

## INFORMATION TO USERS

This dissertation copy was prepared from a negative microfilm created and inspected by the school granting the degree. We are using this film without further inspection or change. If there are any questions about the content, please write directly to the school. The quality of this reproduction is heavily dependent upon the quality of the original material.

The following explanation of techniques is provided to help clarify notations which may appear on this reproduction.

1. Manuscripts may not always be complete. When it is not possible to obtain missing pages, a note appears to indicate this.
2. When copyrighted materials are removed from the manuscript, a note appears to indicate this.
3. Oversize materials (maps, drawings and charts are photographed by sectioning the original, beginning at the upper left hand corner and continuing from left to right in equal sections with small overlaps.

**UMI<sup>®</sup>**

ProQuest Information and Learning  
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA  
800-521-0600

PREVIEW

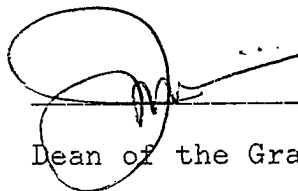
READING PERFORMANCE AS A FUNCTION OF BILINGUALISM

APPROVED:

*Judith B. Goggin*

*David H. Hirsch*

*Harmon M. Hirsch*



Dean of the Graduate School

READING PERFORMANCE AS A FUNCTION OF BILINGUALISM

by

KAJ ALTON MALONE, B.S.

THESIS

Presented to the Faculty of the Graduate School of  
The University of Texas at El Paso  
in Partial Fulfillment  
of the Requirements  
for the Degree of  
MASTER OF ARTS

THE UNIVERSITY OF TEXAS AT EL PASO

December 1987

## Acknowledgements

I thank Dr. Judith P. Goggin for her willingness to guide me in the design and analysis of this experiment. In addition, I thank her for reviewing the numerous drafts of this text. I especially thank Dr. Goggin for the models of professionalism and humanity she provides.

I thank coworkers Jacquelyn Gibson, Diane Herold, Therese Ramirez, Cecilia Corral, and Marie Martin. Jacquelyn's considerable efforts provided important portions of my testing materials. Diane's expertise with the word processor saved me a few gray hairs. Therese, Cecilia, and Marie's help testing the subjects reduced the time I spent on this project.

I thank various members of the Psychology Department faculty. Dr. Hosch helped me to determine which dependent variables most needed to be analyzed, and reacquainted me with the use of the computer. Dr. Bothwell taught me, by example, that patience is needed when writing a computer program. Dr. Whitworth showed me that interpreting data is not difficult.

Most of all, I thank my family for the emotional and financial support they provide. Determination and inquisitiveness are among the inherited attributes I used

to complete this thesis. Keeley Malone and Beverly Jackson also helped me analyze the data.

PREVIEW

## Abstract

The present study attempted to corroborate the findings of Daneman and Carpenter (1980) in which high correlations were found between monolinguals' working memory, and reading comprehension. However, attention was focused on possible differences between working memory of monolinguals and bilinguals in an effort to explain group differences in reading comprehension. The results of the Daneman and Carpenter study were not replicated in many respects by data from the present experiment. Monolinguals outperformed bilinguals on the reading comprehension tests. However, monolinguals' reading and listening spans were not significantly greater than those of the bilinguals. Among monolinguals only the silent span measures were significantly correlated with Verbal SAT/ACT scores, and among bilinguals the silent span and listening span measures were significantly correlated with Verbal SAT/ACT scores. In other respects, the subject groups were similar. Both performed better on fact questions than on pronominal referent questions. In addition, for both groups, recalling pronominal referents was significantly better on the passages with the most number of sentences intervening between the pronoun and its referent. Few

significant correlations were found between the subjects working memory span and reading comprehension, and the pattern of these correlations for the different scoring procedures and the different subject groups was inconsistent.



## Table of Contents

	<u>Page</u>
Acknowledgements .....	iii
Abstract .....	v
List of Tables .....	ix
Introduction .....	11
Definition and Measurement of Bilingualism .....	11
Interdependence of Bilingual Storage Systems .....	17
Text Processing in Bilinguals .....	22
Reading Processes in Monolinguals .....	28
Statement of the Problem .....	44
Hypotheses .....	46
Method .....	46
Subjects .....	46
Materials .....	47
Procedure .....	52
Results .....	56
Subject Characteristics .....	56
Span Tests .....	62
Comprehension Tests .....	71
Correlations Between Spans and Comprehension .....	76
Correlations Between Spans and Additional Measures of Reading .....	80

Correlations Between Comprehension and Additional Measures of Reading .....	82
Discussion .....	88
Comparisons between Daneman and Carpenter and Monolingual Performance .....	89
Comparison between Monolingual and Bilingual Performance .....	95
Appendix A .....	100
Appendix B .....	106
Appendix C .....	124
References .....	134
Vita .....	140

## List of Tables

Table	<u>Page</u>
1     Language Background of Monolinguals and Bilinguals .....	57
2     Language Usage of Monolinguals and Bilinguals ...	58
3     Mean Subtest Scores from the Revised Wechsler Adult Intelligence Scale for Monolinguals and Bilinguals .....	60
4     Mean Scores on Additional Reading Ability Measures for Monolinguals and Bilinguals .....	63
5     Mean Reading and Listening Spans of Monolinguals and Bilinguals .....	64
6     Percent Correct True-False Responses .....	68
7     Correlations Between Span Measures and Percentage of Correct True/False Responses for Monolinguals and Bilinguals .....	70
8     Mean Number (Percentage) of Comprehension Questions Correct for Monolinguals and Bilinguals .....	73
9     Mean Percentage of Pronominal Referent Questions Answered Correctly at Different Distances for Monolinguals and Bilinguals .....	75
10    Correlations Between Reading Span and Reading Comprehension Tests .....	77
11    Correlations Between Listening Span and Listening Comprehension Tests .....	79
12    Correlations Between Reading and Listening Spans and Additional Reading Ability Measures for Monolinguals .....	81
13    Correlations Between Reading and Listening Spans and Additional Reading Ability Measures for Bilinguals .....	83

14	Correlations Between Reading and Listening Comprehension and Additional Reading Ability Measures for Monolinguals .....	85
15	Correlations Between Reading and Listening Comprehension and Additional Reading Ability Measures for Bilinguals .....	86

## Introduction

There are many aspects to the study of bilingualism, but one of the most central questions is how the bilingual differs from the monolingual in the processing of linguistic material. Most of the research on reading skills has focused exclusively on the monolingual, and relatively few researchers have investigated possible differences between monolinguals and bilinguals on reading tasks. The present research was designed to examine the effects of bilingualism on reading comprehension. Specifically, the performance of bilinguals and monolinguals on various tests related to reading ability was analyzed.

## Definition and Measurement of Bilingualism

Researchers do not agree on the definition of bilingualism (Beardsmore, 1982; Mackey, 1969). Some investigators assert that only the person equally competent in both languages is bilingual, while others merely require a minimal degree of proficiency in the second language. Generally, however, the definition of bilingualism as equal competence in two languages is thought to be too restrictive. Beardsmore (1982), for example, asserts that any definition of bilingualism must account for varying

degrees of proficiency in two languages within the individual. He has also recommended that the places where the bilingual normally uses each language should be taken into account; thus, if the person is accustomed to using his base language only at home, he may perform poorly on tasks requiring academic use of that language.

In any case, the term bilingual should encompass the ability to read, listen, speak, and/or write in the second language (Macnamara, 1969) in any combination. For example, a person who is a native speaker of English and who can also read Spanish is bilingual. Reading and listening are decoding skills, whereas speaking and writing are encoding skills. Individuals vary in their degree of bilingualism from reading to listening, and from speaking to writing. The purpose of measures of bilingual proficiency is to determine the extent of the bilingual's communication skills in both languages.

Any measure of bilingual proficiency should be related to the skills of interest to the experimenter (Albert & Obler, 1978; Beardsmore, 1982; Macnamara, 1969), inasmuch as proficiency in two languages involves many subskills, some of which may be more relevant to the psychologist's research than others. Thus, if reading ability is being investigated, then the technique used to

determine degree of bilingualism should measure reading ability. Jacobovits (1969), however, argues that individual measurement of communication skills (reading, listening, speaking, and writing ability) is impossible. Because of this interdependency of communication skills, Jacobovits recommends that any measurement of bilingual proficiency analyze all the skills. The present research assessed the decoding skills of reading and listening ability. For this reason, the measure of bilingual proficiency used contained materials related to reading and listening ability, but also, following Jacobovits' recommendation, included measures of all four skills.

Three problems are confronted when validating any procedure for assessing bilingualism (Mackey, 1969). First, it must be shown that the skills being measured are related to bilingualism. For example, if the assessment procedure requires the translation of words, it must be shown that proficiency, translation skill, and the ability to switch languages, or all three are being measured. Second, difficulties arise if the criterion against which the test instrument is validated uses a different unit of measurement. For example, it is problematic to relate a language background questionnaire (LBQ) to a test of the ability to produce synonyms. Third, obtaining

representative samples to validate tests of bilingual proficiency is hard to achieve; however, if the sample is not representative, erroneous conclusions may be drawn concerning the population to which one is generalizing.

Either direct or indirect instruments are used to measure bilingual proficiency. Direct measures require extensive tests of reading, listening, speaking, and writing ability. Because these measures are time consuming and expensive, indirect measures have been devised. Indirect measures are brief and economic means of measuring bilingual proficiency. Four commonly used indirect measures are: (a) tests of verbal fluency, (b) tests of flexibility, (c) tests of dominance, and (d) rating scales (Macnamara, 1969).

Fluency tests measure the speed of verbal production in the two languages. Measuring the speed with which the subject names pictures is one example of a fluency test, whereas another measures the speed with which bilinguals follow simple instructions given in the two languages. Fluency tests have been found to be correlated with measures of the subject's language background (Macnamara, 1969).

Flexibility tests are based on the hypothesis that bilinguals have more ways to express a concept in their



first than in their second language. These tests require the subject to change linguistic sets in a limited amount of time. For example, the subject might be required to name as many synonyms as he can for a stimulus word. Another example of a flexibility exercise is the word detection test, which requires the subject to identify as many words as possible in a long nonsense word.

Dominance tests present the subject with an ambiguous stimulus, which could belong to either language. The subject is asked to pronounce or interpret the stimulus. For these tests, as with flexibility tests, the language most frequently used is the dominant one.

Two rating techniques used to determine degree of bilingualism are the language background questionnaire (LBQ) and the self-rating scale. The LBQ requires the subject to estimate the extent to which each language is used in his home and community. Answers to all questions are combined to yield a single rating for the subject. The LBQ, although providing useful information about the subject's linguistic history, is generally a poor predictor of performance (Macnamara, 1969). It should be noted, however, that some researchers have used the LBQ to distinguish between bilinguals on the basis of the characteristics of language acquisition. One such

distinction is that between compound and coordinate bilinguals (Ervin & Osgood, 1954). A compound bilingual is defined as one who acquires the two languages in a fused environment in which both languages are used interchangeably. A coordinate bilingual, on the other hand, learns the two languages with some distinct separation between appropriate usage situations; for example, one language may be spoken at home, whereas the other language may be spoken at school. This type of characterization, once popular, is used less frequently today because of the persuasive arguments against it (e.g., Lopez, 1977).

The second technique is self-rating for language skills with which the subject rates himself in the four communication skills (reading, listening, speaking, and writing) in each of the two languages. The ratings are combined to form a single score for bilingual proficiency. Rating scales not only are good predictors of performance but also are highly correlated with the more complex measures of bilingualism (Albert & Obler, 1978; Macnamara, 1969).

In the present experiment, the questionnaire used to determine bilingual proficiency was composed of both rating techniques, but greater emphasis was placed on self-rating

of language skills. The first part of the questionnaire was the LBQ, which examined the language usage of the subject, his family, and his neighborhood. The last part of the questionnaire was a self-rating scale, which required the subject to rate his communication skills in Spanish and English.

### Interdependence of Bilingual Storage Systems

One important, and as yet unresolved, theoretical question regarding bilingualism concerns the form of language storage. Presented most simply, one view is that memory of one's experience is tied with the form of input, with separate representational systems for each language. The alternative position is that there is a common representational system that may be directly accessed from either language. These approaches have been termed the independent vs. interdependent hypotheses (McCormack, 1974).

Among the tasks that have been used to determine the degree of interdependence of the bilingual's two lexical storage systems are association tasks and list learning tasks (Albert & Obler, 1978). The primary aim of these tasks is to identify distinguishing structures of the bilingual lexicon.

### Association Tasks

Association tasks require the subject to respond to stimulus items in some way that will reflect the associational structure of the words. In bilingual studies, the words in a set may be from only one language or from both languages. Subjects may be permitted to respond in either language or constrained to respond in only one language. These tasks address several questions concerning the bilingual's lexicon, such as how equivalent words are stored and how such storage compares to storage of synonyms in the same language.

Tied to storage concepts are two schools of thought regarding the bilingual's method of lexical access, word association theory and concept mediation theory. Word association theory asserts that words learned in a bilingual's first language (L1) are used to establish equivalent words in the second language (L2). Concept mediation theory, on the other hand, suggests that words learned in a bilingual's first language are associated with the equivalent second language words only insofar as the words share an underlying concept. These two theories clearly differ with respect to their assumptions regarding the relationships between the corresponding lexical items in two languages; the word association theory asserts that

the corresponding items have direct associations to each other whereas the concept mediation theory assumes that corresponding items are only indirectly associated through their mutual underlying concept.

These theories make different predictions about the time to name pictures in the second language relative to the time to translate first-language words into the second language. The word association model predicts that an L2 response to a picture will take longer than the same response to an L1 word because two additional steps (retrieving the concept and retrieving the L1 word) are involved. In contrast, the concept mediation model suggests that the stages leading to an L2 response are similar for picture-naming and translation; in both cases, one must first retrieve the concept and then retrieve the L2 word.

Potter, So, Eckardt, and Feldman (1984) tested predictions from these theories in two experiments. Subjects were presented line drawings of items or their labels in one of two languages. They compared the times to read aloud written words, to translate these words into the other language, and to name pictures in one or the other language. The critical comparison was between picture naming in the second language and translating from the

first to the second language.

In their first experiment, subjects were proficient Chinese-English bilinguals. Results showed that naming a picture in L2 took an equivalent amount of time as translating a written L1 word into L2. This pattern of results is predicted by the concept mediation model and suggests that skilled bilinguals do not use direct word associations between their two languages, but rather translate from one language to the other by means of the common concepts underlying the two surface vocabularies.

Potter et al. (1984) then reasoned that direct associations might be more likely with nonfluent bilinguals, who were in the process of learning their second language. As a consequence, they repeated the experiment with relative novice French-English bilinguals. The main findings paralleled those of the first experiment: subjects named pictures in L2 faster than they translated an L1 word into L2; in addition, they named L1 words in L1 much faster than they named pictures in L1. Thus, the results indicate that these nonfluent bilinguals also translated from their native language into the new language via an underlying common concept, not by using a direct association between L1 and L2.

### List Learning Tasks

List learning tasks are similar to association tasks inasmuch as they address questions concerning the bilingual's lexical organization. By contrasting the performance of monolinguals and bilinguals or of bilingual groups with different language backgrounds on list learning, different patterns of lexical organization become evident. For example, some researchers (Kolers, 1965; Lambert, Ignatow, & Krauthammer, 1968) have given list learning tasks to bilinguals with different language histories and have not found significant differences in their recall of mixed-language lists versus single-language lists. Kolers (1968) presented a recall task to bilinguals in which the mixed-language lists contained two types of repetition; some of the lexical items were repeated identically more than once, and some of the words were repeated conceptually in that their translation equivalents were in the list. The two kinds of repetition were found to facilitate recall equally. Kolers interpreted the results as signifying that bilinguals store items semantically in both languages; thus, language interdependence is evident in the bilingual.

### Text Processing in Bilinguals

The research described so far has focused primarily on the bilingual's processing of individual words. However, there has also been experimentation involving more complex materials. Three types of research have been used to analyze the bilingual's processing of sentences in the two languages: (a) an attempt to identify the syntactic aspects of grammar that affect the bilingual's ability to process sentences; (b) an examination of the effects of forced switching between two languages when reading text; and (c) a study of simultaneous translation.

#### Syntactic Aspects of Grammar

Sentence processing studies focus on the syntactic aspects of grammar, which aid or hinder the comprehension of text. The aim of some of this work is to determine the effects of the syntactic features of sentences on cognition. Macnamara's (1970) series of studies, for example, focused on the bilingual's reading ability in the second language. These experiments compared the time required for various types of language processing. In one study, subjects read both silently and aloud two types of passages, one of which followed rules of normal English construction and the other being a scrambled version of the conventionally written passage. Subjects took longer to