

A PSYCHOLINGUISTIC STUDY OF THE INFLUENCE OF SECOND LANGUAGE
ACQUISITION UPON PERFORMANCE IN THE FIRST LANGUAGE

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CHAPTER 1

INTRODUCTION

The recent interest in bilingualism in Canada has generated some controversy, especially among parents and educators, about the advisability of teaching a second language (L2) to young children in school. With the increase in popularity of immersion courses, some important theoretical and practical questions have emerged: a) Can very young children placed in immersion courses cope with the learning of a new linguistic code and continue to make satisfactory progress in their other school subjects as well? b) If a child spends a large proportion of time in his early school years mastering L2, will any retardation result in the further acquisition of his first language (L1)? c) Do children who are heavily exposed to L2 develop intellectually at the same rate as their monolingual counterparts? Longitudinal studies now being carried out, such as those described in Lambert and Tucker (1972) and in the reports of Edwards and Casserly (1971, 1972, 1973), are studying the effects of being schooled primarily in French upon the academic performance of anglophone children. So far, they have found immersion to have no detrimental influence on the academic, linguistic and social development of the children involved. Neufeld (1970) tends to view these projects and others like them as essentially experimental in nature, suggesting that immersion programmes should not be adopted on a large scale until answers to the above questions can be found.

The long-range effects of early bilingualism upon the adult have received considerably less attention than the immediate effects upon the child. In time, the studies presently underway, if pursued, will

yield information about the effects upon general academic performance of being schooled in L2. Notwithstanding these hoped-for data, there is a noticeable lack of research regarding the majority of bilingual adults who are not the products of carefully planned immersion courses where a fairly enriched programme is given in both L1 and L2.

From a psycholinguistic point of view, it is possible that the early acquisition and prolonged use of L2 may influence the bilingual's ability to function in L1. There are two frequently expressed views concerning the direction this influence may take. According to one, the time a bilingual has spent acquiring and using L2 has not been spent developing his skills in L1 beyond basic competence. (Laurendeau, Dunton et al., 1967B). ("Basic competence" is defined here as an individual's mastery of most of the phonological, morphological and syntactic rules of his language, excluding what Neufeld (in press, A) describes as "secondary levels".) One of the assumptions of this view is that a bilingual would not be able to use L1 as efficiently, especially when abstract concepts were being communicated, as a monolingual who has spent his language development time exclusively on L1.

The second view is that the knowledge and use of one or more foreign languages serve to make an individual cognitively more flexible in tasks involving language. (Cummins, 1973) In this case, the bilingual's experience in L2 would not, in theory, retard his development in L1, but rather, would tend to sharpen his ability to use L1 as an aid to perception and thinking.

A third view, strongly supported by present research, is that there is very little positive or negative influence of the learning of a second language upon an individual's use of L1, his academic progress,

or his social integration.

The present project was designed to explore the possible influence of the acquisition of L2 upon the adult's ability to decode in L1. Our first objective was to compare the performance of monolinguals to that of all bilinguals. Second, we compared the performance of monolinguals to that of three different groups of bilinguals where the variable was the age at which they had achieved fluency in L2 and, consequently, the amount of time they had spent using L2. Finally, we compared the three groups of bilinguals to see whether age of acquiring L2 (as interpreted above) had any significant effect upon this performance.

The present project is not parallel to the current child immersion studies cited above. It is intended to complement such studies by providing some additional information about the influence of being bilingual upon the first language of the adult. The research being done on child bilingualism deals with anglophone children in specific municipal areas who are immersed in French. We have dealt with adult francophones from diverse geographical and socioeconomic backgrounds who have learned English mainly in informal, non-immersion contexts. With this study, we hope to provide new insights into the psycholinguistic effects of early bilingualism upon L1 decoding in adults.

CHAPTER 2

EXPERIMENTAL DESIGN2.1 Aims of the Project:

We designed this experiment in order to ascertain:

- a) whether the acquisition and use of English significantly influences the ability of adult francophones to perform in French; and,
- b) whether the time spent using English during and after its acquisition (as determined by the age at which English was acquired) is a relevant variable affecting this performance.

By concentrating upon the ability of the adult to handle language in more abstract situations, we intended to complement existing studies of the influence of second language learning upon the intellectual development and academic progress of the child.

Our sample consisted of four groups of native Quebec francophones. Our aim was to match the groups for verbal intelligence, socioeconomic background, age and year in school; the primary difference between groups lay in their bilingual status. One group was monolingual; the other three were all bilingual, grouped according to the age at which Ss had learned English: as children, as adolescents and as adults. Our approach throughout the project was to compare the performance of groups on tests designed to measure some of the psycholinguistic abilities which we surmised to be involved in decoding auditorily and visually presented materials in French. The abilities which we investigated were the detection of structural ambiguity, the formulation of what we have termed "semantic hypotheses", and the solving of visually presented

problems similar to many found in conventional I.Q. tests. To these we added a measure of French vocabulary richness. These tests will be discussed in detail in Chapters 3 through 6.

2.2 Selection of Subjects:

The population for this study consisted of all francophones attending classes in the Faculty of Arts at the University of Ottawa during the academic year 1972-73 who were, or had been until recently, permanent residents of western Quebec. Ss' ages ranged from 18 to 25.

Participation in the experiment was voluntary. Copies of a questionnaire (see Appendix A) were distributed to interested students meeting our criteria as outlined above in a number of classes in the Faculty of Arts which had been selected in a loosely random manner. In the questionnaire, candidates stated whether they were bilingual, and if so, indicated the age at which they had become proficient in English and the context(s) in which they had acquired the language. They also rated themselves on a six-point scale on their ability to speak, understand, read and write English. This information enabled us to tentatively separate the volunteers into our four experimental groups. Other information such as age and year in school was later used to match groups. As we had only Ss' own opinions of their abilities in English, we formally tested them all for English proficiency in order to have a more objective assessment.

We restricted the scope of English proficiency to listening and reading skills. Since our tests were designed primarily to measure decoding skills, we felt that testing for oral proficiency was neither necessary nor relevant. In addition, the majority of our bilingual Ss

had acquired English in informal contexts where speaking and listening generally precede reading and writing.

Our 35-minute shortened form of the Michigan Test of English Language Proficiency, Form B was used since we found sufficient reliability (.789) between the shortened and long forms of the test. Equated scores on the Michigan test were interpreted by the manual of instructions as follows: scores of 80 and above indicate a high degree of English proficiency; scores of 69 and below show that a working knowledge of English is lacking. We considered those Ss having scores of 75 and over as bilingual, and those with 60 or lower as monolingual. We rejected those whose scores fell between 60 and 75 as borderline cases and thus were able to avoid a continuum of bilinguality. (See Appendix E)

As a test of listening comprehension, we selected 30 items from the auditory section of the English Placement Test "A" which was developed at the University of Ottawa's Centre for Second Language Learning. Using those items which discriminated highly between beginning and advanced students according to an item analysis where 900 papers written in September, 1972 were examined, we prepared a 10-minute taped test, the highest possible score of which was 30. Ss' scores on this test correlated highly with those on the Michigan test of grammar and reading ($r = .85$). (See Appendix F)

While our definitions of monolinguals and bilinguals may seem, at first glance, somewhat arbitrary, we felt that they were appropriate for this study where we were exploring the possible effects of varying amounts of active English usage upon some aspects of competence and performance in French. While all our "monolingual" Ss had had some degree of English contamination, we did not consider them bilinguals possessing an active knowledge of English. We hypothesized that the Ss in this group

were, for all intents and purposes, monolingual, in that despite whatever exposure they had had to English, they could in no way be said to be functional in the language. Further proof of this was obtained during the testing sessions when the bilingual monitor attempted to engage all Ss in casual conversations in English. Where the bilinguals responded, quite idiomatically, in English, the monolinguals were unable to converse meaningfully other than in French. Furthermore, in the author's experience, individuals who score below 60 or 65 on the Michigan test have virtually no written comprehension ability in English. Finally, since the French skills being tested in this project were of a fairly sophisticated nature (as defined in Neufeld's (in press A) distinction of "secondary competence"), we felt that whatever exposure our monolingual Ss had had to English was probably inadequate to influence these French skills.

To measure verbal intelligence, we used a French version of the Otis Self-Administering Test of Mental Ability, Higher Examination, Form A, which had been translated and standardized for French speakers at the University of Ottawa's Faculty of Psychology. The parents of Ss were interviewed by telephone and from the information received, an index of socio-economic background was derived for each S; the scale used here was a modified version of that found in Warner (1960). All Ss had reported their age and year in school on the initial questionnaire. We did not take grade-point averages for past years' performance into account because of the lack of homogeneity of marking systems used by the various high schools, C.E.G.E.P.'s and universities Ss had previously attended.

In the final sample selected, we managed to control for verbal intelligence, socio-economic background and age. However, we were unable to match groups with respect to year in school; on this variable

bilinguals who had learned English as adults were significantly more advanced than the other three groups. Rather than select a new sample at this point, we used a simple analysis of covariance to subtract out the influence of year in school whenever an analysis of variance on any of the dependent variables yielded a significant F-value. There were 56 Ss in our final sample, with 14 in each group.

We realized that generalization of the results of the experiment beyond the scope of our immediate population would be questionable because it is not known whether those students who attend the University of Ottawa are representative of Quebec francophone students at large. They may come to the University of Ottawa for reasons of geographical convenience or, on the other hand, because of the institutions's bilingual nature. Until a study can be made of francophone Quebecers at all universities, indicating why or even whether certain types of students are attracted to certain institutions, our conclusions can only be specifically applied to francophone students in the Faculty of Arts at the University of Ottawa.

2.3 General Procedures:

The items for all the tests in the experiment were made up by a team of twelve native Quebec francophones. All members of the team were enrolled in a graduate psycholinguistics seminar conducted by G. Neufeld at the University of Quebec in Montreal, and all had a marginal knowledge of English.

Testing took place at the University of Ottawa between April 1 and April 20, 1973. During this period, each S made two appointments, at least a day apart, for times which were convenient to him. The order in which Ss were tested was not by group, but rather, according to when they could come in. Two tests were administered during each session. The four

tests used in the experiment were randomly ordered into four blocks and counterbalanced across Ss; within each block, the test items were put into random order.

2.4 Statistical Procedures:

We were primarily interested in determining whether our four groups, each of 14 Ss, differed in their performance on 4 measures, some of which had several subtests. For the two tests which had no subtests, we used a simple one-way analysis of variance. A conventional two-way analysis of variance procedure was used on the other two tests in order to see whether the four groups varied in their performance on individual subtests, and whether their performance varied significantly from subtest to subtest. Inasmuch as we were unable to control for year in school, we included this independent variable in a one-way analysis of covariance where correlation coefficients were found to be above .39, and where the normal assumptions of this procedure could be met. The Levine test of homogeneity was applied in all cases along with scatterplots to determine the degree of linear relationship of covariables. In cases where significant differences at the .05 level were found, conventional t-tests were used to determine where these differences lay. When employing the analysis of covariance, these differences were located by means of a special t, elaborated by A. Edwards (1972). Analyses of treatment effects or of interaction between tests were not run because of the distinct nature of each test.

In two instances, raw scores, as tabulated for each S, could not be used themselves to compile the final means. These two tests were of a dichotomous type in that data on a) correctness of response, and b) time taken to respond, were collected. Our "degree of excellence" for each S's

performance on each test was obtained by converting raw scores, which represented time taken for response, in the following manner:

- 1) 60 intervals between 0 and 60 seconds were plotted;
- 2) the percentage of Ss responding correctly to each item within each interval was then calculated;
- 3) the converted score for an item was obtained by subtracting the cumulated percentages for all previous intervals from 100.

Example: If only 5% of the Ss in Group I responded correctly to an item in from 3 to 4 seconds, their score would equal 95 ($100 - 5 = 95$). If 20% of the group responded correctly in from 11 to 12 seconds, this 20% plus all previous cumulated percentages would be totalled and subtracted from 100.

Assuming for the moment that the only other Ss correctly responding up to the 11 to 12 second interval were those earlier mentioned who answered the question in from 3 to 4 seconds, the cumulated percentage in this case would equal 25%, which in turn would yield a converted score for those answering correctly between 11 and 12 seconds of 75 ($100 - 25 = 75$).

CHAPTER 3

TESTING FOR SENSITIVITY TO STRUCTURAL AMBIGUITY3.1 Introduction:

Kooij (1971) offers two definitions of structural ambiguity. The first and more general of the two calls it "that property of a sentence that it can be interpreted in more than one way" (p. 5). The second definition is more syntactic, saying that structural ambiguity occurs when "a linguistic description assigns more than one structure to one and the same sentence" (p. 6).

Structural ambiguity is generally recognized to be of two types. The first, surface or derived structure ambiguity, such as

- (1) They kept the car in the garage.

is a phenomenon of the position of the elements in the sentence itself. That is, the two or more interpretations can be represented linearly, where bracketing of groups of words indicates the meanings. For example, the two interpretations of (1) could be shown as follows:

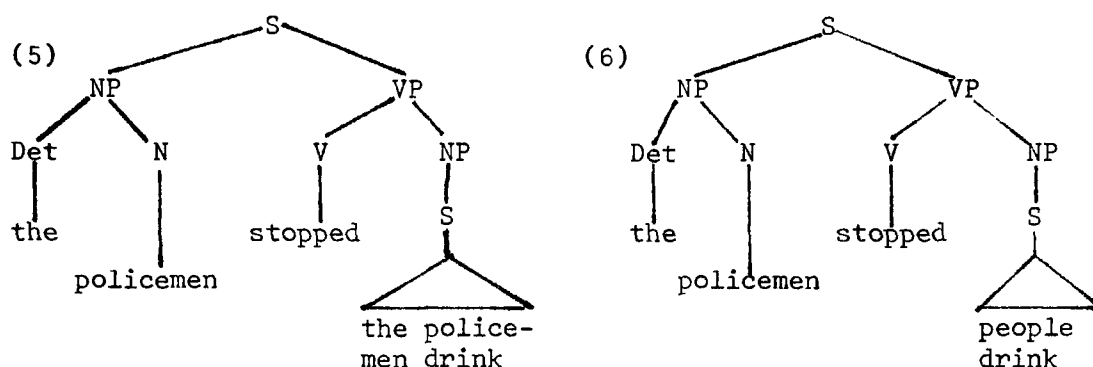
- $$\begin{array}{l}
 (2) \quad S \left[\begin{array}{c} \left\{ \text{NP} \left\{ \text{They} \right\} \right\} \left\{ \text{VP} \left\{ \text{V}(\text{kept}) \text{NP}(\text{the car}) \text{PP}(\text{in the garage}) \right\} \right\} \end{array} \right] \\
 (3) \quad S \left[\begin{array}{c} \left\{ \text{NP} \left\{ \text{They} \right\} \right\} \left\{ \text{VP} \left\{ \text{V}(\text{kept}) \text{NP}(\text{the car in the garage.}) \right\} \right\} \end{array} \right]
 \end{array}$$

The second type, deep or underlying structure ambiguity, such as

- (4) The policemen stopped drinking.

is more subtle, as it arises from the deep structure relations between words; the two or more meanings cannot be shown from the surface structure. That is, bracketing or constituent analysis will not indicate that it can be either the policemen or other people who are drinking. In order to

explain this type of ambiguity, it is necessary to construct a separate tree diagram for each interpretation to show the deep structure relations in each. The two meanings in (4) could be represented as follows:



We avoided cases of lexical homophony where the ambiguity arises more from the possibility of two or more dictionary definitions being applied to one and the same sequence of phonemes, than from the actual structure of the sentence. In many cases, lexical ambiguity exists only for a listener, as in:

- (7) The stripper quit her job because she could not
/beyr/ her body.

Here, the orthography would immediately disambiguate the statement for a reader. However,

- (8) John gave Mary a ring on her birthday.

would be ambiguous for both reader and listener. Drawing tree diagrams or bracketing would reveal nothing about the fact that the ambiguity in (7) and (8) exists only as a function of the decoder's ability to assign definitions which are compatible with the situation or semantic context. Experimental evidence exists to show that lexical ambiguity is more easily perceived and paraphrased by native speakers than

structural ambiguity. (MacKay, 1966; MacKay and Bever, 1967) Thus the former would not provide a sufficient measure of the more subtle aspects which we were exploring in this test. For these reasons, we confined ourselves to structural ambiguity of the type illustrated in (1) and (4) above.

Gleitman and Gleitman (1970) remark that the linguistic competence which all children have acquired by age 5 or 6 varies from child to child with respect to level of achievement. Furthermore, they and Labov (1970) have noted that beyond this innate, universal competence there exists a level of ability to use language which appears to be influenced by certain environmental conditions such as education, socioeconomic level of community, occupation of parents and so forth. We hypothesized that in addition to environmental factors, the acquisition of L2 at an early age might also have some effect, positive or negative, upon the further development of this higher level of competence.

The test of sensitivity to structural ambiguity, as outlined in detail in sections 3.2 through 3.4, was designed to measure Ss' ability to correctly decode 48 randomly mixed statements as ambiguous or unambiguous. It has been shown that native speakers of a language vary in their ability to detect multiple meanings in statements. (MacKay & Bever, 1967; MacKay, 1966; Foss, Bever & Silver, 1968) We hypothesized that the extent of a native speaker's sensitivity to structural ambiguity as defined above would provide at least a partial indication of his general decoding ability in his language. By controlling for as many environmental factors as possible in the selection of our Ss (see 2.2), we expected that any significant differences in performance on this test would be due to the influence of L2.

We speculated upon the possible causes for differences that might arise between groups on this measure. The ability to detect structural ambiguity in a language is a skill developed through exposure to that language. If, as is often postulated, time spent by a bilingual on L2 delays his acquisition of a higher level of competence in L1, then bilinguals might be expected to be less sensitive to structural ambiguity in L1 than monolinguals. In addition, among the bilingual groups, the ability to detect structural ambiguity could be expected to decrease as the amount of time spent acquiring and using L2 increased. If, on the other hand, exposure to L2 increases one's sensitivity to structure in L1 beyond that of a monolingual, then the opposite might result, with monolinguals scoring lowest, and bilinguals who had acquired L2 as children scoring highest.

3.2 Materials:

Approximately 60 statements in French, some structurally ambiguous and the rest unambiguous, were drafted. Care was taken that none of the items contained lexical homophony. Some of the ambiguous statements contained surface structure ambiguity; the rest contained deep structure ambiguity. The fact that all the assistants who made up the original test had had some degree of formal linguistic training (see 2.3) raised the following question: can the average French speaker in Quebec detect ambiguity as well as a trained linguist? As a means of verification, the test items were given to about 500 undergraduate francophone Quebec students in Montreal and Ottawa, excluding Ss, who were asked to indicate whether each statement in turn was, to them, ambiguous, and if so, why. Ambiguous items were retained for the final version of the test when at least 25% of the students found them so and were able to give adequate explanations. This cutoff point indicated to us that the ambiguity in the

statements was not too subtle for the average native speaker. In addition, any unambiguous item which more than 10% of those pretested called ambiguous was rejected at this point.

It was noticed during the verification procedures that students had a tendency to confuse structural ambiguity with indefiniteness or lack of precision. The latter can be seen in a sentence such as

(9) I don't want any.

where there is no antecedent for any expressed. In isolation, such a statement is vague but not ambiguous in the way that (10) is.

(10) Mary's mother married when she was twenty-four.

Here, there are two possible antecedents for she expressed. To avoid confusion which might result from sentences like (9) during the test, careful instructions were prepared to inform Ss that cases of imprecision of the type mentioned above were not to be counted as structural ambiguity.

A total of 48 statements were selected as items for the test; 22 were ambiguous and 26 were unambiguous. Of the ambiguous statements, 6 were examples of surface structure ambiguity, and 16 were of deep structure ambiguity. Each statement was typed onto a separate 5"x8" white card and then made into a photographic slide with white print on a black background. Two sample statements were also made into slides to be used for practice before the test. Finally, instructions in French were taped and dubbed onto the first track of the simultaneous four-track system used for the project. (See Appendix B for a list of all statements used in this test.)

3.3 Procedures:

Each S was tested individually in a small laboratory. S was

seated at a console and wore close-fitting headphones through which he received all instructions. In front of S was a panel with three keys on it. The centre key was marked S; the other two were marked 'plus' and 'minus'. For 50% of the Ss, the right key was 'plus' and the left, 'minus'; the reverse order was used for the rest.

The prerecorded instructions explained that a number of statements would be projected one by one onto a screen. Some would be structurally ambiguous and some not. S was asked to keep his index fingers lightly on the 'plus' and 'minus' keys and to make a decision about each statement in turn as to whether it was ambiguous or unambiguous. Then S was to depress the appropriate key to indicate his decision the instant he was aware of it as his time of reflection was being measured. The key marked 'plus' was to be depressed if he found the statement to be unambiguous; depressing the key marked S immediately afterward would bring the next slide into view. If he found the statement to be ambiguous, however, he was first to depress the key marked 'minus', then verbally express in his own words into the microphone attached to his headphones why he considered it ambiguous. His responses were recorded on an auxiliary tape recorder and later used for scoring purposes. Once his explanation was finished, he was to depress the key marked S for presentation of the next slide. It was made clear that failure to explain the ambiguity when the 'minus' key was depressed would be counted as an error.

Two sample statements were projected, one at a time, and S was asked to observe all previous instructions in making judgments on them. The first statement was clearly unambiguous:

Example 1: Elles éprouvaient le besoin d'aller prendre
un café.

The second statement was clearly ambiguous:

Example 2: Elle a voulu écrire à Jeanne parce qu'elle
était malade.

At this point, the monitor gave any additional instructions that seemed warranted. It was stressed in the prerecorded instructions, and repeated by the monitor if he deemed it necessary, that cases of lexical homophony and of vagueness or imprecision (such as "she went home" versus "Mary went home") were not to be considered as structural ambiguity. S was then instructed to depress the key marked S for presentation of the first slide.

Depression of either the 'plus' or 'minus' key stopped a digital timing device, capable of measuring in milliseconds, which was automatically activated the instant a slide appeared on the screen. In addition, depression of the 'plus' and 'minus' keys on the S's console caused corresponding coloured indicators to light up on the monitor's console directly above the timer. Thus the monitor was able to record both S's decision and decision time for each item on a score sheet. Different score sheets were made up to correspond to each random ordering of slides.

Scoring of Ss' responses was done later by the monitor. Each S's score sheet was compared to a master key which indicated which items were ambiguous and which not. All ambiguous items which S had called unambiguous were marked incorrect and given a raw score of zero. All those which S called ambiguous were checked against the tape made of his verbal explanations; raw scores for items where the explanation given was incorrect were zero; raw scores for items satisfactorily explained consisted of the time taken, in milliseconds, to make the decision.

A response of "ambiguous" was considered correct only where S adequately explained two or more possible interpretations, or where he otherwise indicated unmistakably why the statement was ambiguous. Statement (11) contains deep structure ambiguity. Following it are examples of responses which, while hypothetical, are similar to those recorded during the test; (12) and (13) exemplify satisfactory responses while (14) and (15) would have been counted as incorrect.

(11) The carpenters were all out of doors.

The following responses would have been considered correct:

(12) "This sentence can mean either 'the carpenters were all outside' or 'they had no more doors'".

(13) "'All out of doors' can mean 'all of them outside' or 'lacking doors'".

However, the next two explanations would have been considered incorrect as they do not clearly indicate that two separate meanings were understood:

(14) "I think 'out of doors' is ambiguous, but I don't know why."

(15) "They had no more doors."

In two or three cases, Ss judged an unambiguous statement to be ambiguous and gave satisfactory explanations. Since the nature of the ambiguity in these cases was very subtle, the items were still considered unambiguous on the master key, but were not scored as incorrect in these particular cases.

Raw scores consisting of response times in milliseconds were converted into scores which indicated the "degree of excellence" of each S on each item. (See 2.4) For each S, a mean converted score was calculated for the test. Group mean scores were then calculated and tested for significance.

3.4 Results and Discussion:

Table 1. Results of Test of Sensitivity to Structural Ambiguity: Group Means and Standard Deviations

Group I (monolinguals)	Mean: S.D.:	33.82 (11.70)
Group II (bilinguals who acquired L2 as children)	Mean: S.D.:	34.72 (11.66)
Group III (bilinguals who acquired L2 as adolescents)	Mean: S.D.:	41.14 (9.14)
Group IV (bilinguals who acquired L2 as adults)	Mean: S.D.:	39.23 (12.27)

An analysis of variance of the means of our four groups on the test of ability to detect structural ambiguity yielded no significant differences at the .05 level.

The most plausible explanation for these results appears to be

- a) that being bilingual has no measurable effect upon one's ability to detect structural ambiguity in visually presented statements, and
- b) that the age at which one learns L2 - English in this case - bears no relationship to this ability.

The second explanation may lie in the inherent weaknesses of contrived tests which allegedly measure one's capacity to discern subtle

structural and semantic distinctions in one's language. While this interpretation is always defensible to a certain extent in all laboratory experiments, we believe that our test actually did measure an important psycholinguistic ability and hence that bilingualism, where French remains the dominant language, is not a relevant variable. A rerun of this experiment with adolescents or adults who will have completed their English language studies in highly controlled contexts such as the popular French immersion programmes in Canada would be very worthwhile since if the results were replicated, we could take a more definitive stand with respect to the relevance of this variable.

CHAPTER 4

TESTING FOR ABILITY TO MAKE "SEMANTIC HYPOTHESES"4.1 Introduction:

In the test described in this chapter, we attempted to measure Ss' facility in making "semantic hypotheses" when decoding auditory messages in L1. We equate Ss' "making semantic hypotheses" with their ability, when listening to normal speech spoken at an average rate of speed, to come up with, or to guess, which word or words are to follow. By measuring the time it took Ss to supply words deleted from recorded spoken discourse, we hoped to see whether semantic hypothesis formulation was one of the aspects of L1 decoding which might be significantly influenced by knowledge of L2.

Before attempting to show why we think this kind of test is a relevant variable in this study, we include the following theoretical discussion to ensure that our concept of "semantic hypothesis" is entirely clear. Beginning at the phonological level, we will discuss how the word itself may be identified. Then we will proceed to the lexical level in order to postulate how Ss might predict what word will follow others in an utterance.

Before connected discourse can be understood, it must be segmented into meaningful units. The experimental work of Clark and Hayes (1970) provides some interesting insights into the subject of segmentation of spoken language. They postulate that humans "are able to measure crude correlations [between phonemes] found within words and the weaker correlations across word boundaries" (p. 223) and thus can perceive words as units made up of phonemes without the aid of prosodic markers. The kind of

correlations discussed in Clark and Hayes do not extend beyond the purely lexical level.

Not incompatible with the formalistic model of Clark and Hayes is what one might call a "template" theory. According to this idea, a word is recognized because the listener has been exposed so much to its phonemic pattern that a phonological template is imprinted in the brain. When the word is heard, its phonemic pattern fits the template which is used to retrieve the appropriate concept. The template of a word would permit a number of allophonic variations of each phoneme in the word; acceptable variants would probably be the most frequent of those previously encountered by the listener, either from the environment or from his own experimental speech as a child. If the variation of any sound in the word were so phonetically dissimilar as to be construed as a different phoneme, the listener might have difficulty understanding the word, especially if it were monosyllabic. For example, if the phoneme /æ/ in batch and bachelor were understood by the listener as /ey/, the remaining phonemes in the latter left intact would provide sufficient linguistic environment for the bizarre phoneme to allow the word to be understood, even in isolation. To understand /beyč / as /baeč /, however, the listener would probably need the aid of surrounding syntactic and semantic context.

Lexical items are made up of one or more morphemes which, in turn, are composed of phonemes. The segmentation of discourse into lexical items can be accounted for within the framework of the template theory, as can the fact that a listener can also segment and understand a word such as airplane which contains the known lexical item air in its first few phonemes which carry the tonic stress. For example, in the following

utterances, air (/eɪr/) would match an existing template in a native English speaker.

(1) Birds are flying in the air.

(2) People are flying in the airplane.

In both cases, the final phoneme in air marks a morpheme boundary. In (1), this phoneme also marks a lexical boundary, while in (2), it does not. The intensity of the marker would probably be regulated to a great extent by the syntactic and semantic (defined here as "meaning") environment of the message. In (1), air has a high semantic correlation with flying birds; it also correlates highly syntactically in that it completes a prepositional phrase at the end of a major syntactic unit. In (2), however, while air instead of airplane would be syntactically acceptable for the same reason as air is in (1), it is much less semantically compatible with flying people than airplane.

With the template theory, it seems quite likely that there would be a potential lexical boundary signalled after the boundary of every morpheme for which the listener had an existing lexical template. In the following polysyllabic words, asterisks (*) indicate morpheme boundaries, and broken lines (----) phoneme sequences for which the listener would have templates.

CATEGORY	/ k æ ' t ə g ɔ r i y / -----* -----*
SILENTLY	/ s ə ' l ə n t l i y / -----* -----* -----*
FALSIFY	/ f ə ' l s ə f ə y / -----* -----* -----*

A morpheme boundary would be signalled as a lexical boundary when the sequence of phonemes between it and the immediately preceding lexical boundary a) fit an existing lexical template, and b) correlated highly semantically and syntactically with the rest of the utterance and its context. As soon as the lexical boundary was signalled, the appropriate concept would be retrieved.

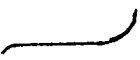
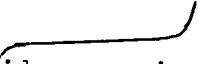
In effect, the template theory, while perhaps more intuitively acceptable, is really no less formalistic than the model proposed by Clark and Hayes (1970). The differences between that which is essentially linguistic and that which is essentially psychological stand out clearly when one attempts to relate descriptive models to cognitive processes.

Along the lines of the Clark and Hayes model, we postulated that the probability of occurrence of words in sentences could also be accounted for in terms of syntactic and semantic correlations between words. For example, when words are combined into sentences, it could be said that the greater the probability of word Y following word X, the higher the correlation between them. The correlations between words in a grammatical and meaningful statement would be greater than the correlations between these words and those in surrounding statements, and, in most cases, greater than the correlations between contiguous statements.

These correlations would be in large part derived from the syntactic, semantic and situational environment. It is impossible to isolate syntax from semantics or to assign primacy to one over the other. There exist many situations where one may serve as a backup system to the other during decoding or where both are entirely necessary for comprehension.

Paralinguistic features, especially intonation, would provide additional cues to aid a listener in making lexical probability statements.

In both the following statements, did you gives the listener a syntactic cue that a question is being asked and therefore that the intonation will probably rise at the end of the sentence.

- (3)  Did you go?
- (4)  Did you go home?

In (3), the rising intonation on go (shown by the intonation contour) signals the end of the sentence. In (4), however, the intonation pattern of a question is not complete after go, and the listener would expect more elements to follow to carry the rising intonation cued by did you.

Because words and sentences have both form and content, the words in a grammatical and meaningful sentence would be interrelated both syntactically and semantically. Thus a listener making an unconscious probability statement about what word will occur next in a sequence he is receiving would need both syntactic and semantic cues to aid him, as well as paralinguistic cues. In most everyday situations involving verbal communication, kinesic cues as well as the physical environment itself may also play a significant role.

As an auditory message is heard, the semantic probability statements that a listener makes about an element to be uttered would be based upon the whole sentence as decoded up to that point and his knowledge of the situational context. Syntactic probability statements about a word, on the other hand, could, in many cases, be made from the word immediately preceding it in the statement. For example, the occurrence of nouns correlates highly with preceding determiners, adverbs with verbs and so on. However, in other cases, a word could probably not be syntactically

predicted from the word immediately before it, as can be seen with the verb ran in the following sentence:

(5) Mr. Jones, a rich lawyer from the city, ran for mayor.

Here, the verb would be syntactically predicted from Mr. Jones, or perhaps, lawyer.

It should be pointed out that, while in discussions like these one must treat semantic hypotheses and syntactic hypotheses separately, these distinct levels of analysis probably co-occur; the most prevalent level would depend upon the particular situation, as already stated.

In the test described in this chapter, all the deleted words Ss were asked to supply were preceded by adequate semantic, syntactic and paralinguistic cues. The following is an example of the task Ss were asked to perform:

(6) This morning, I rushed out of the house, jumped into the car, fumbled in my pocket for the car key and put it in the _____.

In completing this sentence with the appropriate word, ignition, the listener must have received the semantic cues (car, car key, perhaps put in) and the syntactic cues (preposition plus determiner, therefore noun to complete a prepositional phrase) provided in the message. In this particular instance, paralinguistic cues would play no significant role.

The importance of semantic cues or context in making a probability statement about a word can be illustrated when one attempts to supply the missing word in the following sentence:

(7) Last night, I saw a _____.

The number of possibilities here is astronomical because the only major semantic cue given is that the missing element was visible to the speaker the night before. Syntactic cues point to the fact that it is a noun.

An illustration of the preceding theoretical discussion may be seen in the following model of how a native speaker of a language might make, in a largely unconscious manner, semantic and syntactic probability statements about the occurrence of any word in a sentence he is decoding. The auditory input - a compound English sentence spoken at normal speed with normal rhythm and intonation - is presented as it might be decoded by a listener under two conditions: A) following two sentences which clearly establish its situational context; and B) in isolation where the listener has had no previous information about the context. Presumably, the more information the listener has received, i.e., conceptualized and stored, about the context of an utterance he is about to hear, and the more he knows about the topic being discussed, the smaller the range of semantic possibilities he will have to choose from and the more quickly and accurately he will be able to hypothesize about the probability of hearing a given word. In our test, no words were deleted from the discourse Ss were presented with until a situational context was clearly established.

We are not attempting here to assert that the following model is a psychologically real entity; it is intended, rather, to illustrate the numerous complexities involved in the study of decoding and to raise some theoretically interesting questions for future research.

The graphic illustration of our model is set forth in a three-columned chart. The left column contains what the listener hears, i.e., the auditory input. The syntactic hypotheses and semantic hypotheses that the listener might be making when hearing the sentence A) in context and

B) in isolation are presented in the centre and right columns respectively, along with a brief description of how he might chunk and conceptualize the linguistic data when decoding it under each condition.

The following hypothetical situation takes place in the month of February where a listener hears sequences of tape-recorded male adult speech. The first two sentences include the linguistic and situational contexts which precede the sentence to be analyzed **under** condition A. The sentence to be analyzed will be assumed to have been heard in isolation, without the two preceding statements, under condition B.

Context: You should see how much my dog has grown in just six months!

It's so big that my wife refuses to take it for a walk.

Sentence to be analyzed: I bought it just last summer as a tiny puppy,
and now it weighs almost ninety pounds.

LINEAR AUDITORY INPUT	A) SENTENCE HEARD WITH CONTEXT	B) SENTENCE HEARD WITHOUT CONTEXT
I	Conceptualized as speaker (male adult) ← SYNTACTIC HYPOTHESIS (SYN): verb, adverb ← SEMANTIC HYPOTHESIS (SEM): action to follow will concern something speaker did for, to, with, about dog which was previously mentioned	← SAME ← SYN: SAME SEM: no cues; endless possibilities
BOUGHT	Conceptualized; listener now has picture of speaker buying something (perhaps in a store) ← SYN: noun, pronoun, determiner ← SEM: "the dog", "my wife", "a leash", "another dog", "a smaller dog", etc.	← SAME ← SYN: SAME SEM: no cues
IT (lack of falling intonation on <u>it</u> signals that statement is incomplete)	Conceptualized as same big dog referred to in previous sentences; listener now has picture of speaker buying that dog. SYN: adverb, preposition, subordinate conjunction (such as <u>when</u>, <u>where</u>, <u>because</u>, <u>although</u>, etc.) ← SEM: what follows will explain when, how, why, for whom, where, etc. he bought the dog.	Not conceptualized as something specific; listener will wait for reference. ← SYN: SAME SEM: no cues

INPUT	A) WITH CONTEXT	B) WITHOUT CONTEXT
JUST (higher pitch on <u>just</u> gives emphasis to word)	Signal: what is to follow will be limited SYN: adverb, adjective, preposition SEM: likely a time expression to follow: "last August", "last summer", "a few months ago", etc. (cues from context: speaker has just mentioned how large the dog got in six months.)	← SAME ← SYN: SAME SEM: no definite cues; perhaps time expression to follow
LAST	1) Retained in linguistic form in short term memory until noun it modifies is expressed, enabling listener to conceptualize <u>last X</u> as a unit; <u>OR</u> 2) (more likely) listener guesses "X" (see SEM below) because of small number of possibilities, and <u>last X</u> is conceptualized. SYN: noun (common) SEM: "August", "summer", "year", etc. (cues from previous context); definitely a time expression to follow	← SAME (no alternative as with A) ← SYN: SAME SEM: time expression to follow, but listener has received no cues to indicate how much time, or in what denominations it will be expressed

INPUT	A) WITH CONTEXT	B) WITHOUT CONTEXT
SUMMER (higher pitch on <u>summer</u> gives emphasis to word; falling intonation signals possible end of sentence)	In case of 1), <u>last summer</u> conceptualized; in case of 2), semantic hypothesis confirmed (or corrected if listener guessed wrong) SYN: preposition, subordinate conjunction SEM: what follows will say something about how small the dog was when he bought it last summer (cues from previous context); unlikely that speaker would end sentence here.	<u>Last summer</u> conceptualized; listener now has picture of speaker buying something the summer before. SYN: preposition, subordinate conjunction, or nothing (end of sentence) SEM: no cues
AS	Held in linguistic form in short term memory; not enough information to decode it yet SYN: determiner, noun, pronoun, adjective SEM: "a puppy", "a runt", "a gift", "a joke", "a companion", etc.	← SAME SYN: SAME SEM: no cues, except that perhaps what follows will explain why he bought it (e.g. "as I needed one", etc.)
A	1) Held in linguistic form in short term memory with <u>as</u> , <u>OR</u> 2) (more likely) listener guesses "X" (see SEM below) and <u>as a X</u> is conceptualized	← SAME (no alternative) Continued on next page...

INPUT	A) WITH CONTEXT	B) WITHOUT CONTEXT
A (continued)	SYN: adjective, noun (common) SEM: "puppy", "baby", "runt", "joke", "companion", etc.	← SYN: SAME SEM: no cues; what will follow will provide a reference for <u>it</u>.
TINY	In case of 1) above: a) <u>as a tiny</u> held in linguistic form in short term memory until noun is heard; <u>or</u> b) (more likely) "puppy" hypothesized (see SEM below); <u>tiny puppy</u> conceptualized; <u>as a</u>, a purely relational expression, is dropped once listener has established relationship between <u>tiny puppy</u>, <u>bought</u> and <u>dog</u> (from previous context) In case of 2) above: a) if "puppy", "runt", "baby" hypothesized and conceptualized, picture modified when <u>tiny</u> conceptualized; <u>or</u> b) if other possibilities (see SEM above) hypothesized and conceptualized, that concept rejected; and "puppy", "baby", "runt" conceptualized instead with <u>tiny</u>. SYN: noun (common) SEM: "puppy" ("runt", "baby")	<u>As a tiny</u> held in linguistic form in short term memory until noun is heard. ← SYN: SAME SEM: something small and non-human (cues: <u>tiny</u>, <u>it</u>, <u>bought</u>)

INPUT	A) WITH CONTEXT	B) WITHOUT CONTEXT
PUPPY (slightly higher pitch on <u>puppy</u> gives slight emphasis to word; intonation contour and slight pause signal possible end of statement)	<u>Tiny puppy</u> conceptualized if not already done by hypothesis; listener now has picture of speaker buying tiny puppy the summer before, and probably picture of big dog as well. SYN: nothing (end of statement), conjunction. SEM: he will probably go on to say something specific about the size of the dog now.	<u>Tiny puppy</u> conceptualized; as a is forgotten or dropped once it has established relation between <u>tiny puppy</u>, <u>bought</u> and <u>it</u>; listener now knows <u>it</u> is probably a dog; picture of whole utterance now: speaker buying tiny puppy last summer. SYN: SAME SEM: SAME, but less certain of this than if he had heard preceding context.
Note: From this point on, it can be seen that the listener in situation B) has received sufficient information about the context of the message that the semantic hypotheses he makes are virtually identical to those made by the listener in situation A).		
AND	Linguistic form forgotten; <u>and</u> serves as a signal that what follows will be logically related in idea to previous statement. SYN: noun, pronoun, determiner, adverb SEM. "now" (cues: <u>just last summer</u>, <u>and</u>, pause after <u>summer</u>); what follows will state specifically how big the dog is now	← SAME ← SYN: SAME SEM: what follows will state something about the size of the dog now, but listener would not necessarily expect as specific a statement as would the listener in A)

INPUT	A) WITH CONTEXT	B) WITHOUT CONTEXT
NOW (higher pitch on <u>now</u> gives emphasis to word)	Conceptualized; signal that past is being contrasted with present. SYN: noun, pronoun, determiner SEM: "the dog", "it"; (cues: pitch and time change): listener will definitely expect contrast to follow.	← SAME ← SYN: SAME ← SEM: SAME
IT	Conceptualized as same large dog discussed in previous context. SYN: verb SEM: "is", "weighs", "eats", "can", etc.	Conceptualized as a large dog that used to be the tiny puppy referred to in previous statement. ← SYN: SAME ← SEM: SAME
WEIGHS	Conceptualized SYN: adjective (expressing cardinal number), or contrastive expression like "as much as", "more than", etc. SEM: what follows will be dog's weight expressed either absolutely in pounds or relative to something (e.g., the speaker, his wife, a horse, etc.)	← SAME ← SYN: SAME ← SEM: SAME
ALMOST	Conceptualized; signal that expression of dog's weight to follow will be slightly limited.	← SAME Continued on next page....

INPUT	A) WITH CONTEXT	B) WITHOUT CONTEXT
ALMOST (continued)	SYN: same as after <u>weighs</u> SEM: same as after <u>weighs</u>	← SYN: SAME ← SEM: SAME
NINETY	Here, <u>pounds</u> would be hypothesized by both semantic and syntactic hypothesis; <u>ninety pounds</u> conceptualized; speaker can now picture contrast of ninety-pound dog and tiny puppy. SYN and SEM converge absolutely here: <u>pounds</u>; (perhaps, though unlikely, listener might expect another number such as <u>five</u>; speaker seems to want to depict dog as being as large as possible, and it is likely that had the animal weighed 94 pounds the speaker would have said <u>almost one hundred pounds</u>.)	← SAME ← SAME
POUNDS (falling pitch and intonation indicate possible end of statement)	Hypothesis confirmed SYN: nothing (cue: intonation contiuur) SEM: nothing (the message is complete)	← SAME ← SYN: SAME ← SEM: SAME

The preceding model represents what might be the major syntactic and semantic operations involved in our semantic hypothesis test. We included this test because we felt that being bilingual might affect one's speed and accuracy at making hypothetical statements about the probability of occurrence of a word when listening to speech in L1. Following are some speculations about how knowledge of L2 might conceivably affect one's ability to hypothesize in L1 as outlined in our model.

A child of five or six who has achieved basic competence in L1 is obviously not familiar with the more extensive vocabulary used by the adult. When listening to adult speech, as in a television broadcast, for example, the child is forced to guess the meanings of key words he does not know from the linguistic, kinesic and environmental cues available to him. It is clear, then, that even at an early age, the child must frequently make many semantic hypotheses when listening to speech in L1.

Like the child refining his knowledge of L1, an individual of whatever age, when learning L2 in informal contexts, must use his natural ability to guess at unfamiliar vocabulary and structures in order to comprehend L2 messages. For example, a French speaker learning English in the street might hear someone say, "Mary is so upset that her new baby is another boy. She wanted a girl so much." If he does not know the meaning of upset, he could guess it from the context of the message: he knows that Mary already has one or more boys, and that she wanted to have a girl; therefore, he realizes that upset must mean that she is not happy about the birth of her latest son. Clearly, the informal learner of L2 must learn to maximize whatever cues are available to him in the message, as well as those provided paralinguistically, as prosodic features and hesitation phenomena, and extralinguistically, as gestures and facial

expressions. This largely unconscious guessing or hypothesizing mechanism, exercised in L1 and further developed in L2, might very well make the bilingual quicker and more active in following and decoding spoken messages in L1 than the monolingual who lacks L2 experience. One might conclude that, because of his greater need to guess, the bilingual would be a more active listener in both languages. If, indeed, informal learning of L2 does cause an individual to make hypotheses in L1 more readily, then we would expect the bilinguals in our sample, the great majority of whom had acquired English in informal contexts, to perform better than monolinguals on this test.

The four passages which we used as stimulus material varied in subject matter from fairly concrete to quite abstract. We were interested in seeing whether there existed significant differences in Ss' ability to hypothesize in concrete and abstract contexts. If time spent learning L2 is time not spent developing L1 skills beyond basic competence, it is conceivable that bilinguals may be less adept at making semantic hypotheses where the content is more abstract.

4.2 Materials:

The items for this test consisted of four spoken passages of approximately 250 words each. They ranged in subject matter from concrete to abstract, and in style from informal to formal, respectively. The 6 to 8 words to be deleted from each text, mainly nouns, were placed at the ends of sentences or other major syntactic units. Each of these words was preceded in the passage by sufficient syntactic, semantic and prosodic cues to permit Ss to supply the missing word when it was deleted.

To ensure that there was only one possible word that Ss

could provide as a response for each deleted word, each passage was played to groups of native speakers and modified where more than one acceptable choice was supplied. We were able to arrive at a final version of each passage where 90-95% of those pretested were able to come up with each appropriate word as the only logical choice within 15 seconds. (See Appendix C for the passages used in this test.)

The final version of each passage was typed without deletions and recorded as read, at average speed and in a normal manner, by a male native Quebec francophone. The words were deleted when the recording was dubbed onto the second track of the four-track system used for the project. Had the reader deleted the words when reading the passages, the speech would have sounded artificial because of inappropriate prosodic contours at the deletion points in the text. A low modulated tone was superimposed over the word immediately preceding each deleted word; this was S's cue to supply the missing word. This tone, while constituting supplemental noise, proved to have virtually no masking effect. Instructions in French were recorded and dubbed onto the first track of the system.

4.3 Procedures:

Each S, tested individually, wore close-fitting headphones through which he received all instructions and test items. The prerecorded instructions informed him that he would hear four passages at various points in which words would be missing. At the sound of a low modulated tone, he was to supply the missing word by speaking into the small microphone attached to his headphones. His responses were recorded on an auxiliary tape recorder to be used later in determining the acceptability of his responses. At the sound of the tone, the timer was triggered and the master tape stopped. The sound of S's voice uttering the word stopped the timer and restarted

the master tape to continue the passage. As the aim of the test was to see how much time it would take him to come up with the appropriate word, S was advised to refrain from making any noises such as false starts, coughs and so on which might cause the sensitive mechanism to stop the timer before he had uttered the word. As practice, the following sample statement was given, and S was asked to observe all previous instructions.

Example: Mon dîner fini, je me suis levé et je suis sorti de la salle à _____.

In this particular instance, both dîner and manger were considered as correct responses. The monitor then gave any additional instructions when necessary. When S felt ready to proceed, the master tape was started and the auxiliary tape recorder turned on.

While the test proceeded, the monitor recorded the response time for each word, as indicated in milliseconds on the digital timer, on a score sheet. Separate score sheets were used for each random ordering of passages.

The recorded responses of each S were later checked for correctness by the monitor. In cases where the expected word was not given, synonyms - words which expressed virtually the same concept as the expected word, such as housecoat for dressng gown - were accepted as correct. The percentage of actual errors was so small (3-4%) that they were not analyzed.

Raw scores representing times of responses were used to calculate four means for each S, one for each passage. Four similar means were calculated for each group and were tested for significance.

4.4 Results and Discussion:

Table 2. Results of Subtests of Test of Ability to Make Semantic Hypotheses: Group Means and Standard Deviations

		SUBTEST I	SUBTEST II	SUBTEST III	SUBTEST IV
Group I	Means:	39.26	36.80	35.31	36.56
	S.D.'s:	(11.21)	(11.12)	(14.16)	(18.61)
Group II	Means:	42.58	35.92	47.14	40.73
	S.D.'s:	(15.20)	(14.29)	(15.70)	(18.78)
Group III	Means:	37.77	37.37	41.84	34.97
	S.D.'s:	(14.98)	(6.04)	(8.30)	(17.37)
Group IV	Means:	47.63	42.62	48.12	49.04
	S.D.'s:	(11.78)	(12.45)	(13.85)	(15.20)

No significant differences were found between the four sample groups with respect to any of the subtests, in a two-way analysis of variance. We are more inclined to think that the second explanation advanced in Chapter 3, concerning the weakness or inappropriateness of the tests used, may be an important factor accounting for the absence of significant differences. The devices used to stop and start the equipment plus the slight yet nevertheless detectable noise which resulted may have disrupted Ss' performance to some extent.

The other explanation is, of course, that, once again, the fact that one is a fluent bilingual has little to do with the ability to make probability statements about the occurrence of missing words in auditory input. For the time being, we shall assume that the latter explanation is at the base of our results until further work in this area,

with more refined equipment and more controlled language acquisition contexts, can be undertaken.

CHAPTER 5

TESTING FOR ABILITY TO SOLVE BRIEF VISUALLY PRESENTED VERBAL PROBLEMS5.1 Introduction:

Since the sample we were studying consisted of full-time university students for whom reading is assumed to be as vital a means of acquiring information as listening, we included a test where Ss were asked to decode fairly complex material in written form. The visual stimuli for the test were ten briefly expressed situations, in French, which Ss were asked to judge as true or false. The following example is typical of the items used for this test.

- (1) Mary had four goldfish; when all but one died, she had
only three goldfish.

We were interested in the time it took Ss to arrive at correct decisions; in the case of (1), the right answer would be 'false'. We hypothesized that the time taken to respond reflected, to a certain extent, Ss' facility in going through the numerous linguistic and nonlinguistic operations involved in decoding complex written material. Below, we shall speculate about how being bilingual might affect Ss' performance on this test.

By presenting Ss with this kind of task, we were able to measure the time taken for decoding processes and, at the same time, to reduce the relevance of the following potential intrusive variables. First, the problem of having to interpret subjective or qualified responses of Ss was all but eliminated by giving them a dichotomous choice - true or false - and by having them depress a key to signal their decision. We took care that none of our test items were ambiguous in any way and thus not answerable within the choice offered. Second, vocabulary and syntax

were not considered as significant variables because the visually presented material contained no unusual or low frequency words or idioms, and no complicated, heavily embedded grammatical structures. Finally, we felt that individual reading strategies used during the test need not be considered as a significant variable since presumably the brevity of the items, 1 to 4 sentences, and the problem solving nature of the task would require all Ss to adopt an attentive left-to-right scanning technique.

As in many laboratory experiments, the task here was somewhat artificial as Ss had to deal with ten consecutively presented, unrelated situations. In addition, each stimulus lacked the syntactic, semantic and situational contexts which are normally present and heavily relied upon in continuous discourse. Nevertheless, we regarded the items as acceptable in that they represented real situations involving decisions which individuals might be called upon to make from day to day in both formal and informal contexts.

We designed this test in order to see whether being bilingual had any significant effect upon the time it took Ss to correctly solve visually presented problems in L1. It was not our intention to study or analyze the decoding process itself. We surmised that if the data indicated significant differences between monolinguals and bilinguals, these differences could have several possible explanations. The following speculations, which are of theoretical interest only, suggest some possible areas for future research.

One possible explanation for significant differences favouring monolinguals is the hypothesis that a bilingual possesses a single store where lexical items from all languages he knows are retained. (Neufeld, in press, B) This single store hypothesis implies further that concepts

are also stored without regard to the specific language through which they may have been learned. A more commonly held theory is that the bilingual possesses an individual lexical store for each of his languages, (Haugen, 1956; Weinreich, 1954; Lambert, Havelka and Gardner, 1959) and that concepts acquired through a particular language would be retained in conjunction with that language's lexical store.

The significance to decoding of a "common" lexical store and corresponding conceptual store is that, theoretically, the hearing or reading of a lexical item in L1 or L2 would trigger not only the frequently used concepts associated with that particular word, but also those associated with its lexical counterpart(s) in the other language. The rationale for this is as follows. In a bilingual setting, an L2 learner who already has basic competence would tend to bring his previous knowledge and concepts to the foreground while learning L2, thereby having, in essence, two symbols (e.g., cuisine and cooking) for a single concept. This tendency would be much stronger for those who learn L2 as adults, for their conceptual store acquired through L1 and nonlanguage situations would be firmly established. The single lexical store hypothesis neither precludes the internalizing of more than one concept for a given lexical item, nor suggests that an entirely new concept cannot be acquired through L2. For example, an English speaker learning French would soon find his concepts for cooking largely inappropriate for cuisine which represents an altogether higher level of food preparation. In this case, the bilingual's concept of cooking may take on the added features of cuisine.

Despite the many cultural similarities of the English and French language groups in Quebec, it is quite likely that a bilingual's prolonged contact with the other cultural group would tend to add new concepts to

his repertoire. If, indeed, bilinguals do have common lexical and conceptual stores, cooking would retrieve not only those concepts which a monolingual might be expected to have, but also those added concepts associated with the L2 version, cuisine. From among the concepts triggered by the lexical item, the bilingual would have to select those which were most appropriate to the situational context of the message he was receiving. We postulated that the greater number of concepts that a bilingual may have to select from could cause him to take more time than a monolingual on this test, where solving the problems depended to a large extent upon one's ability to accurately conceptualize a complicated message.

A possible explanation for significant differences favouring bilinguals is the notion popular among some researchers that bilinguals are superior to monolinguals in cognitive operations where language is involved. (Cummins, 1973) This is allegedly due to the "expanded horizons" provided by knowing one or more foreign languages. A bilingual who frequently switches linguistic and even semantic systems might indeed be more efficient than a monolingual at carrying out language tasks, whether they involve spoken or written language. If such were the case, one could expect bilinguals to arrive at correct answers in less time on this test than monolinguals.

5.2 Materials:

Fifteen short items of from one to four sentences in French were prepared. Each described a situation consisting of two or more major ideas which were either fully compatible or incompatible, thereby rendering the situation true or false, respectively. In the following example of the items used in this test, the correct response would be 'true'.

- (2) A man drove three miles east, two miles north, and five miles west. Therefore, he ended up north-west of the point where he started.

To be certain that Ss, when exposed to the problems without prior experience, would be able to solve them within a reasonable amount of time, we used a verification procedure similar to that described in 3.2 and on the same group of students. Four of the problems proved quite difficult as the majority of students could not solve them within two minutes. Of the eleven remaining items, one was reserved as a sample to be used as practice before the test.

The eleven problems were typed onto separate 5"x8" white cards, each of which was made into a photographic slide with white print on a black background. Instructions in French were taped and dubbed onto the first track of the four-track system used for the project. (See Appendix D for a list of all items used for this test.)

5.3 Procedures:

S was seated at the console described in 3.3, and wore close-fitting headphones through which he received all instructions. He was told that he would see ten problems presented one by one on the screen. With his index fingers lightly on the 'plus' and 'minus' keys on the console, S was asked to examine each problem in turn and to decide whether the situation described was true or false. If true, the 'plus' key was to be depressed, and if false, the 'minus' key. S was instructed to depress the appropriate key the instant he was aware of his answer, as his decision time was being measured. For 50% of the Ss, the right key was 'plus' and the left 'minus'; the reverse order was used for the rest of the Ss. After

S had signalled his decision by depressing the 'plus' or 'minus' key, depressing the key marked S located between the other two brought the next slide into view. The following sample problem was projected, and S was asked to observe all previous instructions in solving it.

Example: Si la première classe est plus nombreuse que la deuxième, et la deuxième plus nombreuse que la troisième, la troisième est moins nombreuse que la première.

The correct answer here was 'true', and S should have depressed the key marked 'plus'. At this point, the monitor gave any additional instructions where necessary. When S felt ready to start, he was instructed to depress the key marked S for presentation of the first stimulus.

The instant a problem appeared on the screen, a digital timer on the monitor's console was triggered. It stopped when either the 'plus' or 'minus' key was depressed. Coloured lights immediately above the timer indicated to the monitor which key S had depressed, and both response choice and decision time were recorded on a score sheet. Different score sheets were prepared to correspond to each random ordering of slides.

Scoring was done by the monitor who compared each S's score sheet to a master key indicating which items were true and which false. Raw scores for correct items consisted of response times in milliseconds; incorrect items were scored zero. Raw scores were converted into scores which indicated the "degree of excellence" of each S on each item. (See 2.4) For each S, a mean converted score was calculated for the test. Group mean scores were then calculated and tested for significance.

5.4 Results and Discussion:

Table 3. Results of Test of Ability to Solve Brief Visually Presented Verbal Problems: Group Means and Standard Deviations

Group I	Mean: S.D.:	33.24 (12.28)
Group II	Mean: S.D.:	38.22 (17.14)
Group III	Mean: S.D.:	44.29 (12.13)
Group IV	Mean: S.D.:	43.55 (11.81)

As with structural ambiguity, a simple analysis of variance was run to determine whether our monolingual and bilingual Ss differed with respect to their ability to decode short visually presented problems. Again, F-values fell well below chance.

This test was, by far, the most theoretically questionable measure included in the study because of the numerous independent variables we thought to be involved and difficult to control, particularly since many of these variables might well be nonlinguistic in nature. We were, therefore, not surprised at the lack of disparity in performance among our Ss. Were the study to be reconducted, this test would probably be excluded because of the difficulties involved in interpreting significant differences were they obtained.

A more revealing version might be a form in which the stimuli would be presented auditorily where basically different decoding strategies

would have to be employed. The test problems, of course, would have to be shortened and made simpler. Inasmuch as the task involved would not be unlike many everyday situations where the listener must deal rapidly with carefully rehearsed speech (as in university lectures), this modified form would be worth pursuing.

CHAPTER 6

TESTING FOR VOCABULARY RICHNESS6.1 Introduction:

Unlike the other tests in the project, the one discussed in this chapter dealt essentially with production, rather than reception. The aim of the test was to obtain an indication of the richness and variety of Ss' active vocabularies in L1. We assume that someone with a large active vocabulary would communicate more effectively than someone with a smaller, more restricted one. We define effective communication as the ability of an individual to convey to a listener or reader a precise picture of the situation or idea he is expressing; this precision of expression would be, in theory, enhanced by the ability to express subtle distinctions in meaning in a variety of ways, from both a lexical and a stylistic standpoint.

The approach we used in this test was to visually present Ss with stimulus words in French and have them write out as many French synonyms as they could come up with for each. Our working definition of a synonym was any word that had basically the same meaning as the stimulus word. For example, the adjective bright in English would have the following synonyms: shiny, shining, gleaming, dazzling, intelligent, smart, clever. (See 6.3 for a detailed description of how we scored responses on this test.) Where doubt existed as to the acceptability of an S's response as a synonym, the response was given to a number of Quebec francophone students as a stimulus. Where the majority listed the original stimulus item among the first three synonyms given, the response was considered correct.

The stimulus words were drawn from three classes. The first class was frequently used slang words which are generally associated with spoken language used in very informal contexts. Examples in English of such slang words are:

up-tight (adjective) hassle (noun) bug (verb)

The second class was common or everyday high frequency words which are generally associated with normal spoken and written language in both formal and informal contexts. Examples in English of these common words are:

happy (adjective) alarm (noun) fight (verb)

The third class was lower frequency words which are generally associated with language spoken and written in formal contexts. Examples in English of these formal words are:

benevolent (adjective) reverence (noun) lament (verb)

All the French words selected as stimuli were considered to be in current usage throughout the province of Quebec.

Our reason for including this test was as follows. If the time spent by a bilingual achieving basic communication skills in L2 reduces the time he can spend developing L1, it is possible that his L1 vocabulary may not be as rich or varied as that of a monolingual who has spent all his language learning time developing L1. We postulated that if this were so, bilinguals could be expected to produce fewer synonyms than monolinguals. In addition, the longer a bilingual had spent acquiring and using L2, the fewer synonyms we would expect him to give. With respect to the slang/common/formal distinction, we further hypothesized that, among bilinguals, the number of synonyms given for words which are used less frequently and generally in formal contexts would be smaller than for higher frequency

words. For monolinguals, we would not expect to see this tendency to such a degree, if at all.

6.2 Materials:

Approximately 40 words from each class described in 6.1 were selected somewhat arbitrarily where the francophone assistants compiling the test agreed that the words were frequently used in Quebec French. In a number of pretesting sessions, about 500 undergraduate francophone students were given the words as stimuli and asked to write out synonyms for them. Words that elicited 3 or fewer synonyms in 90 seconds were rejected. The final sets of words consisted of 7 items from each class, of the grammatical categories 'noun', 'adjective', and 'verb'. The 21 stimulus words used were:

slang:	achalant (adjective)	common:	cesser (verb)
	branleux (noun)		demeure (noun)
	chialeux (noun)		drôle (adjective)
	écoeurer (verb)		fort (adjective)
	gros (adjective)		groupe (noun)
	jaser (verb)		niais (noun)
	smatte (adjective)		placer (verb)
formal:	atténuer (verb)		méthode (noun)
	classer (verb)		obscur (adjective)
	estimé (adjective)		semblable (adjective)
	examen (noun)		

The grammatical category of each word was printed after it in French to avoid confusion which might arise when words like the following could belong

to more than one category:

bug (noun) (verb) ring (noun) (verb)

The stimulus words were presented to Ss in the form of a booklet. At the top of each page, one stimulus word was typed in capital letters followed, in parentheses, by the grammatical category of the word. Each booklet was covered with a blank page. Four different random orderings of words in the booklets were used throughout the experiment. Instructions in French were prepared and typed onto a page for Ss to read before beginning the test.

6.3 Procedures:

Each S, individually tested, was given 90 seconds, measured by the monitor with a stopwatch, to write down as many synonyms as he could come up with for each of the 21 stimulus words. Pretesting sessions had indicated that few synonyms were given after 60 seconds; therefore, we did not feel that this time limit was restricting or inhibiting. S was asked to read the instructions before beginning the test. If any further instructions were needed, the monitor gave them orally.

In the instructions, S was told that the synonyms he gave should be of the same grammatical category as the stimulus word, but could be slang, common or formal, regardless of the class of the stimulus word. For example, the English stimulus word attire (noun) might elicit the following acceptable synonyms from all classes:

slang: gear, rags, trappings

common: clothes, clothing, dress, costume

formal: raiments, vestments

If a word given as a stimulus was, in fact, a definition, or a narrowing or broadening of the meaning, of the stimulus word, the response would not

be accepted. The following examples in English of stimulus words and acceptable and unacceptable responses serve to illustrate how we scored the synonyms given on this test.

ghost (noun): acceptable: specter, apparition, spirit, revenant,
spook, wraith, phantom, shade
unacceptable: dead person (a definition, not a
synonym)

ring (noun): acceptable: circle, band
unacceptable: sound (a broadening of the meaning;
ring is a subset of sound)

speak (verb): acceptable: talk, communicate, express
unacceptable: argue, shout, bark, whisper (nar-
rowings of the meaning)

car (noun): acceptable: automobile
unacceptable: Pontiac (narrowing of the meaning),
vehicle (broadening of the meaning)

It was made clear to Ss that one-word synonyms were expected. However, idiomatic expressions which are generally hyphenated were accepted as synonyms where there was a general consensus among a number of Quebec francophones consulted that the expression could be considered as a lexical item.

For each S, a mean of the raw scores for each of the three classes of words was obtained. A mean score for each class of words was then calculated for each group. These means were then tested for significance.

6.4 Results and Discussion:

Table 4. Results of Subtests of Vocabulary Richness Test Including: A) Group Means and Standard Deviations; B) ANOVA Results; and C) ANCOVA Results and r-values for X and Y where X = "year in school" and Y = Vocabulary Richness Subtests.

			Subtest 1 (common)	Subtest 2 (slang)	Subtest 3 (formal)
A	Group I	Means: S.D.'s:	2.64 (.84)	2.94 (.54)	1.72 (.59)
	Group II	Means: S.D.'s:	3.28 (.80)	3.23 (.62)	2.13 (.56)
	Group III	Means: S.D.'s:	2.56 (1.18)	2.56 (.98)	1.97 (.86)
	Group IV	Means: S.D.'s:	3.84 (.81)	3.91 (.88)	2.95 (.47)
B	ANOVA (F(4,51) = 2.78 at .05 level	F:	5.936	7.554	9.571
C	ANCOVA F(3,51) = 2.78 at .05 level	r: F:	.53 3.29	.42 5.41	.48 6.27

This test consisted of 21 stimulus words in all, randomly ordered with seven words in each of the earlier described classes. Accordingly, no correction procedures were used to test for interaction or treatment effects. Dealing again with four groups of Ss, we wanted to see whether they differed in their ability to provide synonyms for the visually presented stimulus words. A conventional two-way analysis of variance was run to test for significance between the means for each class of words obtained by each group. As already outlined, we were interested in finding out whether bilinguals differed from monolinguals in their performance and whether there were any discernible differences between bilinguals who had

acquired L2 at different ages.

Beginning with the 'common' word class, we obtained an F-score of 5.936. Since we had already determined that "year in school" might be a significant factor influencing Ss' ability to come up with synonyms, we ran a one-way analysis of covariance in order to subtract out any of the influence this variable might have had. The resulting F-score was 3.29 which was significant with $p < .05$, using 3,51 degrees of freedom. The problem then was to find out which of our four groups accounted for this difference. A special t-test (see 2.4) was run to determine where these differences lay. The only significant t-score was found to be between Groups I, II and III, inclusive, and Group IV. In other words, we found no significant differences between monolinguals and bilinguals as such. For reasons which are difficult to interpret, Ss in Group IV (francophones who had learned L2 as adults) were able to provide more synonyms than those in the other three groups. The variables which account for this superior performance are very likely nonlinguistic, in our opinion.

For the 'slang' word class, virtually the same procedure was followed. An analysis of variance of the four means yielded an F-value of 7.554. The adjusted mean obtained from the analysis of covariance confirmed that, as with 'common' words, "year in school" was a significant factor: $F(3,51) = 5.41$, $p < .001$. As in the previous test, the only significant differences that could be found were between Groups I, II, and III, inclusive, and Group IV. As before, we surmised that these differences were probably due to factors not measured in our test.

Even with respect to 'formal' words, the same factors appeared

to be prevalent when Ss responded to the visual stimuli. An analysis of variance yielded a significant F-score of 9.571. An analysis of covariance still produced a highly significant F-score of 6.27 with $p < .001$ using 3,51 degrees of freedom. The t-tests, as employed earlier, revealed that the observed significant differences resulted from the considerably superior performance on Group IV on the vocabulary richness test. Again, no relationship between monolingualism and bilingualism was detected.

It is interesting to speculate about what might explain Group IV's ability to excel in this kind of task. Except for the fact that the Ss in Group IV began learning L2 as adults, they were, for all intents and purposes, identical to Group I (monolinguals) according to our pre-test data. It is conceivable that those students who choose to remain monolingual at a bilingual university, located in an essentially English-speaking environment, differ in numerous respects not measured here from their earlier monolinguals counterparts who began taking advantage of second language instruction facilities at this university. Whether this inclination suggests a keener interest in language, or whether it suggests superiority or differences in purely nonlinguistic attitudes and abilities, is open to question. The important point to note here is that monolinguals and bilinguals do not appear to differ with respect to this measure, nor, for that matter, do the bilingual groups themselves, to a very large extent at least.

CHAPTER 7

SUMMARY AND CONCLUDING REMARKS

The purpose of the project presented in this thesis was to determine whether a) the fact of having acquired English, and b) the age of acquiring English (as interpreted on p. 3), had any significant effect upon the following decoding abilities in French of our native Quebec francophone Ss: detection of structural ambiguity in visually presented statements; formulation of semantic hypotheses about the occurrence of missing words in auditory input; and solving of brief visually presented verbal problems. No significant differences with respect to either a) or b) above were found on any of these measures. However, with a fourth test of vocabulary richness, which was more a measure of encoding skills, the Group IV bilinguals, who had learned English as adults, scored significantly higher on all the subtests than the other groups, including the monolinguals. We hesitate to say that Group IV was generally superior to the other groups in speech production since our vocabulary richness test measured only a very small part of the skills involved in production.

The tests in this study were part of a larger project in which the same Ss were also given tests of French production. In these additional tests, Ss were asked to give verbal *précis* of auditorily presented French passages, and to give verbal descriptions, in French, of single pictures and cartoon-like sequences depicting situations. Extensive content analyses of the spontaneous speech samples obtained yielded significant differences favouring monolinguals. A description of this segment of the project can be found in Neufeld (in press, C).

With respect to the tests described here, there are certain

modifications in the sample we used which might, in retrospect, have made the study more valuable. Our major concern is the context in which our bilingual Ss has learned English. Although, as mentioned earlier in the report, most had acquired English in informal contexts such as from friends, at home, from television and so on, we felt that were the study to be duplicated, especially the test of semantic hypothesis formulation, comparison of formally and informally trained bilinguals might yield significant and interesting differences.

In addition, it might be interesting to perform a similar experiment using as Ss adolescents or adults whose past history - academic, linguistic, psychological and social - had been carefully recorded longitudinally. This, we hope, will be possible in the future with the students coming out of the pilot immersion projects in Montreal, Ottawa and Toronto.

APPENDIX A

PRELIMINARY QUESTIONNAIRE

1. Nom: _____
2. Sexe: M F 3. Age: _____
4. No. de téléphone où on peut vous rejoindre: _____
5. Adresse locale: _____
6. Faculté: _____ 7. Année: _____
8. Département ou discipline principale: _____
9. Adresse permanente (d'où êtes-vous?) _____
10. Depuis combien de temps habitez-vous la région d'Ottawa? _____
11. Langue maternelle: anglais ☐ français ☐ autre _____
12. Langue maternelle des parents: père _____
 mère _____
13. Autres langues parlées: par vous _____
 à la maison _____
14. Quand est-ce que vous avez commencé à apprendre l'anglais?

Dans quel milieu?

- ☐ à la maison
- ☐ avec des amis
- ☐ dans la rue
- ☐ à l'école
- ☐ autre _____

15. Si vous êtes bilingue (français/anglais), à quel moment avez-vous parlé couramment l'anglais?

- ☐ moins de 6 ans ☐ 9-12 ☐ 15-18
- ☐ 6-9 ☐ 12-15 ☐ plus de 18

16. Connaissant vos capacités en anglais, où vous situez-vous dans

l'échelle des catégories suivantes?

- a) Compréhension orale: ☐ faible
☐ satisfaisante
☐ bonne
☐ très bonne
☐ presque comme un anglophone
☐ comme un anglophone
- b) Expression orale: ☐ faible
☐ satisfaisante
☐ bonne
☐ très bonne
☐ presque comme un anglophone
☐ comme un anglophone
- c) Compréhension écrite: ☐ faible
☐ satisfaisante
☐ bonne
☐ très bonne
☐ presque comme un anglophone
☐ comme un anglophone
- d) Expression écrite: ☐ faible
☐ satisfaisante
☐ bonne
☐ très bonne
☐ presque comme un anglophone
☐ comme un anglophone

17. Dans quelle mesure est-ce que vous utilisez votre anglais?

- ☐ rarement
- ☐ des fois
- ☐ à peu près 25% du temps
- ☐ presque'aussi souvent que le français
- ☐ aussi souvent que le français
- ☐ plus souvent que le français

18. Quel aspect de l'anglais devez-vous utiliser?

- ☐ surtout compréhension orale
- ☐ surtout compréhension orale mais aussi un peu d'expression orale
- ☐ les deux: compréhension orale et expression orale
- ☐ surtout compréhension écrite
- ☐ un peu de tout

19. Où vous servez-vous de l'anglais?

- ☐ à la maison
- ☐ à l'école
- ☐ au bureau
- ☐ dans la rue
- ☐ autre _____

APPENDIX B

ITEMS USED FOR TEST OF SENSITIVITY TO STRUCTURAL AMBIGUITY

UNAMBIGUOUS STATEMENTS:

1. J'estime que donner un cadeau entretient l'amitié.
2. C'est celui qui aura fait le plus de blagues qui aura la tête de cochon.
3. Jean et Renée prirent place à bord de l'avion.
4. Il vit couler le sang de la blessure du policier.
5. Nous avons réalisé qu'Hercule n'était pas venu.
6. C'est le désir de Suzanne de réussir.
7. Nous lui dirons demain avant qu'il s'en aille.
8. C'est à moi et non à Léo qu'il faut la remettre.
9. L'athlète a brisé ce record sans s'en rendre compte.
10. Il courait plaines et bois sans rien manger.
11. Je refuse de réfléchir sur ces problèmes.
12. Je ne vois pas pourquoi on fait cet exercice.
13. Personne, sauf lui, ne prête attention à nos desseins.
14. Il ne pouvait plus endurer de tant travailler.
15. Y a-t-il quelque chose de mieux à manger ici?
16. Il est arrivé après moi mais avant lui.
17. Elle a cherché longtemps pour ne rien trouver finalement.
18. Il se souvient de ce qu'il a promis à son ami.
19. Il souhaite rencontrer la femme au chapeau vert.
20. On se demandait pourquoi elle était heureuse.
21. Il se demandait pourquoi il était impossible de venir.

- 22. Il livre le fruit de ses pensées.
- 23. On ne distinguait que son chandail blanc.
- 24. La soeur de Richard est la blonde de Martin.
- 25. La salle se vida sans panique.
- 26. Il nous annonça le départ pour demain.

STATEMENTS CONTAINING SURFACE STRUCTURE AMBIGUITY:

- 27. Le voleur est poursuivi par le policier armé.
- 28. Le professeur a dit que Paul s'était sauvé hier.
- 29. Venez me rencontrer à bicyclette.
- 30. Je crois mon fils malade.
- 31. A la guerre j'ai vu mes camarades blessés.
- 32. Les patientes du docteur ont été examinées avec plaisir.

STATEMENTS CONTAINING DEEP STRUCTURE AMBIGUITY:

- 33. Il part demain et il veut qu'on lui en parle avant de partir.
- 34. La complexité du problème le rend inabordable.
- 35. Il a vu Paul, et il m'a dit qu'il était déçu.
- 36. Ma soeur aînée a élevé ses enfants mieux que moi.
- 37. Je ne crois pas que Jean porte ses lunettes.
- 38. Ne mens pas comme moi.
- 39. Parlant avec le policier de son complice, le voleur a décidé de
ne pas le tuer.
- 40. La critique de Chomsky a eu peu d'écho.
- 41. Il m'a demandé de les monter les trois marches.
- 42. J'ignore quels ennemis redoutaient les soldats.

- 43. Remets-moi le livre que j'ai acheté à Paul.
- 44. La découverte de Pierre fut un événement important.
- 45. As-tu la copie de la lettre de mon ami?
- 46. Claude ne bat pas sa femme parce qu'il l'aime.
- 47. Il ne pouvait s'empêcher d'admirer son chapeau.
- 48. Il fait trop chaud, je n'y tiens plus.

APPENDIX C

PASSAGES USED IN TEST OF ABILITY TO MAKE SEMANTIC HYPOTHESES

The four texts are arranged in order of increasing abstractness and formality. Words appearing in parentheses are those which were deleted.

SUBTEST I:

Ma femme et moi sommes allés chez des amis hier. De verre de bière en verre de bière, il ne m'a fallu que quelques heures avant de devenir complètement ivre. Or l'ivresse me rend impossiblement distrait. Quand j'ai décidé de partir, j'ai tout vérifié: j'avais ma clef, mon manteau et mes gants. J'ouvre la portière de l'auto et m'installe au (volant). Mais juste avant de mettre la voiture en marche, ma femme me conseille de laisser l'auto et d'arrêter un taxi. Ce n'est qu'une fois rendu chez moi, au moment d'ouvrir la porte de mon appartement, que je me suis rendu compte que je n'avais plus ma (clef). Où avais-je pu la laisser? J'avais pourtant tout vérifié avant de quitter nos amis. Le seul endroit où j'avais pu la laisser était dans l'auto, puisqu'elle n'était dans aucune de mes (poches). Ma femme n'avait pas le double de la clef. Il nous fallait donc retourner chez les Tremblay et arrêter un autre (taxi). Reprendre mes clefs aurait pu être chose facile si, me voyant revenir, ils ne m'avaient offert de boire encore. A cause de ça, j'ai eu tout juste la présence d'esprit en ressortant d'aller chercher mes clefs. Etrangement sur le chemin de retour, j'ai eu extrêmement froid. Ivre comme j'étais, je n'ai pas réalisé que j'avais oublié mon (manteau). Le lendemain matin, comme il avait neigé, j'ai décidé de me lever tôt afin de déblayer mon entrée. Je ne pus faire démarer ma souffleuse car j'avais oublié de renouveler la provision (d'essence). Je suis alors retourné me coucher.

SUBTEST II:

Sitôt que le soleil se lève, à l'Est comme partout ailleurs, il frappe directement à ma fenêtre de chambre à coucher. Or ma fenêtre est sur le mur opposé de celui où se trouve la porte qui donne sur l'extérieure, en direction de (l'Ouest). Tous les matins, à six heures, en même temps que le soleil se lève, je sors prendre ma marche quotidienne. Je trouve ce moment de la journée délicieux: sitôt que j'ai traversé la porte et que je me mets en route, je sens le soleil me frapper dans le (dos). Cette sensation des rayons qui nous cuisent la peau m'encourage à descendre le sentier qui mène à la rivière. Je n'ai alors qu'à tourner à droite pour rejoindre la rangée de cèdres qui borde la gauche du sentier. J'ai toujours aimé ce sentier parce qu'à cette heure où le soleil est encore très doux, je profite de ses rayons qui ne sont pas encore obstrués par la rangée de (cèdres). Ce n'est qu'une centaine de pieds plus loin que le sentier bifurque une seconde fois vers la droite et donne alors sur la (rivière). Là je prends mon canot et descends la rivière vers le Sud. A ma gauche la montagne, à ma droite une grande forêt. Je descends la rivière jusqu'au premier village et fais mes provisions pour la journée. Quand je remonte le courant en direction du chalet, vers le (nord), je m'arrête juste un peu plus haut que les rapides et pêche ma truite en buvant ma bière et mangeant mon fromage. Vers sept heures, un peu avant que le soleil se couche, je reprends une dernière fois mon canot et retourne alors au chalet. A ce moment, les derniers rayons du soleil éclairent la (montagne). Quand je remonte le sentier, j'ai le soleil qui me chauffe le (visage) de ses derniers rayons. Je tourne alors à (gauche) deux fois et entre dans mon chalet.

SUBTEST III

De sa découverte à nos jours, on a constamment amélioré les performances de l'automobile. Ainsi au début du siècle, il n'y avait pas de limites de vitesse sur nos routes. Alors qu'aujourd'hui les autorités demandent aux automobilistes de ne pas rouler au dessus d'une certaine (vitesse). De plus, le nombre des automobilistes a grossi d'une façon effarante, si bien qu'en Amérique il y a au moins pour chaque deux habitants une (automobile). Cette évolution dans le domaine des transports nous a amené le problème de la sécurité routière. Il est clair qu'il en revient au gouvernement de prendre les mesures nécessaires pour faire en sorte que les automobilistes respectent au maximum les normes de (sécurité). Il est bien entendu aussi que ces normes ne s'appliquent pas seulement qu'à ces derniers; il faut aussi que les constructeurs de véhicules en soient saisis. Car trop souvent la qualité de l'assemblage de même que la résistance des matériaux nous porte à croire que notre vie dépend de la (construction). Or de la part du gouvernement, il n'y a qu'une chose à faire: c'est d'établir une législation qui fasse en sorte que tant les automobilistes que les constructeurs prennent garde et sauvent des vies. Cependant, de telles mesures représentent pour un des deux groupes des difficultés d'acceptation, car elles exigent de leur part des déboursés. Si ce n'est pas eux qui les absorbent, il faudra bien que ce soit les (automobilistes). Malheureusement, d'une façon ou d'une autre, cela signifie que le coût des automobiles va augmenter. Voilà pourquoi il est difficile d'accepter des mesures de sécurité venant d'un (gouvernement).

SUBTEST IV

Comme le disent nos grands philosophes, la vie commence à la naissance et se termine avec la mort. Entre ces deux extrêmes, l'homme est en proie aux turpitudes et aux déboires de la vie. Qu'il soit de race jaune, noire ou blanche, il ponctue d'un déchirement et délirant cri sa venue au (monde). Et lorsqu'il nous quitte, un dernier soupir marque sa (mort). Nous pourrions émettre l'idée que la société y est pour quelque chose dans sa démente. Quoiqu'il en soit, c'est un étrange paradoxe que l'homme soit seul pour naître et mourir, et que sa vie durant il soit obligé de la passer en (société). La première cellule sociale à laquelle il doit s'intégrer est limitée à la (famille), et sa vie durant il y sera plongé. De sa naissance à l'âge adulte, il participera comme enfant tandis que par la suite il suivra traditionnellement ses parents et grands-parents, il s'unira à une femme et à son tour, par la procréation, il fera des enfants. Ainsi, comme son ascendance était assuré, il tentera de garantir la vie de son nom par sa (descendance). Celle-ci sera assurée pour peu que biologiquement rien ne la contrarie et en autant que nous pouvons observer les lois biologiques, l'homme a toujours transmis ses caractères dominants par le phénomène de (l'hérédité).

APPENDIX D

ITEMS USED IN TEST OF ABILITY TO SOLVE BRIEF VISUALLY PRESENTED VERBAL PROBLEMS

1. J'ai deux chaises pivotantes face au mur. Si je fais faire un demi tour à gauche à la chaise de gauche, et un tour et demi à droite à la chaise de droite, elles sont dos-à-dos. (False)
2. L'avocat prétend que son client n'a pas tiré sur Louise puisqu'elle a été touchée au ventre, qu'elle faisait face au soleil et son client aussi. (True)
3. Un homme en canot remonte la rivière pour aller à Chicoutimi. Il voit trois canots qui descendent les rapides. Il y a donc quatre canots qui se dirigent vers Chicoutimi. (False)
4. Si je me dirige à gauche et ensuite à droite, et que je fais deux fois plus de chemin à gauche qu'à droite, je me trouve à droite de mon point de départ. (False)
5. Le soleil envoie directement ses rayons sur la façade de la maison; elle projette donc son ombre au sud. (False)
6. Si je suis en face d'une bâtisse et que je fais volte-face, je me tourne le dos à la bâtisse. (True)
7. Jean rédige son testament à l'effet que son fils héritera de la moitié de sa fortune et sa femme de l'autre moitié. La femme meurt, et le fils hérite immédiatement de toute la fortune. (False)
8. Il pleut à boire debout. J'arrête à un feu rouge et j'en profite pour essuyer la buée sur ma fenêtre de côté. Un camion me dépasse à toute vitesse, brûle le feu rouge et me donne un tel coup de vent que j'en perd mon chapeau. (False)

9. Si un vent souffle de l'Est à l'Ouest sur une palissade, et que je suis placé au Nord-Est de celle-ci, elle risque de m'écraser.(False)
10. J'ai douze poules dans mon poulailler. Le renard les a étranglées. Je les ai toutes trouvées ce matin. Il en avait apporté trois.(False)

APPENDIX E

PART I

GRAMMAR

This is a test to show how well you can recognize and use English grammatical structures. Each question in this test is part of a conversation. In each conversation a word (or group of words) is left out. Following the conversation are four choices of words which might be used in the incomplete conversation. You are to select the word (or group of words) which would be used by a speaker of English, and which will best fit into the conversation.

EXAMPLE A:

"What is that thing?"

"That _____ a spider."

- a) to call
- b) for calling
- c) be called
- d) is called

The correct English sentence is: "That is called a spider."

To show that d, is called, is the best answer to this example, a cross has been made next to d for Example A on the answer sheet.

Answer all the questions of Part I in this manner.
Mark only one answer for each problem.

CONTINUE

1. "Why does John drive fast?"
"He tries to make his dull life _____."
 - a) interest
 - b) interested
 - c) interesting
 - d) interestingly
2. "What do you want your son to become?"
"I hope he becomes _____."
 - a) doctor
 - b) a doctor
 - c) the doctor
 - d) one doctor

3. "I would like to have more milk, please."
"How _____ more do you want?"
a) many
b) few
c) little
d) much
4. "Who is going to come to the meeting?"
"Either my husband _____ I will try to be there."
a) with
b) but
c) and
d) or
5. "I was home all night."
"Why _____ to the party?"
a) you not go
b) didn't you go
c) you didn't go
d) didn't go you
6. "Can Mary go swimming with us when she comes home?"
"No. She will have been _____ for 2 hours."
a) swim
b) swam
c) swimming
d) swum
7. "Nobody likes her."
"What caused _____ disliked by her classmates?"
a) hers
b) her to be
c) to be
d) her
8. "I like New York very much."
"There is not another city in the United States _____ New York."
a) like
b) as
c) so as
d) than
9. "What did Jack do last year?"
"I hear _____ taught German."
a) he
b) his
c) he is
d) him

10. "Is Bill in his room?"
"I don't know. I haven't _____ him for for 2 hours."
a) saw
b) seen
c) see
d) seeing
11. "Isn't Kate still going to the doctors?"
"No. But she had been _____ him regularly before she moved away."
a) saw
b) seen
c) seeing
d) see
12. "What happened?"
"The house _____ by the wind."
a) blew down
b) was blown down
c) was to blown down
d) was blown to down.
13. "I am too tired to go shopping today."
"Why don't you _____?"
a) have Matt go
b) have go Matt
c) Matt have gone
d) Matt have go
14. "How often do you go to the movies?"
"Once a month, but I wish _____ more often."
a) we went
b) us going
c) us went
d) we are going
15. "Did the thief fall down the stairs?"
"Yes, not until _____ did we hear him."
a) when
b) then
c) therefore
d) because
16. "May I play here?"
"Yes, as long _____ you are careful."
a) like
b) that
c) while
d) as

17. "Why was Joe sent to prison?"
"He was found guilty _____ armed robbery."
a) of
b) for
c) with
d) by
18. "I haven't written home for a month."
"I'm _____; I haven't written for 3 months."
a) badder
b) worser
c) worst
d) worse
19. "Do you think the restaurant will be crowded by noon?"
"Yes, so I would suggest _____ go early."
a) to
b) for you
c) you to
d) that you
20. "I don't think he is going."
"What are we going to do if he _____ come along?"
a) would
b) should
c) might
d) shall

CONTINUE TO PART II

PART II
VOCABULARY

There are two types of vocabulary items in this test. In the first type you are given a sentence followed by four words or phrases. You are to find the word or phrase that is closest in meaning to the underlined word (or words) in the sentence and that could be used in the sentence without changing its meaning greatly.

EXAMPLE B: It's too windy to go for a stroll.

- a) swim
- b) sail
- c) drive
- d) walk

The word 'walk' means about the same thing as 'stroll' in this sentence. The sentence, "It's too windy to go for a walk," means the same thing as, "It's too windy to go for a stroll." To show that d, walk, is the correct answer, a cross has been made in the space next to d for Example B on the answer sheet.

In the other type of item you are given a sentence with one word omitted and a list of four words. You are to find the word that would best complete the sentence.

EXAMPLE C: Because of the storm and rough waves, it would be foolish to go out sailing today in a small _____.

- a) automobile
- b) house
- c) boat
- d) beast

The word 'boat' fits best in the sentence so that it reads, "Because of the storm and rough waves, it would be foolish to go out sailing today in a small boat." To show that c, boat, is the correct answer, a cross has been made in the space next to c for Example C on the answer sheet.

Answer all of the questions of Part II in this manner
Mark only one answer for each problem.

CONTINUE

21. I don't like this room; it's too gloomy.
a) dark
b) light
c) wide
d) small
22. Nobody lives here. It is a very _____ place.
a) deliberate
b) desolate
c) perpetual
d) sensitive
23. In this locality many people are ill.
a) area
b) city
c) hospital
d) season
24. Professor Burrows teaches Russian history.
He _____ in the Communist period.
a) specifies
b) specializes
c) segments
d) characterizes
25. He lives alone because he is a _____.
a) biscuit
b) bachelor
c) buffalo
d) founder
26. The speaker did not mention many facts, so Helen asked him to be more _____.
a) certain
b) advisory
c) contrite
d) specific
27. Fred had a nightmare.
a) bad dream
b) good trip
c) strange experience
d) black horse

28. You must try to _____ your money.
a) accommodate
b) advocate
c) adapt
d) budget
29. The room was filthy.
a) not clean
b) narrow
c) modern
d) not small
30. Tommy took all the apples, so Mrs. Jones told him that he was being _____.
a) greedy
b) gullible
c) grateful
d) generous
31. When Tom fell from his bicycle, his arm was _____.
a) fractured
b) frozen
c) frenzied
d) fringed
32. She was gorgeous, so I took her out to dinner.
a) finished
b) hungry
c) beautiful
d) tired
33. Were these laid out before I came?
a) stored
b) arranged
c) sold
d) sent
34. I could understand most of his speech, but his last words were _____.
a) ungainly
b) unflinching
c) unlimited
d) unintelligible
35. Flo wanted to bake a cake for dinner. She asked Susan for the _____.
a) formula
b) index
c) focus
d) recipe

36. Mrs. Jones hoards butter.

- a) wants
- b) needs
- c) saves
- d) sells

37. You should refrain.

- a) work
- b) stop
- c) start
- d) hurry

38. Cloth is made on a _____.

- a) loom
- b) loam
- c) limb
- d) limp

39. When Ed told a funny story, everyone began to _____.

- a) tickle
- b) chuckle
- c) bustle
- d) crumble

40. She bought a sheer dress for her sister.

- a) beautiful
- b) thin
- c) practical
- d) warm

CONTINUE TO PART III

PART III

READING COMPREHENSION

This is a test to show how well you read. There are four reading passages, each followed by five questions about the passage. You should read each passage carefully and then try to answer the questions following that passage. If you do not know the answer at first, you may read the passage again, but do not spend too much time on one passage or you will not have enough time to finish.

EXAMPLE:

While I was getting ready to go to town one morning last week, my wife handed me a little piece of red cloth and asked if I would have time during the day to buy her two yards of cloth like that. I told her I would be glad to do it. And putting the piece of cloth into my pocket, I took the train for town.

D. The person telling the story is...

- a) a married lady
- b) an unmarried lady
- c) a married man
- d) an unmarried man

You know that the person telling this story is a married man because he says, "... my wife handed me..." Because c, a married man, is the correct answer, a cross has been made in the space next to c for Example D on the answer sheet.

E. The author was given a piece of red cloth...

- a) in the morning
- b) at noon
- c) in the afternoon
- d) in the evening

The passage says, "... one morning last week, my wife handed me a little piece of red cloth..." To show that a, in the morning, is the correct answer, a cross has been made in the space next to a for Example E on the answer sheet.

Answer all questions for Part III in this manner .
Mark only one answer for each problem.

CONTINUE

Americans do not give cooking, 'considered as one of the fine arts,' an important place in life. Lunch is for them a kind of gratuity paid to the body. They hurriedly toss it a fruit or a fish and go back to work. Certain writers, in rebellion, have founded the club, 'Three Hours for Lunch,' but they are an agreeable exception. Even at dinner, general conversation is rare. Everyone talks to his neighbor. After dinner the men linger at the table, a custom inherited from England. In New York, your host will often propose taking you to the theatre, or else he will provide a pianist, a singer, a lecturer. The idea of leaving the guests to themselves, and expecting them to get pleasure out of meeting one another, astonishes and even appalls him. His excessive modesty does not permit his imagining that his friends can be happy merely in being in his house, with one another. He treats them like children. On Christmas Eve you will see, in some of the pleasantest homes in New York, Christmas trees for grown people. In other places, after a dinner at which you exchange ideas, there will be a magician who will do his best to amuse the oldsters. There you must realize that the absence of conversation in America comes, not from absence of ideas or lack of intelligence or understanding, but from an unconquerable shyness and a prodigious self-distrust.

41. The Americans hurry through lunch because...

- a) they are ambitious
- b) they have rebelled against English customs
- c) they don't think it is important
- d) talking while eating is impolite

42. The author believes that...

- a) people are capable of getting pleasure out of meeting one another
- b) people enjoy their food more when it is attractively served
- c) Americans don't want to act like mature adults
- d) Americans don't think deeply enough to be good conversationalists

43. The author talks about some American writers who...

- a) wrote stories about American eating habits
- b) decided to enjoy leisurely lunches
- c) eat while they work
- d) wrote short plays to be presented at fancy night clubs

44. The author feels that Americans lack...

- a) understanding
- b) self-confidence
- c) self-control
- d) a rebellious spirit

45. According to the author, in England...

- a) the men are accustomed to money
- b) the men remain at the table to talk
- c) the guests expect the host to have entertainment for them
- d) people don't consider Christmas dinner important

All philosophers imagine that causation is one of the fundamental axioms of science, yet, oddly enough, in advanced sciences such as gravitational astronomy, the word "cause" never occurs. Dr. James Ward, in his Naturalism & Agnosticism, makes this a ground of complaint against physics: the business of those who wish to ascertain the ultimate truth about the world, he apparently thinks, should be the discovery of causes, yet physics never even seeks them. To me it seems that philosophy ought not to assume such legislative functions, and that the reason why physics has ceased to look for causes is that, in fact, there are no such things. The law of causality, I believe, like much that passes muster among philosophers, is a relic of a bygone age, surviving, like the monarchy, only because it is erroneously supposed to do no harm.

46. According to the author, philosophy assumes legislative functions when it...
- a) supports the monarchy
 - b) asks for government support
 - c) judges statements and theories as right or wrong
 - d) demands that every scientist look for causes
47. According to the author, philosophers claim that the law of causality...
- a) is a fundamental axiom of science
 - b) is not applicable to gravitational astronomy
 - c) doesn't really exist
 - d) is a relic of a bygone age
48. Physics was singled out for attack by Dr. James Ward because it...
- a) never looks for causes
 - b) imagines that causation is fundamental
 - c) is looking for ultimate truths
 - d) is a relic of a bygone age
49. According to the author, both the monarchy and the law of causality...
- a) are examples of lost causes
 - b) do no harm
 - c) are thought to be harmless
 - d) are revered by philosophers
50. From the description of Dr. James Ward, the reader can assume that he probably is...
- a) a monarchist
 - b) an agnostic
 - c) an astronomer
 - d) a philosopher

END OF TEST

Check your answers

Be sure that your name and Form B have been written on your answer sheet

APPENDIX F

TEST OF LISTENING COMPREHENSION ABILITY IN ENGLISH

(In this 10-minute test, the stimulus items, shown here in capital letters, were played from a tape. Ss were asked to select the appropriate answer and indicate this with an X on the answer paper.)

PART A: LISTEN CAREFULLY TO EACH SENTENCE. WHICH WORD OR GROUP OF WORDS DO YOU HEAR?

1. SHE ASKED HIM A QUESTION. a) ask b) asking c) asks d) asked
2. HE MUST LEAVE SOON. a) leave b) live c) leaves d) lives
3. BILLY THREW THE BALL TO BOB. a) through b) throw c) threw d) though
4. HE'S GOING TO LIVE THERE. a) live b) lives c) leave d) live
5. WERE YOU THERE? a) where b) were c) we're d) why are
6. THERE THEY ARE. a) their b) there c) they're d) they are

PART B: LISTEN CAREFULLY TO THE QUESTION AND CHOOSE THE BEST ANSWER.

7. WHO'S THAT? a) It's John's. b) It's his. c) It's mine. d) It's David.
8. IT'S TEN AFTER TWELVE. WHAT TIME IS IT? a) It's 10:12. b) It's 12:10.
c) It's 12:50. d) It's 11:50.
9. DO YOU HAVE ANY PENCILS? a) Yes, I have any. b) Yes, I have a few.
c) Yes, I have a little. d) Yes, I have much.
10. HAVE YOU EVER BEEN TO QUEBEC CITY? a) No, I never been. b) No, I didn't.
c) No, I haven't. d) No, I wasn't.
11. WHOSE IS THIS? a) It's Jane. b) It's Mary's. c) It's a book. d) It's her.
12. ARE THESE YOUR BOOKS? a) No, it isn't. b) No, they aren't.
b) No, there aren't. d) No, they weren't.

PART C: THIS TIME, LISTEN TO THE SENTENCE AND CHOOSE THE ANSWER WHICH IS
NEAREST IN MEANING TO THE SENTENCE YOU HEAR.

13. I'M GOING TO WRITE A LETTER. a) I'll write a letter soon.
 b) I'm writing the letter now.
 c) I've written the letter already.
 d) I wrote the letter.
14. I HAD MAILED THE LETTER BEFORE HE PHONED. a) He phoned first.
 b) I mailed the letter first.
 c) I was mailing the letter when he phoned.
 d) He phoned while I was mailing the letter.
15. I HAVE TO LEAVE NOW TO CATCH THE BUS. a) I want to go now.
 b) I might leave in a minute.
 c) I should leave soon.
 d) I must go now.
16. IF YOU'D WATCHED THE TOAST, IT WOULDN'T HAVE BURNED.
 a) You didn't watch the toast.
 b) The toast didn't burn.
 c) You watched the toast.
 d) The toast is burning now.
17. HE WAS CLEANING THE FLOOR WHILE I WAS WASHING THE DISHES.
 a) I washed the dishes first.
 b) He cleaned the floor first.
 c) We were working at the same time.
 d) He cleaned the floor when I'd washed the dishes.
18. THE CHILDREN MUSTN'T STAY UP TOO LATE. a) They need not stay up late.
 b) They don't have to stay up late.
 c) They shouldn't stay up late.
 d) They might stay up late.
19. HE WON'T COME UNLESS YOU ASK HIM. a) He won't come if you ask him.
 b) He'll come unless you ask him.
 c) He'll come if you don't ask him.
 d) He'll come if you ask him.
20. I MUST HAVE THE CAR WASHED. a) I'm going to wash my car.
 b) I must have washed my car.
 c) I have to get the car washed.
 d) I should have washed the car.
21. SHE'S SO NERVOUS THAT SHE CAN'T STUDY. a) She's too nervous to study.
 b) She's so nervous that she's going to study.
 c) She's very nervous, so she's going to study.
 d) She's going to study because she's nervous.

22. MY PARENTS WANT TO GO AND SO DO JOHN AND I. a) Only my parents want to go.
b) Only John and I want to go.
c) John and my parents want to go,
d) All of us want to go.
23. HE MUST'VE GONE HOME. a) He should have gone home.
b) He ought to have gone home.
c) He must go home.
d) He has probably gone home.
24. CHRISTINE LOOKS LIKE HER AUNT. a) Christine likes her aunt.
b) Christine and her aunt look alike.
c) Christine is looking at her aunt.
d) Christine is looking for her aunt.
25. THEY WERE SUPPOSED TO ARRIVE AT 6:30. a) They are coming at 6:30.
b) I suppose they'll come at 6:30.
c) They arrived at 6:30.
d) They should have arrived at 6:30.
26. IF THEY HADN'T MISSED THEIR TRAIN, THEY WOULDN'T HAVE BEEN LATE. a) They weren't late.
b) They didn't miss the train.
c) They caught the train.
d) They were late.

PART D: LISTEN TO THE FOLLOWING STORY, THEN ANSWER THE QUESTIONS ABOUT IT.

A FIFTEEN-YEAR-OLD BOY STOOD WITH HIS DOWNCAST FATHER BEFORE A MUNICIPAL JUDGE. THE BOY HAD BEEN CHARGED WITH BREAKING AND ENTERING A LOCAL SCHOOL AT TWO O'CLOCK ONE MORNING. AFTER ADVISING THE BOY THAT HE WOULD BE REQUIRED BY LAW TO MAKE FULL RESTITUTION FOR THE DAMAGE, THE JUDGE SAID, "BECAUSE I WANT THIS TO BE A LESSON YOU'LL NEVER FORGET, IN ADDITION I SENTENCE YOU TO WALK AROUND THAT SCHOOL AT TWO A.M. EVERY MORNING FOR THE NEXT THIRTY DAYS." TURNING TO THE BOY'S FATHER, HE CONTINUED. "AND BECAUSE YOU DIDN'T KNOW WHERE YOUR SON WAS AT THAT HOUR OF THE MORNING, I SENTENCE YOU TO ACCOMPANY HIM TO THAT SCHOOL AND WALK AROUND IT WITH HIM EVERY MORNING FOR THE NEXT THIRTY DAYS. WHEN PARENTS ARE AWARE OF THE WHEREABOUTS OF THEIR CHILDREN AT ALL TIMES, HALF THE BATTLE IS WON."

27. WHY WAS THE BOY'S FATHER UNHAPPY? a) He was guilty of a crime.
b) His son was not doing well at school.
c) His son had not told him where he was going.
d) His son had committed a crime.
28. WHAT DID THE BOY HAVE TO DO, ACCORDING TO THE LAW? a) Report his actions to the judge for a month.
b) Learn a lesson he would never forget.
c) Pay for the damage he had done.
d) Attend school for thirty days.

29. WHAT PUNISHMENT DID THE JUDGE CONSIDER TO BE APPROPRIATE?

- a) The boy should attend school every day for thirty days.
- b) The father and son should walk around the school together.
- c) The father should accompany the boy to school every day.
- d) The father should pay for the damage.

30. HOW CAN PARENTS HELP THEIR CHILDREN TO KEEP OUT OF TROUBLE?

- a) Parents should know where their children are all the time.
- b) Parents should always accompany their children.
- c) Criminals should be forced to pay for their crimes.
- d) Parents should be held responsible for their children's actions.

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ABSTRACT

The project described in this thesis was carried out in order to determine whether a) having acquired English, and/or b) the age of acquiring English, had any significant effect upon the following decoding abilities in French of our native Quebec francophone subjects: detection of structural ambiguity in visually presented statements; formulation of "semantic hypotheses" about the occurrence of missing words in auditory input; and solving of brief, visually presented verbal problems. Of our four experimental groups, one was monolingual and the rest bilingual. No significant differences with respect to either a) or b) above were found on any of these measures, nor were they found with a fourth test of French vocabulary richness which was more a measure of encoding. From the data obtained, we can conclude that, for our subjects, learning English at any age has had no effect upon the French skills measured by our tests.