their similarity ratings. In general, the French group saw more similarity between themselves and all of the other ethnic groups than did either the Control or Immersion groups. For example, the ratings of the French groups did not differentiate appreciably between the two English-speaking dolls and the two French-speaking dolls. As well, the French group, and the Immersion group in this instance, saw less similarity between themselves and the English Canadian doll than did the Control group, who reported the strongest similarity to the English Canadian doll. Both of these tendencies, the tendency to perceive less similarity to the English Canadian doll and the tendency to perceive greater similarity to the other ethnic groups, suggests a reduction of ethnocentrism on the part of the French group.

Study 4 -- Part 2

In December, 1973, the Ethnocentrism test was given a second time. In an attempt to replicate the trends that had been noted in Grades 1 and 2, the Grade 2 group from the previous study, who were now, in Grade 3, were tested again; and two new groups of children in Grades 4 and 5 were added in order to extend the findings.

The previous findings did not reveal the existence of differences in role-taking abilities among the three groups. It was argued that this might have been so because all of the ethnic groups included in the test were either neutral or liked by the subjects. Middleton, Tajfel & Johnson (1970) found that it was more difficult for young children to take the role of a disliked group than of a liked or neutral group. Consequently, a sixth ethnic group, Russian, was included in this testing. Pretesting with a group of 20 Grade 4 children from the same schools as used in the previous study revealed that Russians, with a mean rating of 14.2, were most disliked among ten ethnic groups given for consideration. Thus, a Russian boy doll, Ivan, and a Russian girl doll, Olga, were incorporated in each set of ethnic dolls. The children were asked to take the role of a Russian child and to rate each of the dolls in terms of how much or how little they would like each as a friend. This was done in addition to selecting friends for oneself and for a French Canadian child and to rating each of the dolls in term of similarity to self, all of which had been done in the previous study. Otherwise, the procedure for testing was identical to that already described.

Sample

The same criteria described earlier were again applied. Only children who had been in their respective school programs for the entire preceding years were included in the Grade 4 and 5 samples. For example, only children who had spent the preceding 4 years in a French school were included in the French sample, Grade 5 group. Only children from monolingual families were tested. Monolinguality was assessed by a questionnaire which was sent home and completed by the parents. The resulting sample sizes were:

	Grade 3*	Grade 4	Grade 5
French Group	15	12	14
Immersion Group	12	16	14
Control Group	15	14	15

Results

Four separate five-way analyses of variance (unweighted mean solution for unequal n) were performed on the data from the four parts of the experiment: 1) selecting a friend for oneself; 2) assuming the role of a French Canadian and selecting a friend; 3) assuming the role of a Russian and selecting a friend; 4) the similarity ratings. See Appendices A31 to A34.

First of all, it is evident from an inspection of the mean similarity ratings presented in Table 14A that the children in general saw themselves as most similar to the English Canadian dolls. The Grade 3, 4,

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* The size of the Grade 3 samples was not exactly the same as the size of the Grade 2 samples from the previous study because additional children were added to compensate for attrition. Most of the children in the present Grade 3 sample had been tested as Grade 2 pupils in the previous study;

and 5 children perceived more similarity between themselves and the English Canadian dolls ($\bar{X}$ = 4.84) than did the Grade 1 and 3 children ($\bar{X}$ = 7.43). The older children also saw themselves as more similar to both the American group and the two French-speaking groups, but less similar to the Brazilian group than did the previous Grade 1 and 3 children. By Grade 3 the children probably have more knowledge about Brazil and, thus, have a better basis of comparison that the younger children have. By Grade 3 most of the children probably know Brazilians differ from them in terms of nationality and language.

In summary, the older children have an increased feeling of similarity to their own national-linguistic group (English Canadian) and to other groups who speak either French (French Canadian, European French) or English (American). This suggests a growing awareness on the part of these children of the bilingual nature of their country. At the same time, these children as compared to the younger children, saw themselves as less similar to groups who differ from them in terms of both nationality and language; namely, Brazil and Russia.

Table 13A,B and C present the mean attraction ratings made by the three groups of children for each of the six ethnic groups when selecting a friend for themselves and when assuming the role of a French Canadian and a Russian, respectively. It is evident that the children from each of the three groups were most likely to choose as a friend that doll which represented the ethnic group appropriate to the role they were playing; namely, English Canadian for themselves; French Canadian for French Canadian; and Russian for Russian. Contrary to the findings of Middleton et al the children, even when assuming the role of a generally disliked group--

Table 13

Selection of a Friend

(A)
For Self

	French	Immersion	Control
EC	7 84	6.85	7.10
Am	8 16	7.39	6.80
FC	9 03	8 13	9.57
EF	9 61	8.38	9.19
Br	10 31	9 04	9.47
Ru	11 88	8.88	8.82

p = .2371

(B)
For FC Role

	French	Immersion	Control
EC	9 01	7.71	8.11
Am	9 66	9 05	9.51
FC	5.83	4.46	4.56
EF	6 46	5 62	6.54
Br	11 23	10.04	10.62
Ru	11.66	9.40	11.30

p = .58

(C)
For Russian Role

	French	Immersion	Control
EC	9.65	9.90	9.45
Am	9.66	9.05	9.51
FC	10.13	8.35	9.63
EF	10.21	8.48	8.52
Br	9.20	8.31	8.22
Ru	4.10	3.40	3.73

p = .84

Table 13 con't

(D)

Selection of a Friend

For Self **

Sex of Subject	Sex of Doll: Male	Sex of Doll: Female
Male	5.54	11.50
Female	10.86	5 35

**p = .0003

For FC Role**

Sex of Subject	Sex of Doll: Male	Sex of Doll: Female
Male	5.34	9.68
Female	9.12	5.33

**p<.001

the Russians--were most likely to select a member of that group as a friend. Possible reasons for this discrepancy will be discussed later.

None of the Language Experience X Ethnic Group interactions were statistically significant. Nevertheless, the tendency noted in the previous analysis for the children to attribute greater attraction between members of ethnic groups other than their own is evident in these results as well. Specifically, the subjects reported that a French Canadian would be more attracted to another French Canadian ($\bar{X}_F$ = 5.88; $\bar{X}_I$ = 4.46, $\bar{X}_C$ = 4.56), and a Russian would be more attracted to another Russian ($\bar{X}_F$ = 4.01; $\bar{X}_I$ = 3.40; $\bar{X}_C$ = 3.73) than they would be to another English Canadian ($\bar{X}_F$ = 7.84; $\bar{X}_I$ = 6.85; $\bar{X}_C$ = 7.10). The extreme in-group attraction that the Control group attributed to the French Canadian role in the last study was no longer evident with the older children. In general, the magnitude of in-group attraction seems to increase the more dissimilar the group is to the subject. On the average, the children saw the Russian dolls as less similar to themselves ($\bar{X}$ = 14.22) than were the French Canadian dolls ($\bar{X}$ = 8.24); and they exhibited greater in-group attraction in the former role than in the latter.

It had also been pointed out in the previous study that the subjects reported that a French Canadian person would be more attracted to an English Canadian than they, as representatives of the English Canadian group, would be to a French Canadian. This was interpreted as second-order ethnocentrism. When this comparison is made with the present results for the Self and French Canadian role, this tendency persists for the Control group, but has more or less disappeared for the French and Immersion groups. To be more specific, the three groups, French, Immersion and Control, assigned ratings of 9.03, 8.13 and 9.57, respectively, for the French Canadian dolls

when selecting a friend for themselves, but, when taking the role of a French Canadian their ratings of the English Canadian dolls as friends were 9.01, 7.71 and 8.11, respectively. The discrepancy between their respective ratings is largest for the Control groups(d = 1.46), very small for the Immersion group (d =.42) and non-existent for the French group (d = .02). Thus, the Control group continues to report greater attraction between their own group, English Canadian, and the French Canadian group when playing the role of French Canadian than when selecting for themselves. However, as in the previous study, these findings can only be considered suggestive since the relevant interactions were not statistically significant.

Finally, to clarify how each group differentiated among the dolls when selecting a friend, a series of tests of simple effects (Winer, 1971) were carried out for each Language group when selecting a friend for themselves and when assuming the role of a French Canadian and selecting a friend. A summary of these tests is presented in Appendix A35. There were significant simple effects for all three groups in both conditions, Self and French Canadian, except for the Immersion group in the Self condition. Subsequently, Newman-Keuls Multiple-comparisons tests (Ferguson, 1973) were applied comparing the means in each significant simple effect to all other means in that effect. The significant comparisons are presented in Appendix A36 along with their Q values and p level.

The most general observation that can be made based on these comparisons is to note the greater differentiation exhibited by all three groups of children when assuming the role of French Canadian relative to the amount of differentiation they exhibited when selecting a friend for themselves.

The Control group was by far the most discriminating group when

selecting a friend for themselves. They differentiated between their own group, English Canadian, and all other ethnic group except the Americans. The French group, however, seemed to differentiate only between their own group, English Canadian, and those groups which differ in terms of both linguistic and national-political characteristics, Brazilian and Russian. There was no evidence from this analysis at least that they differentiated between the English- speaking groups, English Canadian and American, and the French-speaking groups, French Canadian and European French. Finally, there was no evidence that the Immersion group differentiated between any of the ethnic dolls. This latter finding corroborates the main Language-Experience effect ($F = 2.8$; $df = 2, 109$; $p = .06$) whereby the Immersion group had the lowest overall attraction rating ($\bar{X} = 8.11$) as compared to the French group ($\bar{X} = 9.48$) and the Control group ($\bar{X} = 8.81$).

The patterns of differentiation for the French and Control groups playing the role of French Canadian were almost identical. The major exception was that the Control group differentiated between French Canadian and European French dolls, whereas there was no evidence that the French group did.

The Immersion group differentiated only between the two French-speaking groups and all the others. Of the three groups, their pattern of selection revealed the least differentiation. It is also interesting to note here that although the Control group differentiated between the European French and French Canadian in the French Canadian condition, they did not make an analogous differentiation between English Canadian and American in the Self condition. This was also true for the Control group in the previous study. The French and Immersion groups did not seem to differentiate

between the English Canadian and American in the Self condition or between the French Canadian and European French in the French Canadian condition. These comparisons have been singled out for examination since they are particularly relevant to the ethnicity of the role involved in these parts of the study as outlined in the introduction. Thus, once again there was the suggestion that the Control group did not reciprocate so completely in their role-playing as did the French and Immersion groups.

There was a very strong same-sex preference when selecting a friend for oneself (F = .209; df = 1,109, p .001), when playing the role of French Canadian (F = 125.2; df = 1, 109, p 001) and when playing the role of a Russian (F = 91.56, df = 1, 109; p .001). The mean ratings by sex of subject, and sex of doll are presented in Table 13D for each condition.

For the similarity ratings, it is evident that the children saw themselves as most similar to the English Canadian dolls ($\bar{X}$ = 4.84) followed by the American dolls ($\bar{X}$ = 6.38), then the French Canadian ($\bar{X}$ = 8.24), European French ($\bar{X}$ = 9.55), Brazilian ($\bar{X}$ = 13.86) and Russian dolls ($\bar{X}$ = 14.22) in decreasing order (F = 101.19; df = 5, 545; p < .001). The mean ratings are presented in Table 14A and have already been discussed. In addition to ethnic similarity, there was a strong same-sex similarity (F = 78.08; df = 1, 109; p < .001). The boys saw themselves as more similar to the male dolls ($\bar{X}$ = 7.5) than to the female dolls ($\bar{X}$ = 11.53), while the girls saw themselves as more similar to the female dolls ($\bar{X}$ = 8.1) than to the male dolls ($\bar{X}$ = 10.94). These two findings which replicate those of the previous study indicate that the children used both ethnicity and sex as dimensions of similarity.

Table 14

(A) Similarity Ratings for all Language Groups Combined

EC	4.84
Am	6.38
FC	8.24
EF	9.55
Br	13.86
Ru	14.22

$p < .05$

(B) Similarity Ratings

	French Immersion	Control	
EC	5.37	4.52	4.64
Am	7.42	6.34	5.39
FC	8.81	6.68	9.25
EF	9.92	8.51	10.22
Br	13.77	14.14	13.68
Ru	13.30	14.48	14.88

$p = .056$

(C) Similarity Ratings for each Language Group

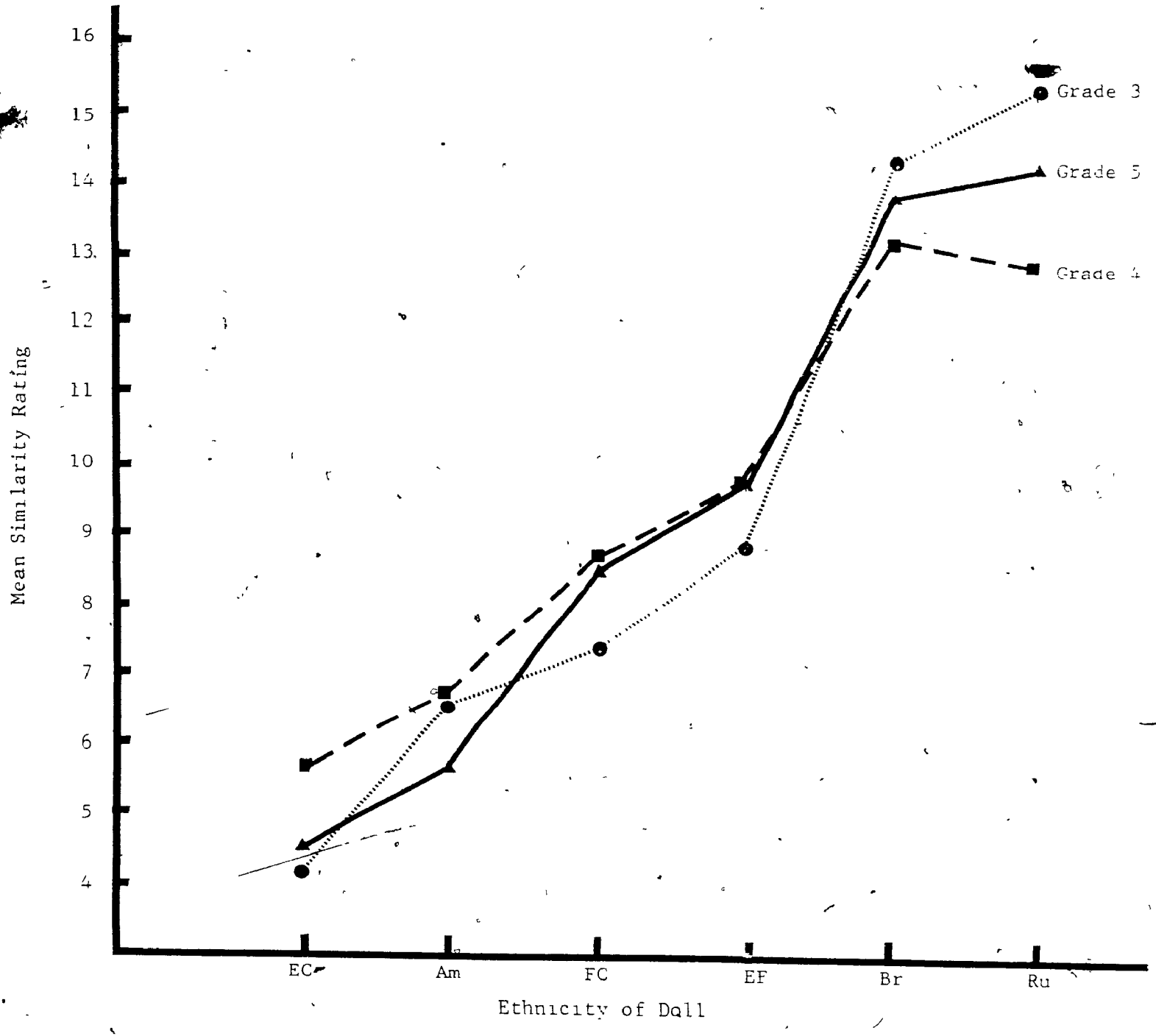
French Immersion	9.77
Control	9.11
	9.68

$p = .35$

Unlike the previous findings, however, where there was a tendency ($p = .06$) for the French group of children to see themselves as more similar to all of the other ethnic groups than did either the Immersion or Control group, there was no such tendency here ($F = 1.05$, $df = 2, 109$; $p = .35$). All three groups reported on the average, equal similarity to all the ethnic groups. The mean overall similarity rating for each group is presented in Table 14C.

The Language Experience X Ethnic group interaction was significant ($F = 1.80$; $df = 10, 545$; $p = .056$). It appears from Table 14B that the French group saw themselves as less similar to the English Canadian group ($\bar{X} = 5.37$) than did either the Immersion ($\bar{X}$ [illegible] 4.5[illegible]) or Control group ($\bar{X} = 4.64$). This was also apparent with the American dolls ($\bar{X}_F = 7.42$, $\bar{X}_I = 6.34$, $\bar{X}_C = 5.39$). Unlike the previous analyses where it was noted that the French group reported more similarity between themselves and the two French dolls (French Canadian, European French) than either the Immersion or Control group, it was the Immersion group in this study that perceived the most similarity between themselves and the two French dolls. Considering the Brazilian and Russian dolls, there was a tendency for the French group to perceive themselves as more similar to them than either of the other two groups of children. The differences here, however, are very small indeed.

The Grade X Ethnic Group interaction which was significant at the .06 level in the previous study was only marginally significant in this study ($F = 1.66$, $df = 10, 545$, $p = .09$). This interaction (see Figure 6) is not easily interpreted. Compared to the curves for the Grade 1 and 2 children from the previous study there is still evidence that the older


16
15
14
13
12
11
10
9
8
7
6
5
4
Mean Similarity Rating
Grade 3
Grade 5
Grade 4
EC
Am
FC
EF
Br
Ru
Ethnicity of Doll

children have a more highly differentiated perception of themselves than the youngest children. In general, the older children--those in Grades 3, 4 and 5--perceived more similarity between themselves and the English and French-speaking dolls than did the children in Grades 1 and 2. On the other hand, the older children, relative to the younger children, saw themselves as less similar to the Brazilian dolls which differ both in terms of nationality and language from themselves.

Interpretation

As in the preceding experiment, the central purpose here was to investigate whether the three groups of children would exhibit differential role-taking abilities. However, in this study, three older groups of children were tested and a sixth, generally disliked ethnic group was included, as a stimulus group. Once again there was no evidence of differential role-taking skills. All children were most likely to select an in-group doll as a best friend even when the role they were playing was that of a Russian child. It had been expected on the basis of the findings by Middleton et al that children would have more difficulty assuming this role than that of a French Canadian. There are two possible explanations for this discrepancy. The first is that although the Russian doll was "generally" disliked, it cannot be said with any certainty that it was disliked by each child. In the Middleton study the "disliked doll" was selected individually for each child. Thus, the same ethnic group was not used in this category for all children in her study. The second possible explanation is that the results of the study by Middleton et al are not universally or crossculturally applicable. It seems, for example, that the children used in their study differed in certain ways from the children tested

in this study, for instance, the Montreal children may well have more exposure to diverse ethnic groups than Middleton's subjects who came from North Oxford, England, a relatively isolated, culturally-homogeneous community.

As in the previous study, there was a tendency for all children to attribute greater in-group attraction to members of other ethnic groups than to their own. This tendency was particularly noticeable in the case of an ethnic group which differed in terms of both national affiliation and language from the subjects' own ethnic group. Additional research would be required to unravel the relative importance of each of these factors and to further substantiate the trends noted here.

Unlike the findings of the previous study, the French group did not report greater similarity between themselves and all other ethnic groups. There was a slight tendency for the French group to perceive themselves as more similar to the Brazilian and Russian dolls, but this tendency was marginal. Of the three groups, the French group reported the least similarity to the two English-speaking ethnic groups (English Canadian, American). And the Immersion group reported the greatest similarity to the two French-speaking groups (French Canadian, European French). However, the Language Experience X Ethnic Group interaction was not statistically significant.

The relatively highly differentiated pattern of similarity shown by the Grade 2 sample from the previous study was displayed by the Grade 3, 4 and 5 children in this study. The most noticeable difference in results between the Grade 1 - 2 group and the Grade 3-4-5 group was the increase in similarity reported by the latter group to the English- and French-speaking ethnic groups and the decrease in similarity to the Brazilian group. This

pattern suggests that the older children have a developing identity with their own national-linguistic group as well as a growing sense of identity with other national groups who share a common language or languages.

Discussion and Conclusions

In the introduction a school program was described in which English-speaking children taught by native-French speaking teachers rather than conventionally, with native-English speaking teachers. The purpose of the present research was to investigate some of the possible social-psychological consequences of this type of education on the children involved. In particular, it was expected that the children--while learning the second language and while learning to function effectively in this somewhat unusual social situation--would develop greater social sensitivity that might manifest itself in verbal communication and possibly in other types of social behavior. Although it was hypothesized that the children would become more sensitive communicators as a result of their French-immersion experience there was still the possibility that this experience would have detrimental effects. To test the generality of the effects, if any, of French-immersion education on cognitive functions other than those involved in communication, a test of non-verbal or perceptual role-taking was also given.

Communication Skills

With regard to the completeness of communication as measured in the Game Explanation Task, the findings suggest that the immersion children had developed greater differential sensitivity than had the children from schools where English--their native language--was the medium of instruction. The French group, English-Canadian children attending all-French schools, were the most sensitive, followed in order by the Immersion group, those in English schools with French-speaking teachers, and finally the Control, those

in English schools with English-speaking teachers, who were the least sensitive. This order of differential sensitivity suggests that the more completely one is exposed to a second language and to members of another ethnolinguistic group, the greater the impact.

From a theoretical point of view, the results imply that children who have themselves experienced difficulties communicating with their teacher and classmates are more sensitive to the needs of others in communication situations. Heightened sensitivity may take two different forms. One is a greater ability or willingness to differentiate between oneself as listener and the other person as listener. According to Vygotsky, differentiation between self and other is the process by which private speech becomes internal and covert while social speech starts to develop at the overt level. This form of sensitivity, however, does not account for the specific fact that the immersion children differed from the non-immersion children in their telling of information about the materials of the game.

An explanation of the children's performance in terms of role-taking would seem to be more suitable. Having experienced communication difficulties themselves, the immersion children are more aware of such difficulties and of possible solutions to them. Consequently, they are better able to empathize with and take the role of others having communication problems. Furthermore, having learned to cope somewhat with their own communication problems, the immersion children are also better able to respond appropriately to the needs of their listeners.

Other data from the same study, however, impose limits on the influences that one may draw about the extent of the consequences of early immersion on communication skills. When the children's explanations of

the game were analyzed in terms of elaboration, no differences were found among the groups. The French group was no more likely than the Control group to elaborate their presentation of the rules of the game by referring to the materials. Thus, although the French children had perceived the need of the blindfolded listener for a fuller description of the materials of the game, they did not react to this need in the expected way (i.e., by explicitly enumerating the materials of the game so that the rules may be better understood). The children may have felt that a more complete description of the materials was all that was necessary to explain the game to the blindfolded listener, thereby making elaboration of the rules seem unnecessary.

On the other hand, there may have been linguistic constraints operating that masked the differences in perceptions that were revealed by the completeness analysis. To know that your listener needs more information about the materials of the game does not mean that you necessarily know how to formulate a message which will adequately inform your listener of such. Flavell (1968) terms this aspect of communication "application". As Flavell points out, application involves the use of age-dependent skills whose acquisition is not necessarily involved in role-taking development, and, in the present context, may not be affected by a French-immersion experience. To investigate the possibility of linguistic constraints a linguistic analysis of the children's explanations was undertaken. Again, there were no differences among the groups. Thus, it was shown that the children from all three groups were using the same proportions of various grammatical structures in their explanations despite the markedly different types of schooling they had experienced. In the case of the partially-

immersed children, these findings corroborate those of Lambert and Tucker (1972) who also found no differences between immersion and non-immersion students in their mother-tongue oral-language skills. In the case of totally-immersed children, these findings are both instructive and encouraging because no detailed analysis of the grammatical structure of the native language of children learning a second language in this way has previously been made. Swain (1972) has suggested that learning two languages simultaneously does not affect the acquisition of either language separately. Therefore, one might have expected that learning a second language after the first one is well developed, at the age of 5 for example, would not alter the structure of the first one.

Further confirmation that there were no negative effects of French immersion on native language skills comes from the findings from the Abstract Designs Task in which there were no significant differences among the groups in terms of actual effectiveness of verbal communication. The previous measures emphasized "intent to communicate" more than communicative competence. The discrepancy between the finding of differential sensitivity in the Game Explanation Task and the lack of differences in the Abstract Designs Task may be explained by the nature of the two tasks. Whereas the Game Explanation Task requires explanatory and linguistic concepts which are present in the child's existing verbal repertoire, the Abstract Designs Task may require skills and concepts that may not be readily available to the child. It is rare for children to be asked to describe geometric shapes which have no referents in reality. Thus, the differential sensitivity which the French children demonstrated in the Game Explanation Task (analysis of completeness) may have been masked in the Abstract Designs

Task by the unusual demands of this test.

From another point of view these findings are encouraging insofar as they indicate that participation in a total immersion school program does not affect the development of communication skills in one's native language. Samuels, Reynolds and Lambert (1969) have already reported similar findings for children participating in partial-immersion programs. Thus, the fears of many educators and parents (see Bicker & d'Anglejan, 1970) that such programs have detrimental effects on their children's native language skills find no support from these results.

Generalizability of Effects to Non-Verbal Skills

There was no clear evidence that the sensitivity which the two immersion groups demonstrated in the Game Explanation Task generalized to a non-verbal, non-social type of situation, such as the Perspectives Task. If any differences were to be extracted from these data they would probably favor the Control group with the two immersion groups--and the French group in particular--showing a slight retardation on this task. However, these data were not very reliable as was evident from the results section of Study 3. The findings reported by other researchers who have tested children of the same age range are also somewhat confused (cf Fishbein, Lewis & Keiffer, 1972; Shantz & Watson, 1971); more interpretable results seem to emerge only when older children (13 or 14 years) have been tested.

Thus, the present data do not seem to offer unambiguous support for either Rubin's suggestion of a single cognitive factor or Hollos and Cowan's of two distinct factors, one related to logical operations and the other to social skills.

The overall findings from the first three studies suggest that

the social effects of education in a second language are likely to be specific and closely related to the social circumstances of these programs. In other words, the effects may best be seen in interpersonal communication situations which involve linguistic and conceptual skills already in the child's repertoire, as is the case of the Game Explanation Task. Social consequences are either less evident or not to be found in communication situations which require unusual responses or in non-verbal, non-social situations, such as the Perspectives Task.

Ethnocentrism

The Ethnocentrism studies were introduced in an attempt to study differential social sensitivity in an unambiguously social situation using a task where the relevant variable, ethnicity, was closely related to the school experience. For example, the French culture becomes a salient component of the school experience of immersion children by virtue of their having a French teacher and French classmates and by virtue of their learning to speak French and study in French.

The data did not suggest that this type of educational experience makes it any easier for these children to take the role of a member of another cultural group, French or otherwise. All of the children, regardless of their instructional experience, were most likely to select a French-Canadian as a best friend when playing the role of French Canadian. In general, choosing a friend when playing the role of a member of another ethnic group was fairly easy for all of these children. Even taking the role of a Russian, who belongs to a group generally disliked by this sample, seemed fairly easy for them. Children in many of Montreal's schools interact daily with children from various ethnic backgrounds. This regular exposure may produce

a good deal of awareness of ethnic diversity. It would be interesting to investigate the reaction by English children from a more socially-homogeneous and isolated community on this task. With such a sample, the ethnocentrism reported by Middleton et al (1970) for their youngest subjects might be replicated

Differences among the groups became more evident when they were asked to give their perceptions of themselves vis a vis various ethnic groups. The French children in the early grades (grades 1 and 2) tended to see themselves as more similar to members of all of the other ethnic groups represented to them than did the Immersion or Control children. In fact, the children in the French schools showed very little differentation among the English-speaking, the French-speaking and the Brazilian groups. As well, they did not rate themselves as being as similar to the English Canadian doll as did the other two groups. It is not surprising that it was the children who are immersed totally in French who reported the greatest similarity to the other ethnic groups, and in particular, to the French groups. Quite likely the empathy that the totally-immersed children express toward the French ethnic groups arises from sharing language experiences with them and from actually having French-speaking friends.

The French children in the older grades (3,4, and 5) did not report the same high degree of similarity to the non-English Canadian groups as did the younger French children. It is difficult to account for the shift in empathy by the French group as they grow older. Possibly they are becoming more aware of their native English identity and wish to differentiate it from their acquired French identity.

The Immersion children in the older grades tended to report relatively

more similarity between themselves and both the English-speaking and French-speaking groups than did the other two groups. However, the differences between the older groups were not as large as those between the younger groups mentioned above.

Implications for Bilingual Education

From a pedagogical point of view, the findings of this research are very encouraging. First, they offer support for reports from other researchers that French-immersion programs in the elementary grades do not have detrimental effects on the development of a child's native language skills (Lambert & Tucker, 1972, Casserly & Edwards, 1973). It is likely that the English-language environment of these children outside school is sufficiently vital to sustain and nurture native language skills despite the paucity of English-language instruction in the school. When social side effects do occur they seem to favor the child in immersion, rather than handicap him, when communication is involved.

Secondly, these findings extend our knowledge about the effects of total French-language instruction on English youngsters. This group of children has not been investigated previously. Another group of Canadians who attend second-language schools and have not been studied previously in terms of language skills are immigrant children who speak neither French nor English but attend either French or English-language schools. Whether, in fact, the findings from the present investigation are generalizable to an immigrant group remains to be tested. Nevertheless, the present results augur well for them. In a country such as Canada where ethnic plurality is encouraged, and, in fact, constitutes official government policy, native language maintenance is to be encouraged if ethnic diversity is to be maintained.

Thirdly, the findings from Study 4 on Ethnocentrism suggest that by teaching children a second language and by providing them with an opportunity to make friends with members of another ethnic group, and specifically, with the French, bilingual education may help to broaden children's perceptions of themselves to encompass ethnic groups other than their native one. Increasing ethnic empathy in this way may help to foster inter-ethnic relations. Whether, in fact, immersion children have more French-speaking friends or whether they would actively seek out French-speaking friends compared with non-immersion children cannot be answered by this investigation. The empathy that the immersion children express toward French Canadians would seem to be a favorable sign that these children might interact with French-speaking people in a way that monolingual children with their limited ethnic and language experiences would not. Needless to say, the skills the immersion children acquire in the French language alone prepares them to interact with French Canadians in a way that monolingually-educated children cannot.

The development of biculturalism, a question which emerges from consideration of the overall effectiveness of bilingual education perhaps cannot be dealt with effectively by the schools exclusively. Broader community and parental involvement may be necessary to help these children realize the social potential they have reaped from their French-immersion experience. Their French-immersion experience will surely serve to facilitate their integration into Montreal's multiethnic community.

Summary

The present research investigated some of the social psychological repercussions of participation in "French immersion programs" on the participating children. Interest was focused particularly on the development of communication skills by the children. Two different experiments were designed, one to assess how sensitive the children would be in the role of communicator to listeners with different communication needs (Game Explanation Task); and one to assess actual effectiveness of communication (Abstract Designs Task).

Three samples of children from Kindergarten, Grade 1 and Grade 2 were tested (1) native-English speaking children attending English-language schools (Control Group), (2) native-English speaking children in French-language schools (French Group), and (3) native-English speaking children attending English schools in which their teachers spoke French to them (Immersion Group). There were approximately 12 subjects in each language by grade sub-sample. All children came from middle class backgrounds.

Preliminary testing with the Raven's Progressive Matrices and the Peabody Picture Vocabulary Test failed to find any statistically significant differences among the three groups of children in terms of non-verbal reasoning or verbal I.Q.

The results from the Game Explanation Task indicated that the French group responded most differentially to the needs of their listeners, in terms of the amount of material information presented, while the Control group differentiated least between the sighted and blindfolded listeners. Subsequent analyses of the children's protocols in terms of linguistic

features and elaboration failed to reveal any differences among the groups.

Thus, the results suggested that the two experimental groups--and the French one in particular--had developed a greater sensitivity to a listener, and, thus greater intent to communicate differentially, but they were no different from the Control group in the actual formulation of their verbal messages.

Findings from the Abstract Designs Task indicated that the two experimental groups of children were neither more nor less effective in actually communicating than were the Control children. These results confirmed the earlier findings from the Game Explanation Task that all children were using their native language in essentially the same way; and, thus, that the French-immersion experience--partial or total--had not changed the children's actual communication skills.

To test the generalizability of the greater differential sensitivity that the experimental children had exhibited in the Game Explanation Task, a test of non-verbal or perceptual sensitivity was administered (Perspectives Task). There was no evidence of differences among the groups on this task. The results from this study were unclear. Nevertheless, it was tentatively suggested that the differential sensitivity which had resulted from the French-immersion experience seemed to be confined to social types of behavior, such as communication, and was not characteristic of the children's non-verbal behavior.

Further signs of social consequences came from the Ethnocentrism study. In this study, it was found that the members of the French group

were more likely to choose a French Canadian as a friend than were the Control children. Furthermore, the experimental children reported that they were equally similar to children from French-speaking and English-speaking ethnic groups; the Control children, on the other hand, saw themselves as more similar to the English-speaking ethnic groups than to the French-speaking ones.

In conclusion, it was suggested that the children from all three groups, despite their rather diverse types of school-language experiences, were similar to one another in terms of their oral English-language skills. On the other hand, the bilingually-educated children seem to have developed greater sensitivity than the monolingually-educated children in communication situations. It was argued that this heightened sensitivity has arisen from enhanced role-taking skills which, in turn, have developed because the experimental children have experienced communication difficulties in school and have learned to cope with them. As a result of their French-immersion experience the experimental children also reported that they were more similar to the French-speaking ethnic groups than did the Control children. It was suggested that the empathy that the immersion children feel toward the French groups is a valuable step in the direction of increased inter-ethnic communication.

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Summaries of the Analyses of Variance on Control Measures

A Peabody Picture Vocabulary Test

Source		df	Mean Square	F Ratio
Language Experience	L	2	59.86	.26
Grade	G	2	102.02	.45
	CxG	4	427.23	1.87
	S	94	228.44	

B. Ravens Progressive Matrices

Source		df	Mean Square	F Ratio
Language Experience	L	2	3.36	.13
Grade	G	2	191.26	7.15*
	CxG	4	25.36	.95
	S	94	26.75	

C. Mean Age

Source		df	Mean Square	F Ratio
Language Experience	L	2	.13	.97
Grade	G	2	27.51	209.44**
	CxG	4	.07	.52
	S	94	.13	

Summary of the Analysis of Variance on

Mean Number of Rules

Source		df	Mean Square	F Ratio
Language Experience	C	2	2.34	1.08
Grade	G	2	11.45	5.28**
Sex of Subject	X	1	.03	.02
	CxG	4	1.36	.62
	CxX	2	.42	.20
	GxX	2	3.67	1.69
	CxGxX	4	4.13	1.90
	S	85	2.17	
Listener Condition	L	1	.44	.49
	CxL	2	.36	.41
	GxL	2	2.43	2.72
	XxL	1	.30	.33
	CxGxL	4	1.13	1.27
	CxXxL	2	.04	.04
	GxXxL	2	3.12	3.51*
	CxGxXxL	4	1.44	1.62
	SxL	85	.89	

*p< 05; **p<.01

Summary of the Analysis of Variance on Mean Number of Materials

Source		df	Mean Square	F Ratio
Language Experience	C	2	3.18	1.80
Grade	G	2	4.49	2.53
Sex of Subject	X	1	.17	.09
	CxG	4	.47	.26
	CxX	2	3.43	1.94
	GxX	2	1.41	.80
	CxGxX	4	1.69	.95
	S	5	1.77	
Listener Condition	L	1	31.73	30.80***
	CxL	2	3.22	3.13*
	GxL	2	1.78	1.72
	XxL	1	.06	.06
	CxGxL	4	.08	.07
	CxXxL	2	2.03	1.96
	GxXxL	2	1.77	1.71
	CxGxXxL	4	.49	.48
	SxL	85	1.03	

*p<.05, ***p<.001

Summary of the Analysis of Variance on

Extra Information

Source		df	Mean Square	F Ratio
Language Experience	C	2	4.34	3.6*
Grade	G	2	2.71	2.25
Sex of Subject	X	1	2.09	1.74
	CxG	4	1.47	1.22
	CxX	2	2.57	2.14
	GxX	2	2.34	1.95
	CxGxX	4	1.93	1.61
	S	85	1.20	
Listener Condition	L	1	.07	.21
	CxL	2	.64	1.85
	GxL	2	.21	.60
	XxL	1	.11	.31
	CxGxL	4	.46	1.33
	CxXxL	2	.08	.23
	GxXxL	2	.21	.61
	CxGxXxL	4	.13	.38
	SxL	85	.35	

*p < .01

Frequency of Occurrence of each Rule as Mentioned by Subjects in the Sighted -and Blindfolded- Listener Conditions

Rule	Sighted	Blind.
1. car each	59	50
2. die in cup	88	66
3. shake die	79	74
4. move car	88	88
5. end - wins	45	45
6 black -- no turn	71	87

Summary of the Analysis of Variance on Mean Number of Elaborated Rules

Source		df	Mean Square	F Ratio
Language Experience	C	2	1.04	.58
Grade	G	2	2.93	1.48
Sex of Subject	X	1	.73	.36
	CxG	4	2.27	1.15
	CxX	2	10.43	5.28**
	GxX	2	.44	.22
	CxGxX	4	1.06	.54
	S^2	85	1.98	

**p<.01

Summary of the Analysis of Variance on Mean Number of Non-Elaborated Rules

Source		df	Mean Square	F Ratio
Language Experience	C	2	2.24	1.27
Grade	G	2	.72	.41
Sex of Subject	X	1	.83	.47
	CxG	4	3.47	1.97
	CxX	2	9.98	5.67**
	GxX	2	.05	.03
	CxGxX	4	5.06	2.87
	S	85	1.76	

**p<.01

Summary of the Analysis of Variance on the Elaboration Ratio

Source		df	Mean Square	F Ratio
Language Experience	C	2	.17	1.95
Grade	G	2	.14	1.66
Sex of Subject	X	1	.02	.002
	CxG	4	.16	1.89
	CxX	2	.73	8.66**
	GxX	2	.04	.50
	CxGxX	4	.08	.88
	S	85	.08	

**p< 01

Summary of the Analysis of Variance

on Number of Utteranges

Source		df	Mean Square	F Ratio
Language Experience	C	2	14.32	1.18
Grade	G	2	30.74	2.54
Sex of Subject	X	1	21.64	1.79
	CxG	4	15.87	1.32
	CxX	2	11.95	.99
	GxX	2	7.21	.50
	CxGxX	4	16.63	1.38
	S	89	12.06	
Listener Condition	L	1	58.92	13.25***
	CxL	2	.31	.07
	GxL	2	6.58	1.48
	XxL	1	1.59	.36
	CxGxL	4	2.19	.49
	CxXxL	2	3.28	.74
	GxXxL	2	4.47	1.01
	CxGxXxL	4	2.52	-
	SxL	89	4.45	

*p<.05; **p<.01; ***p<.001

Summary of the Analysis of Variance

on Mean Length of Utterance

Source		df	Mean Square	F Ratio
Language Experiance	C	2	5.37	.68
Grade	G	2	3.32	.42
Sex of Subject	X	1	2.95	.37
	CxG	4	7.38	.93
	CxX	2	2.29	.29
	GxX	2	14.62	1.85
	CxGxX	4	3.17	.40
	S	89	7.89	
Listener Condition	L	1	4.09	1.35
	CxL	2	.83	.28
	GxL	2	2.08	.69
	XxL	1	8.54	2.84
	CxGxL	4	2.81	.93
	CxXxL	2	2.54	.84
	GxXxL	2	2.95	.98
	CxGxXxL	4	5.42	1.80
	SxL	89	3.01	

Summary of the Analysis of Variance on Mean Number of Simple Sentences

Source		df	Mean Square	F Ratio
Language Experience	C	2	1.22	.27
Grade	G	2	9.81	2.15
Sex of Subject	X	1	2.31	.51
	CxG	4	.91	.20
	CxX	2	8.93	1.96
	GxX	2	1.90	.42
	CxGxX	4	4.46	.98
	S	89	4.56	
Listener Condition	L	1	13.98	6.93*
	CxL	2	.20	.10
	GxL	2	2.06	1.02
	XxL	1	4.52	2.24
	CxGxL	4	.59	.29
	CxXxL	2	.10	.05
	GxXxL	2	.20	.10
	CxGxXxL	4	1.04	.52
	SxL	89	2.02	

*p < .05

Summary of the Analysis of Variance on Mean Number of Coordinate Clauses

Source		df	Mean Square	F Ratio
Language Experience	C	2	1.69	1.79
Grade	G	2	1.60	1.69
Sex of Subject	X	1	.01	.01
	CxG	4	1.00	1.06
	CxX	2	1.42	1.51
	GxX	2	4.69	4.97**
	CxGxX	4	.61	.64
	S	89	.94	
Listener Condition	L	1	1.25	2.16
	CxL	2	.25	.43
	GxL	2	.18	.30
	XxL	1	.005	.008
	CxGxL	4	.23	.39
	CxXxL	2	.25	.43
	GxXxL	2	.28	.48
	CxGxXxL	4	.28	.48
	SxL	89	.59	

**p<.01

Summary of the Analysis of Variance on Mean Number of Subordinate Clauses

Source		df	Mean Square	F Ratio
Language Experience	C	2	10.35	1.36
Grade	G	2	8.80	1.16
Sex of Subject	X	1	3.80	.50
	CxG	4	9.29	1.22
	CxX	2	9.05	1.19
	GxX	2	5.88	.78
	CxGxX	4	6.05	.80
	S	89	7.58	
Listener Condition	L	1	26.68	10.53**
	CxL	2	10.45	4.12*
	GxL	2	.20	.08
	XxL	1	2.44	.96
	CxGxL	4	3.23	1.28
	CxXxL	2	2.21	.88
	GxXxL	2	2.33	.92
	CxGxXxL	4	.70	.27
	SxL	89	2.53	

*p<.05; **p<.01

Summary of the Analysis of Variance on Mean Number of Relative Clauses

Source		df	Mean Square	F Ratio
Language Experience	C	2	.19	.61
Grade	G	2	1.30	4.20*
Sex of Subject	X	1	.72	2.33
	CxG	4	.41	1.31
	CxX	2	.56	1.81
	GxX	2	1.36	4.38*
	CxGxX	4	.46	1.47
	S	89	.31	
Listener Condition	L	1	.001	.005
	CxL	2	.49	.17
	GxL	2	.11	.39
	XxL	1	.22	.71
	CxGxL	4	.04	.13
	CxXxL	2	.04	.12
	GxXxL	2	.003	.01
	CxGxXxL	4	.18	.64
	SxL	89	.29	

*p < .05

Summary of the Analysis of Variance on Mean Number of Predicate Utterances

Source		df	Mean Square	F Ratio
Language Experience	C	2	1.39	4.02*
Grade	G	2	.21	.59
Sex of Subject	X	1	1.06	3.08
	CxG	4	.12	.35
	CxX	2	.58	1.68
	GxX	2	.21	.59
	CxGxX	4	.18	.52
	S	89	.35	
Listener Condition	L	1	.08	.55
	CxL	2	.28	1.84
	GxL	2	.21	1.39
	XxL	1	.09	.63
	CxGxL	4	.04	.26
	CxXxL	2	.10	.65
	GxXxL	2	.28	1.84
	CxGxXxL	4	.22	1.49
	SxL	89	.15	

*$p < .05$

Summary of the Analysis of Variance on Mean Number of Adjectival Utterances

Source		df	Mean Square	F Ratio
Language Experience	C	2	.99	1.70
Grade	G	2	.31	.52
Sex of Subject	X	1	.12	.20
	CxG	4	1.13	1.94
	CxX	2	.15	.25
	GxX	2	.12	.20
	CxGxX	4	1.21	2.07
	S	89	.59	
Listener Condition	L	1	.06	.34
	CxL	2	.25	1.36
	GxL	2	1.29	7.00**
	XxL	1	.002	.01
	CxGxL	4	.21	1.12
	CxXxL	2	.33	1.79
	GxXxL	2	.11	.60
	CxGxXxL	4	.62	3.37*
	SxL	89	.19	

*p<.05; **p<.01; ***p<.001

Summary of the Analysis of Variance

on False Starts

Source		df	Mean Square	F Ratio
Language Experience	C	2	1.08	.73
Grade	G	2	1.27	.86
Sex of Subject	X	1	.01	.08
	CxG	4	1.29	.87
	CxX	2	1.22	.83
	GxX	2	.73	.49
	CxGxX	4	2.06	1.39
	S	89	1.48	
Listener Condition	L	1	.49	1.59
	CxL	2	.99	1.19
	GxL	2	.03	.04
	XxL	1	.33	1.39
	CxGxL	4	1.43	1.72
	CxXxL	2	.82	.98
	GxXxL	2	.05	.06
	CxGxXxL	4	.66	.79
	SxL	89	.83	

Summary of the Analysis of Variance on Mean Number of Attention Getters

Source		df	Mean Square	F Ratio
Language Experience	C	2	.45	.40
Grade	G	2	.06	.05
Sex of Subject	X	1	1.81	1.61
	CxG	4	.69	.62
	CxX	2	.03	.02
	GxX	2	1.12	.99
	CxGxX	4	3.25	2.89*
	S	89	1.13	
Listener Condition	L	1	.07	.22
	CxL	2	.03	.09
	GxL	2	.14	.43
	XxL	1	.07	.24
	CxGxL	4	.12	.38
	CxXxL	2	.08	.25
	GxXxL	2	1.03	3.27*
	CxGxXxL	4	.23	.74
	SxL	89	.31	

*p .05; **p<.01; ***p<.001

Example of Complete Descriptions Given by a Child for all Six Designs

Block 1

S: It .this one looks a little bit like two shark's wrestling with each other.

E: Why?

S: Because they've got big points sticking out

E: Does it look like anthing else?

S: Yeah, it looks like some curvy mountains.

E: Why?

S: Because they've got like big points and little points and all sorts of points and they're bumpy...they look bumpy.

E: Does it look like anything else?

S: No.

Block 2

S: This one looks like somebody's head. There's a foot sticking out of somebody's head, and there's ears.

E: Why a head?

S: Because it's round.

E: Does it look like anything else?

S: Yeh. It looks like a foot sticking out of somebody's head.

E: Why?

S: Because it's big.

E: Does it look like anything else?

S: No.

Block 3

S: This one looks like a T-shirt a little bit.

E: Why?

S: Because, like its got arms and a part for your neck.

E: Does it look like anything else?

S: Yeah. It looks a little bit like a

E: Why?

S: 'cause, because it...like sticking out, two arms and it's sticking out the same way.

E: Does it look like anything else?

S: No.

Block 4

S: That looks like somebody's hand.

E: Why?

S: It looks like a boxer boxing because like he's got big fists sticking out.

E: Does it look like anything else?

S: Yeah. It looks like a U, a little bit

E: Why?

S: Because it curves.

E: Does it look like anything else?

S: No.

Block 5

S: It looks a little bit like a fish

E: Why?

S: Because its got a point at the top and it's got a little bit like a tail.

E: Does it look like anything else?

S: No

Block 6 S: The last one looks like a fish too.

E: Why?

S: Because it's got points on its head too.

E: Does it look like anything else?

S: Yeah It's got a tail that's all...and it looks like somebody with a hat on.

E: Why?

S: Because it shaped like a hat.

E: Does it look like anything else?

S: No.

Example of a Sample of a Child's Description of the Abstract Designs as Given to a Rater

Block 1 S: It...this one looks a little bit like two sharks wrestling with each other.

E: Why?

S: Because they've got big points sticking out.

Block 2 S: This one looks like somebody's head. There's a foot sticking out of somebody's head, and there's ears

E: Why a head?

S: Because it's round.

Block 3 S: This one looks like a T shirt a little bit.

E: Why?

S: Because, like it's got arms and a part for your neck.

Block 4 S: That looks like somebody's hand.

E: Why?

S: It looks like a boxer boxing because like he's got big fists sticking out.

Block 5 S: It looks a little bit like a fish.

E: Why?

S: Because it's got a point at the top and it's got a little bit like a tail.

Block 6 S: The last one looks like a fish too

E: Why?

S: Because it's got points on it's head too.

Summary of the Analysis of Variance on Accuracy Scores for the Abstract Design Task

Source		df	Mean Square	F Ratio
Language Experience	L	2	9.43	.43
Grade	G	2	61.42	2.82
Sex of Subject	X	1	14.10	.65
	CxG	4	5.58	.26
	CxX	2	16.05	.74
	GxX	2	35.63	1.63
	CxGxX	4	10.92	.50
	S	89	21.81	

Summary of the Analysis of Variance on Confidence Ratings for the Abstract Designs Task

Source		df	Mean Square	F Ratio
Language Experience	L	2	.02	.07
Grade	G	2	.78	2.77
Sex of Subject	X	1	1.18	4.20*
	CxG	4	.37	1.31
	CxX	2	.97	3.43*
	GxX	2	.11	.40
	CxGxX	4	.36	1.26
	S	89	.28	

*p<.05

Summary of the Analysis of Variance on Feedback Scores for the Abstract Designs Task

Source		df	Mean Square	F Ratio
Language Experience	L	2	.72	1.48
Grade	G	2	2.21	4.52*
Sex of Subject	X	1	1.14	2.32
	CxG	4	1.0	2.05
	CxX	2	.82	1.68
	GxX	2	1.45	2.97
	CxGxX	4	1.16	2.38
	S	89	.49	

$p < .05$

Summary of the Analysis of Variance on Mean Number of Egocentric, Incorrect Responses

Source		df	Mean Square	F Ratio
Language Experience	C	2	.56	.29
Grade	G	2	6.17	3.17*
	CxG	4	1.56	.80
	S	70	1.94	
Date of Testing	D	2	.65	.74
	CxD	4	.76	.87
	GxD	4	.33	.39
	CxGxD	8	.94	1.08
	SxD	140	.87	

*p<.05; **p<.01; ***p<.001

Summary of the Analysis of Variance on Mean Number of Non-Egocentric, Correct Responses

Source		df	Mean Square	F Ratio
Language Experience	C	2	1.01	.64
Grade	G	2	6.69	4.24*
	CxG	4	.78	.49
	S	70	1.58	
Date of Testing	D	2	1.09	2.17
	CxD	4	.40	.80
	GxD	4	.34	.67
	CxGxD	8	.57	1.14
	SxD	140	.50	

*p<.05; **p<.01; ***p<.001

Summary of the Analysis of Variance on Mean Number of Non-Egocentric, Incorrect Responses

Source		df	Mean Square	F Ratio
Language Experience	C	2	.01	.17
Grade	G	2	1.00	1.73
	CxG	4	.24	.42
	S	70	.58	
Date of Testing	D	2	.09	.19
	CxD	4	.14	.28
	GxD	4	.12	.25
	CxGxD	8	.48	.98
	SxD	140	.49	

*p < .05; **p<.01; ***p<.001

Summary of the Analysis of Variance on Selecting a Friend for Oneself
(June, 1973)

Source		df	Mean Square	F Ratio
Language Experience	C	2	29.92	.48
Grade	G	1	66.73	1.07
Sex of Subject	X	1	26.99	.43
	CxG	2	52.45	.84
	CxX	2	27.49	.44
	GxX	1	3.71	.06
	CxGxX	2	245.49	3.92*
	S	54	62.57	
Ethnicity of Doll	E	4	171.43	5.49**
	CxE	8	19.13	.61
	GxE	4	35.14	1.13
	XxE	4	28.93	.93
	CxGxE	8	13.64	.44
	CxXxE	8	34.65	1.11
	GxXxE	4	15.64	.50
	CxGxXxE	8	39.94	1.28
	SxE	216	31.18	
Sex of Doll	D	1	7.93	.11
	CxD	2	36.99	.50
	GxD	1	23.68	.32
	CxGxD	2	28.53	.38
	XxD	1	5085.29	68.45***
	CxXxD	2	6.70	.09
	GxXxD	1	158.28	2.13
	CxGxXxD	2	23.50	.32
	SxD	54	74.29	
	ExD	4	11.92	.58
	CxExD	8	30.91	1.50
	GxExD	4	12.84	.62
	XxExD	4	39.86	1.94
	CxGxExD	8	6.00	.29
	CxXxExD	8	9.62	.47
	GxXxExD	4	47.17	2.30
	CxGxXxExD	8	10.64	.52
	SxExD	216	20.55	

*p<.05; **p<.10; ***p<.001

Summary of the Analysis of Variance on Selecting a Friend in the Role of a French Canadian (June, 1973)

Source		df	Mean Square	F Ratio
Language Experience	C	2	43.27	.47
Grade	G	1	68.83	.75
Sex of Subject	X	1	12.34	.13
	CxG	2	53.12	.58
	CxX	2	93.91	1.02
	GxX	1	3.04	.03
	CxGxX	2	120.89	1.31
	S	54	92.01	
Ethnicity of Doll	E	4	332.82	10.79***
	CxE	8	28.38	.92
	GxE	4	91.88	2.98
	XxE	4	3.22	.10
	CxGxE	8	29.75	.96
	CxXxE	8	30.09	.97
	GxXxE	4	43.46	1.41
	CxGxXxE	8	26.23	.85
	SxE	216	30.85	
Sex of Doll	D	1	11.71	.22
	CxD	2	74.36	1.42
	GxD	1	11.04	.21
	CxGxD	2	42.27	.81
	XxD	1	2556.01	48.75***
	CxXxD	2	1.59	.03
	GxXxD	1	92.79	1.77
	CxGxXxD	2	73.50	1.40
	SXD	54	52.44	
	ExD	4	3.12	.16
	CxExD	8	12.67	.65
	GxExD	4	1.75	.09
	XxExD	4	30.08	1.54
	CxGxExD	8	20.48	1.05
	CxXxExD	8	11.45	.59
	GxXxExD	4	27.01	1.38
	CxGxXxExD	8	19.59	1.00
	SxExD	216	19.56	

*p<.05; **p<.10; ***p<.001

Summary of the Analysis of Variance on the Mean Similarity Ratings
(June, 1973)

Source		df	Mean Square	F Ratio	
Language Experience	C	2	242.44	3.18	p = .06
Grade	G	1	48.93	.64	
Sex of Subject	X	1	6.11	.08	
	CxG	2	143.44	1.88	
	CxX	2	118.75	1.56	
	GxX	1	125.75	1.65	
	CxGxX	2	55.48	.73	
	S	54	76.25		
Ethnicity of Doll	E	4	359.77	10.96***	
	CxE	8	58.24	1.78	
	GxE	4	120.81	3.68**	
	XxE	4	38.97	1.19	
	CxGxE	8	16.06	.49	
	CxXxE	8	51.57	1.57	
	GxXxE	4	44.88	1.37	
	CxGxXxE	8	37.25	1.14	
	SxE	216	32.81		
Sex of Doll	D	1	55.19	.82	
	CxD	2	77.09	1.14	
	GxD	1	218.13	3.22	
	CxGxD	2	79.84	1.18	
	XxD	1	6289.11	92.89***	
	CxXxD	2	2.17	.03	
	GxXxD	1	.01	.0002	
	CxGxXxD	2	73.63	1.09	
	SXD	54	67.70		
	ExD	4	12.38	.59	
	CxExD	8	34.66	1.64	
	GxExD	4	39.08	1.85	
	XxExD	4	38.56	1.83	
	CxGxExD	8	13.23	.63	
	CxXxExD	8	15.84	.75	
	GxXxExD	4	9.48	.45	
	CxGxXxExD	8	18.58	.88	
	SxExD	216	21.07		

* p<.05; ** p<.01; ***p<.001

Summary of Tests of Simple Effects
(June, 1973)

Selecting a Friend for Self:

Group	MS_{BTWN}	df	MS_{ERROR}	df	F
French	21.77	114	37.46	270	.5
Immersion	73.14	114	37.46	270	1.95
Control	128.92	114	37.46	270	3.44*

*p<.05

Selecting a Friend in Role of FC:

Group	MS_{BTWN}	df	MS_{ERROR}	df	F
French	64.16	94	43.08	270	1.49
Immersion	172.55	94	43.08	270	4.01*
Control	183.59	94	43.08	270	4.26*

*p<.05

Summary of the Analysis of Variance on Selecting a Friend for Oneself (December, 1973)

Source		df	Mean Square	F Ratio
Language Experience	C	2	228.04	2.80 p = .06
Grade	G	2	14.19	.17
Sex of Subject	X	1	34.30	.42
	CxG	4	70 71	.87
	CxG	2	151.69	1.86
	GxX	2	134.77	1.66
	CxGxX	4	267.89	3.29**
	S	109	81.39	
Ethnicity of Doll	E	5	376.54	18.85***
	CxE	10	25.60	1.28
	GxE	10	10.33	:52
	XxE	5	70.52	3.53**
	CxGxE	20	14 90	.75
	CxXxE	10	20.79	1.04
	GxXxE	10	14 97	.75
	CxGxXxE	20	16.71	.84
	SxE	545	19.97	
Sex of Doll	D	1	18.51	.31
	CxD	2	25.82	.42
	GxD	2	36.79	.62
	CxGxD	4	64.37	1.08
	XxD	1	12526.6	209.63***
	CxXxD	2	38.25	.64
	GxXxD	2	74.41	1.25
	CxGxXxD	4	186.96	3.13*
	SxD	109	59.76	
	ExD	5	6.17	.37
	CxExD	10	5.45	.33
	GxExD	10	6.87	.41
	XxExD	5	34.29	2.07
	CxGxExD	20	16.84	1.02
	CxXxExD	10	30.06	1.81
	GxXxExD	10	11.91	.72
	CxGxXxExD	20	8.01	.48
	SxExD	545	16.58	

*p<.05, **p<.01; ***p<.001

Summary of the Analysis of Variance on Selecting a Friend in the Role of a French Canadian (December, 1973)

Source		df	Mean Square	F Ratio
Language Experience	C	2	171.25	1.74
Grade	G	2	48.89	.50
Sex of Subject	X	1	1.75	.02
	CxG	4	59.87	.61
	CxX	2	114.99	1.17
	GxX	2	102.54	1.04
	CxGxX	4	176.55	1.80
	S	109	98.27	
Ethnicity of Doll	E	5	1323.69	69.70***
	CxE	10	16.14	.85
	GxE	10	14.85	.78
	XxE	5	53.18	2.80*
	CxGxE	20	23.26	1.22
	CxXxE	10	23.09	1.22
	GxXxE	10	11.43	.60
	CxGxXxE	20	21.13	1.11
	SxE	545	18.99	
Sex of Doll	D	1	1.50	.03
	CxD	2	67.96	1.53
	GxD	2	32.35	.73
	CxGxD	4	31.81	.71
	XxD	1	5570.55	125.21***
	CxXxD	2	169.22	3.80*
	GxXxD	2	80.69	1.81
	CxGxXxD	4	149.43	3.31*
	SxD	109	44.49	
	ExD	5	3.45	.33
	CxExD	10	9.58	.92
	GxExD	10	5.65	.54
	XxExD	5	16.16	1.55
	CxGxExD	20	8.19	.79
	CxXxExD	10	3.28	.32
	GxXxExD	10	11.83	1.14
	CxGxXxExD	20	2.96	.28
	SxExD	545	10.41	

*p<.05; **p<.01; ***p<.001

Summary of the Analysis of Variance on Selecting a Friend in the Role of a Russian (December, 1973)

Source		df	Mean Square	F Ratio
Language Experience	C	2	102.99	.87
Grade	G	2	48.16	.41
Sex of Subject	X	1	72.41	.62
	CxG	4	58.34	.49
	CxX	2	36.15	.31
	GxX	2	49.66	.42
	CxGxX	4	126.39	1.07
	S	109	117.71	
Ethnicity of Doll	E	5	1258.17	60.41***
	CxE	10	17.51	.84
	GxE	10	17.47	.84
	XxE	5	27.92	1.34
	CxGxE	20	13.79	.66
	CxXxE	10	13.61	.65
	GxXxE	10	20.09	.96
	CxGxXxE	20	18.30	.88
	SxE	545	20.83	
Sex of Doll	D	1	12.90	.31
	CxD	2	16.98	.41
	GxD	2	3.52	.08
	CxGxD	4	31.57	.75
	XxD	1	3832.82	91.56***
	CxXxD	2	166.96	3.99*
	GxXxD	2	26.12	.62
	CxGxXxD	4	120.84	2.89
	SxD	109	41.86	
	ExD	5	12.42	1.14
	CxExD	10	7.19	.66
	GxExD	10	12.75	1.18
	XxExD	5	10.64	.98
	CxGxExD	20	13.40	1.24
	CxXxExD	10	18.97	1.75
	GxXxExD	10	11.27	1.04
	CxGxXxExD	20	9.32	.86
	SxExD	545	10.84	

*p<.05; **p<.01; ***p<.001

Summary of the Analysis of Variance on the Mean Similarity Ratings (December, 1973)

Source		df	Mean Square	F Ratio
Language Experience	C	2	61.09	1.05
Grade	G	2	.58	.01
Sex of Subject	X	1	.0001	0.00
	CxG	4	83.38	1.44
	CxX	2	265.96	4.58*
	GxX	2	7.80	.13
	CxGxX	4	122.99	2.12
	S	109	58.02	
Ethnicity of Doll	E	5	3594.42	101.19***
	CxE	10	63.90	1.80*
	GxE	10	59.09	1.66
	XxE	5	28.65	.81
	CxGxE	20	40.91	1.15
	CxXxE	10	52.73	1.48
	GxXxE	10	79.62	2.25*
	CxGxXxE	20	32.06	.90
	SxE	545	35.52	
Sex of Doll	D	1	127.18	2.32
	CxD	2	53.70	.98
	GxD	2	10.72	.20
	CxGxD	4	33.23	.61
	XxD	1	4287.90	78.08***
	CxXxD	2	352.12	6.41**
	GxXxD	2	72.30	1.32
	CxGxXxD	4	66.97	1.22
	SxD	109	54.92	
	ExD	5	18.76	1.27
	CxExD	10	7.59	.52
	GxExD	10	11.19	.76
	XxExD	5	28.62	1.95
	CxGxExD	20	6.91	.47
	CxXxExD	10	23.39	1.60
	GxXxExD	10	41.42	2.83**
	CxGxXxExD	20	20.68	1.41
	SxExD	545	14.66	

*p<.05; **p<.01; ***p<.001

Summary of Tests of Simple Effects
(December, 1973)

Selecting a Friend for Self:

Group	MS_{BTWN}	df	MS_{ERROR}	df	F
French	182.88	167	30.21	654	6.05*
Immersion	61.10	167	30.21	654	2.02
Control	209.79	167	30.21	654	6.94*

*p<.05

Selecting a Friend in the Role of FC:

Group	MS_{BTWN}	df	MS_{ERROR}	df	F
French	466.14	154	32.20	654	14.47**
Immersion	403.14	154	32.20	654	12.52**
Control	558.01	154	32.20	654	17.33**

**p< 01

Summary of Significant Newman-Keuls Comparisons on Ratings For Selecting a Friend
(December, 1973)

French Group

Selecting a Friend for Self		Selecting a Friend for FC	
	q		q
EC-Ru	6.62	FC-Ru	9.25
EC-Br	4.1	FC-Br	8.57
		FC-EC	5.05
Am-Ru	6.10	FC-Am	4.65
FC-Ru	4.67	EF-Ru	8.25
		EF-Br	7.57
		EF-EC	4.05
		EF-Am	3.65
		Am-Ru	4.63
		Am-Br	3.92
		EC-Ru	4.21

Immersion Group

Selecting a Friend for Self	Selecting a Friend for FC	
		q
No Significant Comparisons	FC-Br	9.0
	FC-Ru	7.97
	FC-Am	6.69
	FC-EC	5.24
	EF-Br	7.13
	EF-Ru	6.10
	EF-Am	4.82
	EF-EC	3.37

Summary of Significant Newman-Keuls Comparisons on Ratings For Selecting a Friend
(December, 1973)

Control Group

Selecting a Friend for Self	q	Selecting a Friend for FC	q
EC-Ru	6.2	FC-Ru	11.23
EC-Br	4.15	FC-Br	10.10
EC-FC	4.02	FC-Am	6.98
EC-EF	3.54	FC-EC	5.96
		FC-EF	3.37
Am-Ru	6.75	EF-Ru	7.93
Am-Br	4.69	EF-Br	6.8
Am-FC	4.53	EF-Am	3.68
		EC-Ru	5.32
		EC-Br	4.18
		Am-Ru	4.25