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A Study of the Effect of Age upon Second Language Aural Comprehension Achievement in Francophone Adults Learning English in an Intensive Course

Linda Seright

A Thesis

in

The Department

of

Applied Linguistics

Presented in Partial Fulfilment of the Requirements
for the Degree of Master of Arts at
Concordia University
Montréal, Québec, Canada

August 1984

ABSTRACT

A Study of the Effect of Age upon Second Language Aural Comprehension Achievement in Francophone Adults Learning English in an Intensive Course

Linda Seright

This study examines the relationship between age and second language achievement in adults in a formal setting. Older learners (aged 25 to 41) and younger learners (aged 18 to 24) are compared with respect to proficiency developed in aural comprehension over a short (twelve-week) time period.

The adult subjects were Quebec francophones, members of the Canadian Armed forces, who were students in an intensive English course involving twenty-five hours of instruction weekly. All had limited L_2 proficiency at the outset.

A pretest-posttest research procedure was adopted in order to assess gains made by subjects in listening comprehension. The same test was administered twice, as a pretest at the start of language training and as a posttest after twelve weeks (300 hours) of L_2 instruction. Pretest-posttest score differences served as a measure of gains made and as a basis of group comparison.

In the analysis of gains, two matched-pair samples were used, each comprising eighteen pairs of older and younger subjects matched on four variables: pretest score, non-verbal IQ, years of schooling and amount of previous ESL instruction. In both samples the mean gain in listening for younger subjects exceeded that for older subjects; the difference was highly significant. This age finding was corroborated by the results of a stepwise regression analysis. Age, along with pretest score, was shown to be a significant predictor of post-test (achievement) score while other variables (non-verbal IQ, education and previous ESL) were not. The study suggests that among adult L_2 learners attainment in aural comprehension decreases as age increases.

ACKNOWLEDGEMENTS

Without the help of many individuals and, particularly, of one organization, this study would not have been possible. Firstly, I am most appreciative of the educational leave granted me by my employer, the Department of National Defence, for the purpose of undertaking master's level studies at Concordia. Although I was originally given one year, this was subsequently extended by three months.

Very instrumental to the completion of this thesis were the support, assistance and encouragement I received from the administrative staff of the Canadian Forces Language School at St.Jean. I would like to express my gratitude to Lieutenant-Colonel Dagenais, Commandant of the Language School, who not only accorded permission for the study to be conducted at the school but also personally saw to it that certain administrative difficulties were overcome. I would like to thank as well, the Director of Pedagogy, J. Bergeron, and the three Unit Heads in the English School - C. Folkerson, K. Jensen and R. Wilkinson - who permitted me to use as subjects any students in the school who appeared suitable. Also to be acknowledged is the assistance received from eight Senior Teachers at the school - M. Bernstein, J. Carter, W. Chamney, D. Howard, M. Huot-Côté, P. Macdonald, A. Staskevicius and G. Taylor - who aided in the selection of potential subjects and made arrangements for the administration of tests, etc.

Throughout the study I was able to rely upon the help and co-operation of the members of the language school teaching staff. Thanks is owed to four teachers - K. Gilbert, D. Mawle, M. Rosengarten and S. Paulauskas - for their useful feedback on the preliminary version of the listening test, and to six teachers (or senior teachers) - W. Chamney, C. Clermont, A. Forget, A. Hopkins, R. McNaughton and A. Staskevicius - for their assistance in recording the test cassette. Also greatly appreciated was the co-operation received from a large number of classroom teachers who did not seem to mind the inconvenience caused by the testing and interviewing of students in their charge.

For assistance rendered in the analysis of data by computer, I am indebted to Ann Barkman of the Concordia Computer Centre.

For a superb job with the lay-out and typing of the final draft of the thesis, I would like to thank Francine Granger.

Finally, and most importantly, I would like to express my gratitude to Jack Upshur and Patsy Lightbown who, as my thesis advisors, provided guidance throughout the study from the planning stages to its final completion, and to Nancy Belmore whose comments on the preliminary draft were very helpful.

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CHAPTER I

INTRODUCTION

Area of Investigation

The relationship between age and the ability to acquire or learn a second language has attracted a great deal of attention, particularly over the past decade, and still remains a much-debated issue. It has given rise to a number of theories and a considerable body of empirical research. The age question constitutes the focus of the present study. More precisely, the study represents an attempt to examine the possible effects of age on second language acquisition[1] in adults.

Principal Rationale for the Study

The empirical research on age effects is based, for the most part, on either child-adult or younger-older child differences. Few researchers have attempted to compare adult L_2 learners of different ages in order to determine whether differential achievement might possibly be related to age. This is, nevertheless, an area well-worthy of consideration given the number of adults in Canada now learning a second language, either through necessity or as a matter of personal choice.

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[1] Some researchers (e.g., Krashen) distinguish between acquisition (a subconscious process) and learning (a conscious process whereby meta-awareness of linguistic rules is gained). In this study no such distinction holds. Rather, acquisition has a neutral connotation; it is synonymous with language development.

Every year in the universities, a substantial number of students, some native Canadians and others not, receive language instruction in either French or English in preparation for academic study in that language. Across the country, provincially and/or federally sponsored language programs, many of which are intensive or semi-intensive, have been created for the purpose of helping adult immigrants to acquire enough English or French to be able to work and live comfortably in their adopted country. The federal government also operates a large-scale language training program for its employees. Annually, thousands of public servants and members of the Canadian Armed Forces of all ages are given training in one of the country's official languages so that they may become bilingual or at least proficient enough in the second language to use it effectively in the performance of their job. Some private industries, as well, require or encourage certain of their personnel to take language courses so that they may gain a functional or working knowledge of the other language. Some companies have even hired teachers and organized their own language instruction programs for employees. In addition to the large number of L_2 learners who undergo language training for a specific purpose (i.e. for survival, work or academic study) through necessity or at the request of an employer, there are many adults who enroll in L_2 courses out of personal choice for a variety of reasons: interest, desire to travel, etc.

In view of the rather sizeable population of adult L_2 learners of all ages and the amount of activity that is presently going on in the area of adult L_2 education, it would seem that there is a need for research into adult language learning, a need for investigating factors which might influence instructional outcomes. One such factor is age,

of course, though there are certainly others which could be identified. The findings of this study and of others which investigate factors involved in adult language learning should be of some assistance to the policy maker who establishes language training objectives, to the program developer who creates training programs or curricula designed around established objectives, to the teacher who is responsible for implementing the curriculum and finally, to the learner himself who embarks upon language training with certain expectations.

One general question which will be raised in this study of adult L_2 learning is the following: Is it reasonable to expect the 40-year-old, or even the 30-year-old, to attain the same level of proficiency as the 20-year-old L_2 learner in the same time span and perhaps through the same learning or instructional procedure? Oddly, it does not appear that this matter has received much attention. During our period of involvement with federal government language training, both within the Public Service and the Department of National Defence, this has not really been an issue. It has been traditional policy to establish terminal proficiency objectives for employees based on the positions or functions they will be assuming, and these employees are expected to meet the required levels of language proficiency after a specified amount of language training (i.e. number of hours or weeks) within a government-operated language program.

If, however, age does have a bearing on one's ability to acquire a second language, and if language acquisition does become progressively more difficult throughout adult life, then the answer to the question above is negative. It is not reasonable to expect the older adult to acquire as much as the younger adult in the same time period

or to learn in the same manner. If this should indeed be the case, then it should carry important implications for policy makers and program developers as well as for teachers and the learners themselves.

Question Addressed

The study was undertaken in an attempt to answer the following question:

> Do older adults differ significantly from younger adults in their rate of development of L_2 listening proficiency in a formal setting, and, if so, how does the difference relate to age?

Nature of the Study

The study revolves around a comparison of older and younger L_2 learners in a formal learning situation. One specific area of linguistic competence is investigated - aural comprehension ability. Proficiency developed in this area over a relatively short period of time - twelve weeks (300 hours of instruction) - is assessed. The younger learners are between 17 and 24 years of age; the older ones are over 25. The L_2 in question is English and the native language of all learners is Quebec French. The study is a short-term longitudinal investigation dealing with rate of acquisition.

Population

The study was conducted at the Canadian Forces Language School in St.Jean,Quebec where, annually, large numbers of adults receive intensive instruction in a second language - English or French. At any given time there are usually between 300 and 400 adult ESL learners undergoing training. Many of them arrive with limited oral proficiency, and there is normally a good cross-section of age. Thus, it was felt that this institution could provide the type of subjects required for the study.

The population with which the study is concerned consists of Quebec francophones, students in the Basic English Program at the St.Jean school. These students are members of the Canadian Armed Forces who have been sent to the language school in order to acquire enough English to enable them to function in that language in their work.

The majority of students are privates between the ages of 17 and 24, though recently a few have been older (i.e. 25 to 27), who have just completed their basic military training and will undergo trades training once they have met certain requirements in English. For the most part, the younger group in this study is representative of those among this body of privates who have little or no proficiency in English when they begin language training.

In addition to the young privates, there is also at the school a much smaller group of non-commissioned officers - NCO's (i.e. corporals, sergeants and warrant officers)-who have already spent some time in the Canadian Forces attached to French language units. They are usually placed on language training so as to acquire enough

language proficiency to enable them to take up duties on military bases where the working language is English. These are people who have either been re-assigned to a different trade, for any one of a variety of reasons, or have been designated for special assignments which require a knowledge of English (i.e. giving courses to anglophones). This group has been increasing in number over the past two years. Their ages are usually between 28 and 32, though recently, some individuals have been as old as 40 or 42, and some as young as 22. The older group of learners used in the study is largely representative of NCO's aged 25 and over who have limited proficiency in English at the outset of language training; it does, however, also include a few older privates (i.e. aged 25 to 27).

Language Training

The language training which students undergo at St.Jean is intensive, involving five hours of instruction daily. Although the average (mean) length of stay at the school is nineteen or twenty weeks, there is a great deal of individual variation depending upon a) initial level of competence, b) terminal proficiency requirements (stated in terms of test scores) and c) ability to progress. An individual is allowed up to twelve months of intensive language training if necessary.

The Basic English Program emphasizes listening and speaking with considerably less attention accorded to reading and writing. Students receive a good deal of individual attention. They are grouped according to level of proficiency. Frequent regroupings occur during the course of training as warranted by progress rates.

Classes are small by normal standards, comprising no more than ten students. Remedial instruction on a one-to-one basis is available on request. The core curriculum focuses on basic grammatical structures and common everyday vocabulary. This, however, is supplemented at will by teachers who tend to use just about every instructional activity imaginable. Considerable attention is paid to specific skill development (e.g. listening and speaking) through the use of what has been labelled "authentic listening material" (e.g. radio and T.V. programs, native-speaker conversations) and so-called "communicative activities".

Although it is customary for a class to be assigned to a specific instructor who will spend the entire five-hour day with the students, a class will not normally remain with the same person longer than eight weeks. Also, as no teacher may teach more than four days a week, students will work with someone other than their regular teacher on the fifth day. Thus, during their stay at the language school students usually encounter several different teachers and enjoy the advantage of being exposed to a variety of native speakers, instructional strategies and teaching materials.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

This chapter will begin with a survey of the literature dealing with age-related differences in L_2 development. In the latter part the focus will shift to a discussion of changes said to occur in the course of adult life. Reference will be made to cognitive and physiological changes as well as to differences observed among adults in a learning situation, all of which appear to take place as the adult grows older. These changes may affect learning ability, both general and language specific.

Age and L_2 Attainment

Introductory Comments

The main preoccupation in the literature has been with adults versus children (or adolescents), younger children versus older children and pre-puberty learners versus post-puberty learners. Work in these areas will be reviewed first as most of the theories advanced and most of the research undertaken relate to them. In comparison, relatively little consideration has been given to possible L_2 achievement differences at different ages in adult life. In the second part of the discussion of age and L_2 achievement, reference will be made to a few studies which have dealt with adults alone and in which age has been one of the variables studied.

Child-Adult and Older-Younger Child Differences

Theories

Penfield and Roberts (1959) were among the first to lend theoretical support to the popular notion that younger L_2 learners were generally more successful than older learners. They maintained that, after age nine L_2 acquisition became increasingly more difficult. The decline in learning capacity was associated with a loss of brain plasticity. But it is probably the critical age hypothesis proposed by Lenneberg (1967) in connection with first language acquisition that represents the most often-cited theory concerning the importance of age in language development. Basing his argument on biological or maturational factors (i.e. lateralization or centralization of language functions in one hemisphere of the brain, usually the left one), Lenneberg hypothesized that there was a critical period for L_1 acquisition extending from age two to puberty. After this time normal L_1 acquisition, if it has not already taken place, is no longer possible.

Since it is a well-recognized fact that substantial L_2 acquisition is possible past puberty, the critical period hypothesis has been applied to L_2 acquisition in a modified form (Scovel 1969, 1978, 1981; Seliger 1978, 1981). It merely sets limits upon the extent of L_2 acquisition for the post-pubertal learner: it predicts that the acquisition of native-like proficiency - possible before puberty - is highly unlikely, if not impossible, after puberty.

While the notion of age-related constraints on L_2 acquisition is accepted by many, there are differences of opinion as to the scope of

these limitations and their underlying source. Firstly, while some researchers (Scovel 1978, 1981; Seliger 1978, 1981) claim that the critical or "sensitive" (as Lamendella (1977) prefers to call it) period places limitations on phonological proficiency only, others have sought to extend the limitations to other aspects of L_2 as well: to listening comprehension (Oyama, 1978) and to oral syntactic production (Patkowski, 1980).

Secondly, a variety of factors have been proposed in attempts to account for the age constraints. Some researchers or theorists have linked maturational changes within the human organism to the decline in language learning ability after puberty. References have been made to a loss of brain plasticity (Penfield and Roberts, 1959) or to the lateralization of language functions to the left hemisphere of the brain, the completion of which is said to coincide with puberty (Lenneberg, 1967). Seliger (1978) proposes, as the cause, the centralization of language functions in one hemisphere (lateralization) along with increasing localization of specific functions within that hemisphere (intrahemispheric localization) and an accompanying gradual loss of plasticity for the complete acquisition of specific language abilities.

Others feel that cognitive and/or affective factors may be largely responsible for the difficulties experienced by post-critical period learners. Rosansky (1975) believes that the acquisitional limitations might be related to cognitive development: the onset of the period of formal operations (Inhelder and Piaget, 1958) could well mark the beginning of the end of a critical period for L_2 acquisition. The child enters this period at roughly age 11 or 12.

Given formal operations, the child's thought can embrace the possible as well as the real. He can entertain hypothetical possibilities, can deal with what might be as well as with what is. He is able to manipulate abstract concepts and to understand formal relations.

Rosansky suggests that the formal operational thinker is impeded in his L_2 acquisition because he is able to observe differences between L_1 and L_2 and to consider social attitudes towards the L_2. Prior to the onset of formal operations, the child does not note differences, but rather attends only to similarities in generative principles for L_1 and L_2. He also has not yet acquired social attitudes towards the target language. These conditions promote acquisition for the pre-formal-operational thinker.

Schumann (1975) also rejects the biologically-based arguments used to account for the child's better success in language learning. He feels that language learning difficulties after puberty may be related to affective changes in the human organism which are concomitant with social and psychological maturation. He points to factors such as anxieties, insecurities, firm or inflexible ego boundaries, motivational orientations, and attitudes towards learning and towards target language speakers - all of which tend to develop around the age of puberty and which tend to block or inhibit the cognitive processes and thus limit L_2 acquisition.

Krashen (1982) also supports the affective argument. He posits the existence of an affective filter in the individual. The acquisition mechanisms (LAD) do not degenerate with age, but affective changes that the individual undergoes at puberty result in a strengthening of an affective filter which prevents some of the necessary L_2 input

from being processed.

Still others maintain that input factors may account for the age-related constraints. The speech addressed to children, they claim, has characteristics (i.e. highly redundant, syntactically simple, related to the immediate environment) which facilitate acquisition while the speech addressed to adults (i.e. too linguistically complex (Wagner-Gough and Hatch, 1975) or too pidginized (Hakuta, 1975)) makes acquisition more difficult.

Empirical Studies

A few of the studies have addressed ultimate or eventual attainment in L_2. Most, however, investigate rate of acquisition.

1. Eventual attainment

The studies addressing eventual attainment revolve around comparisons of pre-puberty and post-puberty L_2 learners. The majority examine phonological proficiency, though a few have looked at other areas of language competence.

Asher and Garcia (1969) used a sentence repetition task to assess the English pronunciation of 71 Cuban immigrants aged 7 to 19. All the Cubans were identified as non-natives by American high school students, but in general, the younger the subject and the longer the period of residency, the greater the probability of a near-native rating.

Seliger, Krashen and Ladefoged (1975) relied upon self-reports in an investigation of 394 L_2 learners of either English or Hebrew. The majority of subjects who began language learning at age 9 or

under reported no "accent" while the majority of those beginning at age 16 or over felt they had an accent.

Using two tasks, paragraph reading and story telling, Oyama (1976) assessed the English pronunciation of 60 male Italian immigrants. In both tasks she found a strong relationship between age of arrival and degree of accent. The youngest arrivals performed similarly to native-speaking controls while those arriving at age 12 or later did not. In the same study, Oyama (see Oyama, 1978) also evaluated aural comprehension ability by requiring her subjects to repeat sentences presented with varying degrees of white noise. Analysis of group mean scores revealed similar scores for native-speaker controls and subjects who had arrived in the U.S. before age 11, and markedly lower scores for subjects arriving after age 15. There was no overall length of stay effect. A question may be raised, however, as to whether the task used really measures listening comprehension.

Scovel (1978) conducted a study focusing on the ability to recognize accents as demonstrated by three native-speaker groups (adults, children and aphasics) and one group of non-natives. His results suggest that late learners of English, despite long periods of residency, can be readily identified as non-native on the basis of their accents and that accent recognition is perfected in a native speaker at around age 10. The lexical-syntactic proficiency of late learners is not similarly constrained by age. Written compositions were not as easy to judge as being native or non-native.

Patkowski (1980) assessed the English oral syntactic proficiency of 67 immigrants of various L_1 backgrounds. Written transcriptions of speech samples, obtained through an oral interview, were rated.

While 32 of the 33 pre-puberty learners scored in the native or near-native range, only 5 of the 34 post-puberty learners did. Analyses showed a strong negative relationship between age and syntactic rating. Other variables were not significant.

The studies of eventual attainment have all produced a similar finding. Pre-puberty learners tend to achieve higher ultimate levels of L_2 proficiency than post-puberty learners. This offers some support for the critical period hypothesis.

2. Rate of acquisition

In the rate of acquisition studies, the type and length of exposure to L_2 varies as do the groups compared and the ability assessed.

a) adults versus children

Olson and Samuels (1973) assessed the German pronunciation of elementary, junior high and college students after ten short sessions (15 to 20 minutes each) of pre-taped phoneme pronunciation instruction. Both the junior high and the college groups were significantly more accurate in pronunciation than the elementary group. The researchers conclude that, given the same learning time and the same quality of exposure, adults are superior to children in L_2 pronunciation.

A similar conclusion is found in a study by Asher and Price(1967). They compared the listening comprehension performance of 8-, 10-, and 14-year-old school children and college adults after they had undergone approximately 25 minutes of training in Russian during which they had listened to commands and made physical responses. It was found that the adults performed significantly better than all other

groups. This is interpreted as suggesting that when adults learn an L_2 under the same conditions as children, the adults are superior.

Snow and Hoefnagel-Höhle (1978) undertook a very ambitious longitudinal study of 51 English speakers learning Dutch while living in Holland. The subjects, all beginners at the outset, fell into five groups: 3-5, 6-8, 8-10, 12-15 years of age, and adults. They were tested three times at approximately five-month intervals; a large battery of tests designed to assess a variety of skills was used. The researchers conclude from their data that the teenagers, followed by the adults, learned more quickly initially but that later the 6-to-10-year-olds improved the most rapidly. Over all, the teenagers were the most rapid acquirers of all skills tested. They were the first to achieve almost native-like proficiency.

b) <u>older versus younger children - informal environment</u>

Some research has compared older and younger children learning an L_2 in an informal environment. The Snow and Hoefnagel-Höhle results show a faster rate of acquisition for teenagers as opposed to younger children in all L_2 areas tested except phonology. Fathman (1976) studied the oral performance in English of children of different ethnic origins who were learning the language through submersion in American schools. Pronunciation was measured by a picture description task and morphology and syntax by a grammar test. She found that when exposure time was held constant, her 11-to-15-year-olds were better than 6-to-10-year-olds in morphology and syntax but not as good in pronunciation. She interprets this as evidence of a faster rate of acquisition for older children in some aspects of L_2.

Another study (Ekstrand, 1976) attempted to evaluate the Swedish L_2 performance of over 2,000 immigrant children aged 8 to 14 with up to two years of residency in Sweden. Language tests tapping a variety of skills were administered. The effect of age was significant on all linguistic measures except free oral production; scores increased with age. Ekstrand concludes that language learning ability increases linearly with age and cites biological factors along with perceptual and motor development as reasons for the increase.

c) older versus younger children - formal learning

A number of studies were undertaken largely for the purpose of determining whether there were advantages to an early introduction of second or foreign language instruction in the schools. These school studies have compared older and younger children with either equal or unequal amounts of formal learning.

Ekstrand (1978) reports an experiment carried out in Sweden in 1968 as part of a larger project designed to determine whether English should be introduced earlier than grade five. Forty classes - ten in each of grades one through four - were given the same instructional treatment in English over eighteen weeks. When pronunciation and listening comprehension were assessed, it was found that scores increased linearly with age. Ekstrand concludes that, given the same learning conditions, language learning ability becomes increasingly better with age in the case of learners who are in the period of concrete operations (Inhelder and Piaget, 1958).

Ramirez and Politzer (1978) compared elementary school ESL learners in an immersion program starting at kindergarten with students learning English by submersion in a regular American high

school program. Though the grade five immersion students showed the best performance on listening comprehension and oral production measures, the junior high students with only a half-year of exposure to English did almost as well as the grade three students with over three years of immersion. The researchers suggest that this result demonstrates the superiority and possible advantage of the high school beginner. It can be argued, however, that the steady increase in proficiency from kindergarten through grade five seen in the elementary students, when compared to a rapid initial rate of progress followed by an almost total levelling-off in the high school students, speaks in favour of early bilingual education.

Burstall (1975) reports on a large scale experiment which spanned a ten-year period, an experiment in which three groups who had started French at age 8 were compared with a) children of the same age who had started French when they were 11 years old and b) children who were older but had the same number of years of French instruction. A major finding was that when French L_2 performance was assessed at age 16, students who had started French at age 8 differed little from those who had started at age 11. The only difference was in listening comprehension. Burstall attributes this result to a greater efficiency on the part of older learners. However, as pointed out by Stern (1975), other factors might account for the failure of the early starters to outperform the late starters: poor instruction, incompetent teachers and failure to provide special programs in the high schools geared specifically to early starters.

Holmstrand (1982) presents the results of a lengthy research project referred to as EPAL (English in the Elementary School

Project) which was undertaken in order to assess the effects of commencing English instruction in the Swedish elementary school earlier than usual. An experimental group of about 500 students (24 classes) who received English instruction beginning in grade one was compared with a "control group" (also 24 classes) which received no English instruction until grade three. Both groups began their elementary school education at the same time (i.e., fall 1970) and were followed from grade one through grade six. Both were given the same type and the same total amount of English instruction; the only difference was the distribution of that instruction over the six-year period. Analysis of scores obtained on tests administered near the end of grade six indicated that the experimental group did not differ significantly from the "control" (i.e., comparison) group with respect to proficiency in English. Holmstrand concludes that, while there appears to be no particular advantage to an earlier start in English (i.e., in grade one), that model may be considered an acceptable alternative to the usual model with English instruction beginning in grade three.

3. Summary

The research on child-adult or younger-older child differences may be summarized as follows:

a) Some studies have dealt exclusively with acquisition in a formal setting while others have assessed acquisition through informal exposure. In some studies, the subjects have had a combination of both formal and informal exposure.

b) A few studies have focused on eventual attainment in L_2 and, by virtue of that, may be regarded as tests of the critical period hypothesis (CPH). In each study the researcher was able to interpret the findings in support of the CPH: pre-puberty beginners tended to attain higher levels of proficiency (often native-like) than post-puberty beginners (rarely native-like).

c) A larger number of studies have examined differences in rate of acquisition in either formal or informal settings. The results suggest a faster initial rate of development for older learners (i.e. teenagers and adults as opposed to younger learners (i.e. children) with respect to morphology and syntax - though not for phonology - regardless of the learning condition. As time passes, however, the younger learners tend to overtake the older ones whose progress appears to level off. Since these studies concern rate rather than ultimate attainment, they do not really address the CPH, although some researchers (e.g. Snow and Hoefnagel-Höhle, Ekstrand) have made claims to the effect that their findings fail to support the CPH.

d) A few studies have been undertaken in order to determine the optimal age for introducing L_2 instruction in the schools. These tend to suggest that there may be advantages, in terms of L_2 proficiency, to early bilingual or immersion programs. In contrast, advantages are not seen for an early introduction of L_2 instruction if the instruction provided is of a limited nature (i.e. 30 minutes a day, or two to four periods a week -

as was the case in Bustall (1975), Ekstrand (1978) and Holmstrand (1982)) - and is not well-coordinated from one grade to the next.

Age Differences in Adults Alone

A search of the literature uncovered relatively little, either of a theoretical or an empirical nature, pertaining to L_2 acquisition undertaken at an adult age.

Theories

An interesting hypothesis is put forth by Seliger (1978), one which, it would seem, might relate to achievement differences in adults of different ages. Seliger suggests that there may be multiple critical periods for L_2 acquisition. Difficulties in L_2 learning may well be linked to both "a centralization of most language functions in a particular hemisphere" of the brain (usually the left) and further "specification or localization" of specific language functions in specific areas of that hemisphere along with a concomitant gradual loss of plasticity for the complete acquisition of language abilities relating to those functions. While the process of localization is going on, there still remains plasticity for the acquisition of language abilities relating to functions not yet localized. Since localization does not take place all at once, but is rather a gradual process affecting different aspects of language at different periods in life, one could expect a different timetable to evolve

for different language abilities and there might be considerable individual variation.

Scovel (1981) discusses the same notion. He proposes that variation in intrahemispheric localization (i.e. localization of language functions within the one hemisphere) may reflect varying degrees of brain plasticity and these differences might correlate with language learning success. He suggests that the effects of neurological aging (i.e. changes which occur in the brain during adult life) upon the ability of adults to learn a second language should be explored. He raises the question as to whether there might be an age ceiling, an upper limit on neurological age, beyond which point an adult advanced in years would not be able to acquire any aspect of a second language.

Research

Many years ago Thorndike (1928) conducted a rather extensive investigation of adult learning. His research included experiments on the learning of Esperanto in which two groups of university students, 20 to 57 years of age, received the same instructional treatment. All subjects spent ten hours in the classroom and ten hours in individual study. Four tests - vocabulary, printed directions, oral directions (aural comprehension) and paragraph reading - were administered before and after the twenty hours of training. Achievement was measured by the difference between pretest and posttest scores. In the evaluation of gains made, the two groups of subjects were combined and then divided again on the basis of age to form three groups: 20-to-25-year-olds, 26-to-34-year-olds, 35-year-olds and over.

It was found that the youngest group had gained the most and the oldest, the least. This result, however, was largely determined by differing gains in the aural comprehension test; there was little or no difference in the other three tests. Thorndike concludes that older and younger adults do not differ a great deal in language learning ability. What differences there are appear mainly in oral tests. He also raises a question as to how much the differences relate to age itself or to some other variable associated with age.

On the other hand, Carroll (1962) found, in the course of research undertaken during the development of the MLAT, that age showed only a slightly negative (non-significant) linear correlation with success in language learning in the case of 83 subjects with a mean age of 34.20 years (standard deviation - 4.99). Carroll, however does not indicate whether or not any control was used for previous linguistic knowledge.

Fiks (1966) presents some interesting findings in a report on the development and evaluation of an eight-week self-instructional programmed course in Vietnamese. The course was designed to enable American military personnel to communicate with Vietnamese nationals. The goal was listening and speaking proficiency at an elementary level. Nineteen officers served as subjects in course evaluation research. Sixteen of them managed to complete the course in the allotted eight-week period. They required a mean of 69 hours of working time to do so. Part of the data used in the evaluation consisted of two measures of the subjects' ability in Vietnamese. Comprehension and speaking tests were administered at three points in the program. The comprehension tests involved written English translations of aurally

presented Vietnamese. The speaking tests required oral translations from English into Vietnamese.

No significant negative correlations were found between age and either comprehension scores, speaking scores or total scores. There were, however, significant negative correlations between aptitude as measured by an army test and a) auditory comprehension scores, b) time taken to complete the course and c) learner age. Since aptitude, time to complete the course and age were all intercorrelated, partial correlation analyses were done. When age was held constant, the correlation between aptitude and time decreased considerably. No comparable decrease was seen when the partial correlation between age and time was computed with aptitude held constant. This implied that trainees with lower aptitude took longer to complete the course because they were older – and older students have lower aptitude. Interestingly, the three subjects who failed to finish were a little older than the group as a whole; their mean age was 32.7 while the group mean was 28.3. Their mean aptitude was also lower than that of the whole group.

In a study undertaken at the American University of Beirut, Za'rour and Buckingham (1969) examined a number of factors believed to affect language learning outcomes. Several (i.e. seven) hypotheses were investigated, one of which was that older students would experience more difficulty in language learning than younger students would. The data was provided by the records of students entering the university's intensive ESL program over a four-year period (1964 to 1968). The objective of the English program was to prepare students for academic study at the university. The subjects selected numbered

284 (239 males and 45 females). Their ages upon entrance to the program ranged from a low of 14 to a high of 46; the median age was 20. Ninety percent of the subjects were between 18 and 28 years of age; five percent were older and five percent were younger. Although sixteen different language backgrounds were represented, nearly half of the subjects (128) were native speakers of Arabic and slightly more than one fifth (63) spoke Persian.

The criterion used to measure gain during the course was the English Entrance Examination developed at the university and described as a two-hour exam which included four sections (vocabulary, structure, reading comprehension and miscellaneous), each comprising 50 multiple-choice items. Subjects were tested initially and then again after they had received approximately 375 hours of English instruction (i.e. five hours daily for fifteen weeks). The basis for the evaluation of improvement was the difference between the scores on the two administrations of the test.

In considering the variable age, the subjects were divided into three nearly equal subgroups (exact numbers are not known). The oldest group showed a mean score improvement that was significantly lower than that of the total group and the youngest, a mean score improvement that was significantly higher. The mean score improvement for the middle age group was not significantly different from that of the total. The researchers conclude that score improvement might be indirectly related to age.

There are, however, two points to be raised in connection with the above finding. Firstly, as the researchers themselves recognize, the youngest group had a significantly lower initial-test mean score

when compared to the total group, and it may have been this that enabled them to show greater gains at the end. Secondly, it is not clear what ages were represented in each of the groups. Ninety percent of the subjects were between 18 and 28 and the median age was 20. It is entirely possible that the youngest and middle groups differed little in age. The youngest probably included primarily 18-and 19-year-olds along with a few (about 14) younger people. The age range in the middle group may have been from 20 to 22 or 23. The oldest group could then have had a large age range extending perhaps over 24 or 25 years. The results would be somewhat easier to interpret if the age groups had been clearly defined, and if divisions had been made more on the basis of age than on the basis of numbers.

Age was also one of the variables under consideration in research completed in Quebec several years ago (D'Anglejan and Renaud, 1977). D'Anglejan was commissioned by the Quebec Ministry of Immigration to conduct a study to determine why some of the adult immigrants in a government-sponsored intensive French language program failed to learn. In her investigation of 400 adult immigrants, the relationship between nine learner characteristics and overall achievement in French, as determined by two criterion measures (tests and teacher ratings), was examined. Multiple regression analysis revealed that age along with non-verbal reasoning and years of education were the most important predictors of success. There was a significant negative correlation between learner age and achievement.

Perhaps the research that is most relevant to the present study is a doctoral thesis by Halladay (1970). He investigated the relationship between age and L_2 achievement in adults enrolled in an

intensive eight-week ESL course at the English Language Institute of the University of Michigan. In his study two subject samples were used: Sample A, consisting of 530 students divided into eight age groups from 19 years and under (one student was as young as 16) to 50 years of age and over, and Sample B, comprising 71 students in five age groups from 19 years and under to 35 years and over - only one student was over 50 and he was 58. The age groups for both samples and the numbers in each group are shown in the tables below. The mean age was 26.6 in Sample A and 27.7 in Sample B.

Age Groups in Sample A (Halladay, 1970)

	Age Group							
	16-19	20-24	25-29	30-34	35-39	40-44	45-50	50-53
No. in group	82	172	125	75	40	19	9	8

Age Groups in Sample B (Halladay, 1970)

	Age Group				
	17-19	20-24	25-29	30-34	35+ (to 58)
No. in group	6	22	18	15	10

Five measures of final achievement (i.e. after eight weeks or approximately 200 hours of aural-oral instruction) were used: grammar, vocabulary, aural comprehension, average of those three, and grammar-aural-comprehension average. For Sample A subjects, final achievement on the five measures was studied in relation to initial placement test scores and amount of education. In the case of Sample B subjects, who were pretested and posttested with the same measures, final achievement scores on the five measures were studied in relation to pretest scores and five descriptive variables: amount of education, use of a non-English language, use of English, intelligence and language aptitude.

When Sample A final grammar scores were adjusted for entrance scores, the differences between the adjusted means for age groups were not significant. The result was similar when Sample B final grammar scores were adjusted for pretest scores and the five variables. This suggested that no differences in grammar achievement were attributable to age.

On the other hand, for vocabulary, in Sample A the three age groups between 20 and 34 and the two age groups over 45 obtained adjusted mean scores that were significantly higher than those of the remaining three age groups. The adjusted means for Sample B favou[illegible] the three groups under age 30. This is interpreted as suggesting that students in their early twenties learn vocabulary at a high level, and that achievement then declines from the early thirties through age 44. The trend is reversed, however, past age 45 and higher levels are again achieved.

For aural-comprehension, final adjusted scores in Sample A showed a downward trend in achievement from the youngest age group through age 44. The highest adjusted mean score, however, belonged to the students in the 45-49 age group. The adjusted means in Sample B favoured the groups under 30 but the differences were not significant. Very similar results were obtained in the case of the fourth measure - average of grammar, vocabulary and aural comprehension. In Sample A adjusted mean scores showed a downward trend from age 30 through 44 and then a rise after age 45. In Sample B final average mean scores for groups adjusted for the five variables and pre-test scores favoured the groups under age 30 significantly. With regard to the fifth measure - grammar-aural-comprehension average - the adjusted means in Sample A favoured the younger students significantly. There was a downward trend from the youngest age group to the oldest. The adjusted means for age groups in Sample B showed significantly higher achievement for groups under age 30. Finally, in subsequent analysis education was not found to be an important determiner of achievement.

The conclusion reached by Halladay is as follows. An adult's ability to gain aural mastery of English decreases with age through the early forties. Students in their thirties and forties do not learn as rapidly as younger students. There is, however, some evidence to suggest that people over 45 years of age compare favourably with much younger people.

More recently Brown (1983) completed a study of adult L_2 learning in which older and younger learners were compared. In her investigation, which was undertaken in an attempt to delineate the

distinguishing characteristics of the older adult language learner, the older learners were over age 55, and the younger learners with whom they were compared were 23 years of age and under. Four questions were addressed by the study. The one which is of particular relevance to the present research is whether there was a difference between the L_2 language learning abilities of older adults (i.e. aged 55-75) and those of younger adults (i.e. aged 19-23). In order to facilitate research on that issue, two more specific questions were formulated:

1. Do older adults differ from younger adults in language learning factors or abilities which seem important to them?
2. Is there a difference between the measured success of older learners and that of younger learners?

The subjects who participated in the study were members of the Church of Jesus Christ of Latter Day Saints (Mormons) who were learning Spanish in preparation for missionary work in areas where that language was spoken. That part of the research which focuses on the above questions is based on a comparison of 18 older and 18 younger missionaries, matched on the variables of sex and previous experience with language, who received intensive instruction in Spanish for a period of eight weeks. The investigative procedures used included a) a study of journals kept by the learners during the instructional period, b) classroom observations of learners and c) the administration of the Foreign Service Institute's oral proficiency interview at the end of the eight-week training period.

The findings pertaining to research question #1 were as follows. Statements made by older and younger learners in their journals were analyzed for mention of factors/abilities having relevance for language learning. This yielded 76 factors. The term factors encompassed many things: learner characteristics such as age and intelligence; psychological factors such as anxiety, attitude, self-concept; specific linguistic abilities or inabilities such as auditory discrimination, communicative competence, errors; learning strategies; teaching activities or procedures; type of instructional materials; teacher characteristics; time considerations; etc.

For each age group, the factors were ranked according to frequency of mention in the journals. Time received the top ranking for both groups. A Spearman rank order computation showed a high degree of correlation (rho = .832) between the rankings established for the 76 factors for older and younger groups. Brown interprets this as suggesting that the two age groups had similar perceptions as to what was important in language learning. On the other hand, rank order correlations using a) only the top twelve factors for older learners and b) only the top twelve factors for younger learners, produced non-significant results (rho = .503 and .262 respectively). This, according to Brown, suggests that while the overall learning task was perceived similarly, the most important factors in the task were perceived differently by the two groups. It should be noted, however, that one would expect a correlational computation based on more factors (76) to yield a higher coefficient than one based on fewer factors (12).

In addition, Brown's examination of all factors which differed by at least ten positions in the two sets of rankings revealed the following pattern. Of the eighteen factors which were more important to older learners, eleven were external (e.g. assignments, teacher attitudes, activities). This indicated, according to Brown, that the older learner was more outwardly focused, more dependent upon external factors for his language learning. In contrast, of the eighteen factors more significant to the younger learners, nine were internal (e.g. memory, thinking in L_2, depth of processing). This suggested to Brown that the younger learner was more inwardly focused, tended to feel greater responsibility for his own learning.

With respect to research question #2, the finding was as follows The scores achieved by the younger learners on the FSI Oral Interview were higher than those achieved by the older learners. A t-test indicated that the difference was highly significant ($t = 4.838$, $p < .001$). Thus, older learners were found to differ from younger learners not only in terms of factors or abilities deemed by them to be important in language learning but also in terms of measured oral (speaking) proficiency.

Summary Comment

In the limited research available on differential achievement in adults at different ages, there are indications that age is an important factor. The literature presents some evidence to the effect that, given equal learning time and a similar instructional procedure, younger adults (under age 30) make greater achievement in a second language than older adults. This seems to apply particu-

larly to aural-oral skills - listening comprehension and speaking.

Maturational Changes During Adult Life

The discussion will now shift to a consideration of certain changes, physiological, cognitive and other, which occur in adults as they age.

Physiological Changes

Reaction Time

As people grow older reaction time is slower. Hodgkins (1962) reports an increase in reaction time to stimuli after age 26, an increase which continues through age 84. Kidd (1973), who recognizes that there is a neuro-muscular basis for this slow-down, suggests that there may be another contributing factor; the older adult may be deliberately slower to react because he is more concerned about correctness of response, particularly when exposed to an ambiguous stimulus or an unfamiliar situation. Thus, the older person apprehends, perceives, acts and thinks more slowly.

Sensory Acuity

Visual acuity, according to Kidd (1973), peaks at around age 18, after which time there is a gradual loss until age 40. Past age 40 there is a sharper decline until age 55. As for auditory acuity, while Kidd indicates that a gradual decline sets in at age 15, other sources (e.g. Bischof, 1969) state that there is little loss of hearing capacity before age 40.

Cognitive Changes

Intelligence

What happens to intellectual ability as the adult grows older is somewhat unclear. The literature is at best equivocal; the research has produced differing findings and the point of view presented in reviews of the subject varies to some extent.

It appears that three cross-sectional studies (Jones and Conrad, 1933; Miles and Miles, 1932; Wechsler, 1955) all showed scores on intelligence tests peaking between 18 and 20 years of age and declining gradually thereafter through age 55. So, according to these results, intellectual capacity increases till age 20 and falls off slowly afterwards. It should be noted, however, that when the Wechsler scores were adjusted at a later date using the revised Wechsler scale, the curve topped a little later (i.e. at around age 30) for verbal skills. Performance was also found to peak at age 30 in a Dutch study (Verhage, 1965). It should also be pointed out that certain methodological problems within the cross-sectional studies have been recognized. The older subjects were generally less-educated, less-informed, less accustomed to test-taking, having been away from school longer, and perhaps more reluctant to participate than the younger subjects. How great a role these factors, along with slower muscular responses, played in the poorer performance of older subjects is not known.

In his discussion of intelligence, Kidd (1973) contends a) that there is a direct connection between education and intellectual capacity and b) that time is an important determiner of adult perform-

ance on IQ tests. Research conducted by Lorge (1950) is cited as evidence. In a study involving males and females tested at age 8 and again at age 34, Lorge found a high correlation between Army Alpha Test scores and highest grade completed. Lorge also discovered that on three timed tests scores declined with age but on an untimed test there was little or no decline. Lorge concludes that intellectual power in itself does not change much with age. There is a decline in rate of learning as age progresses, but it is attributable to losses in visual and auditory acuity, reaction time, an increased fear of failure, a desire to be correct and a modified attitude to learning.

In contrast to the cross-sectional studies, some longitudinal studies (Terman and Oden, 1947; Owens, 1953; Bailey, 1955; Bailey and Oden, 1955)have shown continuing rises in intellectual capacity through age 50 in some areas (i.e. verbal skills). These studies dealt mainly with mentally superior individuals. The findings are not necessarily generalizable to less-gifted people.

There is some evidence to suggest that age-related intellectual deficits vary depending on a) the specific ability in question and b) the original level of achievement. Non-verbal skills appear to be more susceptible to decline than verbal skills. Firstly, older adults score as well as younger adults on tests of general information but do not perform at the same level on measures of rote memory and analogy making (Wechsler, 1955; Jones and Conrad, 1933). Secondly, while scores on vocabulary tests hold steady or increase until age 60, scores on non-verbal tests designed to measure ability to make comparisons and analyze logically drop steadily with age (Foulds and Raven, 1948 - study of industrial workers). Also, as indicated

by Kidd, research from 1950 to 1970 using the Wechsler Adult Intelligence Scale has found that scores on performance tests (i.e. Object Assembly and Digit Symbol) decline during the adult years but scores on subtests of vocabulary, information and comprehension do not. Finally, longitudinal studies have revealed that high scorers at an early age show continued increases in abilities up to old age; those with average scores show increased verbal ability and the same level of non-verbal logical reasoning, and low scorers, a decrease in general vocabulary and a decline in non-verbal reasoning (Botwinick, 1967).

To summarize the above, the following generalizations may be made with respect to age effects upon intelligence:

1. It seems that intellectual growth slows down at approximately age 20.
2. Some decline in intellectual capacity appears around age 30, if not a bit earlier, and continues with age.
3. Verbal abilities are less susceptible to decline - they may even increase - than are non-verbal or performance abilities.
4. The greater the individual's intellectual endowment, the less the deficits that come with aging.
5. There is a connection between educational level and the maintenance of intellectual capacity.
6. Speed losses brought about by aging contribute to declining performance on measures of intelligence.

Learning Ability

Much of the research pertaining to age-related changes in learning ability is based on either motor or rote learning tasks. In their review of studies comparing adults of widely different ages on tasks mainly of this type, Pressey and Kuhlen (1957) come to the following conclusion: there is a slight decline after age 30 for motor learning ability and ability to learn rote material (e.g. digits) as well as sentences, paragraphs and foreign language vocabulary.

In his discussion of this topic, Kidd refers to Thorndike (1928) who concluded from his studies that the most advantageous period for learning was between 20 and 25 years of age and that there was a decline in learning capacity from age 26 to 42 of approximately one percent per year. The first effect of Thorndike's work, maintains Kidd, was to establish an age ceiling of 45 years for effective learning. His results, however, were based on speed of performance, and the tasks used were not representative of learning tasks in real life. Since Thorndike, researchers have adopted a modified approach and have steadily advanced the age at which excellent learning performance can be expected.

Memory

According to Bischof (1969), the bulk of studies on short-term and long-term memory report that the older the adult becomes, the poorer becomes the memory, particularly short-term. The age effects seem to become marked only well past age 40.

Problem Solving

Bischof also indicates that some studies comparing adults of different ages on problem-solving tasks show no significant age differences. Others have found age differences but the poorer performance was in the case of people over sixty.

Age-related Differences in Adult Students

Before terminating this section it might be appropriate to mention briefly some respects in which older students tend to differ from younger ones.

Classroom Orientation

It would seem logical to believe that the younger the adult, the more accustomed he should be to classroom learning as the smaller the time interval since full-time school attendance. As adults grow older, learning comes primarily from work or life experiences. Mature adults often have difficulty adapting to a formal classroom setting. This point is made by both Kidd (1973) and Knowles (1970).

Motivational Orientation

Young adults in their late teens or early twenties usually undertake studies with a view to preparing themselves for future careers. Older adults, who are normally established in the working world, become involved in learning situations for different reasons and tend not to be as concerned with success in terms of grades. Often their primary motivation for taking courses relates to a specific problem

they have encountered in life or at work, a problem for which they are seeking a solution (Knowles 1970).

Conclusion

The literature on life-span development and adult learning appears to indicate that more mature adult learners (mature in terms of age) may differ in some respects from learners in their late teens and early twenties. While physiologically-based differences - differences in speed and sensory acuity - may be negligible till age 40, older learners may differ somewhat from younger learners in intellectual capacity, not in verbal skills but in non-verbal and performance abilities. They also tend to differ with respect to motivational orientations and to the type of instructional setting preferred.

CHAPTER III

RESEARCH DESIGN AND METHOD

Research Design

Definition of Aural Comprehension

The intended focus of the investigation is upon global comprehension of language rather than comprehension of individual lexical items or specific linguistic structures. Aural comprehension ability can be roughly defined as the ability to process connected speech and arrive at some understanding of the general situation and meaning conveyed. This study attempts to assess the subjects' ability to operate beyond the level of individual words, individual structures or single sentences - that is, it attempts to assess their ability to deal with a series of related sentences, their ability to process enough language to be able to grasp the key idea(s) or main message.

Experimental Design

The research design adopted was based on a pretest-posttest procedure used to assess and compare gains made by two matched groups of adult subjects, one older and one younger, in L_2 listening comprehension after a twelve-week period of language training. Each subject in the older group was matched as closely as possible to a subject in the younger group on the following variables: a) initial listening ability (as determined by a pre-training test score), b) amount of informal exposure to English (minimal in all cases), c) years of

schooling, d) amount of formal instruction in English and e) IQ (measured by a non-verbal test[2]). The same listening test was administered twice to all subjects, first as a pretest at the start of language training and then again as a posttest after twelve weeks (300 hours) of intensive instruction. Pretest-posttest score differences served as a measure of gains made and as a basis of group comparison.

Hypothesis

It was hypothesized that the two groups would differ with respect to rate of progress in listening comprehension over the time period under investigation and that this difference would favour the younger group. Thus, the following prediction was made:

> The gains reflected by pretest-posttest score differences would be greater for the younger subjects than for the older subjects.

Subjects

The subjects were Quebec francophones, members of the Canadian Armed Forces, who were undergoing intensive English language training (i.e. 25 hours a week). The purpose of the instruction was to enable them to acquire enough proficiency in English to work in the language. A total of 131 adult learners were selected as potential subjects. Of this number, just slightly more than 50 percent (i.e. 71) were ultimately retained as subjects and were posttested.

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[2] There were two reasons for using a non-verbal IQ measure. Firstly, non-verbal IQ appears to decline with age whereas verbal IQ does not show a similar trend (see Chapter II, page 35). Secondly, non-verbal IQ has been shown to be a predictor of L_2 achievement (D'Anglejan and Renaud, 1977).

These 71 constituted the subject pool used in the investigation. The breakdown according to military rank was as follows: 2 were sergeants, 3 were master corporals, 13 were corporals and 53 were privates. They ranged in age from 17 to 41 years; the mean age was 22.76 (SD = 5.68). As for education, the mean number of years was 10.18 (SD = 1.03). The range was from grade seven to grade eleven (final year of high school) completion. All but two had received some previous ESL instruction, either at school or elsewhere. The mean number of years of ESL was 5.11 (SD = 2.09) with a range from zero to ten years.

All began language training with limited proficiency in listening. Entrance proficiency levels, as determined by the Department of National Defence's aural comprehension test, ranged from 0 to 1; five subjects had a level 1 score, three had -1, seven had +0 and fifty-six had 0. Their scores on the pretest ranged from 5 to 17 (maximum was 34); the mean score was 11.28 (SD = 3.07). In all cases there had been minimal informal exposure to English. None had lived in an English milieu or had used English at home.

The 71 subjects fell into two groups established on the basis of age. The older group included 21 subjects (16 NCO's and 5 privates) who were 25 years of age or more. The mean age for this group was 29.62 (SD = 5.57). The remaining 50 subjects (2 corporals and 48 privates), all of whom were 24 years of age or less, constituted the younger group for which the mean age was 19.88 (SD = 2.03).

Instrument For Measuring Aural Comprehension

It was decided to base the assessment of listening comprehension upon a test designed specifically for the purpose of this study. The rationale for the decision is stated below. Following this, the procedure used in the preparation of the test will be outlined in some detail. Then, the final test form will be described.

Rationale for Test Construction

As was mentioned previously, the Department of National Defence (DND) has its own standardized language tests. Four proficiency tests, each designed to measure a specific L_2 skill (e.g. listening, speaking, reading and writing), are used to determine both the initial and terminal proficiency levels of all students attending the language school. Six levels of language competence are identified ranging from 0 (no measurable proficiency) to 5 (native-speaker proficiency). Plus and minus scores within each level are also recognized (e.g. -3, 3, +3). Normally students are tested initially shortly before they enter the school and at least once again, if not more, prior to departure.

Given the existence of a DND listening test and the availability of pre-language-training scores based on it, it might appear that this test could easily serve as the instrument for assessing subjects' progress in listening comprehension in this study. For a number of reasons, however, some pertaining to conditions governing the administration of DND tests and some to the nature of the test itself, it was simply not very feasible to use the DND test as the primary

instrument for measuring gains in listening.

Firstly, certain regulations concerning test administration and test content are strictly enforced. One such regulation prevented the researcher from administering the test personally. Only authorized personnel attached to the Language Standards Control Detachment in St.Jean (i.e. the testing department) could administer DND language tests. This, in itself, did not present an insurmountable problem. Post-training scores based on the test might still have been obtainable; arrangements might have been made for authorized testers to re-administer the test to subjects after twelve weeks of language training. The greatest obstacle was created by the confidential status of the DND listening test. It is strictly forbidden to divulge the content of the test. It would not have been possible to describe either tasks or items for the reader. Nor would it have been permissible to discuss with the subjects' their performance on individual items, and the experimental design called for this as part of the post-testing procedure.

In addition to the problems cited above, certain characteristics of the test itself militated against its use. Firstly, the test is designed to measure a wide range of ability (i.e. from zero to native-speaker proficiency). The distinctions it makes are fairly broad. It was felt that such a test would probably not be a particularly useful instrument for differentiating among individuals, most of whom would still have limited language proficiency after only twelve weeks of training. Also, there is common agreement among DND testers that the DND test does not discriminate well at the lower levels. Secondly, although the test purports to measure listening, in actual fact, it

measures more than listening. All but one of the tasks used require testees to respond by selecting one of four alternatives presented in writing. Obviously, reading ability comes into play here.

A second question that perhaps deserves an answer is the following: If not the military listening test, then why could another already-existing test not be used? The decision to develop a new test was motivated by the belief that it would be fairly difficult to find a ready-made test that met certain requirements. These requirements, which relate to test length, general level of difficulty, type and number of tasks used, linguistic and situational content, will be discussed below in the section dealing with test development.

Test Preparation

Initially, specific guidelines to be followed in the production of the test were established. The second step was to develop a test design and to construct items in accordance with these guidelines. The next step was to obtain some sort of assessment of the suitability of the items produced and to make any revisions which appeared advisable. The final steps included the assembly of a final test form and its subsequent administration to native speakers and advanced ESL learners.

Design Specifications

Certain characteristics which, it was felt, the test should incorporate were identified. These formed the basis of design specifications for test development, specifications pertaining to test

length, level of difficulty, task type, number of tasks, and test content, both situational and linguistic. The specifications are listed and discussed below.

1. Test items should include a series of sentences relating to a particular topic or situation. They should be representative of connected speech. They should not revolve around a single discrete point of language (e.g. singular versus plural distinction); nor should they consist of a single sentence.

This requirement was in keeping with the main focus of the study. What was to be assessed was the subjects' ability to process connected speech and arrive at some understanding of the general situation or main message.

2. As much as possible, the test should measure listening comprehension only, not listening comprehension in combination with other language skills.

It is not uncommon to find in tests which purport to measure listening, tasks which invoke reading and/or writing skills as well. In order to avoid the simultaneous testing of listening and other skills, it was decided to base a large percentage of test items on oral texts with some form of visual accompaniment (i.e. pictures, diagrams, maps, etc.). Consideration was also given to the inclusion of a task

which involved answering a specific question about an oral text if it could be structured in such a way as not to require subjects to use L_2 speaking, reading or writing skills when responding. A possible procedure might be to permit subjects to respond in French.

3. The test should include a number of different tasks.

There appears to be general agreement among testing specialists that language ability cannot be assessed without the method of measurement's exerting some influence upon the measure obtained. Thus, it was felt that several tasks, varied in nature, would together provide a more reliable measure of listening comprehension than one task alone.

4. The test should reflect a low to moderate level of difficulty.

A major concern was that the test in general be geared to the level of the prospective subjects. One should not require a high level of competence in English (i.e. levels 3 or 4 on the DND proficiency scale, levels which represent functional and integrative bilingualism respectively) in order to score well. What was needed was a test which would a) be sensitive to improvement made over a short period of time by learners who had little proficiency at the outset, and b) be able to differentiate among these low level

learners. Thus, the test should not be overly difficult.

5. The linguistic and situational content of the test should be related to the prospective subjects' realm of experience.

In order to keep the general level of test difficulty reasonably low, two decisions were made. The first was that items should centre around situations drawn from common everyday life and life in a military setting - that is, situations which would be familiar to the subjects and to which they could easily relate. The second decision was to restrict, in as much as possible, the linguistic content of items to the vocabulary and structures likely to be encountered by the subjects in the course of their language training. This would still provide considerable latitude in the construction of items. It merely ruled out the use of very complex structures and esoteric lexical terms that were of an academic or specialized nature.

6. The test should be relatively brief.

In order to minimize possible effects of fatigue, it was decided to limit testing to approximately 30 minutes. The test would include no more than 30 items, each of which would require less than one minute of presentation time. The average text length per item should not exceed 30 seconds.

7. Test instructions should be in French.

In view of the fact that subjects, when tested initially, would have little L_2 proficiency, it seemed appropriate to use the native language for any instructions or explanations.

8. Test items should be presented by a variety of voices.

The decision to use several voices, both male and female, in the recording of test items was based on considerations similar to those that led to the decision to use several tasks. Several voices, just as several tasks, should provide a better measure of listening ability than one alone.

9. Responses should be indicated in the test booklet itself rather than on separate answer sheets.

In many tests students are given answer sheets on which they are to mark responses. They do not write in the test booklet. With this procedure there is always the danger that errors may arise from the placing of a response in the wrong space on the answer sheet. In order to eliminate this possible source of error, it was decided to provide for the marking of responses in the test booklet itself.

Development of Test Format and Item Construction

The second step in the preparation of the listening test was to develop a test format and to construct items in accordance with the above guidelines. After some debate the number of tasks to be used was set at four. This was felt to be a reasonable number in view of the brevity of the test. Then, several possible tasks were considered and a selection of four was made.

Tasks #1 and #2 were both of the multiple-choice variety. In the first, subjects were to select from among four oral descriptions, the one that was most appropriate for a picture. In the second, the procedure was reversed; subjects indicated which of four pictures corresponded best to an oral description. Task #3 called for the placement of numbers on a picture or diagram in accordance with a story and specific instructions presented orally. Task #4, initially designed as a multiple-choice task, involved answering a question about a taped dialogue.

Following the selection of tasks, 30 items were developed: 10 based on task #1, 10 on task #2, 5 on task #3 and 5 on task #4. All of the pictures used were taken from commercial publications (i.e. comic strips, magazines, books and ESL texts). The diagrams and maps were original creations. All of the oral texts (descriptions, stories and dialogues) were original compositions produced specifically for the study. For the majority of items, the total text length was under 20 seconds. The longest texts produced were those for the items reflecting task #3 and the longest of those involved 42 seconds of speaking time.

After their construction, items were grouped into four sections

according to task-type. Item texts were written on index cards; a separate card was used for each. Response sheets were produced, a separate page for each item. For all items in sections 1 through 3, the accompanying visual(s) appeared on the response sheet. In the case of items in section 4, originally the response sheets presented, in French, the question to be answered and, below that, four response possibilities, also written in French. This section, however, underwent modification subsequently.

General instructions for the test, as well as specific instructions for each section, were composed in French. Finally, four additional items, one representing each task-type, were developed in order to serve as examples to be presented at the beginning of each section immediately after the instructions.

Trial and Revision Process

The third step in the preparation of the test was to obtain some sort of assessment of the test in its completed form, a form which was considered only tentative. The major concerns were item clarity, item suitability and level of difficulty. The assessment of items was a two-stage process.

1. Stage one

It was decided to solicit the opinions of ESL teachers at the language school. Five teachers volunteered their services. Each teacher was given a set of response sheets. The researcher then presented the items in much the same fashion as they would be presented on tape while the teachers listened and responded on their answer sheets.

After their experience with the test, the teachers suggested a few minor revisions, all of which were made. These involved a change in the picture choices for one item in section 2, slight modifications to the four diagrams for another item in section 2, a small wording change in each of the four descriptions for one item in section 1 and finally, an amendment to the text of the example for section 3.

After the revisions were made, the items within each section were ordered randomly and the test was recorded on a cassette. Four teachers, two males and two females, assisted in the recording. The accompanying test booklet was completed. Included in it were a written version of all instructions presented on the cassette and response pages for test items and examples. Photocopies of the completed booklet were then produced.

2. Stage two

A second test trial was arranged - this time with ESL learners similar to the prospective subjects. The test was administered to six privates who had just arrived at the language school and had DND entrance scores of 0. The scores they obtained ranged from 9 to 15 (out of 35). The mean was 11.5. This result appeared reasonable given the limited proficiency of the students.

Subsequent analysis of their responses, however, resulted in the decision to make one fairly major revision to the test - namely, the removal of the multiple-choice element in the five items comprising section 4 (see page 50 - for description). An examination of the responses made by the six privates revealed an unexpected level of success in the case of these items which were based on dialogues considered to be quite difficult. Three of the privates got three items

correct. Since none of these individuals had much proficiency in English, it did not seem very likely that their correct responses had resulted from dialogue comprehension. It was surmised that perhaps something in the four response possibilities provided had induced them to respond correctly. Therefore, the multiple-choice-response procedure was eliminated. The four choices were removed from the answer booklet and the instructions were amended so as to direct subjects to respond to the question about the dialogue by writing a few words in French in an allotted space in the booklet.

In addition to this rather major change in item design, minor amendments were made to the items in section 3. In these items subjects were to place numbers on a picture or diagram following a story and specific instructions. It became evident only during this second test trial that some of the instructions were not entirely unambiguous - there was some room for misinterpretation leading to an unanticipated response. Thus, slight wording changes were made in an effort to eliminate any ambiguity.

Completion of Final Test Form

The changes made after the second trial run necessitated amendments to both the tape and the answer booklet. Sections 3 and 4 were re-recorded in entirety. In the answer booklet, response pages for section 4 were re-designed in accordance with the alteration in task. Now, all that appeared in the booklet opposite the item number was the question to be answered, written in French, and following the question, a space for writing a response in French. A large number of copies of the revised booklet was then produced.

Native Speaker and Advanced Learner Data

To provide a final check on the general appropriateness of the test and the suitability of items, the test was administered first, to advanced-intermediate ESL learners, and then to native speakers. The ESL learners, twelve in number, had been chosen from a group of approximately 40 students in the Intermediate English Program at the language school. These twelve were the most advanced learners in the program. They were selected on the basis of teacher opinion and DND listening test scores. All had at least a -3 level (bilingual) on the 0-5 scale in listening comprehension. The group was composed of 9 officer cadets, 2 privates and 1 sergeant. All but the sergeant were under 25 years of age; the sergeant was 30. The scores obtained ranged from 28 to 35 out of a possible 35. The group mean was 31.92 (SD = 2.019).

The native speakers tested were eleven in number. They were all members of the Canadian Forces and students in the French section of the language school. They had begun formal French training just a week prior to testing. These native speakers resembled in many respects the older subjects to be studied in the investigation. They were non-comissioned officers (NCO's): 5 corporals, 5 sergeants and 1 warrant officer. All but one were 28 years of age or over. The age range was 24 to 41; the mean age was 32.45 (SD = 5.63). Their scores ranged from 32 to 35. The mean score was 33.45 (SD = 1.076).

After being tested, the native speakers were asked to provide feedback. Only one serious complaint was received and that pertained to one item (#13) in section 2. The text of this item consisted of a description of a weekly teaching schedule. In the answer booklet, four

schedules were depicted and subjects were to choose which of those fit the oral description. Several of the NCO's indicated that they had experienced great difficulty in visual processing. It had been difficult, if not impossible, for them to decipher or interpret the four schedules illustrated and consequently, they had not been able to determine which of the four corresponded to the oral text.

An examination of the responses for this item revealed that seven of the eleven NCO's had either responded incorrectly or not at all. At this point the responses of the advanced-intermediate ESL learners were checked and it was discovered that seven of them (seven out of twelve) had also missed this item. Thus, it appeared that there were rather serious difficulties with the item, difficulties which were not language-related. The simplest solution to the problem, and the most economical one in terms of time, was to leave the item in the test, rather than attempt to revise it or replace it with another item which might not be any better, but not consider it in the scoring. When scores were adjusted so as to exclude the item, the following revised means were obtained:

1. for the native speakers - 33.18 (SD = .0833)

2. for the advanced-intermediate learners - 31.50 (SD = 1.658)

A perfect score was now 34.

The results from these trial administrations were considered satisfactory. The native speakers' performance, in general, had met expectations: they had tended to make the anticipated responses. It was not expected that everyone would get a perfect score. The performance of the ESL learners was also reassuring. The high group mean suggested no more than a moderate level of test difficulty, a

level of difficulty which should be fairly appropriate for the intended purpose.

Description of Final Form of the Listening Test

General Information

The test materials produced consisted of a set of taped items (30) recorded on a cassette and an accompanying thirty-three-page answer booklet. The test contained four sections with the following distribution of items: ten items in each of sections 1 and 2 and five items in each of sections 3 and 4. Items in sections 1, 2 and 4 were scored one point apiece while those in section 3 were scored two as two responses were required.

The test was prefaced by brief general instructions (in French) presented both orally on the tape and in writing on the first page of the answer booklet. Test items in each section were preceded by specific instructions for the section followed by one example item. These instructions were given in French on the tape; they were also written in the answer booklet. The appropriate responses for example items were also indicated in French.

Item texts consisted of either a description or narrative, a set of descriptions, or a dialogue. Most were under 30 seconds in duration. For each of items 1 to 25 (those in sections 1, 2 and 3), there was a visual accompaniment (i.e. a single picture or diagram, or a set of four pictures or diagrams) which appeared on a separate page in the answer booklet. In the case of items 26 to 30 (those in section 4 which were based on dialogues), all that appeared in the answer booklet, opposite the item number, was a question in French followed by a space

provided for a written response in French. The total test length was 33 minutes.

The recording was done at the language school using the facilities available. The instructions and the explanations concerning example items were read by an English/French bilingual. For the most part, in the presentation of test texts an alternation of male and female voices was arranged from one item to the next. In dialogue items, generally one role was assumed by a male and the other by a female. Six different presenters were used: three native-speaking females and three males, two of whom were native speakers and the other, a bilingual.

In order to provide a more concrete indication as to the nature of the test, the instructions for each section, sample items and presentational details are shown below. The test itself may be obtained from the researcher.

Section 1

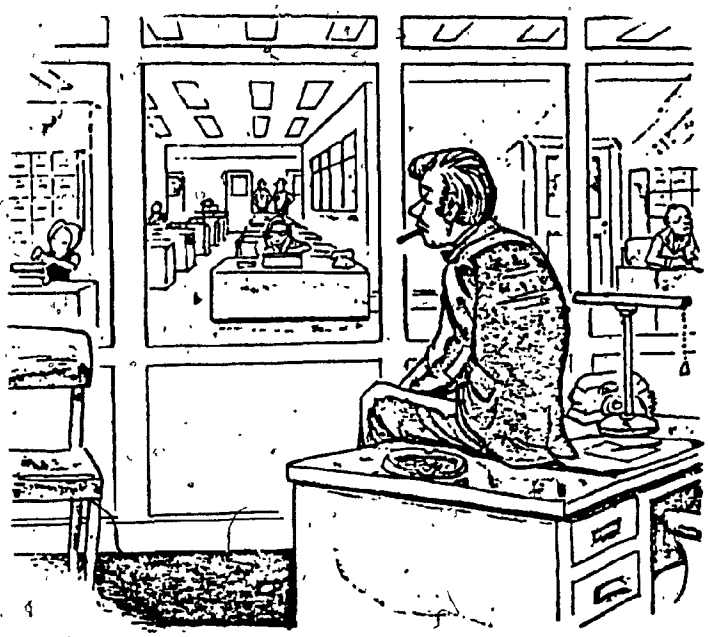
Instructions to subjects (translated)

In this section there are ten questions. For each question there is a picture in your answer booklet. For each picture you will hear four short descriptions on the tape. Look at the picture carefully during the presentation of the four descriptions. Then, choose the description, A B C or D, which corresponds best to the picture and indicate your answer in the booklet.

Sample item

answer booklet

3.



A
B
C
D

oral text

A: Jack has an office job which keeps him very busy. He never has a free moment during the day.

B: Jack would like to work but he can't find a job. He sits at home all day and does nothing.

C: Jack doesn't work in an office. He works outside. He has a government job with the department of agriculture.

D: Jack works for the government. He has an office job but he doesn't find it very interesting. Often he has nothing to do.

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[3]The picture was taken from L.A. Hill, 1977, Intermediate Stories For Reproduction (Tokyo: Oxford University Press).

Presentational details

Test items were recorded in the following manner. The item number was announced and immediately thereafter, the presentation of the description was begun. A five-to-seven second interval separated one description from the next. After the last text was presented, ten seconds were allowed for responding. The total text length per item (i.e. combined length of the four descriptions) varied from 13 to 40 seconds. The mean was 26 seconds.

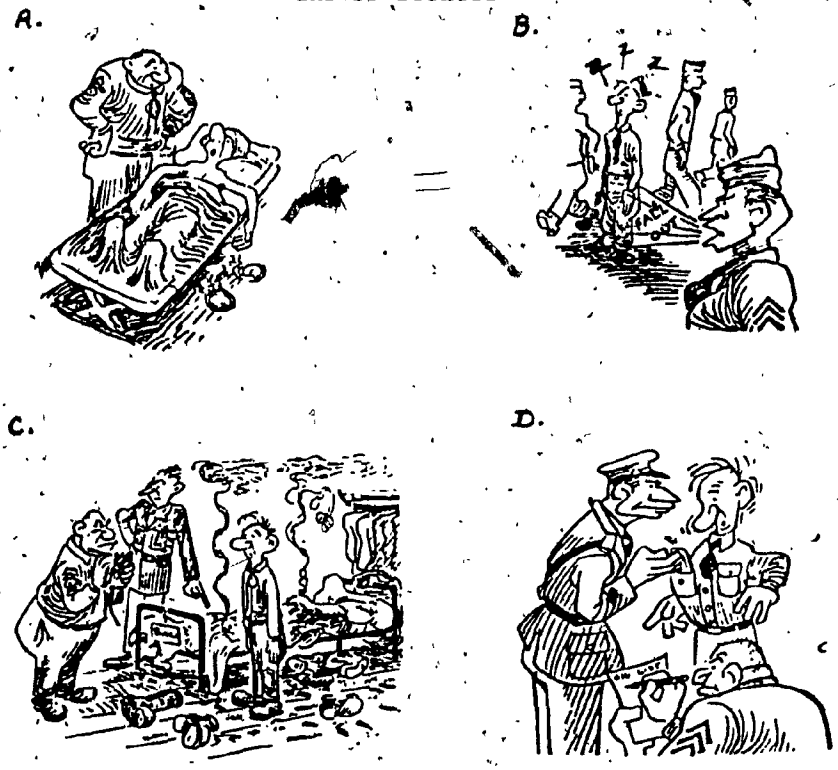
Section 2

Instructions (translated)

In this section there are ten questions. For each question you will see four pictures in your booklet. You will have ten seconds to look at the pictures, and then you will hear a passage on the cassette. You are asked to choose the picture which corresponds the best to the passage. To indicate your answer, put an X beside the letter, A B C or D, which appears above the picture you have chosen.

Sample item

answer booklet



oral text

Private Jones was put on charge this morning. It wasn't because of his inspection. His room was clean and there was nothing wrong with his uniform. But he was very tired and he fell asleep during the parade.

Presentational details

There was a ten-second pause on the tape between the announcement of the item number and the start of the text. This time was to be used for studying the pictures. At the end of the text,

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Pictures were taken from George Baker, 1978, Best of the Original Sad Sack (Boston: Sad Sack Inc.).

approximately twelve seconds were left for responding. Item texts ranged from 7 to 17 seconds in length. The mean was 13 seconds.

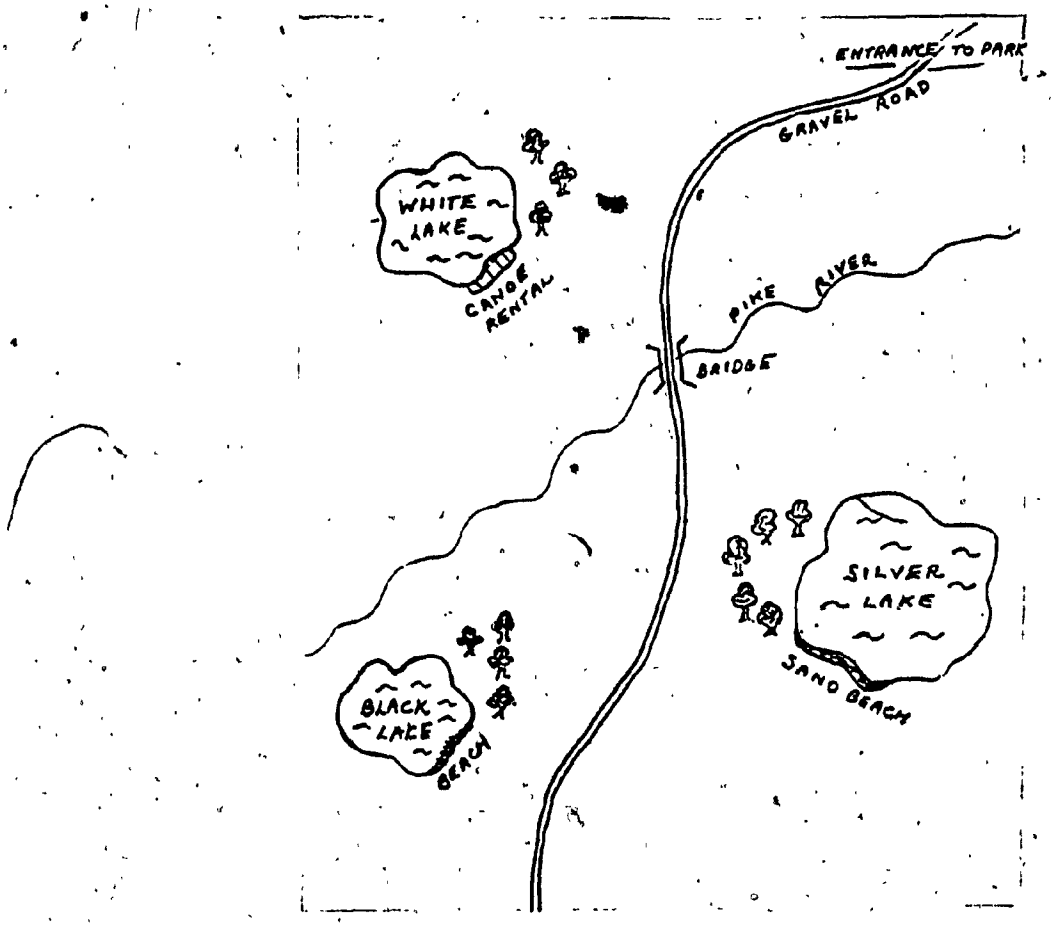
Section 3

Instructions (translated)

In this section there are five questions and each has two answers. For each question you will see a picture in your booklet. You will have ten seconds to look at the picture, and then you will hear a story on the cassette. At two points during the presentation of the story, you will hear a number, 1 or 2, and following that, an instruction telling you to place the number on the part of the picture that has just been described. In order not to make a mistake in placing the number, you will have to listen carefully to the instruction.

Sample item

answer booklet



oral text

Mount Orford Park is a beautiful spot for camping. After you get to the entrance, you should go to the largest lake in the park. You can set up your tent in among the trees near that lake .... number 1 - put 1 in the place for the tent .... There you are. close to the best swimming area. If you like to fish, the lake is not a good place to do it. Fishing is better along the river just east of the bridge .... number 2 - put 2 in the place for fishing ....

Presentational details

A ten-second pause was left on the tape between the announcement of the item number and the start of the text so that subjects might preview the accompanying visual. The numbers and instructions were read by a voice other than that of the story presenter so as to make a sharp distinction between them and the story text itself. Following each instruction there was a five-second pause on the tape before the story resumed. During this time subjects were expected to place the number in question on the picture (or diagram). The total text length per item (i.e. story plus instructions) ranged from 30 to 42 seconds. The mean length was 34 seconds.

Section 4

Instructions (translated)

In this section there are no pictures. You will hear five short dialogues. Before each dialogue is presented, a question about the dialogue will be asked. After listening to the dialogue, you are to answer the question. You will see the question in your booklet. Write the answer in French in the space following the question.

Sample item

answer booklet

Où est-ce que la scène se passe?
La scène se passe .....

dialogue

Où est-ce que la scène se passe dans le dialogue suivant?

A: Would you like to take the plane, sir?

B: No thanks. I think I'll take the train. It's cheaper.

A: Do you want me to put it in a box for you?

B: Yes please, and could you gift-wrap it? It's my son's birthday to-day. I want to give it to him when I get home.

Presentational details

Prior to the presentation of each dialogue, the question to be answered was stated on the tape in French. At the end of each dialogue, fifteen seconds were allowed for the writing of a response. Dialogue length varied from 10 to 24 seconds. The mean length was 15 seconds.

Instruments For Measuring Other Variables

Intelligence Test

The Standard Progressive Matrices, Sets A B C D and E (Raven, 1960) was the instrument used to measure intelligence. The reasons for the choice of a non-verbal test have been stated previously (page 40).

Interview Questionnaire

Information pertaining to a) years of schooling and b) amount of previous L_2 exposure was obtained by means of an interview for which a written questionnaire served as the basis. The language used in the

interview (also in the questionnaire) was French. Questions were designed in such a way as to make it possible to establish for each subject:

1. a general educational level stated in terms of last grade completed
2. the amount of informal contact with English: a) in the home, b) in the community, c) at work, and d) through the media
3. the amount of formal instruction in English received - in terms of years for ESL instruction at public schools, and in terms of hours for other courses.

A few questions were included for the purpose of collecting other information as well: military trade assignment, level of terminal proficiency in English required and personal motivation level. A copy of the questionnaire ("Questionnaire sur les Contacts Linguistiques") appears in Appendix A.

Procedure

Selection of Subjects

English language training at St.Jean is of a continuous nature with instruction being carried on throughout the year without interruption. Each week new students arrive while others depart, having attained the level of terminal proficiency required for their particular military assignment. The subjects used in the investigation were chosen from among the students (approximately 400) who entered the language school over a period of six months extending

from August 8, 1983 to January 30, 1984. The selection process was rather lengthy in terms of both the time span over which it was completed and the number of steps it entailed.

1. The process began with the identification of potential subjects (older and younger) using weekly admission lists bearing the names, assigned trades and initial DND test scores of all incoming students. Every week from August 1, 1983 until January 23, 1984, the admission list for the following week was scrutinized, and all male privates and NCO's who, judging from their entrance scores, appeared to have little proficiency in English were identified as potential subject candidates.
2. During week one of their language training, these potential subjects were given the listening comprehension test which had been developed. Then, all those who had obtained a score of more than 17 (out of 34) were eliminated from the group.
3. Those who remained as subject candidates underwent the questionnaire-based interview. Following this, further eliminations were made. Anyone reporting some informal exposure to English or more than high school education was screened out. This was done in order to make it possible to control exposure and educational variables.

The above three steps were repeated almost every week during the six-month period. A total of 131 people were identified in step 1; 36 were NCO's and 95 were privates. All of the privates had a level 0 or +0 in listening. In the case of NCO's, as there were far fewer

of them entering the school, in order to find a large enough group, it became necessary to identify, along with the level 0's and +0's, those who had a -1 or a 1. With the application of steps 2 and 3, the number of potential subjects was reduced from 131 to 98 (22 NCO's and 76 privates). More details concerning the reduction process and elimination criteria can be found in the next sections.

Initial Administration of Listening Test (Pretest)

As has been indicated above, the listening test was administered to all those designated as potential subjects on the basis of DND entrance scores in listening. Testing took place on day three of the identified subjects' first week at the language school.

The administration procedure was as follows. Subjects were tested in a classroom in groups of no more than ten. The researcher first explained to the group in their native language that she was conducting a study for a Montreal university, and that they had been chosen to participate. In her study she would be looking at progress made by St. Jean students in listening comprehension over a period of time. The results of any tests used in the study would in no way affect the course of language training for any participating student. Subjects were then informed that they were going to take a listening test, the purpose of which was to determine their initial level of proficiency in listening. Following these explanations, test booklets were distributed, and each person was asked to write on the first page his name, rank, social insurance number and age. Immediately thereafter, the test was begun. Total administration time was approximately 40 minutes.

Tests were later scored out of 34 (see page 55 for details), and each subject's responses were recorded on a score sheet (a copy is included in Appendix B). The total number of correct responses for each section was noted on the score sheet along with the total test score.

Then, as the research design called for the use of subjects with limited initial proficiency in listening, all individuals whose scores could not be considered low were eliminated from the potential subject group. This resulted in the elimination of 18 people (12 NCO's and 6 privates) who had scored above 17 on the listening test.

Interviews Based on the Questionnaire

The 113 potential subjects with scores of 17 or below on the listening test were interviewed individually by the researcher. It was explained that certain information was required, information pertaining to previous schooling and contact with English. The researcher then proceeded to read the questions as they were presented in the questionnaire and to note the responses given. When any clarification or explanation was requested by the interviewee, it was provided. The entire procedure was conducted in French and took approximately ten to fifteen minutes.

The questionnaire-based interview had been designed primarily as a tool for controlling two variables: education and previous exposure to English. Following the interview anyone who had reported any schooling beyond the high school level was eliminated. This was done because only younger people could be expected to have had any education beyond high school, and there was no point in retaining those

who fit into that category since they could not be matched to older subjects. Eliminated from the study were five privates who had attended junior college (referred to as CEGEP in Quebec - collège d'enseignement général et professionnel).

With respect to the exposure variable, only people who reported little or no informal exposure to English were retained. Everyone was expected to have had a certain amount of formal exposure through ESL courses at school. By placing a limit on informal exposure, the researcher was attempting a) to equalize the exposure variable in as much as possible for all subjects eventually selected and b) to ensure that all subjects, whether younger or older, had only had limited previous opportunity to learn English. Thus, the following eliminations were made:

1. those who had reported an anglophone parent (1 private)
2. those who had lived in an English milieu (7 privates and 2 corporals)

Those retained as potential subjects could be described as follows:

1. They had never used English at home.
2. They had never lived in an English-speaking community.
3. They had never worked in an organization where English was the language used.
4. Their exposure to English had come through formal instruction and/or the media (i.e. radio and television).

Administration of the Raven Test

The Raven Standard Progressive Matrices was administered to all subject candidates (i.e. 98) who had not been screened out after the

listening test and the interview. This was done during the subjects' second week of language training. The test was given as a group test with no imposed time limit. No more than ten people were tested in any given session. The administrative procedures used complied with the instructions outlined in the test guide.

At the beginning of testing sessions it was explained to subjects that the test which they were being asked to take would assess their capacity for observation and their ability to think logically. They were told that they could work at their own pace; there was no time limit. It was impressed upon them that the results of the test were important for the researcher's study, and that they should put forth their best effort.

Test booklets and response sheets were then distributed. After filling out their name and age on the response sheet, subjects were instructed to turn to the first page of the test booklet. The first problem was explained in French, and subjects were asked to mark the response on their answer sheets in the appropriate place. A check was done in order to make sure that all had complied with this directive. Following this, subjects were informed that all the problems in the booklet involved a similar procedure. They could expect to find the problems at the beginning very easy. As they worked through the test, the problems would become progressively more difficult. Subjects were then told to begin the test.

The time taken to complete the test varied from 19 to 45 minutes depending on the individual. The completed tests were scored. Both raw scores and percentile ranks based on the age norms established by Raven were recorded for each subject (See also Chapter IV, pages 79

and 82).

Subject Matching

The number of potential subjects was, at this point, 98 and they ranged in age from 17 to 42. It now remained for the researcher to create from this pool of subjects two groups, one older and one younger, which were matched on the following variables: initial proficiency in listening, educational level, IQ and amount of ESL. In order to create these two groups, it was decided to take, as older subjects, all individuals in the pool who were 25 years of age or older - there were 25 such individuals - and to match each of them, if possible, with someone who was 22 years of age or younger. The matched pairs of older and younger people would constitute the ultimate experimental subjects.

It was quite conceivable, however, that some subjects might be lost during the twelve-week training period that preceded posttesting. For this reason it was felt that it would be better to delay any matching until after posttesting. This did, in fact, prove to be a wise decision. The subject mortality rate was even greater than anticipated. A total of 22 potential subjects were lost. The circumstances surrounding these loses were as follows. Ten privates, all younger group candidates, were transferred to Canadian Forces Base Borden in Ontario where they continued English language training. Five privates, one older group candidate and four younger group candidates, were withdrawn from language training and sent to trade school at the request of National Defence Headquarters. Four young privates were granted releases from the Canadian Forces. One young corporal was

hospitalized. One corporal in the older group was recalled to his unit. Finally, one forty-two-year-old sergeant was returned to his unit at the request of the language school staff because he had failed to make any visible progress after eight weeks in St. Jean.

Second Administration of Listening Test (Posttest)

Of the 76 potential subjects who were still at the language school after having undergone twelve weeks of English instruction, all but 5 (i.e. 71) were posttested. They took the test on the first, second or third day of week thirteen. Five people who had been eliminated because they had attended junior college (CEGEP) were also tested in order to provide comparison data.

The testing procedure adopted differed in two respects from that used in pretesting. Firstly, subjects were tested individually by the researcher. Secondly, during the test they were asked to indicate, after each response choice, how certain they were of their choice. They did this by placing a check mark beside one of three possibilities ("sure", "not sure", "no idea") which were written on the answer page.

Once a subject had completed the test, all items were reviewed with him. This discussion was conducted in French. Each item was replayed, and the subject was asked to indicate, in French, what he had comprehended and to justify his response choice. He was also asked to describe the procedure he had used in each section - that is, listening and/or responding procedures. This was done in an attempt to determine:

1. how much was comprehended in individual items
2. whether any responses were a) correct by chance or b) correct but not for the right reason or c) incorrect.

but for a reason other than text miscomprehension.

3. what listening and/or responding strategies were being used.

It was felt that this qualitative data might complement the quantitative data (i.e. test scores).

The review of the test proceeded in the following manner. The four descriptions for items in section 1 were replayed. After each description the tape was stopped, and the subject was asked to state what he had comprehended, and why he had or had not considered it appropriate for the picture. Each text in section 2 was replayed. After hearing the text, the subject reported it as he had comprehended it and explained his choice of picture. In section 3 the tape was replayed, and at each pause the subject was asked to account for his number placement. In section 4, after each dialogue was replayed, he was requested to indicate what had been comprehended in the dialogue, and what had induced him to respond as he did. In addition to the above, subjects were also asked to describe, if possible, the techniques or procedures they had used in each section for listening to the texts or for deciding upon a response.

The entire posttesting procedure (i.e. test administration plus subsequent discussion) took from 70 to 90 minutes per subject depending upon the subject's level of ability; the better the subject's ability, the less time it took. All comments made by subjects during the test-review discussion were noted by the researcher.

Immediately after each posttest session, the researcher completed a posttest record sheet for the subject. His responses to all test items were recorded on the sheet along with the total number correct

in each section and the total test score. The degree of certainty was noted beside each response using a scale of 0 to 2 (0 where the subject had no idea, 1 where he was not sure and 2 where he was sure of his response). If any response had apparently been right by chance or right for the wrong reason, it was noted. A notation was also placed beside any responses which were incorrect but for reasons other than text miscomprehension (i.e. difficulty interpreting pictures). On the reverse side of the sheet, comments were made pertaining to the subject's demonstrated extent of comprehension of texts in each section, his ability to handle the task in each section, specific difficulties experienced in each section and any listening or responding strategies used.

CHAPTER IV

ANALYSIS OF DATA

Introduction

The analysis of the data obtained in this study included the following:

1. the calculation of pretest mean scores, posttest mean scores and mean gains for groups tested
2. the determination of pretest and posttest reliability
3. the establishment of mean values for older and younger subjects on the variables of age, IQ, education and ESL
4. a comparison of mean gains made by older and younger subjects in two samples of matched pairs - gains shown in a) the posttest and b) the DND listening test after twelve weeks - and the use of t-tests to determine the significance of the difference between the two group means
5. the computation of correlations a) between posttest scores and DND test scores after week twelve and b) between posttest gain scores and DND test gain scores
6. the use of stepwise regression to determine which of the variables (i.e. age, IQ, education, ESL, pretest score) were the best predictors of posttest score.

Pretest Data

The listening test developed was administered as a pretest to a total of 131 potential subjects. Of these 131 people, 95 fell into the younger age-group category (i.e. below age 25) and 36, into the older age-group category (i.e. age 25 and over). Initial DND test scores for the younger subject candidates ranged from 0 to +0; there were 78 instances of a level 0 score and 17 of a +0. As for the potential older subjects, the range was from 0 to 1 with the following breakdown: 18 had a level 0; 1 had a +0; 3 had a -1; 14 had a level 1 score.

With the eliminations that followed pretesting, the number of potential subjects was reduced to 98 (73 older and 25 younger). Of these, only 71 underwent posttesting; 22 were lost from the group during the twelve-week training period and another 5 were not post-tested due to timing difficulties. The older-younger division among the 71 subjects was as follows: 50 fell into the younger group and 21, into the older group.

Pretest mean scores and standard deviations for a) all potential subjects tested and b) various subgroups among them are shown in Table 1 on the next page. Pretest scores and DND entrance levels for all 131 potential subjects are listed in Appendix C, pages 129-133.

Pretest reliability, as computed using the formula KR-21, was .69. This was about what could be expected given the number of items (34) and the fact that many subjects, having little proficiency in English, had no doubt responded randomly in items. To increase reliability to the .80 level or above, approximately 80 items would be required (Ebel, 1972).

TABLE 1

Descriptive Statistics for Pretest

Group	No. in Group	Mean Score	Standard Deviation
1. All Potential Subjects Tested	131	12.75	4.45
a) All Potential Younger Subjects	95	11.78	3.78
b) All Potential Older Subjects	36	15.30	5.03
2. Potential Subjects not Eliminated	98	11.31	2.85
a) Younger Subjects not Eliminated	73	10.83	2.91
b) Older Subjects not Eliminated	25	12.68	2.85
3. All Subjects Who Reached Posttesting	71	11.28	3.04
a) Younger Subjects Posttested	50	10.80	2.95
b) Older Subjects Posttested	21	12.43	2.95

Posttest Data

As stated previously, the listening comprehension test developed for the purpose of this study was administered a second time - as a posttest - to 71 subjects after they had completed twelve weeks of language training. Table 2 below shows the mean posttest scores and standard deviations for a) the entire group tested, b) the 50 younger subjects and c) the 21 older subjects.

TABLE 2

Descriptive Statistics for Posttest

	No. in Group	Mean Score	Standard Deviation
Entire Group	71	18.90	4.76
Younger Subjects	50	19.76	4.85
Older Subjects	21	16.86	3.86

Posttest reliability computed using KR-21 was .74.

Data pertaining to the variables of age, IQ, education and previous instruction in English (ESL) are presented in Table 3 below. Amount of education is expressed in terms of years of schooling completed. Amount of ESL is based primarily upon the number of years English was studied at school. In cases where subjects had undergone other types of language training (i.e. intensive courses, private tutoring, night school courses, etc.), it was decided that 60 hours of such instruction would be equivalent to one year of school ESL since, according to subjects' reports, in elementary grades (4, 5 and 6) the total time devoted to English per year was roughly 60 hours (1½ to 2 hours a week).

TABLE 3

Descriptive Statistics for Age, IQ, Education and ESL Variables for Suject Groups Posttested

Variable		All Subjects n = 71	Younger Subjects n = 50	Older Subjects n = 21
Age	Range	17-41	17-24	25-41
	Mean	22.76	19.88	29.62
	SD	5.68	2.03	5.57
IQ	Range	37-58	38-58	37-57
	Mean	50.77	51.28	49.57
	SD	4.50	3.97	5.30
Education (years)	Range	7-11	7-11	7-11
	Mean	10.18	10.34	9.81
	SD	1.03	.97	1.01
ESL (years)	Range	0-10	0-9	0-10
	Mean	5.11	5.10	5.14
	SD	2.09	1.87	2.51

Individual data for the 71 subjects appear in Appendix C, pages 134-136.

Data On Gains Made Over Twelve Weeks

The gains made by subjects over the twelve weeks of language training were calculated by subtracting pretest scores from posttest scores. Table 4 shows gains for a) the entire group posttested, b) the younger subjects and c) the older subjects.

TABLE 4

Descriptive Statistics for Gains on Posttest

Group	No. in Group	Mean Gain	Standard Deviation
Entire Group	71	7.65	4.31
Younger Subjects	50	8.98	4.11
Older Subjects	21	4.48	2.90

Matched Pairs Data: Sample One

The primary objective of the study was to compare the gains made by older and younger subjects who were matched on all variables but age. In order to do this, a sample of 18 matched pairs was created from among the pool of 71 subjects posttested. Older subjects (i.e. 25 years of age or over) were matched as closely as possible with younger subjects (i.e. 22 years of age or less) on the following variables: pretest score, IQ, years of education and years of ESL instruction. Paired individuals differed by no more than one point in pretest score; in eight cases the pretest score was identical. The IQ percentiles for

both members of a pair were the same. In order to determine IQ percentiles, all raw scores, regardless of the subject's age, were converted to percentile scores using the norms established by Raven for 20-to-25-year-olds. As this procedure may be questionable, another procedure was adopted in a second sample of matched pairs.

With respect to educational and ESL variables, it was more difficult to match subjects as closely as on the two preceding variables. In six cases the individuals paired had the same number of years of schooling, but in nine cases there was a one-year difference, and in three there was a two-year difference. Matching subjects closely on the amount of ESL was even more difficult. Problems encountered in this area will be discussed in the following chapter. It will suffice to say at this point that both members of a pair had received some previous ESL instruction, though in only six cases was the number of years exactly the same. The differences, however, favoured neither older nor younger subjects as the totals were very similar.

Age and Matching Variables

Data pertaining to age, IQ, education, ESL and pretest means for the eighteen matched pairs of older and younger subjects are presented in Table 5 below.

TABLE 5

Age, Pretest, IQ, Years of Education and Years of ESL Variables for Matched Pairs: Sample 1

Variable		Older Subjects	Younger Subjects
Age	Range	25-40	18-22
	Mean	29.22	19.67
	SD	5.27	1.45
Pretest	Range	5-16	5-17
	Mean	11.89	11.89
	SD	2.83	2.88
IQ	Range	38-57	37-58
	Mean	50.67	50.94
	SD	4.78	4.82
Education (years)	Range	9-11	9-11
	Mean	9.89	10.61
	SD	.81	.59
ESL (years)	Range	1-9	2-7
	Mean	5.11	5.28
	SD	2.13	1.44

Data for individuals may be found in Appendix C, pages 137-138.

Posttest and Gain Scores

Posttest and gain means for the 18 matched pairs in Sample 1 appear in Table 6 below.

TABLE 6

Pretest, Posttest and Gain Statistics for Older and Younger Subjects in Matched Pairs: Sample 1

Variable		Older Subjects	Younger Subjects
Pretest	Range	5-16	5-17
	Mean	11.89	11.89
	SD	2.83	2.88
Posttest	Range	11-24	13-27
	Mean	16.39	21.78
	SD	3.96	3.90
Gain	Range	-1 to +9	+4 to +14
	Mean	4.50	9.89
	SD	2.99	3.18

Scores for individual subjects are indicated in Appendix C, pages 137-138.

Significance of Difference in Mean Gains

The mean gain made by younger subjects (9.89) exceeded that made by older subjects (4.50). In order to determine whether the difference was significant, a t-test for matched pairs was performed. The results indicated that the difference was highly significant (t-ratio = 5.17; $p < .0005$).

Data for Matched Pairs: Sample Two

In matching subjects in Sample 1, raw IQ scores were converted to percentile ranks using the norms established by Raven for ages 20 to 25. This procedure may be rather questionable since the Raven tables

show slightly different raw score ranges for percentile ranks as age increases (e.g. raw score range for the 95th percentile is 55 to 60 for ages 20 to 25 but is 52 to 60 for age 40). Thus, it was decided to create a second sample of matched pairs taking age norms into consideration when converting raw IQ scores to percentile ranks. Data for this sample are presented in Table 7 below.

TABLE 7

Age, IQ, Years of Education and ESL, Pretest, Posttest and Gain Statistics for Older and Younger Subjects in Matched Pairs: Sample 2

Variable		Older Subjects	Younger Subjects
Age	Range	25-40	17-24
	Mean	29.22	19.83
	SD	5.27	1.92
Pretest	Range	5-16	5-17
	Mean	11.89	11.83
	SD	2.82	3.02
IQ	Range	38-57	46-57
	Mean	50.67	52.11
	SD	4.78	3.54
Education (years)	Range	9-11	8-11
	Mean	9.89	10.28
	SD	.81	.87
ESL (years)	Range	1-9	3-7
	Mean	5.17	5.0
	SD	1.99	1.25
Posttest	Range	11-24	13-27
	Mean	16.39	22.11
	SD	3.96	4.04
Gain	Range	-1 to +9	+3 to +20
	Mean	4.50	10.28
	SD	2.99	3.997

This second sample of matched pairs included 13 of the pairs used in Sample 1 along with 5 new pairs. The difference between mean gains made by older and younger subjects (i.e. 4.50 for older subjects versus 10.28 for younger subjects) was even greater than it was in Sample 1. A t-test for matched pairs was highly significant (t-ratio = 4.86; $p < .0005$). Data for individuals comprising Matched Pairs Sample 2 appear in Appendix C, pages 139-140.

Data From DND Tests

DND listening test scores a) at entrance and b) after twelve weeks) obtained by the 36 subjects in Matched Pairs Sample 1 were analyzed in order to determine whether younger subjects showed greater gains there as well as on the listening test developed for this study. To facilitate the analysis, the level scores were translated into numerical values using a scale of 1 to 10 (i.e. level 0 = 1, +0 = 2, -1 = 3, 1 = 4, +1 = 5, -2 = 6, 2 = 7, +2 = 8, -3 = 9, and 3 = 10). Gain scores were calculated by subtracting entrance scores (test #1) from scores after twelve weeks of language training (test #2). The data are shown in Table 8 below.

TABLE 8

DND Test Statistics for Older and Younger Subjects in Matched Pairs 1: Test #1, Test #2 and Gains

Subject Group	Test # 1		Test # 2		Gain	
	Mean	SD	Mean	SD	Mean	SD
Older Subjects	1.78	1.18	5.61	1.60	3.83	1.57
Younger Subjects	1.05	.23	6.28	1.24	5.22	1.22

Here also, the mean gain shown by younger subjects (5.22) exceeded the mean gain shown by older subjects (3.83). A t-test indicated that the difference between means was highly significant (t-ratio = 3.828; $p < .005$), though not quite to the same degree as was the difference between the mean gain scores in the case of the researcher's listening test.

Complete data for individual subjects (i.e. all 36) can be found in Appendix C, pages 141-142.

Correlational Data

Pearson product-moment correlations were computed between a) posttest scores (on the listening test developed for this study) and DND test scores after 12 weeks of language training for all subjects who had taken both tests, b) posttest scores and DND test scores after 12 weeks for subjects comprising Matched Pairs Sample 1, and c) gains shown in the posttest and gains shown in the DND test for subjects in Matched Pairs Sample 1. The following is a summary of the correlational results:

1. Posttest scores and DND test scores after 12 weeks:
   $n = 69$
   $r = .545 \quad (p < .01)$

2. Posttest scores and DND test scores for subjects in Matched Pairs Sample 1:
   $n = 36$
   $r = .539 \quad (p < .01)$

3. Posttest gain scores and DND test gain scores for subjects in Matched Pairs Sample 1:
   $n = 36$
   $r = .394 \quad (p < .05)$

Stepwise Regression Data

Stepwise regression was performed in order to assess the relationship between posttest scores and other variables in addition to age (i.e. IQ, education, ESL and pretest score). The analysis was done by computer. Three data samples were entered: Sample #1 comprising the 36 subjects in Matched Pairs Sample 1; Sample #2, the 36 subjects in Matched Pairs Sample 2 and Sample #3, all 71 subjects who were post-tested. The regression results appear below.

Analysis of Variance

Tables 9, 10 and 11 show for each sample, the results of an analysis of variance with the effects of all variables present.

TABLE 9

Analysis of Variance with Effects of All Variables Present : Sample #1 (n = 36)

Variable	Partial Correlation With Posttest	F
Age	-.453	8.80 *
IQ	.251	2.28
Education	.361	5.10
ESL	.248	2.22
Pretest	.517	12.43 *

* $p < .01$

TABLE 10

Analysis of Variance with Effects of All Variables Present: Sample #2 (n = 36)

Variable	Partial Correlation with Posttest	F
Age	-.480	10.18 *
IQ	.269	2.66
Education	.204	1.49
ESL	.244	2.15
Pretest	.415	7.07 *

* $p < .01$

TABLE 11

Analysis of Variance with Effects of All Variables Present: Sample #3 (n = 71)

Variable	Partial Correlation with Posttest	F
Age	-.211	3.22
IQ	.233	3.96
Education	.214	3.32
ESL	.226	3.70
Pretest	.457	18.23 *

* $p < .01$

Regression Analysis

In Sample #1, pretest score was shown to have the greatest effect upon posttest score (see Table 9); thus, it was the first variable entered into the regression. With the effects of pretest removed at step one, the age variable continued to show a significant effect (i.e. partial correlation = -.487; F = 10.25), and so it was entered

next. At step two the variables in the equation were age and pretest, as is shown in the table below.

TABLE 12

Stepwise Regression Analysis for Posttest
Sample #1

Variable	Coefficient	F
Age	-.324	10.25 *
Pretest	.812	13.92 *

* $p < .01$

Equation: $\hat{x} = 17.35 + .812$ pretest $- .324$ age
$R^2 = .44$

The next partial correlation was of IQ (.213) but, as it was not significant, it was not entered. The other two variables, education and ESL, showed even less effect than IQ (i.e. partial correlations were .061 and -.009 respectively) once the effects of pretest and age were removed.

In Sample #2, age showed the greatest effect (see Table 10); thus, it was entered first. With age removed at step one, the pretest variable had the highest partial correlation with posttest score (i.e. .448; F = 8.27) and was therefore entered next. At step two the variables in the regression equation were age and pretest as indicated below.

TABLE 13

Stepwise Regression Analysis for Posttest
Sample #2

Variable	Coefficient	F
Age	-.370	11.39 *
Pretest	.662	8.27 *

* $p < .01$

Equation: $\hat{x} = 20.45 + .663$ pretest $- .370$ age
$R^2 = .38$

As in the previous sample, the next partial correlation was of IQ, but it was too small (i.e. .167) to be entered. Education and ESL variables showed little effect at that point; the partial correlations were -.091 and .052 respectively.

In Sample #3, pretest showed the greatest effect (see Table 11) and was the first to be entered into regression. With the effects of that variable removed, age had the highest partial correlation with pretest score (i.e. -.353; F = 9.69), and it was entered next. At step two the variables in the equation were age and pretest as shown below.

TABLE 14

Stepwise Regression Analysis for Posttest
Sample #3

Variable	Coefficient	F
Age	-.271	9.67*
Pretest	.821	25.82*

* $p < .01$

Equation: $\hat{x} = 15.81 + .821$ pretest $- .271$ age
$R^2 = .31$

The next partial correlation was of IQ (.196) which was again not significant and therefore not entered. Education and ESL variables showed almost no effect with pretest and age removed; partial correlations were .049 and .062 respectively.

In summary, for the three samples the regression coefficients were as follows: in Sample #1, .812 for pretest and -.324 for age; in Sample #2, .662 for pretest and -.390 for age; in Sample #3, .821 for pretest and -.271 for age. These coefficients are for predicting posttest scores based on actual score. However, the relative importance of the predictors is given by standardized coefficients, and for the three samples they are for pretest and age respectively:

Sample #1:	.487	and	-.418
Sample #2:	.393	and	-.461
Sample #3:	.524	and	-.321

Thus, in the first two samples there was not a great deal of difference between the two predictors. In Sample #3 there was a larger difference with pretest outranking age. In this sample, however, the age distribution was more skewed (skewness = 1.5990) than it was in Sample #1 (skewness = 1.0554) or in Sample #2 (skewness = 1.0019). This fact may also explain why R^2 was smaller in Sample #3 (R^2 = .31) than it was in Sample #1 (R^2 = .44) or in Sample #2 (R^2 = .38).

CHAPTER V

DISCUSSION OF RESULTS

Age and L_2 Achievement

It was hypothesized that older subjects would differ from younger subjects with respect to rate of progress in listening comprehension over the twelve-week time period under investigation, and that the difference would favour the younger group. It had been predicted that the gains reflected by pretest-posttest score differences would be greater for younger subjects than for older subjects.

This hypothesis and the prediction based upon it were confirmed by the mean gain results for the two samples of matched pairs where older and younger subjects were matched on all variables (i.e. pretest score, IQ, education and ESL) but age. In both samples the mean gain (i.e. posttest score minus pretest score) made by the 18 younger subjects exceeded that made by the 18 older subjects, and the difference between the two means was highly significant ($p < .0005$).

Analysis of the two sets of DND aural comprehension test scores (i.e. entrance scores and scores obtained after twelve weeks of language training) for the 36 subjects in Matched Pairs Sample 1 served to corroborate the above finding. Here again, the mean gain score (i.e. test #2 score minus test #1 score) for the 18 younger subjects was greater than that for the 18 older subjects. This difference was also highly significant ($p < .005$), though not quite to the same degree as it was in the case of the other listening test.

The two listening tests were correlated. Significant positive correlations were found a) between posttest scores and DND test scores after 12 weeks (i.e. $r = .54$; $p < .01$) and b) between posttest gain scores and DND test gain scores for subjects in Matched Pairs Sample 1 (i.e. $r = .39$; $p < .05$).

The size of the correlations obtained was about what could be expected given the differences between the two tests. Although both tests purport to measure listening comprehension, neither measures listening comprehension alone; nor do they measure the same type of comprehension. Firstly, the DND test assesses L_2 reading ability as well as listening since most items require testees to respond by choosing one of four possibilities presented in writing. The researcher's test, on the other hand, does not activate L_2 skills other than listening as it is based on pictures. Performance is, however, dependent to a certain extent upon picture interpretation ability and ability to process auditory and visual information simultaneously, skills which do not really come into play in the DND test. Secondly, the DND test taps sentence-level comprehension mainly; most items consist of single sentences or, at times, pairs of sentences. In contrast, the researcher's test was designed to assess discourse-level comprehension and incorporates items which consist of several connected utterances. Thirdly, the two tests differ in format. While the DND test uses only items of the multiple-choice variety, the researcher's test combines multiple-choice with other item types.

Finally, the results produced by the stepwise regression analysis further confirmed the relationship between age and L_2 listening achieve-

ment found in the analyses of matched-pair gains. In all three samples analyzed, age and pretest score were shown to have a strong effect upon posttest score. There was a significant positive partial correlation between pretest score and posttest score and a significant negative correlation between age and posttest score. While standardized regression coefficients indicated that pretest was the more important predictor of posttest score in two samples (i.e. #1 and #3), in one of those samples - Sample #1 - age was not far behind (i.e. coefficient for pretest = .487; coefficient for age = -.418). In the other - Sample #3 - there was a larger margin of difference between the two predictors (i.e. coefficient for pretest = .524; coefficient for age = -.321). The fact that the age distribution was skewed to a greater extent in this sample might account for this result. Sample #3 included 71 subjects, 50 of whom fell into the younger age category, and the mean age was 22.76. In contrast, Sample #1 comprised 36 subjects, 18 of whom were younger and 18 of whom were older; the mean age was 24.44.

In the one other sample analyzed - Sample #2, which, like Sample #1, was comprised of an equal number of younger and older subjects - age was shown to be a more important predictor than pretest, but the difference between the two was not great (i.e. coefficient for age = -.461; coefficient for pretest = .393).

In summary, the above findings appear to suggest that, with the adult learner, there is a significant relationship between learner age and achievement in aural comprehension. The older the learner, the less the achievement tends to be, given the same time span and similar learning conditions - that is, formal instruction based on

the same syllabus five hours a day for a period of twelve weeks.

IQ and L_2 Achievement

As was pointed out in the previous chapter, a problem arose in connection with the matching of subjects on the IQ variable. It was decided to convert raw scores on the Raven test to percentile ranks and to match subjects with the same percentile rank. There was some question, however, as to what norms should be applied in the conversion. The Raven tables show somewhat different conversion norms for different age ranges since research with the test showed that scores tended to decrease with increasing age. This was mentioned in Chapter II where literature on intelligence was reviewed. So it was debatable as to whether the same norms should be used for all subjects, regardless of age, in the conversion of raw scores to percentile scores (for example, a raw score of 44 converts to a 50th percentile rank in all cases), or whether age should be taken into account and different norms applied for different ages (i.e. a raw score of 38 becomes a 50th percentile rank for a 40-year-old but a 25th percentile rank for a 20-year-old).

The problem was finally resolved by matching subjects on IQ percentiles as determined by both procedures. This, of course, produced two slightly different samples of matched pairs, both of which yielded more or less the same result in subsequent analyses. In both cases age was shown to affect gain scores negatively.

When stepwise regression was performed with three samples, one of which, as previously indicated, consisted of data from all 71 subjects posttested, the raw scores obtained on the Raven test were used. In

none of the samples was the IQ variable found to have any significant effect upon posttest score. This would suggest there is little relationship between non-verbal IQ and L_2 achievement in listening; hence, non-verbal IQ is not a good predictor of success in acquiring L_2 aural comprehension skills.

Education and L_2 Achievement

In this study attempts were made to control for the amount of education by eliminating from the subject pool any individuals who had reported more than high school education. None of the 71 experimental subjects posttested had more than eleven years of schooling. There were some differences in the group; the range was from grade 7 education to grade 11. These differences, however, all lay within the high school level of education, and they may not have been very substantial since most subjects reported either nine, ten or eleven years of schooling.

In stepwise regression the education variable was not shown to be a significant predictor of posttest score. Once the effects of age were removed, amount of schooling showed very little effect. This suggests that, in the present study, education did not have much relationship with gains made in listening comprehension.

This finding alleviates, to a certain extent, the concerns expressed earlier (page 79) over difficulties encountered in matching older and younger subjects closely on the educational variable. It does much to enhance confidence in the matched-pair samples used and in the age result obtained from them.

The finding concerning education should be treated cautiously, however, since the study deals with a limited educational range. Although the posttest was administered to some subjects who had been eliminated from the experimental group as they had attended junior college, the results were not analyzed as these subjects were too few in number (i.e. five). It is entirely conceivable that, had the educational range in the study been greater (i.e. from grade 7 to university), the findings pertaining to the educational variable might have been different.

ESL and L_2 Achievement

Though none of the subjects who were posttested had ever been exposed to English in an English environment, almost all had received some previous formal instruction in the language. Assessing subjects on this variable was rather problematic. The numerical values used for amount of ESL were based primarily upon the number of years subjects had taken English in school. This, in itself, is a very rough estimate since schools differ as to the quality of instruction, the focus (i.e. whether on oral language or written) and the amount of time provided (i.e. number of hours per week). The problem was compounded by the inability of some subjects to remember exactly when they had begun English at school. Further difficulty arose when certain subjects reported having undergone other types of instruction such as private tutoring, night courses or intensive courses in small groups. It was decided, for reasons outlined in Chapter IV (page 77), that 60 hours of such instruction would constitute the equivalent of one year of ESL at school. In the final analysis, the measure of ESL used in this

study is, at best, a very crude one.

Regression results for all three subject samples showed little effect upon posttest score for the ESL variable. The relatively small effect witnessed in the analysis of variance with all variables present all but disappeared when the effects of pretest were removed. Though amount of ESL appeared to have some relationship with pretest score, it was not shown to have any significant relationship with posttest score when effects of age and pretest score were removed.

The difficulties experienced in matching subjects closely on the ESL variable were discussed in the previous chapter (page 79). Concerns in this area were minimized considerably when regression analysis indicated that amount of ESL was not significantly related to posttest score. Confidence in the age finding produced by the matched-pair samples was increased.

Finally, the finding pertaining to ESL instruction yielded by the regression analysis has to be interpreted carefully, given the difficulties with the measure. It is possible that the measure of ESL used did not adequately reflect actual differences. It is also equally possible that there were no substantial differences among subjects. The quality of previous instruction may have not have been very good, and consequently, more or less of it did not matter much. Also, the teaching may have focused on grammar and vocabulary and/or written skills rather than on aural-oral skills, and therefore, the amount of it was not very important in determining listening achievement outcomes in the present study.

Other Factors and L_2 Achievement

Although age and pretest were shown to be important predictors of gains made, they could only account for a portion of reliable gain. Thus, other factors must have determined, to some extent, achievement made in listening comprehension. It might be fitting now to consider factors other than age which might have influenced aural comprehension performance in this study, some of which appear to be linked with age and some of which appear to operate independently of age.

Factors Linked With Age

One might ask whether any physiologically-based differences could perhaps account in any way for the poorer performance of some subjects, particularly in the older group. Loss of auditory acuity and increased reaction time (or slower response to stimuli), both of which were discussed in the review of the literature, are usually associated with aging. The literature, however, suggests that such physiological changes do not become marked till past age 40. The mean age of the older subjects in the study was 29; only five were over 35 years of age, and the oldest was 41. Thus, given the ages of the older subjects and the fact that none was reported to be suffering from any physical handicap, it is doubtful whether any physiological differences between older and younger subjects could have played a very important role.

Also related to age, is time away from school. It is fairly obvious that for the older subjects the time interval between language training in St.Jean and regular school attendance was considerably greater than it was for younger subjects. A survey conducted among the older subjects, however, revealed that all of them had been exposed

to classroom learning situations while in the Armed Forces. Over fifty percent had attended courses in the last three years, courses which had involved daily instruction in a classroom for varying time periods (i.e. from one week up to several months). That notwithstanding, it is still very conceivable that the younger subjects, on the whole, found it easier to adapt to classroom language instruction since their high school experience was more recent. It is also very likely that within both subject groups, younger and older, there were individual differences with respect to ability to cope with the classroom situation.

Aptitude

Aptitude for language learning is one factor that might possibly account for some of the variance in listening achievement. In the study no attempt was made to control for aptitude; in fact, it was not even measured. Some research has revealed that scores on aptitude tests tend to decline with age. Carroll (1963) found a negative, though not significant, correlation between Modern Language Aptitude Test (MLAT) scores and age. Fiks (1966), who used a different test to measure aptitude (the Army Language Aptitude Test), also found that aptitude scores were negatively correlated with age; his correlation was significant. This suggests that aptitude may, to some extent, be related to learner age. Thus, it may account for some of the age-related difference between groups. Older subjects may have shown less improvement in listening because they had less aptitude since they were older. Language aptitude, however, also operates independently

of age. It could well account for some of the individual differences among subjects within age groups.

Motivation

Another factor which may have had some effect upon gains shown in aural comprehension is motivation. All subjects were asked during the course of the interview based on the questionnaire whether their own personal goal was a) working proficiency in English or b) sufficient proficiency for living comfortably in an English environment or c) almost native-like proficiency in the language. Subjects differed to some extent in their response to this question; the vast majority selected b) but a few chose a) and a few, c). Chi Square analysis, however, revealed no significant between-group differences with respect to the response distribution for the three choices. The analysis was performed with three samples: sample #1 comprised the 36 subjects in Matched Pairs 1 (χ^2 = 1.20, df = 2, $p > .50$); sample #2 comprised the 36 subjects in Matched Pairs 2 (χ^2 = 2.326, df = 2, $p > .25$); sample #3 included all 71 subjects posttested (χ^2 = .571, df = 2, $p > .75$).

Similarly, although subjects did not all have the same terminal proficiency requirement in listening (i.e. most required a level 2 but a few needed a level 3), there was no significant between-group difference in the distribution for the two levels. Analysis yielded the following non-significant results (with one degree of freedom) for the three above-mentioned samples respectively: χ^2 = .176, $p > .50$; χ^2 = 0; χ^2 = .070, $p > .75$. Thus, differing personal goals, as

reflected by a),b) and c) above, and differing terminal proficiency requirements do not appear to account in any way for achievement differences between older and younger subjects. They may, however, explain some of the individual variation within age groups.

Another point which could be mentioned in this discussion of motivation relates to learner freedom of choice. The majority of older subjects (all but five) were NCO's, well-established in their military careers, who had requested language training. Some of them had been waiting for a long time (i.e. several years) for an opportunity to study English. In contrast, with only two exceptions, the younger subjects had not elected to come to the language school: They had been sent to the school by administrative authorities as a knowledge of English was deemed necessary for the performance of future duties within the Canadian Forces. Thus; this would lead one to believe that the older subjects enjoyed a motivational (or attitudinal) advantage derived from their having personally opted to study English. As a group they were extremely conscientious and hard-working. Perhaps this had an attenuating effect upon the differences seen between age groups. Had this not been the case, the differences might have been greater.

Miscellaneous Factors

As was indicated in Chapter III (page 71), after each subject had been posttested, the test was replayed, and he was asked to discuss each item stating what he had comprehended and justifying his response. Questions were asked pertaining to working procedures adopted and to listening and responding strategies used. These discussions revealed,

In addition to differences in amount of comprehension, a number of differences which were essentially non-linguistic - some psychological in nature, some related to certain abilities or inabilities and some connected with working procedures adopted.

Firstly, a few subjects admitted that concern over the failure to comprehend a word or phrase early in an item prevented them from comprehending anything afterwards; further auditory processing was blocked. Others, however, did not worry about bits and pieces missed; they concentrated on grasping as much as they could and tried to work with that.

Secondly, some subjects appeared to lack confidence in their listening ability. They became discouraged very easily and, at times, gave up. With some there was a reluctance to make guesses based on what had been comprehended. Occasionally an individual refused to respond at all. A few were very hesitant in making response decisions; they deliberated for a long time. In contrast, others appeared quite confident in their ability. They responded quickly to items. They did not always comprehend completely, but they were willing to make guesses based on partial comprehension.

A third difference related to deductive ability. Some subjects seemed to be able to deduce situations and to arrive at correct responses using the limited clues available to them. Others were less able to make logical deductions on the basis of limited comprehension. Fourthly, a number of subjects experienced difficulty processing auditory and visual(pictures) information simultaneously. For others, this presented no problem. Fifthly, while some subjects appeared to

have used systematic working procedures for handling tasks, others did not. Finally, a few subjects (low scorers) had a tendency to resort to pure invention in order to fill in comprehension gaps. When they had comprehended little in a text, they invented a story or situation and based their response upon that.

While the above-mentioned differences were noted, there was little evidence to suggest that they were age-related. It is likely, however, that factors such as confidence level, deductive ability, willingness to guess and capacity for simultaneous processing in two modes (auditory and visual) had some effect upon gains made by individuals within the two age groups.

Before terminating this discussion of individual differences that came to light in the course of questioning that followed post-testing, it might also be mentioned that large variations in the amount of actual comprehension in items were noted. These differences became apparent when subjects were asked to indicate in French what they had comprehended in each item immediately after hearing the item replayed. Some subjects were able to produce very detailed and accurate reports for most texts. Some were usually able to report the main idea and/or the most important details. There were some, however, who said repeatedly that they had only understood a few words - words which they reported. There were also a few subjects who had a tendency to produce stories that differed quite radically from the oral texts presented. Thus, individuals differed in their comprehension both a) in terms of the number of texts comprehended - that is, the number of texts in which <u>at least</u> the main idea or essential information was grasped - and b) in terms of the number of details understood in texts.

Age Findings: Present Study - Previous Studies

In its finding pertaining to age, this investigation differs somewhat from a few of the rate of acquisition studies cited in Chapter II. Some researchers who compared adults with adolescents and children reported that in the early stages of L_2 acquisition adults outperformed children and either outperformed or kept pace with adolescents in the following areas: phonology (Olson and Samuels, 1973); aural comprehension (Asher and Price, 1967); morphology and syntax (Snow and Hoefnagel-Höhle, 1978). These results suggested a more rapid initial rate of acquisition for older learners (adults and teenagers) than for younger learners (children) in some aspects of L_2. The present study also examined L_2 development in the early stages, but it found a slower initial rate of acquisition for older learners (adults) when compared with younger learners (also adults). To what extent does this finding contradict those of previous studies?

Certainly a finding to the effect that adults as a group acquire some L_2 skills more rapidly initially than young children does not necessarily conflict with the finding produced by the present study - namely that, within the adult group, those who are younger surpass initially those who are older. That adults as a group have been found to rival or surpass teenagers in some studies, however, is a little more difficult to reconcile with present findings. Yet, it is possible to a certain degree. The older learners (adults) who outperformed teenagers in two of the previous studies (Asher and Price; Olson and Samuels) did not represent a wide cross-section of ages. They were college students who ranged in age from the late teens to

the early twenties. Thus, they were very similar in age to the younger learners in the present study - the group which showed the best performance. The two studies do not conflict with the present study. There is nothing in this study to suggest that 18-to-24-year-olds do not acquire L_2 proficiency in listening as quickly or more quickly than adolescents. The issue was simply not addressed.

The same argument, however, cannot be applied in the case of Snow and Hoefnagel-Höhle. The adults in that investigation were older than those in the other two studies. Most were married and had families; some had teenage children. The age range was from 18 to 60. The fact that such a group of adults showed an initial rate of L_2 development which rivalled that shown by teenagers is very difficult to reconcile with the finding yielded by the present study.

On the other hand, the present finding is entirely consistent with Thorndike's (1928), Halladay's (1970) and Brown's (1983)results. These studies all involved adults only. Thorndike found that in aural comprehension of Esperanto,20-to-25-year-olds achieved more than 26-to-34-year-olds, who, in turn, achieved more than people 35 years of age and over. Halladay's study showed that adults in their thirties and early forties did not acquire L_2 aural comprehension skills as readily as adults in their twenties. Similarly, Brown found that learners 55 years of age and over did not develop L_2 oral skills (i.e. speaking) as quickly as learners between 18 and 23 years of age. All three studies show, as does the present study, that, in adults, L_2 oral ability decreases with increasing age.

CHAPTER VI

SUMMARY AND CONCLUSION

Main Findings Summarized

The main findings of the present study can be summarized as follows:

1. The hypothesis (stated in Chapter III, page 40) was supported. Older adults (aged 25 and over) showed less achievement than younger adults (aged 22 and under) in L_2 listening comprehension over the twelve-week period under investigation. As predicted (page 40), the gains reflected by pretest-posttest score differences were greater for the younger subject group than for the older group.

2. An analysis of scores obtained by some of the same subjects on the Department of National Defence's aural comprehension test served to corroborate the above finding and thus, to provide further support for the hypothesis. The mean gain shown by the younger subjects after twelve weeks of training was significantly greater than that shown by the older subjects.

3. A significant positive correlation was found between posttest scores and DND test scores after twelve weeks, not only in the case of subjects constituting the first sample of matched

pairs, but also in the case of all 69 subjects who took both tests. For subjects in the matched-pair sample, there was also a significant positive correlation, though somewhat lower, between posttest gain scores and DND test gain scores.

4. Stepwise regression analysis showed pretest score and age to be significant predictors of posttest score. As for their relative importance, in two of the samples analyzed, each of which included 36 subjects (18 older and 18 younger), there was not a large difference between the two predictors. In one, pretest outranked age by a little while in the other, the reverse was true. In the third sample analyzed, a sample which included all 71 subjects posttested, the difference between predictors was greater, with pretest shown as the more important of the two. This sample, however, differed from the other two samples in that the age distribution was skewed to a greater extent; 50 of the 71 subjects were under 25 years of age.

5. The regression analysis revealed no significant relationship between posttest score and the variables of IQ, education and amount of previous ESL instruction.

Subsidiary Findings

Pretest score and age could only account for some of the reliable variance in gains made in listening comprehension. Thus, it would

appear that other factors must also have influenced scores. Possibly, differences in aptitude for language learning and/or differences in motivation relating to terminal proficiency level required and personal goals in L_2 acquisition affected gains made in listening. Neither of these factors was carefully investigated in this study.

Also, discussions with subjects subsequent to posttesting revealed other areas in which subjects differed. These areas related to personal characteristics, specific abilities or deficits and strategies employed. While there was little evidence to suggest that the differences were age-related, it is conceivable that they might have influenced gains independently of age. The differences observed pertained to:

1. confidence in listening ability
2. willingness to guess
3. decisiveness versus hesitation in responding
4. breakdown versus continuation of aural processing when a word or phrase was missed
5. ability to process auditory and visual information simultaneously
6. ability to make logical deductions using available clues
7. tendency to resort to pure invention in order to fill in comprehension blanks
8. working procedures (systematic or not) used to cope with listening tasks.

Why The Age Effect?

Although age was shown to be an important determiner of achievement in listening, it is not clear why or just what it is about age that is responsible for this. As chronological age in itself means relatively little, it would be logical to assume that the age-related decline in ability must be associated with certain characteristics, either physiological or otherwise, that are concomitant with age. In Chapter II a number of possibilities were discussed (see pages 10-12 where reasons that have been proposed for the age-related decline in L_2 learning ability are outlined).

Loss of auditory acuity and increased reaction time to stimuli, both of which tend to accompany aging, are possible associated factors, but it is not very likely that they assumed more than a minimal role in this study, given the ages of the older subjects. It is possible to speculate that some type of neurological change (i.e. change within brain mechanisms brought about by aging) is, in some way, responsible for the poorer achievement of the older subjects in the study, but this would be pure conjecture based on no observable evidence. Perhaps the older subjects were hampered by psychological problems. They might have been more inhibited and less confident than the younger subjects and, possibly, aging makes one prone to greater inhibitions and loss of self-confidence when faced with new learning tasks. This, however, was not explored in the study. Further research would be necessary in order to confirm this possibility.

One age-related factor to which it is reasonably safe to assign some importance in the study is time away from school. The older the

subject was, the longer was the time away from school. Consequently, the older the subject, the less-accustomed he was to classroom instruction. It should be acknowledged, however, that time away from school is an external factor (i.e. external to the human organism) rather than an internal one like acuity, neurological change or loss of confidence and, as such, could not be said to be intimately related to age.

Present Findings Versus Previous Findings

Briefly stated, the main finding produced by the present study is as follows. In the case of the adult L_2 learners studied, rate of development in listening decreased as age increased. When learning time and instructional conditions were held constant, the younger the learner, the greater the achievement in aural comprehension.

Several of the rate of acquisition studies cited in Chapter II (Asher and Price, 1967; Olson and Samuels, 1973; Snow and Hoefnagel-Höhle, 1978) differ from the present study in that they suggest a faster initial rate of acquisition for <u>older learners</u> (adults and teenagers) as opposed to younger learners (children) in some aspects of L_2 (i.e. notably morphology, syntax and aural comprehension). There is, however, no essential contradiction between most of these previous findings and that produced by the present study; the same questions were not addressed. The only previous finding that is difficult to reconcile with the present investigation is one reported by Snow and Hoefnagel-Höhle - namely, that a group of adults ranging in age from 18 to 60 rivalled teenagers in L_2 development initially.

In addition, the present study, which finds that initial rate of L_2 development in listening is inversely related to age, is consistent

with Halladay's conclusion – that is, an adult's ability to gain aural mastery of a second language decreases with age. This conclusion was based upon findings pertaining to aural comprehension. Earlier, Thorndike (1928) also found that L_2 achievement in aural comprehension in adults decreased with age. More recently, Brown (1983) found a similar age-related decline in adults with respect to the ability to acquire speaking skills.

Generalizability

It would hardly be justifiable at this point to attempt to generalize the findings of the present study to other adult L_2 learners. The major limitation derives from the nature of the subjects used. They were representative of a very specific and extremely homogeneous group of learners: all were Quebec francophones, members of the Canadian Armed Forces, required to learn English for a similar purpose (i.e. work-related); all had similar amounts of education (i.e. high school completion or less); all had limited initial proficiency in English and none had any previous informal exposure to the language. What may appear to be true of older adults with limited initial proficiency and no informal exposure may not apply when there is more substantial proficiency at the outset and/or a considerable amount of informal exposure. Although education was not shown to be a significant predictor of L_2 achievement in this study, it is still conceivable that, given a wider range of educational differences, it might have been. What may be the case with people who have high school education or less may not necessarily be the case with people who have more educational background.

It is also recognized that the results of an investigation of achievement with one particular instructional program are not necessarily generalizable to L_2 learning contexts where other types of programs are used. It is entirely possible that the program used at the Canadian Forces Language School is biased towards younger learners. A different program might have produced somewhat different results.

Thirdly, achievement was measured in relation to one skill only - listening. There is nothing in the study to suggest that the findings pertaining to listening comprehension are generalizable to any other L_2 skill. One might be inclined to suspect that if older adults progress more slowly in listening they could also be slower to acquire the other oral skill - speaking. This, however, does not necessarily follow; it is a question that would have to be addressed by other research.

Despite the limitations on generalizability cited above, there is reason to believe that future researchers may obtain similar results in other adult learning situations. There was a good deal of agreement between present findings and those obtained by Halladay (1970). Halladay's study also examined listening achievement but involved a more diversified group of learners representing a variety of L_1 backgrounds, occupational areas and educational levels. Also, a different time span (i.e. eight weeks) and a different instructional program were used. Given the similarity in findings produced by this study and Halladay's, there is cause to suspect that L_2 listening comprehension achievement in adults may well decrease with age regardless of other variables (i.e. L_1 background, educational level, initial proficiency and instructional program) - at least in a formal learning

situation.

It should be borne in mind that Brown (1983) also found an age-related decline in measured achievement in a sample of adult learners. Her study involved another skill (i.e. speaking), another L_2 (i.e. Spanish) and a different instructional method. When the results of the present study are viewed along with those of Brown and Halladay, a trend begins to emerge, a trend which suggests that, in adults learning an L_2 in a formal setting, achievement in aural-oral skills decreases with increasing age.

Implications

As the results of this investigation were significant – older learners did not show the same rate of achievement as younger learners – the findings carry with them certain implications, implications which relate to several levels within the language training system. Comments concerning such implications will be restricted to the federal government language training program within the context of which the study was conducted. The remarks will also be brief as the purpose of the study was <u>not</u> to determine whether policy and instructional procedures should be changed and, if so, to outline new directions.

With respect to federal or departmental (i.e. DND) policy concerning time allotted per person for language training and levels of terminal proficiency expected within that time frame, it would appear that more consideration should be paid to the age of individual learners. The same guidelines should not be applied to all government

employees who are required to learn a second language (i.e. either English or French). It does not seem reasonable to expect a 40-year-old or even a 30-year-old to attain the same level of proficiency as a 20-year-old in the same amount of time and under the same learning conditions, given the present language training program.

On the instructional level, it would first seem appropriate to re-examine the curriculum used to instruct older students. This could be done with a view to making modifications. As was suggested earlier, the program now used may be biased towards younger learners not long out of school. Any modifications would have to be based, however, on a thorough study of older learners - that is, a study of distinguishing characteristics and linguistic needs. Available literature could be consulted and some empirical investigation undertaken. A second step might be to educate teachers about the older learner so that, when called upon to instruct older people, they might be able to alter their teaching procedures so as to make them more appropriate.

Finally, with respect to the older learner himself, it would be helpful if he were cognizant of limitations which appear to come with aging.. When older learners embark upon language training with high expectations, there is a risk that they will become discouraged over failure to obtain immediate results and consequently, lose their motivation to learn. Pre-training information sessions with older learners might help to alleviate some problems in this area.

Areas For Future Research

The suggestions relating to future research will be limited to questions raised by the present study and issues pertinent to the teaching situation at the Canadian Forces Language School in St.Jean.

1. An area that might be worthwhile exploring is the relationship between response certainty and learner age. One question raised by this study was whether older subjects might have been more inhibited and less confident than younger subjects. If so, this might have had an effect upon performance scores. During posttesting an attempt was made to collect data pertaining to degree of response certainty, but the procedure used was not felt to be very satisfactory. Perhaps in future research a more suitable measure of response certainty might be devised. The relationship between a) certainty scores and posttest scores and b) certainty totals and age might then be explored.

2. Posttest discussions uncovered certain characteristics and strategies which were not necessarily related to age but which might have affected posttest scores. Additional research might attempt to determine firstly, whether any of these might indeed be related to age and secondly, what characteristics and strategies, if any, set older adult language learners apart from younger ones.

3. In the present study the younger adults acquired listening skills more rapidly than the older adults. It would be interesting to determine whether the speaking skill could also be shown to be similarly affected by age. Teachers who have worked with older learners generally feel that they experience greater difficulty with speaking than with listening. Test scores (i.e. DND scores) tend to support this; in most cases speaking scores are lower than listening scores. It is quite possible that speaking development is more prone to the influence of age than is listening comprehension development. This question should be addressed at some future date.

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APPENDIX A

INTERVIEW QUESTIONNAIRE

QUESTIONNAIRE SUR LES CONTACTS LINGUISTIQUES

A. RENSEIGNEMENTS PERSONNELS

1. Nom _____ N.A.S. _____

   Grade _____

2. Métier _____

3. Age _____

4. Sexe _____

5. Date d'arrivée à l'Ecole de Langues _____

6. Dernière année scolaire complétée _____

7. Autres études faites _____

8. Nombre d'années que vous avez travaillé _____

B. CONNAISSANCES LINGUISTIQUES

9. Quelle est votre langue maternelle? _____

10. A quel âge et où avez-vous pris contact avec l'anglais pour la première fois?

Age: _____ Endroit: _____

11. a) Quelle(s) autre(s) langue(s) connaissez-vous? _____

b) Où avez-vous appris cette (ces) langue(s)? _____

c) Indiquez votre compétence dans cette (ces) langue(s) (i.e. excellente, bonne, médiocre, faible ou nulle):

à parler _____

à comprendre _____

à lire _____

à écrire _____

12. Indiquez votre compétence de l'anglais (i.e. excellente, bonne, médiocre, faible ou nulle):

à parler _____

à comprendre _____

à lire _____

à écrire _____

C. CONTACT AVEC L'ANGLAIS A LA MAISON

13. a) Quand vous étiez jeune est-ce que l'anglais était utilisé chez-vous?

b) Si oui, qui utilisait l'anglais à la maison?

votre mère? _____

votre père? _____

vos frères et vos soeurs? _____

vous? _____

autres personnes? _____

c) Pendant combien d'heures par jour est-ce que l'anglais était utilisé chez vous?

jamais _____ moins d'une heure _____ 1-2 hres. _____ 2-4 hres. _____ plus de 4 hres. _____

14. Est-ce que les membres de votre famille étaient capables de parler ou de comprendre l'anglais?

votre mère? _____

votre père? _____

vos frères et vos soeurs? _____

15. a). Si vous êtes marié est-ce que vous ou votre femme ou vos enfants utilisent l'anglais à la maison maintenant?

vous? _____

votre femme? _____

vos enfants? _____

b) Est-ce qu'il y a quelqu'un dans la famille qui est capable de parler ou de comprendre l'anglais?

votre femme? _____

vos enfants? _____

D. CONTACT AVEC L'ANGLAIS A L'ECOLE

16. En quelle année avez-vous commencé à étudier l'anglais à l'école? _____

17. Pendant combien d'années avez-vous étudié l'anglais à l'école?

Au primaire _____ Au secondaire _____

D. CONTACT AVEC L'ANGLAIS A L'ECOLE (suite)

18. Veuillez indiquer dans l'espace ci-dessous toute année où vous avez étudié l'anglais à l'école ainsi que le nombre d'heures de cours par semaine et le genre de programme (oral ou écrit).

	Année	No. d'heures par semaine	Programme (oral ou écrit)
Au primaire:			
Au secondaire:			
Autre:			

19. Est-ce que vous avez eu des amis anglophones à l'école et avec qui vous parliez anglais à l'extérieur de la salle de classe? _____

20. a) Avez-vous suivi des cours où la langue d'enseignement était l'anglais? _____

b) Si oui, quel(s) cours et pendant combien de temps?

Cours	Durée

21. a) Avez-vous suivi un cours d'anglais qui s'est donné ailleurs qu'à l'école primaire ou secondaire?

b) Si oui, indiquez quel cours, la durée du cours (nombre d'heures) et l'endroit où vous l'avez suivi?

Cours	Durée	Endroit

E. CONTACT AVEC L'ANGLAIS DANS LA COMMUNAUTE

22. a) Avez-vous demeuré dans un milieu anglophone?

b) Si oui, quelle communauté et pour combien de temps?

Endroit	Temps (mois ou années)

23. Dans l'espace ci-dessous, veuillez indiquer chaque endroit où vous avez demeuré au cours de votre vie ainsi que le nombre d'années vécues à cet endroit. On vous demande aussi d'estimer pour chaque endroit, la fréquence avec laquelle vous avez eu l'occasion de parler ou d'entendre parler l'anglais lors de votre séjour à cet endroit. Pour indiquer la fréquence écrivez: a) tous les jours, b) souvent, c) occasionnellement, d) rarement ou e) jamais

	Endroit	No. d'années à	Fréquence pour parler l'anglais	Fréquence pour entendre parler
1.				
2.				
3.				
4.				

F. CONTACT AVEC L'ANGLAIS AU TRAVAIL

24. a) Avez-vous utilisé l'anglais au travail? _____

b) Si oui, dans quel genre de travail et pour quelle période de temps?

Travail	Période de temps (mois ou années)

c) Indiquez le nombre d'heures par jour que vous avez mis à écouter, parler, lire ou écrire l'anglais en travaillant?

Ecouter	Parler	Lire	Ecrire

G. L'USAGE DU MEDIA

25. a) Est-ce que vous écoutez des stations radiophoniques anglophones? _____

b) Si oui, pendant combien d'heures par jour? _____

c) Depuis combien d'années écoutez-vous des postes anglais? _____

d) Quel genre d'émission écoutez-vous? _____

26. a) Est-ce que vous regardez des émissions de télévision en anglais? _____

b) Si oui, pendant combien d'heures par jour? _____

c) Depuis combien d'années regardez-vous la télévision anglaise? _____

d) Quels programmes regardez-vous? _____

27. a) Est-ce que vous lisez des publications anglaises (i.e. livres, journaux, revues)? _____

b) Si oui, pendant combien d'heures par jour? _____

c) Depuis combien d'années lisez-vous ces publications anglaises? _____

d) Quelles publications lisez-vous? _____

H. MOTIVATION

28. Pourquoi êtes-vous à l'école d'anglais? _____

_____

29. Est-ce que vous avez eu le choix de venir? _____

30. De quel niveau de compétence en anglais avez-vous besoin dans votre travail? _____

31. Quel niveau de compétence orale aimeriez-vous avoir en anglais éventuellement?

a) excellente, presque aussi bonne qu'un anglophone _____

b) assez pour vivre avec aise dans un milieu anglophone _____

c) assez pour travailler en anglais _____

APPENDIX B

SCORE SHEET FOR LISTENING TEST

LISTENING COMPREHENSION TEST

SCORE SHEET

NAME _____ SIN _____

RANK _____ AGE _____

STARTING DATE _____ TEST DATE _____

TOTAL SCORE _____

SECTION I

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

TOTAL _____

SECTION II

11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

TOTAL _____

SECTION III

21. _____
22. _____
23. _____
24. _____
25. _____

TOTAL _____

SECTION IV

26. _____
27. _____
28. _____
29. _____
30. _____

TOTAL _____

APPENDIX C

DATA FOR INDIVIDUAL SUBJECTS

Entrance Score Levels on DND Test and Pretest Scores for Potential Subjects Pretested

n = 131

Subject No.	Age	DND Test Level Score	Pretest Score	Outcome
1	28	1	25	Elim. high score
2	29	1	25	"
3	40	1	20	"
4	26	0	20	"
5	26	1	22	"
6	26	1	24	"
7	37	1	21	"
8	27	1	21	"
9	28	0	26	"
10	28	1	16	Elim.inform.exp.
11	31	1	14	"
12	27	0	15	Lost
13	42	0	15	Lost
14	27	0	11	Lost
15	29	1	15	Posttested
16	31	-1	11	"
17	31	0	13	"
18	41	1	17	"
19	38	0	11	"
20	39	0	7	"
21	29	1	16	"
22	40	0	13	"
23	25	1	15	"
24	30	1	15	"
25	25	-1	12	"
26	26	0	5	"
27	26	0	15	"
28	25	0	13	"
29	25	0	13	"

Subject No.	Age	DND Test Level Score	Pretest Score	Outcome
30	25	0	15	Posttested
31	25	0	11	"
32	25	+0	9	"
33	26	0	9	"
34	25	0	13	"
35	36	0	13	"
36	30	-1	15	Not posttested due to time
37	19	+0	15	Posttested
38	20	+0	9	"
39	22	0	11	"
40	18	+0	13	"
41	18	0	11	"
42	20	0	13	"
43	22	0	17	"
44	18	0	7	"
45	18	0	6	"
46	20	0	14	"
47	17	0	15	"
48	18	0	14	"
49	18	0	7	"
50	17	0	6	"
51	19	0	11	"
52	19	0	8	"
53	20	0	12	"
54	18	+0	13	"
55	21	0	9	"
56	22	0	10	"
57	18	0	11	"
58	19	0	8	"
59	19	+0	7	"
60	18	0	11	"
61	18	0	9	"

Subject No.	Age	DND Test Level Score	Pretest Score	Outcome
62	18	0	11	Posttested
63	19	0	13	"
64	19	0	13	"
65	18	0	11	"
66	22	0	9	"
67	18	0	9	"
68	21	0	8	"
69	22	0	5	"
70	22	0	5	"
71	19	0	12	"
72	19	0	11	"
73	18	0	12	"
74	19	0	12	"
75	19	0	10	"
76	23	0	11	"
77	23	0	11	"
78	23	0	15	"
79	24	+0	12	"
80	24	-1	12	"
81	24	0	13	"
82	19	0	14	Elim. educ.
83	24	0	15	"
84	21	+0	14	"
85	21	0	10	"
86	22	+0	14	"
87	23	0	11	Posttested
88	23	0	5	"
89	20	0	16	"
90	19	0	16	"
91	19	0	10	"
92	21	0	12	Not Posttested due to time
93	17	0	11	"

Subject No.	Age	DND Test Level Score	Pretest Score	Outcome
94	20	0	15	Not Posttested due to time
95	21	0	10	"
96	20	0	20	Elim. high score
97	19	0	18	"
98	21	0	20	"
99	21	+0	21	"
100	22	1	19	"
101	22	1	19	"
102	22	0	20	"
103	24	0	18	"
104	23	-1	19	"
105	19	0	9	Elim. ang. mom
106	18	+0	14	Elim. inform. exp
107	19	0	7	"
108	24	0	14	"
109	21	0	16	"
110	20	0	4	"
111	24	1	12	"
112	22	1	11	"
113	?	0	10	Lost
114	24	+0	10	"
115	20	+0	16	"
116	22	0	8	"
117	20	0	15	"
118	21	0	4	"
119	21	0	9	"
120	18	0	15	"
121	19	0	15	"
122	19	0	10	"
123	18	0	11	"
124	19	0	9	"
125	18	0	13	"

Subject No.	Age	DND Test Level Score	Pretest Score	Outcome
126	18	0	10	Lost
127	21	+0	10	"
128	18	0	10	"
129	22	0	11	"
130	23	0	7	"
131	21	0	10	"

All Subjects Posttested:
Age, IQ, Education and ESL Variables
Pretest, Posttest and Gain Scores
DND Test Scores (Entrance and After 12 Weeks) and Gain Scores

n = 71

Subject No.	Age	IQ	Years Educ	Years ESL	Pretest	Posttest	Gain	DND Test 1	DND Test 2	Gain
15	29	57	10	9	15	20	5	1 (4)	2 (7)	(3)
16	31	53	10	2	11	14	3	-1 (3)	+1 (5)	(2)
17	31	44	9	2	13	21	8	0 (1)	-2 (6)	(5)
18	41	42	7	0	17	19	2	1 (4)	2 (7)	(3)
19	38	52	10	6	11	15	4	0 (1)	+1 (5)	(4)
20	39	50	9	4	7	12	5	0 (1)	1 (4)	(3)
21	29	56	9	5	16	24	8	1 (4)	3 (10)	(6)
22	40	46	9	3	13	16	3	0 (1)	1 (4)	(3)
23	25	51	11	8	15	23	8	1 (4)	-2 (6)	(2)
24	30	47	11	10	15	21	6	1 (4)	+2 (8)	(4)
25	25	46	9	1	12	13	1	-1 (3)	1 (4)	(1)
26	26	51	10	5	5	14	9	0 (1)	1 (4)	(3)
27	26	56	11	7	15	20	5	0 (1)	+2 (8)	(7)
28	25	53	11	8	13	15	2	0 (1)	-2 (6)	(5)
29	25	50	11	6	13	12	-1	0 (1)	2 (7)	(6)
30	25	40	10	6	15	19	4	0 (1)	-2 (6)	(5)
31	25	47	10	5	11	11	0	0 (1)	-2 (6)	(5)
32	25	55	11	6	9	18	9	+0 (2)	+1 (5)	(3)
33	26	55	9	4	9	11	2	0 (1)	-2 (6)	(5)
34	25	52	10	6	13	17	4	0 (1)	1 (4)	(3)
35	36	38	9	5	13	19	6	0 (1)	1 (4)	(3)
37	19	56	11	7	15	25	10	+0 (2)	2 (7)	(5)
38	20	51	11	5	9	15	6	+0 (2)	+1 (5)	(3)
39	22	49	11	2	11	22	11	0 (1)	+1 (5)	(4)
40	18	46	11	5	13	16	3	+0 (2)	+1 (5)	(3)
41	18	53	11	7	11	22	11	0 (1)	2 (7)	(6)
42	20	46	10	7	13	23	10	0 (1)	-2 (6)	(5)

N.B. The numbers in brackets represent the numerical values assigned to DND level scores: minimum = 1 (level 0) and maximum = 10 (level +3).

Subject No.	Age	IQ	Years Educ.	Years ESL	Pretest	Posttest	Gain	DND Test 1	DND Test 2	Gain
43	22	55	11	5	17	24	7	0 (1)	-2 (6)	(5)
44	18	50	10	1	7	14	7	0 (1)	0 (1)	(0)
45	18	54	10	4	6	26	20	0 (1)	+1 (5)	(4)
46	20	49	11	7	14	24	10	0 (1)	2 (6)	(5)
47	17	57	11	6	15	25	10	0 (1)	+2 (8)	(7)
48	18	53	11	4	14	27	13	0 (1)	-2 (6)	(5)
49	18	53	11	6	7	16	9	0 (1)	2 (7)	(6)
50	17	55	10	3	6	23	17	0 (1)	2 (7)	(6)
51	19	51	11	7	11	25	14	0 (1)	2 (7)	(6)
52	19	48	10	5	8	15	7	0 (1)	1 (4)	(3)
53	20	56	10	4	12	19	7	0 (1)	+2 (8)	(7)
54	18	55	11	5	13	27	14	+0 (2)	+2 (8)	(6)
55	21	51	11	7	9	24	15	0 (1)	-2 (6)	(5)
56	22	55	11	4	10	22	12	0 (1)	2 (7)	(6)
57	18	53	10	6	11	13	2	0 (1)	+1 (5)	(4)
58	19	55	11	6	8	22	14	0 (1)	+2 (8)	(7)
59	19	52	11	7	7	11	4	+0 (2)	+1 (5)	(3)
60	18	50	10	7	11	18	7	0 (1)	1 (4)	(3)
61	18	51	11	8	9	16	7	0 (1)	+2 (8)	(7)
62	18	57	10	4	11	13	2	0 (1)	1 (4)	(3)
63	19	52	9	5	13	27	14	0 (1)	+2 (8)	(7)
64	19	46	10	5	13	18	5	0 (1)	1 (4)	(3)
65	18	48	10	5	11	15	4	0 (1)	1 (4)	(3)
66	22	47	11	1	9	12	3	0 (1)	1 (4)	(3)
67	18	53	10	5	9	15	6	0 (1)	-1 (3)	(2)
68	21	52	10	6	8	20	12	0 (1)	-2 (6)	(5)
69	22	52	11	7	5	13	8	0 (1)	+1 (5)	(4)
70	22	53	10	3	5	13	8	0 (1)	+1 (5)	(4)
71	19	53	11	4	12	26	14	0 (1)	2 (7)	(6)
72	19	47	11	5	11	22	11	0 (1)	+1 (5)	(4)
73	18	37	11	6	12	16	4	0 (1)	2 (7)	(6)
74	19	56	11	5	12	17	5	0 (1)	-2 (6)	(5)
75	19	52	11	6	10	21	11	0 (1)	-2 (6)	(5)

Subject No.	Age	IQ	Years Educ.	Years ESL	Pretest	Posttest	Gain	DND Test 1	DND Test 2	Gain
76	23	50	11	5	11	22	11	0 (1)	2 (7)	(6)
77	23	54	8	6	11	23	12	0 (1)	+1 (5)	(4)
78	23	54	11	5	15	27	12	0 (1)	----	---
79	24	50	9	9	12	20	8	+0 (2)	-2 (6)	(4)
80	24	43	9	5	12	21	9	-1 (3)	-2 (5)	(2)
81	24	49	9	3	13	19	6	0 (1)	+1 (5)	(4)
87	23	50	7	1	11	12	1	0 (1)	1 (4)	(3)
88	23	45	7	0	5	17	12	0 (1)	-1 (3)	(2)
89	20	54	11	6	16	27	11	0 (1)	-2 (6)	(5)
90	19	58	11	7	16	24	8	0 (1)	+2 (8)	(7)
91	19	48	11	6	10	14	4	0 (1)	----	---

Matched Pairs Sample 1:
Age, Education and ESL Variables;
Pretest, Posttest and Gain Scores

no. pairs = 18

Pair No.	Subject No.	Age	IQ	Years Educ.	Years ESL	Pretest	Posttest	Gain	Gain Diff.
1	26	26	51	10	5	5	14	9	
	70	22	53	10	3	5	13	8	-1
2	20	39	50	9	4	7	12	5	
	68	21	52	10	6	8	20	12	+7
3	32	25	55	11	6	9	18	9	
	58	19	55	11	6	8	22	14	+5
4	33	26	55	9	4	9	11	2	
	56	22	55	11	4	10	22	12	+10
5	19	38	52	10	6	11	15	4	
	41	18	53	11	7	11	22	11	+7
6	16	31	53	10	2	11	14	3	
	39	22	49	11	2	11	22	11	+8
7	31	25	47	10	5	11	11	0	
	72	19	47	11	5	11	22	11	+11
8	25	25	46	9	1	12	13	1	
	65	18	48	10	5	11	15	4	+3
9	17	31	44	9	2	13	21	8	
	42	20	46	10	7	13	23	10	+2
10	34	25	52	10	6	13	17	4	
	63	19	52	9	5	13	27	14	+10

Pair No.	Subject No.	Age	IQ	Years Educ.	Years ESL	Pretest	Posttest	Gain	Gain Diff.
11	22	40	46	9	3	13	16	3	
	64	19	46	10	5	13	18	5	+2
12	35	36	38	9	5	13	19	6	
	73	18	37	11	6	12	16	4	-2
13	29	25	50	11	6	13	12	-1	
	46	20	49	11	7	14	24	10	+11
14	15	29	57	10	9	15	20	5	
	37	19	56	11	7	15	25	10	+5
15	23	25	51	11	8	15	23	8	
	48	18	53	11	4	14	27	13	+5
16	28	25	53	11	8	13	15	2	
	71	19	53	11	4	12	26	14	+12
17	21	29	56	9	5	16	24	8	
	43	22	55	11	5	17	24	7	-1
18	27	26	56	11	7	15	20	5	
	90	19	58	11	7	16	24	8	+3

Matched Pairs Sample 2:
Age, IQ, Education and ESL Variables
Pretest, Posttest and Gain Scores

no. pairs = 18

Pair No.	Subject No.	Age	IQ	Years Educ.	Years ESL	Pretest	Posttest	Gain	Gain Diff.
1	26	26	51	10	5	5	14	9	
	70	22	53	10	3	5	13	8	-1
2	20	39	50	9	4	7	12	5	
	45	18	54	10	4	6	26	20	+15
3	32	25	55	11	6	9	18	9	
	58	19	55	11	6	8	22	14	+ 5
4	33	26	55	9	4	9	11	2	
	56	22	55	11	4	10	22	12	+ 10
5	19	38	52	10	6	11	15	4	
	53	20	56	10	4	12	19	7	+ 3
6	16	31	53	10	2	11	14	3	
	77	23	54	8	6	11	23	12	+ 9
7	31	25	47	10	5	11	11	0	
	72	19	47	11	5	11	22	11	+ 11
8	25	25	46	9	1	12	13	1	
	65	18	48	10	5	11	15	4	+ 3
9	17	31	44	9	2	13	21	8	
	42	20	46	10	7	13	23	10	+ 2
10	34	25	52	10	6	13	17	4	
	63	19	52	9	5	13	27	14	+ 10

Pair No.	Subject No.	Age	IQ	Years Educ.	Years ESL	Pretest	Posttest	Gain	Gain Diff.
11	22	40	46	9	3	13	16	3	
	81	24	49	9	3	13	19	6	+3
12	35	36	38	9	5	13	19	6	
	40	18	46	11	5	13	16	3	-3
13	29	25	50	11	6	13	12	-1	
	46	20	49	11	7	14	24	10	+11
14	15	29	57	10	9	15	20	5	
	37	19	56	11	7	15	25	10	+5
15	23	25	51	11	8	15	23	8	
	48	18	53	11	4	14	27	13	+5
16	28	25	53	11	8	13	15	2	
	71	19	53	11	4	12	26	14	+12
17	21	29	56	9	5	16	24	8	
	43	22	55	10	5	17	24	7	-1
18	27	26	56	11	7	15	20	5	
	47	17	57	11	6	15	25	10	+5

Matched Pairs Sample 1
DND Test Scores at Time 1 and Time 2, Gains Made

no. pairs = 18

Pair No.	Subject No.	Age	Test 1	Test 2	Gain	Gain Diff.
1.	26	26	0 (1)	1 (4)	(3)	
	70	22	0 (1)	+1 (5)	(4)	(+1)
2	20	39	0 (1)	1 (4)	(3)	
	68	21	0 (1)	-2 (6)	(5)	(+2)
3	32	25	+0 (2)	+1 (5)	(3)	
	58	19	0 (1)	+2 (8)	(7)	(+4)
4	33	26	0 (1)	-2 (6)	(5)	
	56	22	0 (1)	2 (7)	(6)	(+1)
5	19	38	0 (1)	+1 (5)	(4)	
	41	18	0 (1)	2 (7)	(6)	(+2)
6	16	31	-1 (3)	+1 (5)	(2)	
	39	22	0 (1)	+1 (5)	(4)	(+2)
7	31	25	0 (1)	-2 (6)	(5)	
	92	19	0 (1)	+1 (5)	(4)	(-1)
8	25	25	-1 (3)	1 (4)	(1)	
	65	18	0 (1)	1 (4)	(3)	(+2)
9	17	31	0 (1)	-2 (6)	(5)	
	42	20	0 (1)	-2 (6)	(5)	
10	34	25	0 (1)	1 (4)	(3)	
	63	19	0 (1)	+2 (8)	(7)	(+4)
11	22	40	0 (1)	1 (4)	(3)	
	64	19	0 (1)	1 (4)	(3)	

Pair No.	Subject No.	Age	Test 1	Test 2	Gain	Gain Diff.
12	35	36	0 (1)	1 (4)	(3)	
	73	18	0 (1)	2 (7)	(6)	(+3)
13	29	25	0 (1)	2 (7)	(6)	
	46	20	0 (1)	2 (7)	(6)	
14	15	29	1 (4)	2 (7)	(3)	
	37	19	+0 (2)	2 (7)	(5)	(+2)
15	23	25	1 (4)	-2 (6)	(2)	
	48	18	0 (1)	-2 (6)	(5)	(+3)
16	28	25	0 (1)	-2 (6)	(5)	
	71	19	0 (1)	2 (7)	(6)	(+1)
17	21	29	1 (4)	3 (10)	(6)	
	43	22	0 (1)	-2 (6)	(5)	(-1)
18	27	26	0 (1)	+2 (8)	(7)	
	90	19	0 (1)	+2 (8)	(7)	

NB The numbers in brackets represent the numerical values assigned to level scores: minimum = 1 (level 0) and maximum = 10 (level +3)