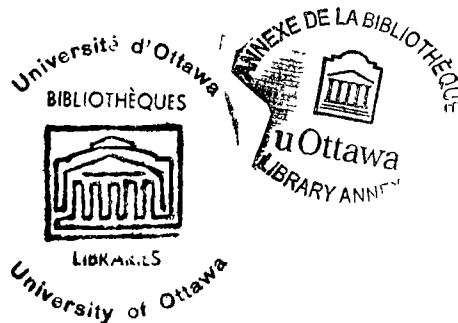


BILINGUALISM: A STUDY OF SWITCHING BEHAVIOR IN A  
SAMPLE OF GRADE II FRENCH IMMERSION CHILDREN

by Diane Bourbonnais

Thesis presented to the School of  
Graduate Studies of the University  
of Ottawa as partial fulfillment of  
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## CURRICULUM STUDIORUM

Diane Bourbonnais was born on April 15th, 1943, in Timmins, Ontario. She received the Bachelor of Arts degree from the University of Ottawa, Ontario, in May 1971.

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## INTRODUCTION

Much research has been generated around the effects of second language learning as well as the linguistic and the psychological behaviors of bilinguals.<sup>1</sup> However, investigations have less systematically studied the switching behavior of bilinguals in general and still less so, that of children involved in the process of learning a second language.

Theorists and researchers have often observed the ability of most bilinguals to switch from one language to another and have spoken of this phenomenon in terms of interference.<sup>2</sup> Moreover, interference, of which switching is a part, has been attributed mainly to linguistic and/or psychosocial factors. The former primarily concerns the linguist, who studies the structural factors on which depend the organization of language into a definite system, different from any other language and somewhat independent from behavior. The psychological aspect of linguistic interference deals with the non-structural factors which are derived from experience, familiarity, or symbolic value

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1 William F. Mackey, Bibliographie internationale sur le bilinguisme/International Bibliography on Bilingualism, Québec, Les Presses de L'Université Laval, 1972.

2 Uriel Weinreich, Languages in Contact, The Hague, Paris, Mouton, 1968, p. 1.

that the individual who employs a particular system, demonstrates behaviorally. This extra-linguistic aspect of interference is of concern to the psychologist whose role it is to attempt to understand the effects of bilingualism on the individual personality in view of his total development: intellectual, social, and psychological.

The present study represents an effort to examine the switching phenomenon in the context of French Immersion classes at the Grade II level, from a psychosocial viewpoint. More specifically, it wishes to explore some characteristic or factor that influences or predisposes a child to switch from one language (L1) to another (L2) when placed in a situation where he has to respond to someone who uses two languages while speaking to him during the same encounter.

## CHAPTER I

### REVIEW OF THE LITERATURE

The research leading up to the study reported here is presented in this chapter in six parts. In part one, a description of the problem of bilingualism as well as an attempt to clarify the confusion in semantics that may exist in the use of terminologies by different authors is presented. The problem of switching in particular makes up part two and is followed by a review of the structural and non-structural factors which may impede or promote linguistic interference. Part four reports on the manner in which switching has been quantified. The specific problem studied is stated in part five. Part six contains a general statement of the hypotheses formulated and tested.

#### 1. Considerations Concerning Bilingualism.

Defining bilingualism and determining who is bilingual, and to what degree, will be the first concern of this chapter. Most authors agree that bilingualism involves the use of two languages by the same person. Weinreich's definition expresses this in the following terms: "The

practice of alternately using two languages will be called bilingualism, and the persons involved, bilingual."<sup>1</sup>

Other definitions have been proposed which consider lesser degrees of facility than required by Weinreich's definition. Diebold,<sup>2</sup> preoccupied by the learning process, states that individuals learn elements of a non-native language through the contact of both languages. This initial stage he calls incipient bilingualism, because he believes that we cannot properly speak of proficiency in the second language at this point. In contrast, Haugen suggests that a person can be qualified as bilingual as soon as he can "produce complete meaningful utterances in the other language."<sup>3</sup> Probably a most comprehensive viewpoint would be that described by Macnamara,<sup>4</sup> who considers bilingualism to be a continuum, varying according to the individual and the particular task at hand, whether it be reading, writing, listening, or speaking. Thus, he considers as bilingual a person who possesses even to a minimal

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1 Uriel Weinreich, Languages in Contact, The Hague, Paris, Mouton, 1968, p. 1.

2 Richard Diebold, "Incipient Bilingualism," Language, Vol. 37, No. 1, 1961, p. 99.

3 Ibid., p. 69.

4 John Macnamara, "The Bilingual's Linguistic Performance. A Psychological Overview," Journal of Social Issues, Vol. 23, No. 2, 1967, p. 59-60.

degree at least one of the above skills. Speaking and writing he calls encoding; listening and reading, decoding. Encoding allows the person to produce, and decoding the possibility to receive.

To further clarify the phenomenon, authors often prefer to dichotomize bilingualism into types. Weinreich<sup>5</sup> and Haugen<sup>6</sup> classified bilinguals into pure or mixed, subordinate or coordinate, according to whether or not words in the two languages are interpreted as having different meanings or the same meaning. Whether a bilingual uses the second language for a specific purpose or not, he will be called specialized or unspecialized; he may be called orderly or disorderly when specialization is confused.

Perhaps the major distinction, much in relation to Penfield's<sup>7</sup> "direct and indirect" methods of learning a second language, is the distinction between coordinate and compound bilinguals. Compound bilinguals are those who give the same meaning to corresponding words in both languages as a result of having learned the languages in the

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5 Weinreich, op. cit., p. 9-10.

6 E. Haugen, "The Bilingual Individual," in S. Saporta (Ed.), Psycholinguistics: A Book of Readings, New York, Holt, Rinehart & Winston, 1966, p. 402.

7 W. Penfield and L. Roberts, Speech and Brain Mechanisms, Princeton, N.J., Princeton University Press, 1959, p. 251-253.

same context, sociologically speaking. Neurologically speaking, the same set of linguistic signs and responses is associated, as there is only one set of representational mediation processes. On the other hand, coordinate bilinguals are those who derive different meanings from corresponding words in both languages mainly because they acquired their languages in a different sociological context, thus creating two neuronal patterns in the brain for the same referent. Individuals who have learned a second language through the coordinate system are often considered as "true" bilinguals. Ervin and Osgood<sup>8</sup> attempted to explain the sociological and neurophysiological factors differentiating between compound and coordinate bilinguals. Penfield<sup>9</sup> discussed the neurophysiological, psychological, and biological factors of second language learning in relation to two methods: the direct or mother's method and the indirect method. The direct method used during the first years of life in the home through imitation of mother's language if applied to second language learning would account for coordinate bilingualism. The indirect method whereby a second language is learned through a translation process would explain compound bilingualism.

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<sup>8</sup> S. Ervin and C. E. Osgood, "Second Language Learning and Bilingualism," Journal of Abnormal and Social Psychology, Vol. 49, 1954, p. 139-146.

<sup>9</sup> Penfield and Roberts, op. cit., p. 239-257.

Some research tends to support a compound-coordinate bilingual theory. The following will point out the basis for this and will show how bilingual types differ.

Lambert, Havelka and Crosby,<sup>10</sup> relating a study to the compound-coordinate theory of bilingual language systems, found that bilinguals who acquired their second language in a separated context (coordinate bilinguals) have more functionally separate or independent language systems than those who learned their second language in a fused context (compound bilinguals).

In another study by Lambert and Rawlings<sup>11</sup> it was found that bilinguals with compound linguistic experiences were more efficient in solving problems requiring processing of mixed-language associative networks.

Kolers<sup>12,13</sup> agrees that a compound-coordinate theory is a useful and logical categorization based on the

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10 W. E. Lambert, J. Havelka, and C. Crosby, "The Influence of Language Acquisition Contexts on Bilingualism," in S. Saporta (Ed.), Psycholinguistics: A Book of Readings, New York, Holt, Rinehart & Winston, 1966, p. 408.

11 W. E. Lambert and C. Rawlings, "Bilingual Processing of Mixed-Language Associative Networks," Journal of Verbal Learning and Verbal Behavior, Vol. 8, 1969, p. 604-609.

12 P. Kolers, "Bilingual and Information Processing," Scientific American, Vol. 218, No. 3, 1968, p. 81-83.

13 -----, "Interlingual Word Associations," Journal of Verbal Learning and Verbal Behavior, Vol. 2, 1963, p. 291-300.

method of learning a second language. He finds that it is limited in its ability to explain the "psychological processes underlying a bilingual's successful use of his two languages."<sup>14</sup> In an attempt to understand how a bilingual's information is processed, he discovered through word association tests that there were significant differences in the associational responses of his subjects, though most were of the compound type. These results led him to the conclusion that bilinguals store information according to two different arrangements. On the one hand, information is stored centrally ("common storage hypothesis") and the person has access to it equally with both languages; on the other hand, information is stored separately ("separate storage hypothesis") in linguistically associated ways. His results also suggest that bilinguals develop compound relations for certain experiences and coordinate relations for others, depending on the nature of the event.

Diebold,<sup>15</sup> experimenting in Mexico, classified his subjects into coordinate, subordinate, and monolingual Huave-speakers. The coordinate bilinguals appeared to speak Spanish without an accent. Those who had a noticeable accent were classified as subordinate bilinguals.

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14 Ibid., p. 299.

15 Diebold, op. cit., p. 97-112.

These distinctions and classifications into systems are important for theoretic and research purposes. Practically, people distribute themselves "along a continuum from a pure compound system to a pure coordinate system."<sup>16</sup> Perhaps the most important factor to consider is that, although differences between individuals exist for neurological, psychological, or sociological reasons, difficulties still remain in understanding the processes involved in second language learning.

A final consideration concerns a psychologically oriented conception of ideal bilingualism against which this writer's understanding of linguistic interference, in general, and switching, in particular, will be contrasted. Weinreich's definition of the ideal bilingual will provide the framework for the succeeding discussion:

The Ideal Bilingual switches from one language to the other according to appropriate changes in the speech situation (interlocutors, topics) but not in an unchanged speech situation and certainly not within a single sentence.<sup>17</sup>

## 2. The Problem of Switching.

Having presented the general considerations concerning bilingualism in the first section, this part

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<sup>16</sup> Ervin and Osgood, op. cit., p. 141.

<sup>17</sup> Weinreich, op. cit., p. 73.

attempts to clarify what is meant by switching. First, we have attempted to distinguish it from other confusing concepts found in the literature. Second, research studies related directly to this topic are discussed as well as the theoretical positions that have emerged in terms of the storage and retrieval of second language systems.

To distinguish switching from "interference and integration" and to show how these concepts are related to one another, we shall refer mainly to Haugen's<sup>18</sup> and Weinreich's<sup>19</sup> definitions. For Haugen, interference is the "overlapping of two languages"; switching is the "alternate use of two languages," and integration is the "regular use of materials from one language in another, so that there is no longer either switching or overlapping, except in an historical sense." Weinreich, on the other hand, used the term interference in such a way as to cover both Haugen's "interference and integration." For him, interference refers to deviations "from the norms of either language which occur in the speech of bilinguals as a result of their familiarity with more than one language."<sup>20</sup>

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18 Einar Haugen, Bilingualism in the Americas: A Bibliography and Research Guide, Alabama, Alabama University Press, 1956.

19 Weinreich, op. cit., p. 1.

20 Ibid.

Weinreich also speaks of interference in langue (language) and parole (speech), which in a sense resembles Haugen's distinctions between "integration and interference." The domain of langue refers to speakers of an entire community which would suppose integration of culture as well as of language. The domain of parole would be characteristic of bilinguals who still overlap languages grammatically while speaking the second language. Mackey<sup>21</sup> reserves the term interference only for what Weinreich calls interference in parole (speech), the more momentary aspect of discourse. This latter view of interference will also be adopted in this study.

In deciphering the meanings of the above words, it is notable that Haugen's definition of switching as the "alternate use of two languages" barely distinguishes between Weinreich's definition of bilingualism as the "practice of alternately using two languages" (reported above, p. 1-2). In this paper, switching designates the use of a different language (L2) as a response to a stimulus in another language (L1), independent of whether the cues that provoked the switch from L1 to L2 or L2 to L1 are internal or external to the bilingual person; that is,

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21 W. Mackey, Description and Measurement of Bilingualism/Description et mesure du bilinguisme (ed. by L. G. Kelly), Toronto, University of Toronto Press, 1969, p. 123.

an incongruence between stimulus (S) and response (R) in terms of appropriate choice for R.

Yet another distinction can be made between "translating" and "switching." Translation is like switching although more limited in that it implies an ability to say in another language (L2) only words which have the same meaning as the words in the original language (L1). Macnamara<sup>22</sup> suggests that translation is of interest to the psychologist because it can throw some light "on language switching mechanisms, on the semantic aspects of bilingualism and on the problems and possibilities of communication" across languages.

In order to grasp a more comprehensive understanding of the meaning and implications of switching, the following indicates the most pertinent research dealing with this phenomenon. It will be observed that few studies have dealt directly with the problem of switching.

Empirical research seems to indicate that switching is observable in terms of time, context, and content.

Macnamara<sup>23</sup> and Macnamara et al.<sup>24</sup> found that switching takes an observable amount of time, but that bilinguals

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<sup>22</sup> Macnamara, "The Bilingual's Linguistic Performance," p. 71-72.

<sup>23</sup> Ibid.

<sup>24</sup> J. Macnamara, M. Krauthammer, and M. Bolgar, "Language Switching in Bilinguals as a Function of Stimulus and Response Uncertainty," Journal of Experimental Psychology, Vol. 78, No. 2, 1968, p. 208-215.

can switch without an apparent pause when they can anticipate the switch. By some mechanism they are able to trigger a readiness to respond in the other language, though they do not yet know the response. This appears to be an effect of a reduction in response uncertainty which could be attributed to set.

When tested for their performance by reading a number of lists, results show that there is no significant difference between the performances of bilinguals on unilingual lists, but that they took more time to read mixed random order lists than regular patterned mixed lists. Macnamara also suggests that these results support the theory of functionally separate language systems.

Kolers<sup>25</sup> found similar results when he assessed the "psychological cost of code-switching." Bilinguals were given a connected discourse to read silently, then aloud. The same passages were presented four ways: unilingually in English and in French and bilingually in mixed form, one passage favoring English word order and the other favoring French. Results indicated that subjects had almost identical scores on a comprehension test following silent reading. They lost no time in switching between languages. When subjects read the passages aloud, they needed more

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<sup>25</sup> Kolers, "Bilingualism and Information Processing," p. 79-80.

time with the mixed passages than with the unilingual ones. It was determined that the average amount of time required for each switch was one-third of a second. Kolers also points out that the experiments with the mixed passages brought out the role of context. Subjects were able to comprehend the passages because they had a thematic continuity and a system of symbols which were familiar to them.

In 1958, Lambert et al.<sup>26</sup> studied the bilingual's ease of switching in relation to context. They predicted that bilinguals who learn a second language in different contexts would show less facility for switching from one language to the other. Contrary to prediction, no significant differences were found between the groups of fused and separated language contexts. Thus "coordinate and compound bilinguals appear to have equal facility in switching from one language to the other." However, the writer notes that failure to find statistically significant differences does not necessarily mean that there are no differences between these two types of bilinguals.

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26 Lambert et al. "The Influence of Language Acquisition Contexts on Bilingualism," p. 413-414.

As a general critique of the use of the theoretical concepts compound and coordinate types of bilinguals for research purposes, it is found that the major difficulty lies in establishing adequate and meaningful criteria distinguishing between these two types of bilinguals in reality. Recent research done in this area considers not only the sociocultural context but also the neuro-physiological components of language centers in the brain, in terms of memory stores and linguistic mediational processes. Thus, to dichotomize bilinguals into compound-coordinate types seems to be inadequate and thus creates doubt on many of the conclusions reported in the literature, particularly with regards to Lambert's and co-workers' research in this area.

Susan Ervin-Tripp,<sup>27</sup> in 1967, demonstrated that some Japanese women shift in content when they associate

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<sup>27</sup> Susan Ervin-Tripp, "An Issei Learns English," Journal of Social Issues, Vol. 23, No. 2, 1967, p. 89.

pictures on the Thematic Apperception Test to culturally different experiences. Differences were found also on measures of conservatism, identification with Americans, and acculturation between those women who gave typically American responses.

Most of the authors who dealt with the process of switching attempted to account for the smoothness and effortlessness in the speech of the bilingual person as he changes from one language to another without getting his languages mixed. Some hypothesized a theory of linguistic independence,<sup>28,29</sup> while others adopted the view that linguistic systems are interdependent<sup>30,31,32,33,34</sup> to describe how verbal experiences are stored and retrieved.

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28 J. Macnamara, "The Linguistic Independence of Bilinguals," Journal of Verbal Learning and Verbal Behavior, Vol. 6, 1967, p. 729-736.

29 E. Tulving and V. A. Colotla, "Free Recall of Trilingual Lists," Cognitive Psychology, Vol. 1, 1970, p. 86-98.

30 Kolers, "Bilingualism and Information Processing," p. 78-85.

31 M. Glanza and A. Duarte, "Repetition Between and Within Languages in Free Recall," Journal of Verbal Learning and Verbal Behavior, Vol. 10, 1971, p. 625-630.

32 M. Lopez and R. K. Young, "The Linguistic Interdependence of Bilinguals," Journal of Experimental Psychology, Vol. 102, No. 4, 1974, p. 981-983.

33 J. F. Hamers and W. E. Lambert, "Bilingual Interdependencies in Auditory Perception," Journal of Verbal Learning and Verbal Behavior, Vol. 11, 1972, p. 303-310.

34 W. Kintsch and E. Kintsch, "Interlingual Interference and Memory Processes," Journal of Verbal Learning and Verbal Behavior, Vol. 8, 1969, p. 16-19.

The independence hypothesis assumes that the bilingual has two separate and very distinct memory stores, one for each language, with information presented in one language not readily available to the other language system. The interdependence hypothesis assumes that bilinguals store words in terms of their semantic features only tagging the items with the proper language at the time of the output.

The discussion on how bilingual information is stored and retrieved continues to be a major concern for the psychologists and neurologists who hope to find a more integrative explanation for switching behavior.

### 3. Factors Associated with Switching.

Interference appears to be the result of the combination or the interaction of linguistic factors peculiar to the structure of the language itself and the extra linguistic factors pertaining to the person's behavior in a particular situation. To understand the implications here, one must look at the problem from the linguist's point of view, who provides an analysis and a description of the structural factors. On the other hand, non-structural factors of particular interest to the psychologists need to be considered, insofar as research on this aspect of language learning suggests effects of sociological and

psychological factors which may facilitate or hinder second language learning. Psychology has not yet formulated any theory to explain bilingualism and psychologists, in their attempt to theorize on this problem, base many of their assumptions on linguistic theories.<sup>35,36</sup> The linguistic theories, therefore, which provide a basis for the study of switching will be presented first.

#### A. Structural Factors

In a general sense, each nation or culture possesses its own language system for the purpose of interpersonal communication. Each system comprises its peculiar sounds (phonemes), meaning units (morphemes), grammar (syntax), and vocabulary. Similarities and differences between two languages can be determined by analyzing the languages according to levels: the phonic, the grammatical, and the lexical. This analysis is important, for differences between languages thus analyzed can suggest potential areas of learning problems and interference in the speech of the bilingual.

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35 W. E. Lambert, R. C. Gardner, H. C. Barik, and K. Tunstall, "Attitudinal and Cognitive Aspects of Intensive Study of a Second Language," Journal of Abnormal and Social Psychology, Vol. 66, 1963, p. 358.

36 L. Selinker, "Interlanguage," International Review of Applied Linguistics, Vol. 13, 1972, p. 209-231.

Another important concept proposed by Saussure, the French linguist, is the distinction between speech and language or message and code, process and system.<sup>37</sup> Interference in speech is more an awareness of borrowing elements from the other language, whereas interference in language occurs when elements or patterns have become habitualized after many repetitions.

If one could determine the nature of the linguistic sign (speech or language) explained by Saussure, one could also determine to what type of bilingualism a person belongs: the coordinate, if the word from one language to the other has different meanings (speech); or the compound, if the sign or word has the same meaning in one language or the other. For example, the coordinate bilingual would give different meanings to the word "pamphlet" whereas the compound bilingual would be less likely to do so.

Mackey<sup>38</sup> proposed a system for analyzing, describing, and measuring the structural components of bilingual behavior. He studied interference according to units, at all levels of the structure of a text, from the sentence, clause, phrase, word, morpheme, and phonological levels.

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37 Weinreich, op. cit., p. 9-11.

38 W. F. Mackey, "Measurement of Bilingual Behavior," The Canadian Psychologist, Vol. 7, 1966, p. 75-92.

Within each level, he distinguished between two different types of bilingual units: modification and combination, with bilingual modifications of two kinds. To illustrate what he meant, here are a few examples.

In bilingual modification, there is a change in the sequence of linguistic components. In the sentence, "I him see," the elements belong to the English language, whereas the grammatical arrangement belongs to the French language. The modification is sequential for "Je le vois," and represents grammatical interference. The modification may also be referential, as in the following: "Il a pris un nouveau bail sur la vie." Here, although the elements are French, the reference is English.

The other type of bilingual interference is that in which there are structural elements belonging to two languages in the same sentence. At the clause level, one could be in French and the other in English as in the following: "Elle est partie/so you did not see her." At the phrase level, one may find something like this: "pour mon/friend" or "Il a placé livre/on the desk." Words also may be formed by a combination of bilingual morphemes, such as "grounder," "bumper." "Ground" or "bump" is an English morpheme, whereas "er" is a French morpheme. On the phonological level, final s's, d's, t's, etc. may not be pronounced by a French-speaking individual at first because,

in his linguistic system, these final letters are mute. For example, in the word "faces" the final "s" would be heard in English but would not be heard in French and would be preceded by an article like "les or des" to indicate the plural form.

Merrill Swain<sup>39</sup> studied language transfer with children enrolled in immersion classes in Toronto, and found similar interferences as those noted by Mackay. She also proposed that these children, because of linguistic interferences from one language to the next, were possibly learning another language. She and another co-worker,<sup>40</sup> while analyzing the boundaries of the language switch, also discovered that in the speech of a bilingual child, they were unable to determine any consistency in the location of a language switch. Some switches even occurred between two verb elements, as in, "Elle est/giving the ball."

Thus, as a general summary of what has been said about the linguistic factors, it is noted that any point of difference between two systems may be an adequate

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39 Merrill Swain, paper presented at the Ontario Psychological Association Convention in Ottawa, February 1974.

40 M. Swain and M. Weshe, "Linguistic Interaction: Case Study of a Bilingual Child," in Working Papers on Bilingualism/Travaux de recherches sur le bilinguisme, Toronto, Ontario Institute for Studies in Education, 1974.

stimulus giving rise to interference for a bilingual person, at any level of a linguistic structure, from sentences to letters and with respect to phonic, grammatical or lexical difficulties. However, the differences in the structural aspects of the languages in contact do not account for all the interference. Other relevant factors are considered in the following section.

#### B. Non-structural Factors

The individual's internal or psychological make-up as well as his sociocultural setting can also provide indispensable clues to the understanding of factors associated with linguistic interference.

Psychological factors relevant to the mastery of a second language include aptitude, motivation, and interest for learning. Theoretically, the non-structural factors inherent in the bilingual person related to aptitude would include intelligence, facility of verbal expression, control of switching, adaptation to the interlocutor, emotional adjustment.

One study by Lambert and Gardner<sup>41</sup> indicates that second language achievement depends upon two factors:

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41 W. E. Lambert and R.C.Gardner, "Motivational Variables in Second Language Acquisition," Canadian Journal of Psychology, Vol. 13, 1959, p. 271.

a linguistic aptitude factor related to intelligence and, secondly, a motivational factor "characterized by a willingness to be like valued members of the language community." Weinreich and Haugen support these findings because they also believe that aptitude is a necessary characteristic of a bilingual person's speech even before the situation arises.<sup>42</sup>

D'Anglejan and Tucker<sup>43</sup> pointed out that even professional translators, supposedly ideal bilinguals possessing maximum aptitude for second languages, do not always assure effective communication between language groups who do not share a common cultural frame of reference.

Switching facility, the major variable studied in this research, emerges as an important characteristic of the bilingual speaker. Haugen states that, "Individuals differ in language aptitude which is probably not one single skill, but a complex of several, and is reflected among bilinguals in differing switching facility."<sup>44</sup> Macnamara,<sup>45</sup>

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42 Weinreich, op. cit., p. 73.

43 A. D'Anglejan and G. R. Tucker, "Communicating Across Cultures: An Empirical Investigation," Montreal, McGill University, September 1972.

44 Haugen, "The Bilingual Individual," p. 403.

45 Macnamara, "The Bilingual's Linguistic Performance," p. 70-71.

like Haugen, also says that part of the bilingual's skill is his ability to switch from one language to the other. However, he adds that it is difficult to determine what psychologically influences the bilingual in his choice of language. Referring to the same problem of switching facility, Weinreich suggests that the nature of the interpersonal encounter may account for the choice of language, when he states that, "The Ideal Bilingual switches from one language to the other according to appropriate changes in the speech situation (interlocutors, topics, etc.)."<sup>46</sup> A bilingual person who behaves as stated above would be considered to possess linguistic independence, suggesting his ability to keep his language systems separate, as well as his capacity to adapt to the stimulus (speakers or other symbols).

Gumperz<sup>47</sup> also points out that code-switching may be due to social cues, provided by the role relationship between speakers, or the prestige or status of the person to whom one is speaking. Also at play are the circumstances, situation, or context of the meeting. Other varieties of code switching are termed marked or unmarked

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46 Weinreich, op. cit., p. 73.

47 Nils Hasselmo, "How Can We Measure the Effects Which One Language May Have on the Other in the Speech of Bilinguals?" in L. G. Kelly (Ed.), Description and Measurement of Bilingualism, Toronto, University of Toronto Press, 1967, p. 127.

switching depending on whether or not there were indications of a change of language; consequential and anticipational triggering, termed by Clyne, indicating language changes due to ambiguity. According to Fishman, language choice depends on "who speaks what language to whom and when."<sup>48</sup>

A case study<sup>49</sup> of a three-year-old bilingual child illustrates furthermore the "psychological reality" of the grammatical organization in the speech of a young bilingual. The authors spent twenty-five hours playing with this child and recorded all verbal interactions, as one adult spoke English only to the child while the other French only. It was observed that the child's desire to communicate simultaneously with the unilingual speakers in his two languages caused more linguistic interference in the child's speech. He switched from one language to the next in the same sentence or even changed a whole sentence in one language to provide an appropriate context for the unilingual adult to understand what he wished to say.

Intelligence has been studied extensively in relation to bilingualism. The possible effects of bilingualism on intelligence are generally viewed to have serious social and even linguistic implications. It is not the writer's

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48 Ibid., p. 128.

49 Swain and Weshe, op. cit., p. 11-29.

intention to elaborate on this problem, other than to say that the literature expresses conflicting results with regards to the impact of bilingualism on the intellectual growth and emotional adjustment of the individual.

Weinreich,<sup>50</sup> Peal and Lambert,<sup>51</sup> and Jensen<sup>52</sup> are but a few authors who reviewed the representative studies begun as early as 1920. One important point made in Peal and Lambert's study with regard to bilingualism and its effects on an individual's thought processes clarifies another aspect of the switching problem. They found that bilinguals perform better on non-verbal tests involving concept-formation or symbolic flexibility and then hypothesized the following in relation to switching facility as an asset for intellectual development:

A second hypothesis is that bilinguals may have developed more flexibility in thinking. Compound bilinguals typically acquire experience in switching from one language to another, possibly trying to solve a problem while thinking in one language, and then, when blocked, switching to the other. This habit, if it were developed, could help them in their performance on tests requiring symbolic reorganization since they demand a readiness to drop one hypothesis or concept and try another.<sup>53</sup>

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50 Weinreich, op. cit., p. 116-121.

51 Elizabeth Peal and W. E. Lambert, "The Relation of Bilingualism to Intelligence," Psychological Monographs: General and Applied, Vol. 76, No. 27, 1962, p. 1-7.

52 J. V. Jensen, Bilingualism, Effects of Childhood Bilingualism, Champaign, Ill., National Council of Teachers of English, 1962, p. 1-20.

53 Peal and Lambert, op. cit., p. 14.

Besides individual factors that interplay in second language learning, sociocultural factors also appear to be important non-linguistic attributes that determine switching facility. In the following section, the writer will review studies that bring forth the implications of attitudes or the social value attributed to the recipient language.

The influence of attitudes toward the second culture has been emphasized by Arsenian in 1937 and by Christophersen in 1948 in terms of sympathies and antipathies.<sup>54</sup> Weinreich<sup>55</sup> explained this in terms of idiosyncratic or stereotype depending on "prestige" or status value, whereas Peal and Lambert<sup>56</sup> expressed the same idea in terms of favorable and unfavorable dispositions, whereby feelings of inferiority or shame could have detrimental effects on the interpersonal relationship.

Though bilinguals may have comparable knowledge and ability for speaking both languages, they may differ with regards to the attitudes they have, regarding the second language. Whether one's language is considered as model or replica, status may be the criteria of choice. In other

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54 Peal and Lambert, op. cit., p. 7.

55 Weinreich, op. cit., p. 3.

56 Peal and Lambert, op. cit., p. 7.

situations, social advance determines the use of one language over the other. Emotional attachment to one language may be related to childhood experiences, parental attitudes toward the other group, adult experiences of friendship or love affairs, to cite some. The age of learning, the cultural esthetic value, all these and the above-mentioned factors contribute to what is called the "dominance configuration"<sup>57</sup> and help in understanding, to a certain extent, how social determinants affect the bilingual person.

Most authors have suggested the importance of attitudes for second language learning, but it seems that Lambert et al. have substantiated this fact through empirical study such that they are gaining increasing evidence for a "psychological theory of second-language learning."<sup>58</sup>

In 1959, Lambert and Gardner<sup>59</sup> found that aptitude and motivational variables such as a desire to be identified with valued members of the linguistic group were related to the efficiency of second language achievement.

In 1962, Peal and Lambert<sup>60</sup> explored the relationship between bilingualism, school achievement, and student

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57 Weinreich, op. cit., p. 74-80.

58 Lambert et al., "Attitudinal and Cognitive Aspects of Intensive Study of a Second Language," p. 358.

59 Lambert and Gardner, op. cit., p. 266-272.

60 Peal and Lambert, op. cit., p. 19-20.

attitude of ten-year-olds from French schools in Montreal. By comparing the performance of the monolinguals and the bilinguals they found that attitudes seem to be related to socioeconomic class; that a preference of French Canadians for English Canadians may be explained because of a goal or value attached to learning the other group's language. Such value appeared to reflect the parents' favorable attitudes toward the English Canadians. Moreover, it was noted that bilinguals tend to identify with the English group more than do monolinguals. As far as the relationship between achievement and attitudes is concerned, the more favorable the attitudes toward the English community, the better the learning of their language.

Another study,<sup>61</sup> examining teacher attitudes to French language programs in English language schools, stated the importance of positive teacher attitudes of both ethnic groups for the success of second language programs of the Ottawa Separate School Board.

In 1963, Lambert et al.<sup>62</sup> reported another study which provides more information about the relation of

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61 M. C. Casserly, H. P. Edwards, and E. G. Achorn, "An Examination of Teachers' Attitudes to Second Language Programs," The Ottawa Roman Catholic Separate School Board, February 1973.

62 Lambert et al., "Attitudinal and Cognitive Aspects of Intensive Study of a Second Language," p. 358-368.

bilingualism to attitudes, motivations, and the interaction of the two language systems: English and French. This time the authors dealt with adult students attending a six-week French summer school. Findings showed that learning or achievement in a second language depends on attitudes toward the other ethnic group as well as on the motivation toward language study. Motivation may be of two types: instrumental orientation, which is more utilitarian or goal oriented; and integrative orientation, which means the person's desire to become part of the other group.

Since the non-structural factors described may be of internal or external nature to the bilingual, it is difficult for the observer to pinpoint for any one person all what helps or hinders his acquisition of a new language.

This part of the review of the literature attempted to convey the complexity of the problem of linguistic interference as well as the importance of some variables over some others. The following section discusses some of the techniques and methods found useful for quantifying interference factors.

#### 4. Quantification of Interference.

The most complete account of the various methods of quantifying interferences from a non-psychological point of view has been presented by Nils Hasselmo in Description

and Measurement of Bilingualism.<sup>63</sup> A feasible method has been to separate interference according to domains: phonemic, lexical, and grammatical, and to count the words borrowed from the second language. But, according to Weinreich, this method has its limitations:

No easy way of measuring or characterizing the total impact of one language on another in the speech of bilinguals has been, or probably can be devised. The only possible procedure is to describe the various forms of interference and to tabulate their frequency.<sup>64</sup>

Mackey<sup>65</sup> elaborated on this problem and focused, as previously stated, on one specific text, taking into account the specific place, style, and context of the language sample to be analyzed. He distinguished between the main language and the secondary language of the individual, and separate the units according to whether they were bilingual by combination or by modification. He was able to obtain also a proportion of interference and a rate of interference which permits one to see patterns and types of speakers in relation to the situation.

Indirect measures such as rating scales, tests of dominances, flexibility tests, and association tests have

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63 Hasselmo, op. cit., p. 128-133.

64 Weinreich, op. cit., p. 63.

65 Mackey, op. cit., p. 75-92.

been used to measure degree of bilingualism. These methods could also be used to measure degree of interference.

Less has been found for measuring psychological interference, and this probably indicates that psychologists as a whole have not been interested in quantifying the psychological factors in interlingual interference. Hasselmo states in reference to Lambert's study on language dominance, that an "ordinary foreign language test that involves a time factor can be regarded as the simplest form of psychological measurement of interference."<sup>66</sup>

#### 5. Statement of the Problem.

A review of the literature made evident the fact that most research done in the area of bilingualism related to the adult whose history of acquisition of a second language was a fait accompli. It is also important to note that less research has dealt with bilingual children from a psychological point of view and in the context of the problem studied herein: switching behavior.

In this study, a sample of children, who were at the primal stage of learning a second language in a specific context and in a well controlled program, was selected. Specifically, the subjects were chosen from a group of

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66 Hasselmo, op. cit., p. 133.

Grade II children, enrolled in a French Immersion Program of the Ottawa Roman Catholic Separate School Board.

Chapter II will discuss this program and major characteristics of the group.

In studying the switching behavior of children beginning to learn a second language, our interest is not didactic, that is, how to learn or teach a language. Rather, this paper wishes to consider the more phenomenological reality, that is, observing directly how each child responds to two types of tasks, a Word Association Task and a Story Telling Task,<sup>67</sup> while placed in a dyadic encounter with a person (tester) who speaks to them in one language, then in another during the same interview.

This study addresses itself to the following questions:

When an Anglophone child currently being schooled in French is addressed in both English and French by a bilingual adult stranger during the course of a single interview, will the child

- use only one language?
- switch from one to the other language in keeping with the language changes of the adult?
- tend to switch languages more or less depending on whether the child is a boy or a girl?
- tend to switch languages more or less depending on his or her pre-school language background?

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67 These two tests will be described in Chapter II.

## 6. Summary and Basic Hypotheses.

Switching can be caused by the interaction of structural or linguistic factors and with non-structural or psychosocial factors. Consideration of linguistic and psychosocial aspects of the problem permitted a review of multiple variables that must be taken into account to understand why an individual switches from one language to another. Though many reasons can account for switching, how a person does so is a more recent object of serious investigation. Studies are focusing more on the physiological aspects of memory storage and retrieval of language systems than on the theoretical and somewhat arbitrary distinctions between types of bilinguals or degree of bilingualism.

Some of the factors related to switching as discovered in the review of the literature can be summarized as follows:

### A. Individual factors.

1. Aptitude for learning and motivation
2. Emotional adjustment
3. Age of the speaker

### B. Sociocultural factors.

4. Separate context is favored over fused context
5. Nature and circumstances of the interpersonal encounter
6. Favorable attitudes toward the other's language

Though all these factors may at any time influence the quantity of switching or the amount of control over one's use of one language over the other in a bilingual situation, the criteria for choice of language a bilingual makes, from a psychological point of view, remains difficult to determine.

The present study, in search of some psychological factors influencing this choice of language, hypothesizes:

- (a) that children from bilingual pre-school backgrounds will switch more frequently than children from unilingual pre-school backgrounds;
- (b) that boys will switch more frequently than girls;
- (c) that in the adult-child interaction, both the language of contact employed by the adult and the language of instruction relating to the task will influence the frequency of switching.

The following chapter describes the study designed to answer these questions. The null hypotheses to be tested statistically will also be found in Chapter II.

## CHAPTER II

### RESEARCH DESIGN

This chapter is concerned with a description of the procedure involved in testing the hypotheses of this study. It describes (1) the sample, (2) the selection of the subjects, (3) the instruments used to measure switching, (4) the administration of the tests, (5) the scoring of results, and (6) the null hypotheses and statistical treatment of the data.

#### 1. Description of the Sample.

The subjects in this study were chosen from a group of Grade II children enrolled in a French Immersion program of the Ottawa Roman Catholic Separate Schools in 1971-72.

This program<sup>1</sup> was initiated in 1969-70 in response to a growing need for bilingualism on the part of the

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<sup>1</sup> For more specifics about the research plan and purpose of the French program, the interested reader may refer to the following reports: (1) H. P. Edwards and M. C. Casserly, Research and Evaluation of Second Language Programs: 1970-71 Annual Report, Ottawa, The Ottawa Separate School Board, 1971; (2) H. P. Edwards and M. C. Casserly, Research and Evaluation of Second Language Programs: 1971-72 Annual Report, Ottawa, The Ottawa Separate School Board, 1972; (3) H. P. Edwards and M. C. Casserly, Research and Evaluation of Second Language Programs, 1972-73 Annual Report, Ottawa, The Ottawa Separate School Board, 1973.

English Roman Catholic population of Ottawa. The first year, 90 percent of the kindergarten children attended full day classes--half day in English and the other half day in French. The following year, 1970-71, two options were made available for a Grade I program in cooperation with the parents. They were a French Immersion program and a 75-minutes of French per day program. The same options were offered in Grade II in 1971-72. Our sample was chosen amongst the Grade II students who had followed the French Immersion option. This meant that they had attended a half day of French in kindergarten and had received all instruction in the French language during Grade I and half way through Grade II (testing was done in February), except for religion which was taught in English by another teacher for twenty minutes per day.

## 2. Selection of the Sample.

Subjects were selected by the Research Officer of the Ottawa Roman Catholic Separate School Board according to three criteria: pre-school linguistic background, sex, and IQ scores.

Although all children in the Immersion group were English speaking, some, however, had had some exposure to another language other than English (French, 39%, third language 1%). For the purpose of this study, thirty

subjects (N=30) coming from a purely English unilingual background and thirty subjects (N=30) having experienced some French influence in the home were chosen. For the latter group this meant, for example, that occasionally one of the child's parents or a grandparent spoke French in the home such that the child would have had some ear training in the French language or perhaps understand and speak a few words in French. It was considered, therefore, that these children possessed a minimum degree of bilingualism at the start of the French Immersion program. The decision to compare the two groups is supported by results from the research of Edwards and Casserly whereby significant differences have been found between French pre-school language background children and English pre-school language background children in relation to achievement tests<sup>2,3</sup> and some personality factors.<sup>4</sup> The children from French pre-school linguistic backgrounds will be referred to herein as bilingual background subjects, and the children from English pre-school linguistic backgrounds will be categorized as unilingual background subjects.

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2 Edwards and Casserly, Annual Report 1970-71, p. 212-213.

3 -----, Annual Report 1971-72, p. 127-136.

4 -----, Annual Report 1972-73, p. 51.

It was attempted to include comparable numbers of boys and girls. Due to the limited total number of subjects available in the Immersion program (N=128), to the decision to eliminate extreme IQ scores, and due to the inclusion only of purely English background children and French background children, as described above, the ratio of boys to girls was 34:26, respectively.

Another consideration in selecting subjects was IQ scores on the Lorge-Thorndike Intelligence Test, Primary Battery, eliminating extreme scorers. The mean IQ score of the total sample of sixty subjects was 111.06, with a standard deviation of 7.06. The norms for this test indicate a mean IQ of 100 and standard deviation of 16. The IQ range of the sample was 96 to 123.

In summary, at the time of the study, there existed eight Immersion classes with a total of 128 students in Grade II. A sample of sixty subjects was chosen from five schools after linguistic background, IQ scores, and the possibility of visiting the schools at that particular time (i.e., the period beginning on January 28th until February 18th) were checked out by the Research Officer. The tester had only a list of names and schools as information until the testing and scoring of results were completed. Any biases on the part of the tester which could have influenced the subjects' responses were reduced by this procedure.

### 3. Description of the Instruments Used to Measure Switching.

This study obtained responses to two sets of stimuli: a Word Association Task, and a Story Telling Task.

The Word Association Task consisted of a list of twenty words, randomly selected from Edwards and Casserly's Word Association Skills Test.<sup>5</sup> Half of the words (N=10) were chosen from the English version, while the other half of the words (N=10) were selected from the French version using a table of random numbers.<sup>6</sup> The mixed word list used in this study appears in Appendix 2.

The second task consisted of having the child tell two different stories from two colored illustrations. This test is referred to as the Story Telling Task. The two pictures appear in Appendix 3 by order of presentation to the subjects. All encounters were taperecorded to facilitate scoring of the subjects' responses on the two tests.

The procedures for testing and the language of instructions will be presented in the next section of this chapter.

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<sup>5</sup> This test was derived from the Peabody Picture Vocabulary Test by W. E. Lambert of McGill University, and was used by Edwards and Casserly of the Ottawa Roman Catholic School Board in the Evaluation of Second Language Programs.

<sup>6</sup> H. E. Klugh, Statistics, The Essentials for Research, New York, Wiley, 1970, p. 338-339.

#### 4. Testing Procedure.

The Word Association Task and the Story Telling Task were administered to the total sample within a period of twenty-one days in five sessions. The experimenter met with each child individually for a period of approximately ten minutes. The subjects responded to verbal stimuli after a short introduction to establish rapport and to give instructions.

In order to balance the possible effects of the language of contact by approaching a subject in his first or second language, the following method was adopted. The total sample was divided into two groups. The first thirty subjects tested were greeted and given instructions first in English; the last thirty children were greeted and given instructions first in French.

For the Word Association Task, the first thirty subjects were given the following instructions<sup>7</sup> after being greeted in English:

I am going to say some words to you. Listen carefully. When you hear the word you are to say the very first thing that you can think of. You are to say a different word. For example, if I say, "snow" you might say "white." Do you know how to play our game? Now remember to say the word as quickly as you can. Ready?

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<sup>7</sup> These instructions are an adaptation of those used for research purposes by Edwards and Casserly.

The last thirty subjects were greeted in French and received the following French instructions:

Je vais te dire mots. Ecoute-moi bien. Quand tu entends le mot, tu dois me dire le premier mot à laquelle tu penses. Tu dois dire un mot différent. Par exemple, si je dis "neige," tu peux dire "blanc." Tu comprends notre jeu? Souviens-toi, tu dois dire le mot aussi vite que possible. Es-tu prêt?

If the subjects failed to understand the instructions in either language, examples were given until they knew how to answer before the mixed-word list was read to them.

The methodology related to the Story Telling Task is a little more complex, since two stories were involved, one for each picture. This task always followed the Word Association Task for all subjects. The first half of the sample (N=30) was given instructions in English for the first picture and in French for the second picture, consistent with the language of contact. The instructions<sup>8</sup> were given as follows to the first group:

Picture 1: Now let's do something else. This time I am going to show a picture. I want you to tell me all about the picture. Make up a story for me. (Show picture.) Now tell me what is happening.

Picture 2: Voici une autre image (montrez l'image à l'enfant). Regarde l'image attentivement. Dis-moi ce qui se passe. Raconte-moi une histoire.

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<sup>8</sup> These instructions are an adaptation of those used for research purposes by Edwards and Casserly for the Story Creation Skills Test.

To the second half of the sample the instructions for the first picture were in French, and in English for the second picture:

Picture 1: Maintenant, nous allons faire autre chose. Cette fois-ci je vais te montrer une image. Regarde cette image très attentivement. Dis-moi ce que tu vois (montrez l'image). Reconte-moi une histoire.

Picture 2: Here is another picture (show picture). I want you to tell me all about it. Tell me a story.

Throughout this report, the above procedure will be referred to as method of instruction. Method 1 (M1) means that the language of contact and the first language of instruction to the subjects for both tasks were given in English. Method 2 (M2) means that the language of contact and the first instructions to the subjects for both tasks were given in French. The method of instruction is one of the independent variables considered in this study.

A description of the scoring procedures is presented in the following section.

## 5. Scoring of Results.

For both tasks, the experimenter wished to observe how the subjects would react to this bilingual encounter in terms of switching behavior, that is, giving a response in a different language than the stimulus language. Thus

switching responses were tabulated as frequencies for the Word Association Task and as dichotomous data (switch or non-switch) for the Story Telling Task.

One type of switching on the Word Association Task is called a "translation switch" when the response was the equivalent of the stimulus word. For example, if a subject answered "toujours" to the stimulus "always," this response was tabulated as a translation switch. On the other hand, if the subject responded "jamais" to the stimulus "always," this answer would be considered as an "association switch," the second type of switching response. The third possible response would be to adapt to the stimulus language and respond in the same language as the stimulus, in which case no score was counted.

Although the frequency of total switching was the main interest for this study, whether it be a translation type switch or an associational type switch, these distinctions give a better description of the responses obtained. The results will be discussed in the following chapter in terms of these types of switching (i.e., total switching, association switching, and translation switching).

For the Story Telling Task, only two possibilities were examined to test the main hypotheses. Either the subject told his story in the same language as the instructions (stimulus) or he responded by telling his story in

the other language, different from the stimulus language. The results were tabulated as dichotomous data (switch or non-switch). Whether the child switched for one story or for the two, the results fell into the switch category. If the child adapted to the language of instruction between picture 1 and picture 2, his score fell into the non-switch category.

During the interview it was observed that the children adapted less frequently to the instructions for picture 2, whether method 1 or method 2 was used (described on p. 39-40). Thus a secondary hypothesis was added to the study as an exploratory measure. It will be stated at the end of this chapter and the results will be discussed in Chapter III.

The raw data for this study, which include schools, linguistic background, sex, IQ scores, method of instruction, and results on two tests, can be found in Appendix 1.

#### 6. Null Hypotheses, Statistics and Summary.

In this section, the null hypotheses will be stated and the statistical procedures used to verify them will also be described.

The first set of hypotheses is related to the switching behavior of the sample of Grade II French

Immersion children on the Word Association Task. They are as follows:

1. There is no significant difference between the average scores of bilinguals and unilinguals.
2. There is no significant difference between the average scores of boys and girls.
3. There is no significant difference between the average scores of subjects who were greeted and given their first instructions in English in comparison to those who were greeted and given their first instructions in French.

In order to test for significant differences among the three independent variables--linguistic background, sex, and method of instruction--a three-way fixed factor Analysis of Variance was performed using Soupac, Bolanova 5 Program. The level of significance,  $p < .05$ , was used as the basis for rejection of null hypotheses 1, 2, and 3. Hartley's test for Homogeneity of Variance was found tenable. The observed  $F_{max}$  statistic ( $F_{max} = 4.31$ ) did not exceed the critical value ( $.95 F(8,8) = 10.5$ ).<sup>9</sup>

The second set of hypotheses refers to the switching behavior of the sample of Grade II French Immersion children on the Story Telling Task. They are as follows:

4. There is no significant difference between the proportions of girls and boys who switch.

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<sup>9</sup> Martin Cooper, Instapak, Faculty of Education, University of Ottawa, p. 28.

5. There is no significant difference in the proportions of bilinguals and unilinguals who switch.
6. There is no significant difference in the proportions of the two groups of subjects who switch when submitted to different methods of instructions (that is, one group [N=30] is greeted and given instructions first in English and the other group [N=30] is greeted and given instructions first in French).

The approximate method of the Fisher Exact Test<sup>10</sup> was used to test null hypotheses 4, 5, and 6. The approximation of the Fisher Exact Test, based on the normal distribution, uses the  $\underline{z}$  statistic when the samples are large.

$$\underline{z} = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}_0 \hat{q}_0 \left\{ \frac{1}{n_1} + \frac{1}{n_2} \right\}}}$$

The  $p < .05$  was used as the level of significance for the rejection of null hypotheses 4, 5, and 6.

A secondary hypothesis was developed as an exploratory measure after direct observation that fewer children adapted to the language of instruction for story 2. This secondary hypothesis states that:

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<sup>10</sup> Virginia Keith and Martin Cooper, Non-Parametric Design and Analysis, Ottawa, University of Ottawa Press, 1974, p. 146-150.

7. When the language of instructions given for story 1 differs from the language of instructions given for story 2, there is no significant change in the subjects' switching behavior, i.e., the subjects will change language as the instructor changes language.

The similarity to a repeated measures procedure required an analysis of the data using the Cochran Q statistic to determine whether the subjects' choice of language in response to the tester's language changed from one treatment to the other (the language of instructions given for story 1 differs from the language of instructions given for story 2).

The Q statistic is expressed as:

$$\underline{Q} = \frac{k(k-1) \sum (T_j - T)^2}{k \sum S_i - \sum S_i^2} \quad 11$$

The critical value of chi-squared at the .05 level of significance was used to determine whether significant differences existed in switching for the two treatments (the language of instructions given prior to story 1 differs from the language of instructions given prior to story 2).

This chapter presented a description of the sample, the instruments used, the procedures for testing and scoring the null hypotheses, as well as a report of the statistical treatment applied.

In the next chapter the results will be presented and discussed.

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11 Ibid., p. 291-301.

## CHAPTER III

### PRESENTATION AND DISCUSSION OF RESULTS

In this chapter the results of the two measures of linguistic switching, the Word Association Task and the Story Telling Task, will be presented and discussed. Suggestions for further research will conclude this research paper.

#### 1. Total Switching.

A two-level, three-way, fixed factor Analysis of Variance for unequal Ns was carried out to test the null hypotheses that there are no significant differences among the average switching scores of the subjects regarding three independent variables: linguistic background, methods of instruction, and sex, with reference to the Word Association Task. Table I summarizes the results of the Analysis of Variance for total switching. Factor B shows a significant difference between the two methods of instruction ( $p < .05$ ), whereas the results for the variables sex and linguistic background are nonsignificant.

There is a significant difference in the children's switching scores, depending on whether they were greeted and given their first instructions in English or in French. These results seem to indicate that the language of contact

Table I.-

Analysis of Variance Summary Table for the Total Amount of Switching on the Word Association Task according to Background, Methods of Instruction, and Sex.

Source	df	MS	F	p
Background (A)	1	7.522	0.38	n.s.
Methods (B)	1	141.13	7.28	<0.01
Sex (C)	1	19.08	0.98	n.s.
AB	1	3.31	0.17	n.s.
AC	1	4.33	0.22	n.s.
BC	1	2.59	0.13	n.s.
ABC	1	4.03	0.20	n.s.
Within Cells	52	19.39		

and the language of instruction first used accounted for the greater number of switching events. It will be recalled that switching means giving a response in the language different from the stimulus language. Since the subjects tended to respond in the language first used by the interlocutor, independent of more immediate cues to change language, the establishment of a psychological set or some modeling of the tester's language seems, in this case, to be an important factor in the subject's decision for maintaining one language over another while speaking to a bilingual person in a bilingual encounter.

## 2. Association Switching versus Translation Switching.

Although the writer was primarily interested in total switching, whether it be of an association type or a translation type (see Chapter II, p. 41), two more Analyses of Variance were carried out, as an exploratory measure, in an attempt to determine what type of switching occurred more frequently and also to determine if any relationship between types of switching and the three independent variables, linguistic background, methods of instruction, and sex, could be found. Table II presents a summary of the Analysis of Variance for the association

switches on the Word Association Task. The results for the translation switches appear in Table III.

The results of these two Analyses of Variance indicate that translation switching contributed significantly to total switching in the context of methods of instruction, whereas association switching was found statistically nonsignificant. In fact, more translation switching was to be expected since, in the initial stages of learning a language, one concentrates more on simple meanings than on higher order associations.

Table IV presents the means for translation switching and total switching with two methods of instruction. It shows that when English was used as first language, more switching occurred.

### 3. Switching on the Story Telling Task.

An approximation of the Fisher Exact Test was calculated using the  $\chi^2$  statistic for testing the hypotheses that there are no significant differences in the proportions of subjects switching on the Story Telling Task according to linguistic background, methods of instruction, and sex. Table V presents the results of this analysis.

With reference to null hypotheses 4 and 5, the proportion of girls and boys, as well as the proportion of bilinguals and unilinguals who switch on the Story

Table II.-

Analysis of Variance Summary Table for Association Switching  
on the Word Association Task according to Background,  
Methods of Instruction, and Sex.

Source	df	MS	F	p
Background (A)	1	26.30	2.94	n.s.
Methods (B)	1	2.18	0.24	n.s.
Sex (C)	1	19.26	2.15	n.s.
AB	1	5.13	0.57	n.s.
AC	1	3.50	0.39	n.s.
BC	1	0.23	0.02	n.s.
ABC	1	4.11	0.46	n.s.
Within Cells	52	8.93		

Table III.-

Analysis of Variance Summary Table for Translation Switching  
on the Word Association Task according to Background,  
Methods of Instruction, and Sex.

Source	df	MS	F	p
Background (A)	1	7.50	0.64	n.s.
Methods (B)	1	101.12	8.66	< 0.01
Sex (C)	1	0.14	0.01	n.s.
AB	1	13.92	1.19	n.s.
AC	1	0.31	0.02	n.s.
BC	1	3.04	0.26	n.s.
ABC	1	0.11	0.00	n.s.
Within Cells	52	11.66		

Table IV.-

Table of Average Frequencies of Switching for Translation Switching and Total Switching with Two Methods of Instructions.

	Methods of Instruction	
	M1 (English)	M2 (French)
Total switching	6.87	3.73
Translation switching	3.23	0.57

Table V.-

Results of Fisher Exact Test for Switching Behavior on the  
Story Telling Task.

Variables	<u>z</u> Statistic	p
Background	-0.53	n.s.
Methods of Instruction	-2.24	< 0.01
Sex	1.43	n.s.

Telling Task are not significantly different, and hence these hypotheses are not rejected.

The null hypothesis stating that there is no significant difference in the proportions of two groups of subjects who switch when submitted to different methods of instruction (half the sample was greeted and given instructions first in English, the other half was greeted and given instructions first in French) is rejected, as the proportions of subjects who switch, depending on the methods of instruction, are found to be significantly different (Fisher's  $\underline{z} = 2.24, p < 0.01$ ).

#### 4. Switching between Story 1 and Story 2.

The Cochran Q test was used to verify the secondary null hypothesis that when the language of instruction given for story 1 differs from the language of instruction given for story 2, there is no significant switching between the child's response and the language used by the tester for either story. Since the obtained value of  $Q = 17.06$  exceeds the critical value of chi squared ( $\chi^2 = 3.84$ ), the null hypothesis is rejected,  $p < 0.05$ .

The results show significant differences in the subject's choice of language in responding to the language of instruction given for story 1 (half the sample was given instructions in English, the other half was given

instructions in French) from their choice of language, in response to the change in the tester's language for story 2 (half the sample was given instructions in French, the other half was given instructions in English). The instructions given for the Story Telling Task can be found in Chapter II, p. 39-40.

It seems that the initial set was much stronger, as all subjects except one adapted to the stimulus language of instruction given for story 1. For the second story, thirty-four children continued telling their story in the same language as the first, without paying attention to the change in the language of instruction given for story 2. It could also be hypothesized that, for this task, in addition to the establishment of a mental set, or a desire to model the tester's language first used, the pictures per se (see Appendix 3) could have attracted the children's attention such that they paid less attention to the change in the language of instruction given prior to story 2. In fact, the children not only had to deal with verbal stimuli but also with visual stimuli. Therefore, it is difficult to say what contributed to the significant differences in switching between story 1 and story 2.

Table VI is a contingency table which presents the number of subjects who switched and the number of subjects who did not switch when the method of instruction differed from the method of instruction for story 2.

Table VI.-

Contingency Table to Show the Switching Behavior of Subjects  
when the Language of Instruction Given for Story 1  
Differed from the Language of Instruction  
Given for Story 2.

	Story 1	Story 2
Switch	1	34
Nonswitch	59	26

### 5. General Interpretation of Set.

In Chapter I, the importance of mental set was discussed in relation to studies reported by Macnamara et al.<sup>1,2</sup> and Kolers<sup>3</sup> (see p. 10-11). It was found that the more a bilingual person can anticipate in which language he is to respond, the less time it takes him to switch languages. Switching time is also reduced when a bilingual person can follow a theme or when he can situate a problem within a certain context, or if the symbols he utilizes are familiar to him. Time of switching from one language to another was important to these researchers as they wished to discover how language systems are stored and retrieved in the minds of the bilingual person. Are their language systems functionally separate or interdependent?

Although this study did not necessitate a control of time of switching, nor was it intended to determine how language systems interact in the minds of bilinguals,

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1 J. Macnamara, "The Bilingual's Linguistic Performance, A Psychological Overview," Journal of Social Issues, Vol. 23, No. 2, 1967, p. 70-71.

2 J. Macnamara, M. Krauthammer, and M. Bolgar, "Language Switching in Bilinguals as a Function of Stimulus and Response Uncertainty," Journal of Experimental Psychology, Vol. 78, No. 2, 1968, p. 208-215.

3 P. Kolers, "Bilingualism and Information Processing," Scientific American, Vol. 218, No. 3, 1968, p. 79-80.

the observations reported by the above authors relating switching to factors such as expectancy, continuity, familiarity of symbols, etc., indicate that such factors are important in the switching behavior of the subjects in this research.

In this study, the importance of set has been found significant in relation to what appears to be a more psychosocial determinant. The initial language used by the interlocutor seemed to set forth an imitative process in the children. From the very beginning of the dyadic encounter, the child seeks dependence on the adult for this learning experience. This mental set causes interference in view of the task and thus weakens the child's ability to adapt to the changes in linguistic stimuli. In fact, eight subjects from the total sample (N = 60) adapted completely to the various changes in linguistic stimuli. These subjects would thus appear to abide by Weinreich's criteria of the "Ideal Bilingual" (see p. 7).

The Ideal Bilingual switches from one language to the other according to appropriate changes in the speech situation (interlocutors, topics) but not in an unchanged speech situation and certainly not within a single sentence.<sup>4</sup>

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<sup>4</sup> Uriel Weinreich, Languages in Contact, The Hague, Paris, Mouton, 1968, p. 73.

## 6. Summary and Conclusions.

This research was initiated in an attempt to study the switching behavior of a sample of children enrolled in French Immersion classes. To discover how a child, at the early stages of learning a second language (French), adapts to changes in linguistic stimuli during an interview with a bilingual adult, three independent variables were considered. They are pre-school linguistic background, sex, and methods of instruction (i.e., the language first used by the tester while greeting the subjects and language of instruction first given to them). Two tests were chosen as measures of switching behavior: a Word Association Task and a Story Telling Task.

In final summary, it can be emphasized that the results of this research indicate that the methods of instruction, that is, the language of contact and the language of instruction first used by the tester were found to influence significantly the subject's frequency of switching, independent of sex and pre-school linguistic background.

The fact that the subjects tended to respond in the language first used by the interlocutor, independent of more immediate cues to change language or to adapt to the stimulus language (French or English) has been interpreted as a psychological set or an attempt by the children to model the language first used by the adult from the beginning of

the encounter. Because of the strength of the mental set established from the beginning of the dyadic encounter, the child's ability to adapt to the linguistic changes throughout the tasks, tended to be lessened and thus there resulted more linguistic interference or switching (i.e., giving a response in a language different from the stimulus language). Eight subjects, however, from the total sample (N = 60) were able to adapt completely to the linguistic stimuli and respond in accordance with each change in language initiated by the adult interviewer. These subjects would be considered ideal bilinguals in Weinreich's terms.<sup>5</sup> They possess the ability to adapt to linguistic changes or to switch from one language to another in accordance with the changes in the speech situation.

The hypotheses investigating differences between sexes in frequency of switching as well as those designed to test differences in switching behavior between those children having had some French language exposure in the home before starting in the French Immersion program (herein referred to as bilingual background subjects) and those children coming from a purely English pre-school background, having had no other linguistic contact in the

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5 Ibid., p. 73.

home (herein referred to as unilingual background subjects), were found statistically nonsignificant.

The results in terms of pre-linguistic school background could be explained by the fact that those subjects categorized as bilinguals possessed, in fact, a minimum degree of bilingualism. Therefore, there appeared to be little differentiation between the two groups at the onset in terms of switching capacity. Future research could clarify the possibility of varying switching behavior between subjects of different linguistic backgrounds if subjects possessing a greater degree of bilingualism were compared.

The results also indicated that the type of switching that contributed most to the total amount of switching was the translation type instead of the association type.

Further longitudinal studies concerning the child's capacity of adaptation to changes in linguistic situations could answer some questions that emerge from this research.

One might wish to explore:

- (a) the importance of age or psychological maturation of the subjects. Does the child's need to identify with the adult remain as strong as he progresses in the French Immersion program?
- (b) What factors contributed in the adaptation of eight subjects to the changes in linguistic stimuli during the interview?

- (c) the type of switching. Will the students evolve more towards the associational type, a higher order of learning than the translation type, as the child progresses in the French Immersion program?

Age of the subjects, intellectual functioning, psychological maturation, degree of bilingualism, are but a few areas that could be pursued in other research, in search of factors influencing linguistic interference or switching versus linguistic adaptation.

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APPENDIX 1

RAW DATA FOR SUBJECTS WHO RECEIVED THEIR FIRST INSTRUCTIONS  
IN ENGLISH AND FOR SUBJECTS WHO RECEIVED THEIR FIRST  
INSTRUCTIONS IN FRENCH

## APPENDIX 1

RAW DATA FOR SUBJECTS WHO RECEIVED THEIR FIRST INSTRUCTIONS  
IN ENGLISH AND FOR SUBJECTS WHO RECEIVED THEIR FIRST  
INSTRUCTIONS IN FRENCH

School	Subj. No.	Ling. Back.	Sex	IQ	No. of Switches on Word Association Task	Switches on Story Telling Task
Subjects Who Received Their First Instructions in English						
1	1	B	F	107	16	0
	2	U	M	109	8	S
	3	U	F	115	16	0
	4	B	F	96	8	S
	5	U	M	122	0	0*
	6	U	M	102	7	0
	7	U	F	107	0	0*
	8	B	M	116	0	0*
	9	B	M	110	17	0
	10	U	M	101	11	S
2	11	U	F	99	6	0
	12	U	M	122	3	0
	13	U	M	116	4	S
	14	U	F	111	2	S
	15	U	F	106	9	S
	16	U	M	116	11	0
3	17	U	M	110	11	0
	18	B	F	98	9	S
	19	B	F	112	2	S
	20	B	M	113	13	S
	21	B	F	107	2	0
	22	B	F	116	5	S
	23	B	F	109	7	S
	24	U	M	110	9	0

B = bilingual

U = unilingual

\* = subjects adapting completely to  
tester's changes in language

## RAW DATA (Cont'd.)

School	Subj. No.	Ling. Back.	Sex	IQ	No. of Switches on <u>Word</u> <u>Association Task</u>	Switches on <u>Story Telling</u> <u>Task</u>
3	25	B	M	116	6	0
	26	B	M	118	8	S
	27	U	M	116	6	S
	28	B	F	118	3	S
	29	B	M	101	0	S
	30	B	M	119	8	S

Subjects Who Received Their First Instructions in  
French

4	31	U	F	119	8	S
	32	U	F	100	0	0*
	33	U	M	100	0	S
	34	B	M	119	1	S
	35	U	M	103	7	S
	36	U	M	113	0	S
	37	U	F	107	0	0*
	38	B	M	115	0	S
	39	U	F	113	7	S
	40	U	M	106	0	S
	41	B	F	108	6	S
	42	B	M	116	9	S
5	43	B	M	107	6	S
	44	U	F	113	2	0
	45	U	F	115	0	0*
	46	U	M	116	6	S
	47	U	M	122	2	0
	48	B	F	112	0	0*
	49	U	M	113	4	S
	50	U	F	122	1	0
	51	B	F	115	6	0
	52	U	M	123	6	S
	53	B	F	119	0	0*
	54	B	F	122	3	0
	55	U	M	104	8	S
	56	B	M	98	9	S
	57	B	M	106	9	S
	58	U	F	105	8	S
	59	B	M	110	9	S
	60	B	M	107	2	S

APPENDIX 2

LIST OF WORDS USED AS STIMULI ON THE WORD ASSOCIATION  
TASK

## APPENDIX 2

LIST OF WORDS USED AS STIMULI ON THE WORD ASSOCIATION  
TASK<sup>1</sup>

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maison	carry
salt	jaune
music	listen
chair	aujourd'hui
manger	always
sad	préparer
table (French)	entrer
hard	river
vite	pleasant
fruit	froid

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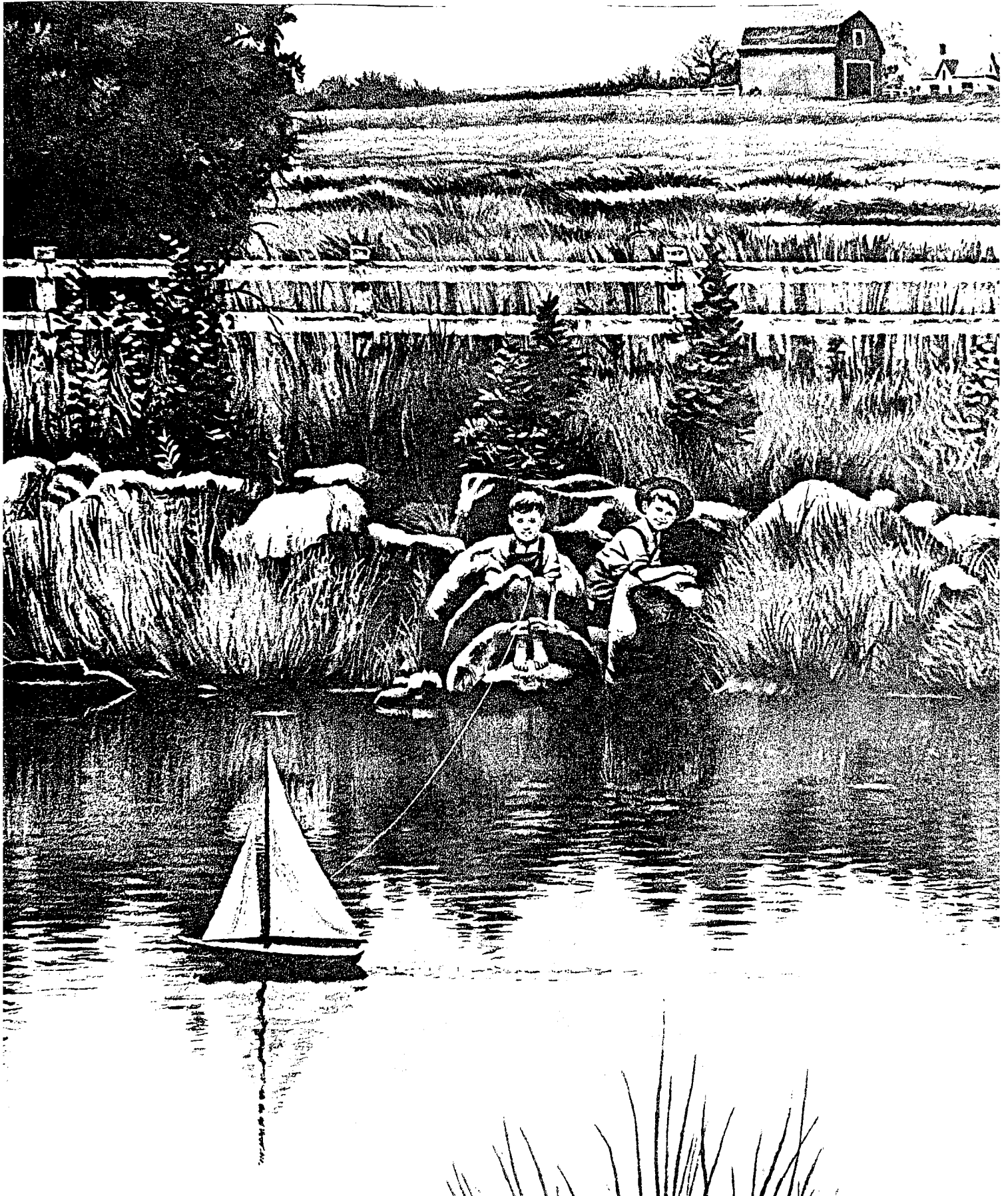
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<sup>1</sup>These words were selected from Edwards and Casserly's Word Association Skills Test.

APPENDIX 3

REPRODUCTION OF PICTURES USED IN THE STORY TELLING TASK

STORY 1



STORY 2



APPENDIX 4

ABSTRACT OF

Bilingualism: A Study of Switching Behavior in a  
Sample of Grade II French Immersion Children

APPENDIX 4

ABSTRACT OF

Bilingualism: A Study of Switching Behavior in a  
Sample of Grade II French Immersion Children<sup>1</sup>

This research is concerned with exploring the switching behavior of a sample of children enrolled in the Grade II French Immersion program of the Ottawa Roman Catholic Separate School Board. The bilingual's ability to switch from one language to the next has been acknowledged by many researchers interested in their psychosocial behavior. However, few have studied switching behavior per se, in the context of personal interactions. Weinreich has theorized that the ideal bilingual would adapt to the speech situation and switch from one language to the next only in accordance with the changes in the linguistic situation (interlocutor, topic, etc.). In the present study, an attempt is made to discover some factor that may influence a child's switching behavior, as he is placed in a dyadic encounter with a bilingual adult who switches from one language to the next (French or English) during the same interview.

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<sup>1</sup> Diane Bourbonnais, Master's thesis presented to the School of Graduate Studies of the University of Ottawa, Ontario, 1976, vii-77 p.

Sixty subjects in Grade II French Immersion were chosen, based on their pre-school linguistic background (half the sample had some French influence in the home, though minimal, before starting the program in kindergarten; the other half of the sample had no other linguistic influence except English), sex, and their intelligence quotient. In order to evaluate switching, two tests were administered: a Word Association Task and a Story Telling Task.

The acceptance or rejection of the hypotheses relating frequency of switching to three independent variables, pre-school linguistic background, sex, and methods of instruction (i.e., the language first used upon greeting each subject and the language of instruction first given) were determined by the Analysis of Variance method on the Word Association Task. On the Story Telling Task the hypotheses were tested by an approximation of the Fisher Exact Test in order to determine the proportions of subjects who switched according to the same three variables: pre-school linguistic background, sex, and methods of instruction. An exploratory measure was added to test differences in switching between the two stories that were part of the Story Telling Task. The Cochran Q statistic tested the significance of the two treatments.

The results seem to indicate that one factor measured, the language first used by the interviewer, influenced significantly the frequency of switching or linguistic interference

experienced by the subjects in this study. The children's reaction to the bilingual tasks has been interpreted as resulting from a process of identification with the adult, such that a mental set was formed from the beginning of the encounter. To some extent, this set determined the children's decision for maintaining the language first used by the adult, independent of changes in linguistic stimuli that could compel an Ideal Bilingual in the Weinreich theory to adapt to the changes in languages. The hypotheses related to pre-school linguistic background of the subjects, as well as those formulating greater frequency of switching for boys than for girls, were found to be statistically nonsignificant.

Further longitudinal research could actually give some evidence of good or poor progress on the part of the children involved in the French Immersion program, if one could determine what factors contributed to the complete adaptation of a few subjects to all linguistic changes in the course of the encounter. If determining the appropriateness of switching from one language to the other, according to the situation, reflects in fact a characteristic of the ideal bilingual, the results found in this study would seem to require a more thorough investigation into the possibility of a psychological maturation process based on a dependency need of children to identify with a model.