

R E P O R T R E S U M E S

ED 013 046

48

FL 000 519

MASSIVE VOCABULARY EXPANSION IN A FOREIGN LANGUAGE BEYOND THE BASIC COURSE--THE EFFECTS OF STIMULI, TIMING, AND ORDER OF PRESENTATION. FINAL REPORT.

BY- LADO, ROBERT

GEORGETOWN UNIV., WASHINGTON, D.C.

REPORT NUMBER BR-5-1095

PUB DATE JUN 67

GRANT OEG-6-14-021

EDRS PRICE MF-\$0.75 HC-\$7.24 181P.

DESCRIPTORS- \*LANGUAGE INSTRUCTION, \*MULTISENSORY LEARNING, \*TIME FACTORS (LEARNING), \*VOCABULARY DEVELOPMENT, \*SPANISH, SECOND LANGUAGE LEARNING, LANGUAGE RESEARCH, EXPERIMENTAL TEACHING, SECONDARY SCHOOLS, STATISTICAL DATA, UNDERGRADUATE STUDY, VERBAL STIMULI, VISUAL STIMULI,

THE IDENTIFICATION OF THE OPTIMAL COMBINATION OF STIMULI AND THEIR TIMING FOR LARGE INCREASES IN RECOGNITION VOCABULARY IN A FOREIGN LANGUAGE AFTER STUDENTS HAVE MASTERED THE BASIC STRUCTURE OF THE LANGUAGE WAS THE SUBJECT OF RESEARCH UNDERTAKEN WITH STUDENTS ENROLLED AT THE GEORGETOWN UNIVERSITY SCHOOL OF LANGUAGES AND LINGUISTICS. FOLLOWING A SURVEY OF THE PROBLEM, OBJECTIVES, AND RELATED RESEARCH, THE REPORT DISCUSSES THE GENERAL METHODS FOLLOWED IN NINE EXPERIMENTS. THE REPORT CONSIDERS IN DETAIL THE SPECIFIC PROCEDURES, ANALYSES, AND FINDINGS FOR EACH EXPERIMENT AND SUPPORTS EACH WITH A TABLE OF STATISTICAL FINDINGS. THE WHOLE EXPERIMENTAL SERIES DEALT CUMULATIVELY WITH THREE COMPLEX VARIABLES--EXPRESSION, DENOTATION, AND CONTEXT--PLUS ORDER AND MODES OF PRESENTATION OF THEIR ELEMENTS, E.G., (1) LISTENING VS. READING, (2) NATIVE LANGUAGE VS. TARGET LANGUAGE READING VS. LISTENING, AND (3) PICTURE, SENTENCE, AND OTHER CONTEXTUAL CLUES. ANALYSES OF THE FINDINGS INCLUDE SEVEN GENERAL CONCLUSIONS, IMPLICATIONS FOR VOCABULARY EXPANSION AND LEARNING RESEARCH, RECOMMENDATIONS, A SUMMARY OF THE RESEARCH, AND A LIST OF REFERENCES. IN THE EXTENSIVE APPENDIXES ARE (1) LISTS OF SYMBOLS, (2) VOCABULARY ITEMS, (3) INSTRUCTIONS, ADMINISTRATIVE FORMAT, AND TESTING MATERIALS FOR EACH EXPERIMENT, (4) QUESTIONNAIRES BASED ON APTITUDE, ATTITUDE, AND DEBRIEFING, AND (5) A GENERAL BIBLIOGRAPHY. (AB)

ED013046

Final Report

BR-Project No. 5-1095

Grant No. OE-6-14-021

DA 48

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE  
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE  
PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS  
STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION  
POSITION OR POLICY

**Massive Vocabulary Expansion  
in a Foreign Language Beyond the Basic Course  
The Effects of Stimuli, Timing,  
and Order of Presentation**



June 1967

U.S. Department of  
Health, Education, and Welfare  
Office of Education  
Bureau of Research

FL000 519

FINAL REPORT  
Project No. 5-1095  
Grant No. OE-6-14-021

MASSIVE VOCABULARY EXPANSION  
IN A FOREIGN LANGUAGE BEYOND THE BASIC COURSE:  
THE EFFECTS OF STIMULI, TIMING AND ORDER OF PRESENTATION

June 1967

U.S. DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE

Office of Education  
Bureau of Research

MASSIVE VOCABULARY EXPANSION  
IN A FOREIGN LANGUAGE BEYOND THE BASIC COURSE:  
THE EFFECTS OF STIMULI, TIMING AND ORDER OF PRESENTATION

Project No. 5-1095  
Grant No. OE-6-14-021

Robert Lado, Project Director

Beverly Baldwin, Research Assistant  
Felix Lobo, S.J., Research Assistant

June 1967

The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

School of Languages and Linguistics  
Georgetown University

Washington, D.C.

TABLE OF CONTENTS

	Page
<b>I. Introduction</b>	
1. The Problem .....	2
2. Objectives .....	3
3. Related Research .....	3
<b>II. Methods, Results and Discussion</b>	
1. General Procedure .....	5
2. Specific Procedures, Analyses and Findings for Each Experiment	
Experiment I .....	13
Experiment II .....	19
Experiment III .....	24
Experiment IV .....	28
Experiment V .....	33
Experiment VI .....	36
Experiment VII .....	39
Experiment VIII .....	45
Experiment IX .....	49
<b>III. Conclusions, Implications and Recommendations</b>	
1. General Conclusions .....	52
2. Implications .....	53
Vocabulary Expansion .....	53
Learning Research .....	53
3. Recommendations .....	54

	Page
IV. Summary .....	54
V. References .....	59
VI. Appendices	
1. Symbols .....	62
2. Vocabulary Items	
Experiment I .....	63
Experiment II .....	68
Experiments III, IV .....	73
Experiments V, VI .....	78
Experiment VII .....	78
Experiments VIII, IX .....	98
Sample Pictures .....	118
3. Instructions and Administration Format	
Experiment I .....	120
Experiment II .....	122
Experiment III .....	123
Experiment IV .....	124
Experiment V .....	125
Experiment VI .....	125
Experiment VII .....	126
Experiment VIII .....	127
Experiment IX .....	128
4. Testing Materials	
Experiment I .....	131
Experiment II .....	131

	Page
Experiments III, IV .....	143
Experiments V - IX .....	160
5. Questionnaires	
Aptitude .....	161
Attitude .....	162
Debriefing .....	165
6. General Bibliography .....	166



## ACKNOWLEDGEMENT

Many colleagues and students contributed in various ways to this research. Although it is not possible to mention everyone, we wish to record our debt to the following and our gratitude to all those not mentioned.

### Consultants:

JOHN B. CARROLL, psychology, improvement of design  
ANTANAS SUZIEDELIS, statistics  
OTHMAR WINKLER, statistics

### Administrative:

JAMES E. ALATIS, support and encouragement  
JOSE M. HERNANDEZ  
ELIZABETH JOHANSEN

### Preparation of slides:

DYLA ALVES, illustrations  
FRANK MANN, illustrations  
MAURICIO ESCARDO, S.J., photography

### Preparation and synchronization of tapes and slides:

LESLIE HANZELY  
SANDOR ZADORI

### Faculty support in recruiting subjects:

R. ARIAS MICHELENA	ENRIQUE MORENO
EDWARD L. BLANSITT, Jr.	MARIO PARREAGUIRRE
JOSEPH P. BOCSI	MARIO PAVIA
JOSEFA A. CLAUDIO	CARLOS SOLE
LUCIA MENA	YOLANDA SOLE

### Secretarial:

JENNIFER BUTLER  
DENISE ENTWISTLE  
LUCIA LOBO



## I. INTRODUCTION

### 1. THE PROBLEM

This research was designed to identify optimal combinations of stimuli and their timing for large increases in recognition vocabulary in a foreign language after students have mastered the basic structure of the language. Justification for pursuing such a practical objective was found in (1) the conviction that large recognition vocabularies are needed for effective use of a second language and (2) the possibility that language students have considerably more power to learn vocabulary than is now being put to effective use.

Supporting (1) are the findings of Seashore (1947) and others who reported recognition vocabularies of 40,000 basic and 80,000 basic and derived words as the average for high school seniors and 61,000 basic and 157,000 basic and derived words for college students in three universities sampled. These figures have been challenged by Lorge and Chall (1963) as grossly inflated because of methodological problems in sampling, but even when reduced to one-half or one-fourth their size, they still leave estimates of vocabulary size which are out of all proportion to the 850 to 2,000 word vocabularies often mentioned in foreign language materials.

Also supporting (1) is the research of Ellegard (1960) who estimates that a book of 100,000 running words may be expected to contain 4,750 different "lexical units" such as those of the Thorndike and Lorge list (1944) excluding proper names. He estimated that ten such books in a "homogeneous course" would contain a cumulative total of 11,300 different lexical units, and that ten books in a "heterogeneous course" would contain 21,000 different units.

Supporting (2) is the fact that the large recognition vocabularies in the native language have been acquired by the subjects largely on their own and in ways about which there is more folklore than factual information. Whatever power the students have for the acquisition of vocabulary in their native language is not being tapped for the expansion of vocabulary in the foreign language.

With limitations in the amount of time that can be devoted to vocabulary and to the foreign language itself, the importance of finding favorable learning factors and combinations is self-evident.

## 2. OBJECTIVES

The immediate and specific objective of the research was to identify the most effective combination of factors from a field of more than forty promising possibilities by successive elimination in cumulative experiments with lists of one hundred words from beyond the 10,000 most frequent ones in Spanish. Positive results would be of immediate practical use in second and third level foreign language courses. Secondly, they would make possible a second series of experiments to identify optimal reentry schedules of reinforcement to give permanence to the vocabulary acquired under optimal massive presentation.

A third objective was to gather experimental data that might permit more specific hypotheses of second language learning, since the researchers feel that present theories are too general to support specific methodological inferences.

## 3. RELATED RESEARCH

Carroll (1961, p. 23) summarizes an early attempt at intensive vocabulary acquisition as follows: "An extensive report by Thorndike (1908) is instructive, even though it was based on experimentation under rather uncontrolled conditions. Thorndike had 22 students learn the English meanings of 1,200 German words, divided into 12 lists of 100 words each. Subjects learned at home, using whatever method they preferred, and kept records of their time. When each student felt confident that he knew practically all the 1,200 words, he was tested with the entire list. Retention was measured one month later. On the average, students learned about 1,030 words in 30 hours of study. Individual performances ranged from 380 words learned in 42 hours to 1,046 words learned in 18 hours. Retention was about 35 per cent after 40 days. There was no evidence of improvement in learning ability (i.e., 'learning to learn'), but the subjects reported the task became more interesting as time progressed."

Although the experiment has little generalizing value because we do not know how or why the results were achieved, it is interesting that the best student learned 58 words an hour on the average and the entire group learned 34 an hour.

A number of experiments by Krawiec (1946), Dunkel (1948), Kessman (1959), Postman and Rosenzweig (1956), Pimsleur and Bonkowsky (1961) and Asher (1962) have compared the relative effectiveness of visual versus auditory presentation of verbal learning material. Krawiec, Dunkel and Kessman found significantly better results when stimuli were presented visually. Postman and Rosenzweig (1956) and Asher (1962) found that students who learned visually and relearned aurally achieved superior performance in comparison with the perfor-

mance of students who learned aurally and relearned visually. Pimsleur and Bonkowsky, on the other hand, report greater transfer from aural to visual learning than vice versa.

In regard to the presentation of meaning, the audio-lingual approach has been advocating the minimization of the use of the native language. However, little experimental validation has been advanced to substantiate this claim.

Lambert et. al. (1963) found that students of a second language who kept the native and target languages functionally separated throughout their course did more poorly in their course work than did those who permitted the semantic features of the two languages to interact.

T. Mishima (1966) conducted an experiment in which she attempted to compare the value of conveying meaning through the native language versus the target language in vocabulary acquisition. Her results showed that presentation of meaning in the native language was far more effective.

As Carroll (1966 p. 1077) pointed out, "there is no evidence that the use of the learner's native language inhibits learning of the foreign word or its meaning." The above experimental findings seem to suggest that further research on the question of the "direct" method of teaching foreign languages is badly needed.

Although experiments on the problem of vocabulary learning in lists as opposed to vocabulary learning in context date back some twenty years, little research has been done on this important question in recent years. Seibert (1930) and Morgan and Bailey (1943) have suggested from their findings that context may act as a source of interference in the acquisition of vocabulary items. Morgan and Foltz (1944), in duplicating the study of Morgan and Bailey, found that vocabulary exercises in the form of a short story were preferable to vocabulary exercises without the story. The role of context in vocabulary learning in a foreign language is in great need of further study.

Carroll (1961, p. 24) suggests that "Further experimental work would be useful in determining the parameters of foreign language vocabulary learning. What are wanted are statements such as 'if you want to teach a vocabulary of size n, you may expect the student to spend x hours in attaining mastery, studying in such and such a manner.'"

## II. METHODS, RESULTS AND DISCUSSION

### 1. GENERAL PROCEDURE

The procedures and materials for each experiment varied in accord with the particular combinations of stimuli--i.e. modalities--to be tested within the same overall design. Taken together, the whole series dealt cumulatively with three complex variables,

E = Expression  
D = Denotation, and  
C = Context

plus order and modes of presentation of their elements, e.g.

E: listening vs. reading  
D: native language vs. target language  
reading vs. listening  
C: picture  
sentence  
other contextual clues.

In general, for each experiment, 100 words were prepared for reading and/or listening to be taught to subjects through synchronized presentation via slides and tapes. The subjects were tested for their knowledge of the meaning of these words by measuring recall when they saw the word in written form. The test for Experiment I was a recall test while that of Experiment II was multiple choice, and both recall and multiple-choice tests were used in III through IX.

#### Lists of Words\*

A master list of words to be used in the series of experiments was compiled as a random sample taken from beyond the 10 thousand most frequent lexical items in Rodríguez Bou's Recuento de Vocabulario Español (1952).\*\* The list totaled 1,019 items. From this master list, it was intended that 100 words be extracted randomly for each individual experiment. Such was the case for Experiments I, III, VII and VIII. For Experiment II, an item count of the difficulty of the

---

\* See Appendix II.

\*\*Originally the criteria for selection of items were 1) not cognates, 2) not proper nouns, 3) preferably known to the researchers, and 4) preferably picturable. However, the decision was soon made that a random sample of lexical items from Bou's list would provide a more objectively selected and representative sample, as well as being more consistent with the design of this study.



words used in Experiment I was obtained. Those words which were known on the pre-test of Experiment I by 7 or more subjects were eliminated and replaced by 25 words taken from the master list; i.e. 75 of the words used in Experiment II were the same as those of Experiment I, and 25 of the words used in Experiment II were new. For Experiment III, a new sample of 100 items was randomly extracted from the master list. This same list was used in Experiments IV, V and VI. For Experiments VII and VIII, two new samples were used; the same sample used in Experiment VIII was used for Experiment IX.

#### Full Rotation of Modalities.

Because there are many words in Spanish which are similar in both form and meaning in English (even at the level beyond 10,000 frequency), it became apparent from the first two experiments that the measure of number of words learned by our subjects could be a function of this similarity in form and meaning between the two languages. Dr. John B. Carroll advised that the 'difficulty' range of words per mode might be more tightly controlled if five sets of materials (slides, tapes, answer sheets, "correction schedules") were prepared in which every word would be exposed to each of the five modalities. This meant that 100 slides for each modality had to be prepared. In the administration of the experiment, five subjects would be taught 20 words in one modality; the next five subjects would be taught the same twenty words, but in a different modality; and so on, for five groups of five subjects each (total 25 subjects per experiment), until each word had been taught in every modality. Because this modification in the design required from 200 to 600 slides per experiment, depending on the modalities, the same sample of words was used for Experiments III, IV, V and VI, and adapted accordingly to the modalities of these four experiments. This meant, of course, that new subjects had to be used for each of these experiments.

#### Denotations\*

A meaning was given to each item in the master list. Martínez Amador's Diccionario Inglés-Español (1945) was used as the basic source, and when there was a choice of meaning for a single word, the first entry was arbitrarily assigned. When an item from Bou's list could not be found in Amador, other sources were consulted (e.g., Velázquez, Cuyás, Vox, Real Academia), and the first entry accordingly selected. Because our corpus was drawn from beyond the 10,000 most frequent, we were faced with the problem of unfamiliarity of denotation in English, which would seem to add an extraneous learning burden to our subjects. If a more familiar denotation could be found, it was used. However, this was not possible for all such problem items without resorting to lengthy definitions and explanations; the

---

\*See Appendix II.

meanings for these items, then, were left unchanged, on the assumption that a reader who came upon such an item in a non-experimental reading-set would be faced with a similar comprehension problem to the degree that the context did not signal a meaningful association. An example would be "salesiano," for which Amador gives "Salesian" as the first (and only) meaning, and which refers to the oratory of Saint Francis of Sales, a 19th century fraternity for the education of youth. The first entry in one of the dictionaries used, then, was taken as our basis in assigning a meaning to each word in the master list.

Besides familiarity of D in the native language, the choice of meaning was further modified or adjusted according to the following principles:

- 1) 'more current' meaning to Dr. Lado and Dr. Lobo, both native speakers of Spanish,
- 2) picturability, if this was part of the modality,
- 3) similarity in form to E (cf. in particular Exp. VII).

#### Equalization of Syllable Load and Form Class

Once the sample list (both E and D) had been established, the number of syllables in each E was determined and each E was assigned to a form class. Further, the form-class of each D was made parallel to that of its corresponding E. For example, the meaning of "feriado" is given by Amador as "day in which the courts are shut," which in English is a noun phrase. In Spanish, however, it functions as an adjective. To make the correspondence between expression and denotation parallel, the meaning of this word became "applied to legal holidays," an adjectival in English.

The items in the sample list were then arranged in the following order:

two syllable nouns  
two syllable adjectives  
verbs  
adverbs  
three syllable nouns  
adjectives  
verbs  
adverbs  
four syllable nouns  
adjectives, etc.,

up to 7 or 8 syllable forms. The words were further arranged alphabetically within each syllable- form class grouping.

### Randomization of Lists

Next the list was divided into five sub-groups, 20 words for each modality, according to the following randomization scheme (suggested by Dr. A. Suziedelis):

a b c d e  
c b a e d  
c a d b e  
a c e d b  
a b c d e  
...

The five sub-groups thus obtained were then equalized so that each sub-group would contain an equal or near equal number of words of 'x' form-classes.

### Teaching Procedure\*

Each experiment had a teaching stage and a testing stage. The teaching stimuli (E, D, C, depending on the experiment) were typed on 5 x 8 index cards to be photographed and made into slides:

Expression  
Denotation  
Context

The films were developed commercially and mounted by the research team. The aural stimuli were programmed onto tapes and the audio-visual synchronization was recorded on the second channel of each tape.\*\*

Five consecutive items were taught by one mode, followed by five items taught by another mode, and five by the next, etc. To equalize the possible effect of one mode upon another, the same scheme of randomization used in dividing the 100 words into the five sub-groups was followed (see above).

Exposure time for each variable component (E, D, C) was calculated at 3 seconds. Total teaching time for one round averaged 30 to 45 minutes.

---

\* See Appendix III

\*\*Since the special equipment designed for the project arrived late and suffered several breakdowns, most of the experiments were carried out with a 3M Wollensak tape recorder coupled to a Carousel AV-900 slide projector. (cf. section on Equipment, p. 11).



### Testing\*

For Experiments I and II, Ss were tested by means of a pre- and post-test; for the remaining experiments the pre-test was eliminated and replaced by two post-tests -- one a production test and the second a multiple choice recognition test. Total testing time was 15 to 20 minutes.

Responses were scored for identifiability with the-'core meaning' of the denotation taught. Belyayev's\*\* scheme concerning the inter-relationships of words in two lexical systems was adopted here. For example, an item was marked correct if the Ss answer expressed complete semantic coincidence with E, if it stood in a relationship of genus and species (subordination) with E, or if it stood in a relationship of partial coincidence or mutual intersection with E. These guidelines might seem very lenient but they were followed on the assumption that some positive learning had occurred which would either be reinforced or further specified by contextual clues in the reading situation. The motivation of this research was designed around a recognition-reading vocabulary which in the non-experimental set would include contextual clues of one sort or another to signal meaning. One point was given for each item known and the data was submitted to analysis of variance, analysis of covariance, and t-test (Experiment V) to determine statistical significance.

### Questionnaires\*\*\*

In the administration of each experiment, three questionnaires were used for the purpose of describing our population of subjects and of eliciting their reactions to the experiment. The first was a memory test, parallel to Part V of the Modern Language Aptitude Test, prepared by David L. Horton. The second was an attitude questionnaire designed to evaluate the motivation and attitudes of our subjects towards learning Spanish. The 7-slot scale of Osgood, Suci and Tannenbaum (1957) for the semantic differential as the index of range and intensity was adopted as the basic format. The questions were directed towards Spanish as an academic course, Spanish as an instrument to employment and Spanish as an "integrative" force.\*\*\*\* The third questionnaire was for purposes of "debriefing" our subjects after each experiment had been administered.

---

\* See Appendix IV.

\*\* See Belyayev (1964), p.151-159.

\*\*\* See Appendix V.

\*\*\*\*See Lambert et. al. (1963)

## Subjects

The subjects used in each experiment were students enrolled at Georgetown University who had completed or were close to completing at least a basic course in Spanish, equivalent to approximately six credits of college Spanish.

A total of 228 Ss participated in the series of nine experiments: 159 (70 females & 89 males) participated in one of the nine; 36 in two and 17 in a total of three of the series.

The following data were obtained for 154 of the 159 Ss:

Mean Aptitude Score	16 (out of a possible 24)
Mean Age	21 years
Mean years contact with Spanish outside of home*	3 years
Mean years contact with a foreign language other than Spanish and outside of home**	7 years

The native language was English for 94% of the population and a foreign language for 6%. However, 28% of the population reported contact with a foreign language in the home (i.e. through parents or relatives).

The breakdown of major field of study was as follows:

Institute of Languages and Linguistics:	Spanish	29%
	Other F.L.	22%
	Linguistics	<u>5%</u>
		56%
College (Liberal Arts)		12%
School of Foreign Service		23%
Special Student		9%

The attitude questionnaire (see Appendix V-B) was scored from +3 to -3 on the 7-slot scale. Summing up all scores per S, the mean score was as follows:

---

\* Included travel as well as formal study in high school and college.  
\*\*Same as above.

Interest Index	+5	(questions 1-5)
Instrumental Index	+6	(questions 6-6h)
Integrative Index	<u>+14</u>	(questions 7-7h)
Total	+25	(out of a possible <u>+69</u> )

### Equipment

A single lens reflex 35 mm. Honeywell Pentax camera with a close-up lens (49 mm. - no. 1) and a copy stand with two light bulbs and art board were used for photographing the visual stimuli. The film used was Kodak High Contrast Copy Film M135-36, which was developed commercially. The negatives were then mounted into 2 x 2 cardboard frames by the research team.

Especially designed equipment with synchronized audio and visual elements was designed by Foringer and Co., Inc., (Rockville, Maryland), in consultation with the chief investigator. It provided a system for the presentation of aural and visual stimuli with precisely controlled timing relationships and sequences, and a voice operated relay to measure reponse time in tenths of a second. The aural stimulus was recorded onto channel 1 or a presentation tape with its time of presentation and the commands for visual stimuli programmed onto the second channel.

A single trial would start with an intertrial interval (of 8 seconds). The apparatus first scanned the coding on the second channel to determine whether the visual or audio stimulus came first, or whether they should overlap and to what degree. This scan also picked up and stored which of 16 possible time intervals were designated for the interstimulus interval as well as which of 16 possible intervals were designated for the visual display duration. At the time out of the intertrial interval, the system then went into the appropriate mode of operation, either presenting the audio or visual stimulus as per the coding.

Subject response was picked up via a voice operated relay. His first sound output that exceeded the threshold of the relay activated a pulse stream generator and print counter to record his latency in responding in tenths of a second. The administrator identified the response as correct or incorrect by pushing or not pushing a button on a separate console (1=correct; 0=incorrect).

The recording, programming and print counter units were mounted in a 75" cabinet. A separate Visual Test Module projected the visual stimuli on a 6" x 9" screen. A control box with six buttons started and stopped the unit during administration, identified a response as correct or incorrect, and reset the trial number.

Since the A.V.W.P.A.D. equipment was not delivered in time for use in the first three experiments and suffered several breakdowns, a Wollensak tape recorder and a Carousel AV-900 slide projector were used. A signal was programmed onto the second channel of the presentation tape to coordinate the visual and audio elements.

### Pilot Experiments

Pilot experiments had been conducted previous to the formalization of the experimental design. They showed measurable differences in learning for different modalities of presentation. When the problem of serial position of items and its effect on learning was considered, it was decided that additional pilot experiments were needed to determine whether rotation for each item would be feasible. This arrangement would permit maximum randomization of the five modalities to be tested in each experiment. After these pilot experiments, the items were distributed in cells of five items each, with random rotation of the cells as indicated above. The results of these experiments were only suggestive in view of the small number of subjects involved and inadequacy of control, but the design itself proved tractable.

## 2. SPECIFIC PROCEDURES, ANALYSES AND FINDINGS FOR EACH EXPERIMENT

### EXPERIMENT I

#### VARIATIONS IN PRESENTATION OF LISTENING AND READING FOR E

##### Objective and Procedure

The specific objective of Experiment I was to discover any differences in learning related to different modes of presentation of E (expression). In terms of Ss activity, the five modes compared were -

- (a) reading followed by listening (E: r + l)
- (b) listening followed by reading (E: l + r)
- (c) listening and reading simultaneously (E: r/l)
- (d) reading alone (E:r)
- (e) listening alone (E:l).

These modalities represent various ways in which vocabulary is presented in the foreign language classroom without thought as to possible differences in learning. Some of these modalities have been discarded by the audio-lingual approach. However, any differences in learning that might occur because of the above means of presentation has been in need of further experimental study.\*

##### Format

The format for presentation of stimuli in the teaching phase allowed 3 to 6 seconds for visual exposure, 3 to 6 seconds for aural exposure (three repetitions at the rate of one second each) so combined as to take the same total time, one second or less for a beep to signal the students to respond, 4 seconds for the response (Ss were instructed to "try to give the meaning orally" immediately after exposure to each E), and 1 or 2 seconds for the denotation (D) of each item to be given aurally in the native language via the tape. Since the different modes required different combinations of the elements of the basic format, the specific sequences are given below in abbreviated form.\*\*

---

\*See Scherer and Wertheimer (1963) for a recent experimental comparison of the traditional versus the audio-lingual approach.

\*\*(" = change of slide; numbers = cumulative number of seconds of exposure and length of slide projection - before, after or simultaneously with audio; letters = audio stimuli, with E = repetition of expression, D = denotation, ln = listening in native language, and each E, D representing approximately one second to deliver).

(a) E (reading) followed by E (listening):

"1-2-3-"E-E-E-"beep-1-2-3-4-Dln

i.e. The slide came on for 3 seconds

A blank slide came on and the tape presented the word three times

Beep followed by 4 seconds silence for Ss response

Tape gave the denotation once in the native language

(b) E (listening) followed by E (reading):

"E-E-E-"4-5-6-"beep-1-2-3-4-Dln

i.e. The tape presented the word three times

A blank slide went off and the slide with E on it came on for 3 seconds

A blank slide came on simultaneously with the beep followed by 4 seconds silence for Ss response

Tape gave the denotation once in the native language

(c) E (listening and reading simultaneously):

"E-2-E-4-E-6-"beep-1-2-3-4-Dln

i.e. The slide gave word for 6 seconds and at the same time the tape repeated the word three times at the rate of E(1001)-E(1001)-E(1001)

A blank slide came on simultaneously with the beep followed by 4 seconds silence for Ss response

Tape gave the denotation once in the native language

(d) E (reading alone):

"1-2-3-4-5-6-"beep-1-2-3-4-Dln

i.e. The slide showed the word for 6 seconds

A blank slide came on simultaneously with the beep followed by 4 seconds of silence for Ss response

Tape gave the denotation once in the native language

(e) E (listening alone):

"E-2-E-4-E-6-"beep-1-2-3-4-Dln

i.e. Tape repeated the word three times at the rate of E(1001)-E(1001)-E(1001) - at same time with blank slide

Beep followed by 4 seconds silence for Ss response

Tape gave the denotation once in the native language



Directions for the teaching phase were given orally via the tape. Ten examples, 2 per mode, preceded the presentation of the items to be learned. The modality changed every 5 items. Ss were cued when the modality changed: the tape simply said "Read and listen," followed by the five items, then "Listen and read" followed by the next five items, and so forth.

Once the tapes and slides were ready for the experiment they were administered to 7 subjects as a dry run. While no experimental data were collected, this exercise proved quite valuable in anticipating potential troubles inherent in synchronizing the tape recorder and slide projector in the experiment proper. The subjects to be used were divided in two groups for the actual experiment, because the language laboratory could not accommodate more than 15 Ss at a time under the conditions required by the design.

This experiment involved four presentations of the 100 words in the following sequence:

- Step 1, TEST
- Step 2, TEACH
- Step 3, TEACH
- Step 4, TEST

In the pre- and post-tests, Steps 1 and 4, all the words were presented via slides for silent reading. Ss were instructed to say the meaning in the native language, English, and their response was recorded on individual tapes. Ss had 5 seconds in which to respond before the next slide appeared. They were told that they would not be penalized for guessing. The purpose of the pre-test was to determine the number of words already known before teaching so that the difference with the post-test could be taken as the amount of learning. Testing time for the 100 word total list plus instructions was 15 minutes.

In steps 2 and 3, teaching, the 100 words were presented with instructions to try to learn them. Depending on the mode, Ss listened to the items through earphones and/or read them on a screen. Teaching time per round took 30 minutes. It was observed that during the teaching phases the Ss repeated aloud the E in Spanish along with the voice on the tape, and if they knew the denotation, they responded as instructed during the 4 second interval allotted for 'response.' When presumably they did not know the denotation, they repeated it aloud after it was given on the tape.

The total number of subjects used in the experiment was 22. Due to the failure of two recording units in the laboratory, results were obtained for 20 Ss.



## Scoring

The responses were scored according to two different methods: (1) a correct response had to represent the same lexical meaning and the same form-class as the denotation taught; (2) a correct response need represent only the same lexical meaning, whether or not it was given in the same form-class.

## Results and Interpretation (See Table 1)

The largest increase from Test 1 to Test 2 by both scoring methods was shown by Mode (c), listening and reading simultaneously. The total for the 20 Ss was 221 words or 11.0 words per subject. The smallest increase was shown by (e) Listen only, with a total of 156 by Method A and 126 by Method B, or 7.8 and 6.3 words per Ss respectively. The analysis of variance indicated that the results by both methods of scoring were statistically significant at a level of confidence of  $P < .05$  for Method A and  $P < .001$  for Method B. The analysis of covariance, however, showed significance only for Method B of scoring, at  $P < .05$ . The differences were not significant statistically for Method A.

The extremely interesting results should be considered probable rather than certain in view of the lack of statistical significance by the analysis of covariance under the stricter method of scoring. Possibly the lists of words did not represent equivalent learning tasks despite the great care that went into their equalization. This possibility is suggested by the fact that the highest increase went with the list showing lowest initial scores and the lowest increase went with the highest initial ones.

Since our objective was to identify the mode showing the greatest probability of being most effective, there is no difficulty in selecting (c) listen and read simultaneously as that mode, and adopting it as the standard presentation of E in Experiment II.

An additional suggestion might be implicit in the data, namely that, of the three factors manipulated in the modes--reading, listening, and simultaneity-- reading may have been the strongest in contributing to learning of these single words as determined by recall of their meaning in the native language when reading them within an hour of the learning experience. This possibility would not support or deny any absolute superiority of visual versus auditory stimuli: it would mean simply that college level Ss familiar with Spanish to the extent of at least "six credits" of college Spanish seem to learn more new words through graphic presentation than through auditory presentation alone. Auditory presentation alone was least effective even with these Ss, who knew enough Spanish to hear the new words

TABLE 1  
EXPERIMENT I  
VARIATIONS IN PRESENTATION OF  
LISTENING AND READING FOR E

<u>Mode</u>	<u>No. of Ss</u>	<u>Strict Scoring: M words per Ss</u>	<u>Liberal Scoring: M words per Ss</u>
(a) r + l	20	9.05	8.25
(b) l + r	20	9.60	9.50
(c) l/r	20	11.05	11.05
(d) r	20	9.25	8.40
(e) l	20	7.80	6.30

ANALYSIS OF VARIANCE - DIFFERENCE SCORES

Degrees of Freedom 4, 76

B=	27.275	61.075
W=	4.359	3.843
F=	6.257	15.891
P	<.05	<.001

ANALYSIS OF COVARIANCE - DIFFERENCE SCORES

Degrees of Freedom 4, 75

B=	6.560	8.295
W=	3.729	3.110
F=	1.759	2.667
P	NSD	<.05

reasonably well.

### Possible Implications

Any implications that might be drawn from the data of this first experiment must be considered only in the realm of possibility in view of the statistical analysis. Nevertheless the possible implications are interesting enough to warrant replication of the experiment and variations of it.

One possible implication might be that if reading contributes heavily to vocabulary learning for Ss who are familiar with the sound of Spanish, it might also contribute to learning vocabulary by those who are beginning the study of Spanish and are less likely to listen effectively. To know this would be interesting regardless of any negative effects the graphic stimuli might have on pronunciation, which requires conscious learning effort by college level subjects in any event.

Another possible implication might be further support for the hypothesis of contiguity in time--simultaneity--as a factor in vocabulary learning, i.e. that the closer in time such mutually confirmatory experiences as reading and listening are exercised the greater the amount of learning.

A third possible implication is that the reason for the apparent superiority of the reading/listening mode was due partly to the nature of the test, which required reading and recall rather than listening and recall. Variations of the experiment could test this possibility by introducing a listen and recall test as well.

There is no implication in the result for the "simultaneity of input hypothesis" (Asher, 1961, p. 70) even if the results were confirmed on replication, since the design was not intended to reveal information beyond global amount of learning by the different stimuli and their combinations in the five modes. Three repetitions of the auditory stimulus involving isolated words in Spanish would constitute an excessive exposure if the object were to explore specific differences between visual and auditory stimuli.

## EXPERIMENT II

### VARIATIONS IN ORDER OF PRESENTATION OF E AND D

#### Objective and Procedure

The main objective of Experiment II was to discover if different orders of presentation of expression (E) and denotation (D) resulted in different amounts of learning. The modes represented possible orders of presentation in the classroom. In addition, within the simultaneous presentation of E for reading and listening selected from Experiment I, two variations were introduced in the rate of the voice for listening in order to test a more rapid presentation at the beginning of the reading exposure and a delayed presentation of the voice toward the end of the reading. Thus the five modes were as follows:

- (a) Expression as in Exp. I followed by denotation read in native language (E: r/l + D: rn)
- (b) Denotation read in native language followed by expression as in Exp. I (D: rn + E: r/l)
- (c) Expression and denotation simultaneously with voicing of expression at the beginning of reading exposure (E: r/l/D: rn)
- (d) Expression and denotation simultaneously with voice as in Exp. I (E:r/l./D: rn.)
- (e) Expression and denotation simultaneously with voice delayed after three seconds of the six of graphic exposure for reading (E: r/l/D: rn...)

The procedure was again to test, then teach, and finally test again to measure the amount of gain from the first to the last test. The teaching phase was reduced to one round instead of the two of Experiment I because the two teaching rounds plus the two rounds of testing resulted in some noticeable fatigue on the part of the Ss, and there was something of a logistics problem in retaining Ss for more than an hour when all classes were on an hourly schedule. Furthermore, the amount of learning (Test 2 minus Test 1) in Experiment 1 was sufficient to justify reduction to one round and still expect measurable increases.

Because of the mechanical difficulties in recording responses during the testing rounds and the time involved in scoring them, it was decided that a multiple-choice test would be more objective and faster to score. The stimulus for the testing rounds was still presented by slides; in addition, the correct D and five choices\* appeared on the slide as well. The number of each slide appeared on the negative itself to guide the Ss in answering the corresponding number on an answer sheet. Eight seconds were allowed for each slide and concurrent Ss response. The subjects were instructed to answer every item.

#### Format

The material to be taught was programmed onto a tape and photographed for slides. The tape was synchronized with the slide projector for the presentation of E in the mode selected from Experiment I and for the order of presentation of E and D. The denotation was arbitrarily presented through reading in the native language (D: rn), keeping in mind that different ways of presenting the denotation were scheduled to be tested in subsequent experiments. Two examples were given for each mode.

The specific sequence of elements in each mode follow:

- (a) E followed by Drn

"E-E-E-"4-5-6-

i.e. First slide showed E for 3 seconds and at the same time the tape repeated E three times  
Second slide gave denotation for 3 seconds silent reading

- (b) Drn followed by E

"1-2-3-"E-E-E-

i.e. First slide gave Drn for 3 seconds silent reading  
Second slide showed E for 3 seconds with simultaneous repetition of E (3 times) via the tape

- (c) E simultaneous with Drn with voicing of E at the beginning

"E-E-E-4-5-6-

i.e. Slide gave E at upper left of screen and Drn at center of screen for 6 seconds while tape gave E three times at beginning (at the rate of one second a repetition)

---

\*See Appendix IV-B.

(d) E simultaneous with Drn with voicing of E slower

"E-2-E-4-E-6"

i.e. Slide gave E and Drn for 6 seconds as in (c) above, while tape played E simultaneously three times at rate of E-(1001)-E-(1001)-E-(1001)

(e) E and D simultaneously with voicing delayed

"1-2-3-E-E-E-"

i.e. Slide gave E and Drn as in (c) and (d) above and tape gave three repetitions of E after a 3 second delay

The experiment was given a trial run to four subjects and administered formally to 28 Ss. It was observed that the subjects did not repeat the expression aloud as they had done in Experiment I, although they reported they did it silently.

#### Results and Interpretation (See Table 2)

The mode which showed the greatest gain in words learned (T2 - T1 = Learning) was (e) expression and denotation simultaneously with voice delayed. The amount of gain was 387 words for the 28 subjects or 13.8 words per subject. The results were significant at the  $P < .05$  level of confidence in the analysis of variance, but they were not statistically significant by the analysis of covariance. Again there arose the possibility that the difference in difficulty of the lists might be responsible for at least part of the difference. Again the best mode was also the one with the lowest total score in the pre-test (T1).

Under the criteria predetermined for the experiment, however, the results were interpreted as showing that mode (e) had the greatest probability of being in fact the most efficient one. Consequently it was selected for use in all subsequent experiments as the model for order of presentation of E and D where physically possible. This last reservation was necessary for Experiments IV, V and VI in order to keep the time of presentation constant while incorporating other modalities which had additional aural elements.

#### Possible Implications

The order of presentation of E and D has been the subject of considerable debate, with some insisting that presentation of D before E would obviously be superior. Others, including the senior researcher, expected better results from presentation of E before D, on the



TABLE 2  
 EXPERIMENT II  
 VARIATIONS IN ORDER OF PRESENTATION OF  
 E AND D

<u>Mode</u>	<u>No. of Ss</u>	<u>M words per Ss</u>
(a) E + D	28	12.18
(b) D + E	28	12.68
(c) E/D	28	12.21
(d) E./D.	28	12.50
(e) E/D...	28	13.82

ANALYSIS OF VARIANCE - DIFFERENCE SCORES

Degrees of Freedom 4, 108

B=	12.625
W=	4.392
F=	2.875
P	<.05

ANALYSIS OF COVARIANCE - DIFFERENCE SCORES

Degrees of Freedom 4, 107

B=	2.532
W=	1.798
F=	1.408
P	NSD



assumption that presentation of E first would make the unfamiliar stimulus temporarily more familiar and thus reduce it to associating a now familiar stimulus to a familiar D as response. The results, if they were to be confirmed by replication would favor neither hypothesis but one of closeness(contiguity in time) of both stimulus and response. This possibility is advanced only as a research suggestion since the differences among the modalities are not impressive numerically and not significant by the analysis of covariance.

### EXPERIMENT III

#### VARIATIONS IN THE PRESENTATION OF D: READING MODES

##### Objective and Procedure

Does the presentation of the denotation of the words affect significantly the amount of learning when it is read in the native language, the target language, or combinations of these with and without pictures? This was the question that Experiment III was to answer within the conditions of the research design.

In Experiment II, we arbitrarily presented D as rn, reading in the native language, since the objective was to discover any effects ascribable to order of presentation. In III, the five modes of presentation were variations in the presentation of D.

- (a) Reading in the native language (Drn)
- (b) Reading in the target language (Drt)
- (c) Reading in the native language simultaneously with a picture illustrating the denotation (Drn/p)
- (d) Reading in the native language simultaneously with reading in the target language (Drn/Drt)
- (e) Reading in the native language simultaneously with reading in the target language plus picture illustrating the denotation (Drn/Drt/p)

The presentation of expression and the order of expression and denotation, in keeping with the cumulative design of the experiments, was in the mode that showed most learning in I and II, namely simultaneous presentation of E, reading and listening, voice-delayed, and D - i.e. "1-2-3-E-E-E". Every slide presented E/D for reading and the tape repeated E three times simultaneously with the slide in the voice-delayed mode.

A new sample of 100 words was taken randomly from the master list. A denotation in the native language was selected for each word on the same principle as for I and II. In addition, a synonym was selected for the D in the target language, parallel in form-class to the one chosen in the native language. A picture (p) was drawn for every word with the idea of supplementing the D via a drawing. Pictures were not used alone to convey D.

### Format

Since in Experiments I and II there remained the possibility that the five lists of 20 words were not equivalent in difficulty, Dr. Carroll suggested a modification of the design that would equalize any such differences among the five modes of teaching. Accordingly, each modality was used with the five lists, rotating them among the students so that mode (a) was used with one of the lists on five subjects, with a second list on another five subjects, with the third list on a third group of five Ss, and so forth until each mode was used with all five lists for five students each.

This change in design involved the preparation of materials for all five modes for the 100 words instead of for only 20 words per mode. It also entailed five administrations to groups of 5 Ss instead of two administrations as before. Since the rotation of the lists among the five modes was an attempt to eliminate any bias in favor of any one mode resulting from differences among the lists, it was thought possible also to forgo the pre-test and decide the relative effectiveness of the modes on the post-test alone. This change was also suggested by Dr. Carroll.

Two post-tests were prepared and administered: one a 15-minute production test, consisting of a list of the words taught, with instructions to the Ss to write the meaning in either English or Spanish. The other, a 10-minute multiple-choice test consisted of 100 items with one correct choice and three distractors drawn randomly from the denotations of the other words taught. The fifth choice labeled "don't know" in the multiple-choice tests of Experiment II was discarded because the subjects felt it increased the burden of reading and was an unnecessary distraction while taking the test. The choices were given in English or Spanish, depending on the mode of presentation of each word for the particular set of 5 subjects. The tests were in the form of mimeographed sheets instead of the slides synchronized with a tape used for Experiments I and II. The mimeographed sheets eliminated the possible confusion and distraction of looking up and down from screen to paper.

### Results and Interpretation (See Table 3)

The most productive mode for the presentation of D was (c) reading in the native language with a supporting picture. The results were significant at the level of  $P < .001$  for the production test and  $P < .05$  for the multiple-choice test.

Applying the "distribution of the studentized range statistic,"\* all modes are significantly ( $P < .05$ ) better than rt except rn; in

---

\*Winer (1962).

TABLE 3  
 EXPERIMENT III  
 VARIATIONS IN THE PRESENTATION OF D:  
 READING MODES

<u>Mode</u>	<u>No. of Ss</u>	<u>Production Test M words per Ss</u>	<u>Recognition Test M words per Ss</u>
(All E/D...)			
(a) D:rn	25	9.44	17.64
(b) D:rt	25	8.68	16.36
(c) D:rn/p	25	11.44	18.00
(d) D:rn/rt	25	10.04	17.40
(e) D:rn/rt/p	25	11.28	17.44
ANALYSIS OF VARIANCE			
Degrees of Freedom 4, 96			
	B=	32.212	9.348
	W=	3.399	3.131
	F=	9.475	2.985
	P	<.001	<.05

other words, rn is not significantly better than rt, but all other modes are.

### Possible Implications

In addition to selection of mode rn/p for the successive experiments of the series, it is possible to interpret the results as supporting the hypothesis of greater efficiency in learning via the presence of a familiar system, the native language. In other words, simultaneous confirmatory evidence via the picture and/or the target language seems to aid the learning efficiency in the presence of the native language. While it is not clear what the nature of the effect of pictures or the target language actually is, it seems to indicate clearer perception resulting from the contextualization afforded by the picture or greater meaningfulness afforded by some additional context. These are interesting areas for further research beyond the specific objectives of the present series.

## EXPERIMENT IV

### VARIATIONS IN THE PRESENTATION OF D: LISTENING MODES

#### Objective, Procedure, Format

The objective of Experiment IV was to discover any differences in learning resulting from different modes of presentation of D in the native and the target language via listening with and without the aid of pictures. Since the best mode of III, D: rn/p was not included in IV, it was foreseen that Experiment V should compare the best mode of IV with that of III.

The five modes of Experiment IV were parallel to those of III except that the denotation was presented for listening via the tape instead of reading via the slides.

The modes then were:

- (a) Listening in the native language (Dln)
- (b) Listening in the target language (Dlt)
- (c) Listening in the native language  
simultaneously with a picture (Dln/p)
- (d) Listening in the native language  
and listening in the target  
language (Dln/Dlt)
- (e) Listening in the native language  
and listening in the target  
language simultaneously with a  
picture (Dln/Dlt/p)

The list of words used and the basic design for both the teaching and the testing phases were the same as Experiment III. The expression appeared on the slides and each audio-visual exposure was timed for presentation proportionate to the audio delivery, with both E and D repeated three times. Since the aural presentation of Drn and Drt could not be simultaneous with the aural presentation of E, we chose to present D before E.\*

---

\*The programming scheme was -

1. "D-D-D-E-E-E-" for modes (a) in English, (b) in Spanish, and (c) in English plus picture
2. "D-D-D-E-E-E-D-D-D-" for modes (d) in English and in Spanish and (e) in English and in Spanish plus picture. Drn preceded E and Drt followed E.

Exposure time approximated 6 seconds per slide.

TABLE 4  
 EXPERIMENT IV  
 VARIATIONS IN THE PRESENTATION OF D:  
 LISTENING MODES

<u>Mode</u>	<u>No. of Ss</u>	<u>Prod. Test M words per Ss</u>	<u>Recog. Test M words per Ss</u>	<u>Combined Scores (both tests) M words per Ss</u>
(All E/D...)				
(a) D:ln	25	12.96	18.92	31.88
(b) D:lt	25	9.16	16.00	25.16
(c) D:ln/p	25	13.64	18.64	32.28
(d) D:ln/lt	25	13.08	18.84	31.92
(e) D:ln/lt/p	25	13.12	19.12	32.24

ANALYSIS OF VARIANCE

Degrees of Freedom 4, 96

B=	83.308	42.212
W=	4.437	2.253
F=	18.775	18.730
P	<.001	<.001



It might seem more logical to present E aurally before the aural presentation of D, if for no other reason that the design of the slides was such that E appeared first, in the upper left-hand corner and presumably was the first stimulus perceived by the subjects. However, the results of Experiment II showed D followed by E to be the second most productive mode in raw scores and E followed by D to be the least productive in raw scores. On the basis of this information, when an aural repetition of D was part of a modality, it preceded the aural repetition of E when both D and E had to be presented aurally, simultaneously with the slide.

#### Results and Interpretation (See Table 4)

The results of the production test favored (c) listening in the native language plus pictures, and those of the multiple-choice test favored (e) listening in the native and target languages plus pictures. The results were significant for both at the level of confidence  $P < .001$ . In consultation with Dr. Carroll the raw scores on both tests were combined and since the two top modes were practically the same (1 point difference in favor of (c) ln/p), we chose (c) as best. This choice was based also on the fact that (c) was simpler to administer with no loss in effectiveness over (e). Furthermore, Experiment V was designed to compare the best modes of III and IV and since (c) of IV was exactly parallel to (c) of III, ln/p versus rn/p would permit specific comparison of the factor of reading versus listening in the presentation of D.

More interesting than the rather small differences among the modalities involving listening in the native language with and without other elements is the dramatically lower performance of (b) D: listening in the target language. The studentized range statistic showed that all modes were significantly ( $P < .05$ ) better than rt. A graph brings out this fact sharply as well. See Fig. 1.

#### Possible Implications

The above evidence again supports the hypothesis of greater learning efficiency in the presence of the more familiar system. The hypothesis is supported in its negative effect, that is, the inefficiency in learning via the less familiar system, that of the target language alone.

The effect of pictures in the listening modes does not seem to be as clear a factor in learning as it was in the reading modes. In Experiment III - Test 1, rn/p and rt/p were significantly better than rn/rt, rn and rt, but not significantly better than each other; also, there was a significant difference in favor of rn/rt over rt. In Test 2 rn/p and rn/rt were significantly better than rt, with no

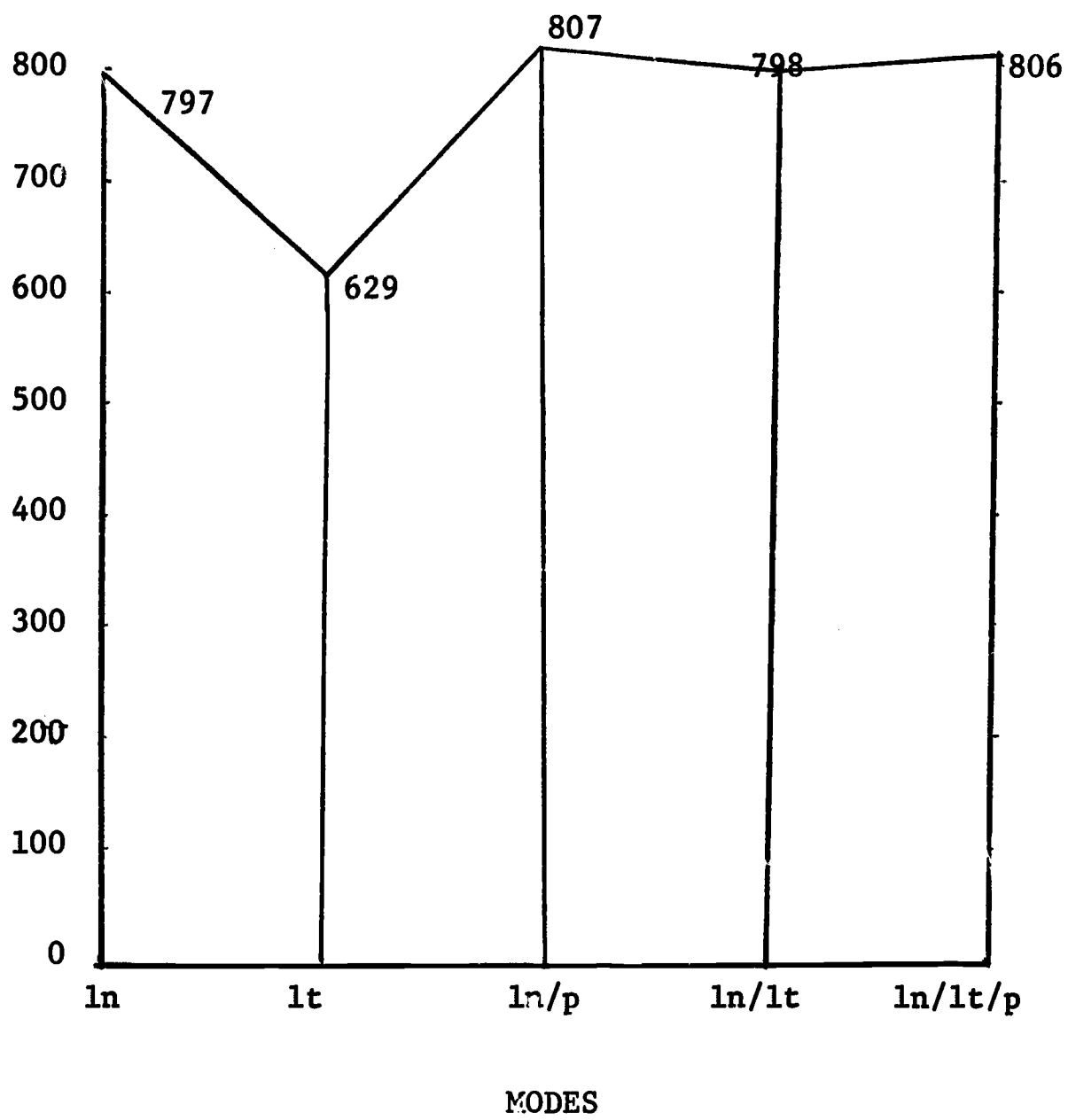


FIGURE 1. Combined Raw Scores on Recall and Multiple-Choice Tests for Experiment IV.

significant difference between the other modes. For Experiment IV, however, all other modes\* showed a significant difference over lt, for both tests. This experiment might be replicated, using lt/p instead of lt.

There are obvious implications here for the more extreme positions in direct methods that do not allow the use of the native language for anything. Our results would seem to imply a loss of effectiveness with regard to vocabulary expansion beyond the elementary level when the native language is eliminated.

\*ln, ln/p, ln/lt, ln/lt/p.

## EXPERIMENT V

### VARIATIONS IN THE PRESENTATION OF D: LISTENING VERSUS READING IN N

#### Objective, Procedure, Format

Since Experiments III and IV had determined presentation of D in the native language with a picture to be the most productive mode, Experiment V was designed to compare the relative effectiveness of listening versus reading in the native language, using pictures with both. There were only two modes then; ln/p and rn/p.

The list of words used and the basic design for both teaching and testing phases were the same as for Experiments III and IV. The slides were thus already prepared; it was necessary only to cut new tapes. The testing materials were basically the same except that the target language choices were eliminated from the multiple-choice tests.

#### Results and Interpretation (See Table 5)

The experiment was administered to two groups of 15 Ss each, or a total of 30 Ss. The results were tabulated for the 30 subjects and the t-test for correlated means was applied. Test 2 (multiple-choice recognition) showed significance at  $P < .05$  in favor of the listening mode (ln/p) and Test 1 (recall) gave a non-significant difference in favor of the reading mode (rn/p). Comparing the results of the two groups of 15 Ss on Test 1 the following was observed: the first group did not show a significant difference between the two modes ( $t=2.13$ ) although the raw score difference favored listening. The second group showed a very significant difference in favor of reading ( $t=7.51$ ). Comparing the two groups within Test 1 as independent samples (ordinary t-test, not for correlated means), a highly significant difference between their change scores ( $t=5.79$ ) was found.

The same difference between groups was also observed in the results of Test 2, where the statistically significant difference favoring the listening mode was due exclusively to the first group. The results are summarized in Table 5.

In the opinion of the senior researcher, the unusual fact that a raw difference of 29 points between totals approximating 1400 should be statistically significant and that the same raw difference of 29 between lower totals approximating 900 should not, is very likely due to the inhibition of variance in the higher scores because they were

TABLE 5

EXPERIMENT V

VARIATIONS IN THE PRESENTATION OF D:  
READING VERSUS LISTENING IN N

<u>Mode</u>	No. of <u>Ss</u>	<u>Production Test</u>		<u>Recognition Test</u>	
		M for 30 Ss	M for 15 Ss	M for 30 Ss	M for 15 Ss
		<u>G1</u>	<u>G2</u>	<u>G1</u>	<u>G2</u>
(All E/D...)					
(a) D:ln/p	30	29.50	30.46 28.53	47.36	47.53 45.60
(b) D:rn/p	30	30.46	28.53 32.40	46.40	47.20 47.20

t-test, correlated means

P

NSD

<.05

quite near the ceiling and in many cases must have been truncated at the top. As a result of this inhibition of variance a spurious uniformity of scores resulted.

Nevertheless, the statistically significant difference between change scores of the two subgroups is important. On the assumption that higher aptitude scores might favor the reading mode (Suziedelis consultation), a correlation coefficient was computed between the change scores on Test 1 and the aptitude scores obtained from the aptitude questionnaire. No correlation was found.

Comparing the attitude scores of each subgroup, Group 1 (favoring the listening mode) had a substantially lower mean score on the instrumental index: + .332 (Group 1) versus + 5.866 (Group 2), which was probably to be expected since Group 1 was comprised of English and Biology majors who were taking Spanish essentially to fulfill a language requirement. Group 2 was composed of Foreign Service majors who anticipated using Spanish to some extent in their future employment.

The breakdown of mean attitude scores for the two groups follows:

	Group 1 (English, Biology)	Group 2 (Foreign Service)
Interest	+ 5.916	+ 4.066
Instrumental	+ .332	+ 5.866
Integrative	<u>+ 9.332</u>	<u>+12.930</u>
Total	+15.580	+22.862

It is suggested that for students whose main interests are not directed along the lines of foreign languages, the audio mode of presentation of meaning provides a greater focus of attention or concentration. Replication of this experiment would seem very worthwhile.

Since the subjects employed in the subgroup that favored (b) reading simultaneous with picture, were students in the School of Foreign Service and they were presumably more like those of the students of the Institute of Languages and Linguistics in their attitudes towards language learning (a subjective judgement), mode (b) was selected for subsequent experiments, and a further qualification of our subjects became that they be enrolled in the School of Foreign Service or the Institute of Languages and Linguistics.

## EXPERIMENT VI

### VARIATIONS IN PRESENTATION OF D: ORDER OF R AND L

#### Objective, Procedure, Format

The chief objective of this experiment was to discover if combinations of reading and listening and different order of presentation for reading and listening would result in differences in learning for D. Pictures were included in all modes. It was also possible to include listening and reading with pictures as separate modes in partial replication of Experiment V.

The modes were:

- |                       |   |
|-----------------------|---|
| (a) D: rn/p           | Reading in the native language simultaneous with picture  |
| (b) D: ln/p           | Listening in the native language simultaneous with picture  |
| (c) D: ln/p + D: rn/p | Listening in the native language simultaneous with picture, followed by reading in the native language also simultaneous with picture |
| (d) D: rn/p + D: ln/p | The reverse order of (c)  |
| (e) D: ln/rn/p        | Listening and reading in the native language simultaneous with picture  |

Again, the same list of words was used as in Experiments III, IV and V. Each expression was presented graphically for reading and was given three aural repetitions during the teaching phase via the tape. Each D was repeated aurally for those modes involving ln/p; the order of aural presentation of E and D was programmed as follows -

- |                       |  |
|-----------------------|--|
| for (a) D: rn/p       | E and D simultaneous "1-2-3-E-E-E-"  |
| (b) D: ln/p           | E and D simultaneous except that D in the native language was given aurally during the period of voice delay before the aural repetition of E, thus "D-D-D-E-E-E-"             |
| (c) D: ln/p + D: rn/p | <u>Listening</u> three times to D in the native language simultaneous with picture and with reading of E in the target language, followed by listening to E three times in the |



target language simultaneous with  
reading D in the native language  
and with picture, thus "D-D-D-"E-E-E--"

(d) D: rn/p + D: ln/p      The same as (c) but in reverse order,  
thus "E-E-E-"D-D-D--"

(e) D: ln/rn/p              The same as (b) but with the addi-  
tion of D for reading in the native  
language on the same slide, thus  
"D-D-D-E-E-E--"

### Results and Interpretations (See Table 6)

The fact that no statistically significant variation appeared in either the recall or the multiple-choice tests is interpreted as evidence that the five modes of presentation of D were approximately equivalent in effectiveness as ways of presenting vocabulary for recognition. Consequently, for classroom use, it would be reasonable to choose (a) and (b) as the most desirable since they are less complicated than the other three. Any choice between (a) and (b) should be decided on the basis of convenience or personal preference. In general it might be easier to use (a) rn/p, since (b) is rather complicated in the preparation of the tape material.

### Possible Implications

The absence of significant variation among the modes may be interpreted as evidence of a uniform strong factor or set of factors in all modes whose effect on learning must have far outweighed any possible differences contributed by the different presentations. The hypothesis is advanced that the strong common factor was the native language as the learning vehicle for D, supported of course by the pictures, which were also common to all modes.

This hypothesis is in turn based on the more general hypothesis advanced above (Experiment III), namely that of greater efficiency in learning resulting from the presence of the native language plus pictures. The evidence from the data would seem to suggest that this factor of familiarity is stronger in its effects than the factor of closeness in time hypothesized in Experiments I and II.

TABLE 6  
 EXPERIMENT VI  
 VARIATIONS IN THE PRESENTATION OF D:  
 ORDER OF R AND L

<u>Mode</u>	<u>No. of Ss</u>	<u>Production Test M words per Ss</u>	<u>Recognition Test M words per Ss</u>
(a) D:rn/p	25	12.60	18.56
(b) D:ln/p	25	11.64	18.64
(c) D:ln/p + D:rn/p	25	11.48	19.00
(d) D:rn/p + D:ln/p	25	11.80	18.84
(e) D:ln/rn/p	25	12.04	18.48
ANALYSIS OF VARIANCE			
Degrees of Freedom 4, 96			
	B=	--	--
	W=	--	--
	F=	--	--
	P	NSD	NSD

## EXPERIMENT VII

### THE COMPLEX VARIABLE C (CONTEXT): CLASSIFICATION, MEANINGFULNESS, CONTEXTUAL SENTENCES

#### Objective, Procedure, Format

With the variables of order of presentation and avenues of presentation of E and D screened in the preceding six experiments and the consequent selection of a preferred mode, E: r/l/D: rn/p, the research was directed to the complex variable C (Context), representing vaguely understood matters of broad semantic area, linguistic context, activation of meaningfulness in both native and target languages, etc. The pictures, included as part of D in the previous experiments, might more properly have been considered part of C, since in the implementation of the experimental design the pictures were employed as a supplement to D rather than as D itself. This contextual character of pictures might well be essentially their nature in communication since pictures are ambiguous in all but the simplest uses without the aid of language or other specifying signals.

The five modes compared in this experiment were:

- |  |         |
|--|---------|
| (a) D followed by re-entry of D in lieu of C | (D + D) |
| (b) Coordinate classification                | (Coor)  |
| (c) Meaningfulness in the native language    | (Mn)    |
| (d) Meaningfulness in the target language    | (Mt)    |
| (e) Contextual sentence                      | (Crt)   |

This selection of modes represents a number of decisions and considerations as follows:

Mode (a) was the mode selected from the previous experiment in keeping with the cumulative nature of the series. The re-entry of D was chosen as a satisfactory way of equalizing the time of exposure under each mode. Allowing 3 seconds for E, 3 seconds for D, and 3 seconds for C, the mode with D alone would involve only a 6 second total exposure. With the re-entry of D for 3 seconds, the time exposure per mode was equalized. The programming model for all modes was "1-2-3-E-E-E-7-8-9."

An earlier plan to use a composite picture as part of one of the modes was discarded on the basis of three considerations: (1) It would be impractical to attempt to draw a single composite picture to include the 20 words of each sample taken randomly from the master list; (2) it seemed overly complicated and distracting to change composite pictures every word or group of words as needed. Also, category

grouping as contextualization was included in the coordinate mode; and (3) pictures were already part of another mode, D: rn/p, followed by re-entry of the same.

In all modes except (a) D followed by D, the context (C) was treated in the same manner as the pictures, that is, as a supplement to D rather than another D. The denotation assigned to each E, though following the same principles employed in the previous experiments, was modified to accommodate the mode so that the contextual clue would not overlap with the form of E or D. In other words, D was kept different in form from E for all modes, and C was kept different in form from D and E for the coordinate mode. The purpose of this was to keep the contextual clue as different as possible from the rest of the information regarding a particular word; i.e., in order to make "coordination" distinct from "meaningfulness in the native language," a meaning was assigned which had to be different in form from E.

For example, items like the following were avoided:

E: académicamente

D: academically

C: EDUCATION

It seemed obvious that we would not be measuring the contribution of the context "EDUCATION," to learning the denotation, "academically," in such an item. Learning of this item was much more likely to occur through the meaningfulness of the familiar native language form of D rather than through the coordinate clue. Therefore, it was decided that to better compare the modalities, the effect of "meaningfulness in the native language" should be minimized for (b) the coordinate modality.

In preparing the materials for mode (b), coordinate, the guiding principles were as follows: (1) Where possible, the coordinate stimulus was deliberately different in form from that of both E and D. For example,

E: maquina

D: automatic

C: INSTRUMENT

"INSTRUMENT" rather than "MACHINERY" was used to avoid the similarity

of the form of the latter. Similarly in the item,

E: ex-dirigente

D: former manager

C: BUSINESS ADMINISTRATION

"BUSINESS ADMINISTRATION" rather than "MANAGEMENT" was used for the same reason.

On the other hand, the following was allowed for lack of a coordinate which was not similar in form to D,

E: conservatorio

D: music school

C: MUSICOLOGY

(2) Since it was difficult, if not impossible, to find a single coordinate label for all twenty words which happened to fall into the same randomized, equalized sub-list, or even to find a single label for the 5 words of each cell, it was decided to give a coordinate label to each word. On the other hand it was difficult to find a separate label for each word which did not overlap with the label of at least one other word in a particular cell. However, no single label had to cover more than two words. In equalizing these combined items, syllable-load and form-class were kept equal among sub-groups, so that the original randomization-equalization would not be disturbed.

For mode (c), meaningfulness in the native language, the basic idea was to structure C through meaningfulness of one linking item in the native language to a member of a derivational family of words in the target language. The guiding criteria were (1) semantic similarity to D, (2) formal similarity to E, or similarity of initial phonemes at least, e.g. "avante" with C: ahead, and (3) etymological rapport when possible, e.g. "ancuroso" with C: ample.

It was not possible to cover every item in the list with these principles. Rather than tamper with the randomized sample to accommodate this mode, two items were presented on the basis of pure phonetic association. For example,

E: buscapié

D: clue

C: \*bus\*cap\*yes\*

In addition, the criteria of semantic similarity was not restricted to strictly synonymous meaning nor to the same form-class as E or D. Examples,

E: alumnado

D: student body

C: alumnus

E: ubicar

D: to be situated

C: ubiety

For mode (d), meaningfulness in the target language, C was structured through quasi-morphological cuts; for example,

E: académicamente

D: scholarly

C: académico + mente

Again, this solution was not possible for such items as carabao, bledo, cupé, etc. These items were left unchanged, and E was simply repeated as C; for example,

E: carabao

D: water buffalo

C: carabao

Since there were 22 items of this kind, they were equalized among the five sub-lists, keeping the syllable-load and form-class of the original equalization the same.

The teaching phase consisted of the presentation of a slide with the E, D and C appearing simultaneously on it for a total of 9 seconds and the aural repetition of E coming on via the tape 3 seconds after the beginning of exposure.

The testing phase followed the same design as for Experiments III-VI: Test 1, written recall of D on mimeographed list of all 100 words; and Test 2, multiple-choice test of same words.



### Results, Interpretation, Implications (See Table 7)

The most productive mode on the basis of raw scores was (a) D followed by re-entry of D. The variation is statistically significant with the recall test and not significant with the multiple-choice test. It is quite probable that we have here a case of truncation of variability with the multiple-choice test because of insufficient ceiling. Fifteen out of the 25 subjects scored the maximum 20 in mode (a) on the multiple-choice test. Twelve out of the 25 scored the maximum for modes (c) and (d) and 11 and 8 scored the maximum in modes (b) and (e) respectively. Presumably mode (a) suffered the heaviest truncation since it had the largest number of maximum scores. By extrapolation, it could be predicted that the advantage of (a) would have been increased if Test 2 had had a higher ceiling. It seems safe, therefore, to select (a) re-entry of D, as the most productive mode of this experiment.

Further, the studentized range statistic, applied to Test 1 indicated a significant ( $P < .05$ ) difference in favor of D + D over all other modes except Mn. Here again presence of the native language with a supporting picture or a supporting native language clue is suggested as a productive learning instrument.

TABLE 7  
 EXPERIMENT VII  
 VARIATIONS IN C:  
 CLASSIFICATION, MEANINGFULNESS, CONTEXTUAL SENTENCES

<u>Mode</u>	<u>No. of Ss</u>	<u>Production Test M words per Ss</u>	<u>Recognition Test M words per Ss</u>
(All E/D.../C)			
(a) C:D + D	25	14.40	19.28
(b) C:Coor.-rn	25	12.52	18.84
(c) C:Mn	25	13.24	19.08
(d) C:Mt	25	12.48	19.08
(e) C:Crt	25	12.68	18.52
ANALYSIS OF VARIANCE			
Degrees of Freedom 4, 96			
	B=	16.252	2.120
	W=	5.306	.986
	F=	3.062	2.148
	P	<.05	NSD

## EXPERIMENT VIII

### VARIATIONS OF C: SEQUENCE, SUSPENSE, MNEMONICS

#### Objective, Procedure, Format

The modes of this experiment dealt with further variations in the general area labeled C, context. That some contextual information is helpful to the learning of vocabulary has proven consistently true through each experiment from III on, if we consider the supporting picture as C. This experiment was concerned with the relative effectiveness of different kinds of context, namely re-entry of D with a picture, factual sequence, suspense, and two kinds of mnemonic associations. All of them represent viable teaching devices which good teachers use intuitively without specific information as to their effectiveness.

The modes compared were specifically,

- |                        |   |
|------------------------|---|
| (a) D + D.             | Re-entry of D as context, the most productive mode from Experiment VII  |
| (b) Suspense.          | Some connected sequence involving a story with an element of suspense elaborated for the purpose  |
| (c) Factual sequence.  | Some connected sequence not involving suspense as an element of interest but with some unity as in a factual report   |
| (d) Mnemonic device 1: | "familiar place." Arbitrary association to some mnemonic device in general use with no sequential relation  |
| (e) Mnemonic device 2: | "geographical names." Arbitrary association or mediation through familiar words that may help recall the learning items--the common device of associating new names to other words or statements to facilitate their recall, again with no sequential relation. The words used were geographic names presumably familiar to the Ss. |

A new sample list was randomly extracted from the master list. The materials were designed for presentation so that all 20 items would be taught consecutively for modes (b) suspense and (c) factual sequence. The remaining three modes were taught so that 5 consecutive items were presented in one mode, then the next five in another, the next five in another, and so forth. The randomization scheme of order of modality presentation was followed for all modes except (b) and (c).

Special considerations were taken into account in the preparation of the materials for each modality:

(a) D + D. The modal used in Experiment VII was maintained, i.e. D: m/p + D: m/p.

(b) Suspense. A story was created using the vocabulary of each sub-list with the express intent of arousing the interest of the Ss in the initial sentences and maintaining it as much as possible throughout the development of the story. Each new word was introduced in a short sentence and the series of sentences constituted the story.

(c) Factual sequence. The general principle was to create a connected report emphasizing the sequential development of the facts built around each sub-list of vocabulary items. It was also important to de-emphasize any suspense factor or special interest element to avoid duplication of the suspense mode.

(d) Mnemonic device 1, familiar place. The principle was to center the vocabulary items around a kind of conceptual mnemonic device, the home and daily life. The design of the associations was semantically oriented, e.g.

E: abarrotar

D: to overcrowd

C: closet

E: apabullar

D: to flatten

C: cockroach

(e) Mnemonic device 2, geographic names. Names of cities and countries, preferably well-known, were selected for association with the words to be learned. The associating device was form oriented rather than semantically oriented, e.g.,

E: cacha

D: drinking horn

C: Kashmir

E: cinegético

D: pertaining to the art of hunting

C: Cincinnati

Five sets of slides and tapes were prepared, based on the cumulative incorporation of the most productive modes of the previous experiments, namely, E(r/l)/D(rn/p)/C--("1-2-3-E-E-E-7-8-9-"), and completed for the five modes of this experiment.

The testing materials were of the same two types: recall and multiple-choice as in previous experiments.

#### Results, Interpretation, Implications (See Table 8)

With the recall test, (a) and (b) D with p as C, and Suspense, show a noticeable numerical advantage over the other modes. The multiple-choice test seems to bunch together the first four modes and shows a noticeable numerical drop for (e) geographic names. When the scores on both tests are combined the numerical superiority of (a) and (b) becomes even clearer. The analysis of variance however showed no significance. On the basis of greater probability of being most effective, modes (a) and (b) are selected in this experiment. The addition of a suspense story to E/Drn is suggested as an effective learning instrument equal in effect to a supporting picture.

It is interesting that the two least similar modes turn out to be most probably most effective. It would be relatively simple to combine the two modes to see if they might complement each other. This seems a promising possibility for continued research.

TABLE 8  
EXPERIMENT VIII  
VARIATIONS OF C:  
SEQUENCE, SUSPENSE, MNEMONICS

<u>Mode</u>	<u>No. of Ss</u>	<u>Prod. Test M words per Ss</u>	<u>Recog. Test M words per Ss</u>	<u>Combined Scores (both tests) M words per Ss</u>
(All E/D.../C)				
(a) C:D + D	25	12.20	18.12	30.32
(b) C:Suspense	25	12.16	18.36	30.52
(c) C:Factual sequence	25	11.40	18.00	29.40
(d) C:Familiar place	25	11.24	18.16	29.40
(e) C:Geographic names	25	11.16	17.56	28.72

ANALYSIS OF VARIANCE

Degrees of Freedom 4, 96

B=	---	---
W=	---	---
F=	---	---
P	NSD	NSD



## EXPERIMENT IX

### VARIATIONS IN THE MODE OF RESPONSE

#### Objective, Procedure, Format

This was the last experiment of the present series. Its purpose was to explore the effect of various modes of response by the subjects during the learning phase. The speculation was that measurable differences in learning would result from participation in the form of writing versus speaking of the words or the denotations. Merely listening was not included as a variable on the assumption that speaking or writing would be more effective. This assumption was based on the general superiority of active versus passive participation as learning activities.

The five modes selected as most promising were:

- |                              |   |
|------------------------------|---|
| (a) Response, E:st           | The subject spoke the word in the target language after the model                                   |
| (b) Response, D:sn           | Subjects spoke the denotation in the native language after the tape                                 |
| (c) Response, D:wn           | Subjects wrote the denotation in the native language after exposure                                 |
| (d) Response, D:sn +<br>D:wn | Subjects spoke the denotation and then wrote it down, both in the native language                   |
| (e) Response, E:st + D:sn    | Subjects spoke the word in the target language and then spoke the denotation in the native language |

The learning matter was presented in mode (a) of Experiment VIII, namely, stimulus =  $E(r/l)/D(rn/p) + E(r/l)/D(rn/p)$ . This required 5 tapes and only one set of slides, rotated among the 5 groups.

The experiment was administered individually through the A.V.W.P.A.D. equipment and all latencies in responding were measured and tabulated. Latencies had been scheduled for measurement in an earlier experiment but the repeated difficulties in getting the equipment to function precluded the effective use of the latency unit until this last experiment.

The time required for administration of the experiment to each subject averaged 45 to 50 minutes for each of the 25 subjects.

### Results and Interpretation (See Table 9)

Although there is some variation in total raw scores among the modes, the differences are of minor effect and were not statistically significant.

### Possible Implications

The absence of significant differences in learning resulting from the various modes of response permits the formulation of a hypothesis with regard to such responses, namely that when the vocabulary items are presented in the above manner (i.e. E/D + E/D), the subjects engage in an internal (covert) learning activity that seems to be independent of any particular mode of response and that is a more significant factor in learning than the overt activity itself. This hypothesis is only suggested as a possibility from the above results.

TABLE 9  
 EXPERIMENT IX  
 VARIATIONS IN THE MODE OF RESPONSE

<u>Mode</u>	<u>No. of Ss</u>	<u>Prod. Test M words per Ss</u>	<u>Recog. Test M words per Ss</u>	<u>Mean Latency</u>
(a) Resp.:Est	25	12.48	18.64	1.3
(b) Resp.:Dsn	25	12.92	18.72	1.3
(c) Resp.:Dwn	25	12.72	18.52	1.5
(d) Resp.:Dsn + Dwn	25	12.68	19.00	1.3
(e) Resp.:Est + Dsn	25	12.60	18.68	1.3

ANALYSIS OF VARIANCE

Degrees of Freedom 4, 96

B=	--	--
W=	--	--
F=	--	--
P	NSD	NSD

### III. CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

A number of things have been learned or supported by this cumulative series of experiments. The design of the series was deliberately practical, because of the conviction that present theories of learning were too general to explain language learning or draw inferences in any systematic or cumulative way.

One of the things supported has been the need for a specific theory of language learning including second language learning. In the absence of such a specific theory, hypotheses as well as interpretation of data are given under the heading of conclusions.

#### 1. GENERAL CONCLUSIONS

(1) The first practical conclusion to be drawn from this research is that massive vocabulary expansion for recognition in written form is possible. It proved possible through concentrated, carefully programmed, short sessions, using Spanish vocabulary from beyond the 10,000 most frequent items in I. Rodríguez Bou's count (1952). Twenty-five college students who had completed at least 6 credits of college Spanish achieved recognition scores averaging 95 per cent in Experiment IX after a single round of teaching of the 100 word list. The teaching phase of this presentation lasted 45 to 50 minutes.

(2) A second practical observation has been that many of these words are already part of the recognition vocabulary of these students. In the test preceding teaching in Experiment I, the Ss were able to recall the denotation of 17 per cent of the words by strict scoring criteria, and 27 per cent by more liberal scoring criteria.

(3) A third conclusion has been that vocabulary learning and teaching involve many more variables and factors than those usually mentioned in the literature. General labels such as audio-lingual, audio-visual, audio-active and audio-passive are grossly unspecific and ambiguous as identifying terms for modes of presentation of language learning materials. The experiments show that the effect of such variables as E, D and C, plus different aspects of each, and the order of their presentation are not trivial.

(4) Simultaneity of presentation was a consistently positive factor in learning: simultaneous presentation of E through reading and listening; simultaneous presentation of E and D, voice-delayed; and simultaneous presentation of p, although this latter was not compared with sequential presentation of p.

(5) The presence of the native language in the presentation of D was consistently superior to presentation through the target language alone. The effect of this factor was stronger than any differences between listening and reading of D. This may be a specific effect of familiarity with the vehicle or medium of learning.

(6) There is a consistently positive effect of a context of some kind: pictures had a positive effect probably in this role. Connected sequences involving some element of suspense and the re-entry of Dm/p had the strongest effect.

(7) The absence of significant differences in learning resulting from variations in the modes of response suggests as a hypothesis that when vocabulary is presented in the manner of these last experiments, the subjects engage in internal (covert) activity that seems to be independent of the particular mode of overt response and is a heavier factor of learning than the overt activity itself.\*

## 2. IMPLICATIONS

### Vocabulary Expansion

The most interesting practical implication is the possibility of scheduling intensive vocabulary expansion sessions in regular language courses beyond the basic one. A recognition vocabulary of 7,000 to 10,000 words at the end of second year college Spanish becomes a distinct possibility.

### Learning Research

Further exploration of several of the variables for still more effective combinations and timing suggested themselves throughout the experiments. Specifically the length of exposure and overlap of E:l and E:r with D: m/p should be pursued further to map out the most productive lengths and periods of overlap. More sharply contrasting types of context can be compared to further understand the nature of the contribution of context to vocabulary learning.

---

\*A number of items in the vocabulary lists used were consistently missed by our subjects, no matter what the mode of presentation (e.g. leñazo = blow with a club, garlopa = long plane). This seems to suggest that subject interaction with list of words (patterns of difficulty) and mode of presentation, as well as source of subject (e.g. Experiment V - Foreign Service vs. College) are important reflections of the covert activity mentioned above. Although these factors are beyond the scope of this research, they indicate interesting areas for further investigation.

With the type of presentation arrived at in this series, it would now be rewarding to explore effective schedules of massive increases in vocabulary for college courses, searching both for maximum rates of increase and minimum re-entry for effective review. This was originally part of the research project and furthermore the intention was to work out a practical application of the findings so far.

It is interesting to speculate what effect various factors and conditions might have on learning other elements of language such as pronunciation, generation of sentences and active spoken vocabulary. The research design as modified has proved practical and effective. Labels of various methods are as unspecific and ambiguous with regard to these other elements of language as with learning vocabulary for recognition, and general theories of learning are equally as unspecific for the extraction of systematic inferences.

### 3. RECOMMENDATIONS

The following recommendations seem desirable:

(1) That the research be continued along the lines begun and those suggested in the section of implications.

(2) That various experiments be replicated as before and with introduction of promising variations.

(3) That the research be extended to other aspects and elements of second language learning and teaching.

### IV. SUMMARY

The research was designed to identify optimal combinations of stimuli for increases in recognition vocabulary in a foreign language after the basic structure of the language has been learned. The specific objective was to select the most effective combinations of stimuli from among some forty possibilities by successive elimination in nine cumulative experiments. The learning tasks were lists of 100 Spanish words from beyond the 10,000 most frequent ones in Rodríguez Bou's count (1952). Previous studies concentrated on the relative effectiveness of visual versus auditory learning and on transfer of learning from one mode to the other. The present study sought to identify most effective combinations of stimuli and factors. On the question of meaning and the role of context in foreign language learning, little research to date has been done.



The complex variables explored in various combinations were expression, reading and listening; denotation, reading and listening in the native and target languages; context, including pictures, connected sequence, suspense and mnemonic associations; and overt responses such as speaking and writing of expression and denotation.

Each experiment typically compared five promising combinations of stimuli. The 20 subjects of Experiment I and 28 of II attempted to learn the 100 words using a different combination of stimuli (mode) for each of 5 sub-lists of 20 words. The lists were randomly selected and equalized for syllable length and form-class. In Experiments I and II, the amount of learning was determined by the difference in scores between pre- and post-tests covering all 100 words. The subjects were asked to recall the denotation of the words in Experiment I and to identify the denotation in a multiple-choice test for Experiment II.

The design was modified after Experiment II in an attempt to eliminate the effect of differences in the difficulty of the sub-lists. In the remaining experiments except V, every sub-list of 20 words was taught by all five modes to separate groups of 5 subjects--total 25 subjects. The pre-test was eliminated and two post-tests were administered instead: one a recall type requiring the student to write the denotation of the given word; the other, a multiple-choice recognition test.

An aptitude questionnaire prepared along the lines of Part V of the MLAT by David L. Horton was administered to all subjects in order to better describe the population. An attitude questionnaire was prepared along the lines of Lambert et al., (1963) to determine their motivation and feelings toward Spanish. Ss also answered "debriefing" questions after each experiment.

Since the special equipment designed for the project arrived late and suffered several breakdowns, most of the experiments were carried out with a 3M Wollensak tape recorder coupled to a Carousel AV-900 slide projector.

Experiment I compared variations in the presentation of expression in the target language, namely reading followed by listening, listening followed by reading, listening and reading simultaneously, reading alone and listening alone. The simultaneous presentation of reading and listening stimuli was the most productive. Of the three factors manipulated--reading, listening, and simultaneity--, reading seems to have contributed most. An interesting implication might be the possible contribution of reading combined simultaneously with listening to the learning of vocabulary at the beginning level. Another possible implication would be support of

the hypothesis of contiguity in time--simultaneity--as a general factor in vocabulary learning, i.e. that the closer in time such mutually confirmatory experiences as reading and listening are exercised, the greater the amount of learning.

Experiment II compared different orders of presentation of expression and denotation, namely, expression before denotation, denotation before expression and expression and denotation simultaneously in three styles: listening concentrated at the beginning, spread throughout, and delayed toward the end of the reading exposure. The most productive mode was the simultaneous one with listening delayed.

Experiment III compared variations in the presentation of D (denotation), namely, reading in the native language, reading in the target one, reading in the native language plus a picture shown simultaneously, reading in the native language and reading in the target languages combined, and this latter plus a picture. The design was modified to permit rotation of the five modes with the five sub-lists: a different combination was used with each of five groups of five students. The pre-test was eliminated and two post-tests were used. The most productive mode was the one combining reading in the native language with the simultaneous presentation of a supporting picture. In addition, the presence of the native language in D appeared as the strongest learning factor. This would seem to support a hypothesis of greater efficiency in learning in the presence of a more familiar system, the native language.

Experiment IV paralleled III, substituting listening for reading in every mode. The most effective mode as measured by the recall test was the one parallel to the best mode in III, namely, listening in the native language plus a simultaneous picture. The multiple-choice test favored a different modality, that involving listening in the native and the target languages plus the picture. By combining the two tests and interpreting other evidence in the data, it was possible to select listening in the native language plus the picture as the best mode. Significantly lower performance of listening in the target language was noted.

Experiment V compared only two modes: those selected as best in III and IV, namely, reading in the native language plus the picture and listening in the native language plus the picture. The recall test showed a non-significant difference in favor of reading while the multiple-choice test showed a significant difference in favor of listening. However, there was a highly significant difference in the behavior of the two sub-groups on Test 1, when compared

to each other as independent samples. Difference of aptitude did not seem to be responsible. An inquiry into their respective attitude scores indicated a difference in instrumental index and Ss source (i.e. School of Foreign Service versus College). It was clear that the interaction effect of source of subject and mode of presentation was significantly at play.

In Test 2, it seemed likely that low ceiling had resulted in a spuriously significant ratio of a small difference of 29 words in raw scores. Consequently, both modes were included among the five of Experiment VI.

Experiment VI compared the two modes of V plus variations in the order of reading and reading and listening simultaneously. Pictures were included in all five modes. No significant differences were found by either test, confirming the hypothesis that the significant difference yielded by the multiple-choice test of V was a spurious one. In the absence of significant differences, it is reasonable to adopt the simpler modes of presentation, namely reading plus picture or listening plus picture. The data seems also to suggest that the factor of familiarity with the learning vehicle--presence of the native language--is stronger than the factor of closeness in time.

Experiments VII and VIII compared the effect of various types of context, namely extension of the exposure to the denotation-plus-picture as context, coordinate labeling, meaningfulness in the native language, meaningfulness in the target language, a contextually supporting sentence, a connected sequence with an element of suspense, a factual sequence not involving suspense, associations to a familiar place as a mnemonic device and associations to geographic names also as a mnemonic device.

Two modes seem to emerge as superior from these two experiments: (1) extension of the time of exposure to denotation with picture, and (2) a connected story with an element of suspense.

Experiment IX compared variations in the mode of response, namely repeating the expression in the target language, saying the denotation in the native language, writing the denotation in the native language, saying it and writing it in the native language and repeating the expression in the target language plus writing the denotation in the native language. No significant differences were obtained among these modes by either test. This could be interpreted as evidence for internal (covert) activity permeating all the overt responses compared and having a stronger effect than the particular variations in overt responses.

The conclusions are (1) that massive vocabulary expansion for recognition is possible in normal language courses; (2) that many non-frequent words are already known by students in second year college Spanish; (3) that the many variables in vocabulary presentation masked by general methods labels are not trivial in their effect on learning; (4) that simultaneity of presentation was a positive factor in learning; (5) that the presence of the native language in the presentation of denotation was more effective than the presence of the target language alone and that the effect of this factor of familiarity with the learning vehicle was stronger than any differences between listening and reading in D; (6) that a context of some kind had a positive effect on learning and that among the contexts the combination of denotation in the native language plus picture and a re-entry of same, or a story involving an element of suspense were most effective; (7) that in the absence of any significant differences resulting from variations in the mode of active overt response by the subjects, it is possible to postulate some more general covert activity by the Ss that permeates the specific overt varieties tested and is independent of any specific effect of the overt differences.

An interesting practical implication is the possibility of attaining recognition vocabularies of 7,000 to 10,000 at the end of second year college Spanish courses.

Research implications include the possibility of further refinement of the combinations of stimuli toward more effective results, the scheduling of course length vocabulary increases searching for maximum rates of increase with minimum re-entry for review, and the exploration of similar combinations of stimuli for the teaching of other elements of a second language at earlier and later levels of mastery.

It is recommended that (1) the research be continued along the same lines, that (2) various experiments be replicated with promising variations, and that (3) the research be extended to other aspects of foreign language teaching.



## REFERENCES

- Amador, Emilio M. Diccionario Inglés-Español y Español-Inglés. Barcelona: Editorial R, Sopena, S.A., 1945.
- Asher, James J. Sensory Interrelationships in The Automated Teaching of Foreign Languages. Research supported by Grant #7-04-091, United States Office of Education, Department of Health, Education and Welfare, 1961.
- Belyayev, B.V. The Psychology of Teaching Foreign Languages. New York: The Macmillan Co., 1964.
- Bou, I. Rodríguez. Recuento de Vocabulario Español (Vol. 1); trabajos de investigación auspiciados por el consejo superior de enseñanza. Río Piedras, Puerto Rico: Universidad de Puerto Rico, 1952.
- Carroll, John B. Research in Teaching Foreign Languages. Ann Arbor, Michigan, 1961. Also in N. Gage (Ed.) Handbook of Research on Teaching. Chicago: Rand McNally and Co., 1963, p. 1060-1100.
- Carroll, John B. "Research in Foreign Language Teaching: The Last Five Years," In G. Mead Jr. (Ed.) Language Teaching: Broader Contexts. Report of the Working Committees, Northeast Conference on the Teaching of Foreign Languages, 1966, 12-37.
- Cuyás, Arturo. Appleton's Revised English-Spanish and Spanish-English Dictionary. New York: Appleton-Century Crofts, 1960.
- Dunkel, H.B. Second Language Learning. Boston: Ginn, 1948.
- Ellegard, A. "Estimating Vocabulary Size." WORD, 1965, 16, 219-244.
- Kessman, M. Experimental Comparison of Writing-Speaking Versus Speaking-Writing Sequences in Learning Paired-associates. Unpublished Doctoral Dissertation, Indiana University, 1959.
- Kjeldergaard, Paul M. "Predicting Paired-associate Learning Speed." PSYCHOL. REPORT, 1962, 11, 353-354.
- Krawiec, T.S. "A Comparison of Learning and Retention of Materials Presented Visually and Auditorially." J. GEN. PSYCHOL., 1946, 34, 179-195.

- Lambert, Wallace E., Gardner, R.C., Barik, H.C., and Tunstall, K. "Attitudinal and Cognitive Aspects of Intensive Study of a Second Language." J. ABNORM. and SOC. PSYCHOL., 1963, 66 (4), 358-368.
- Lorge, Irving, and Chall, Jeanne. "Estimating the Size of Vocabularies of Children and Adults: An Analysis of Methodological Issues." J. EXPERIMENTAL PSYCHOL., 1963, 32 (2), 147-157.
- Mishima, Toshiko. An Experiment Comparing Five Modalities of Conveying Meaning for the Teaching of Foreign Language Vocabulary. Unpublished Doctoral Dissertation, Georgetown University, 1966.
- Morgan, C.L., and Bailey, W.L. "The Effect of Context on Learning a French Vocabulary." J. EDUC. PSYCHOL., 1943, 34, 561-563.
- Morgan, C.L., and Foltz, M.C. "The Effect of Context on Learning a French Vocabulary." J. EDUC. RESEARCH, 1944, 38, 213-216.
- Osgood, C.E., Suci, C.J., and Tannenbaum, P.H. The Measurement of Meaning. Urbana: University of Illinois Press, 1957.
- Pimsleur, P., and Bonkowski, R.J. "Transfer of Verbal Material Across Sense Modalities." J. EDUC. PSYCHOL., April, 1961, 52 (2), 104-107.
- Postman, Leo, and Rosenzweig, Mark. "Practice and Transfer in the Visual and Auditory Recognition of Verbal Stimuli." AMER. J. PSYCHOL., 1956, 69, 209-226.
- Real Academia Española. Diccionario de la Lengua Española. Madrid, Espasa-Calpe, S.A., 1956.
- Scherer, George A.C., and Wertheimer, Michael. A Psycholinguistic Experiment in Foreign-language Teaching. New York: McGraw Hill, 1964.
- Seashore, R. "How Many Words Do Children Know?" The Packet: Heath's Service Bulletin for Elementary Teachers, 1947, 2 (2), 3-17.
- Seibert, Louise C. "An Experiment on the Relative Efficiency of Studying French Vocabulary in Associated Pairs Versus Studying French Vocabulary in Context." J. EDUC. PSYCHOL., 1930, 31, 297-314.



Thorndike, E.L. "Memory of Paired Associates." PSYCHOL. REVIEW, 1908, 15, 122-138.

Thorndike, E.L., and Lorge, Irving. The Teacher's Word Book of 30,000 Words. New York: Bureau of Publications, Teacher's College, Columbia University, 1944.

Velázquez de la Cadena, Mariano. A New Pronouncing Dictionary of the Spanish and English Languages. New York: Appleton and Co., 1942.

Vox, Diccionario General Ilustrado de la Lengua Española; Segunda Edición. Barcelona, Publicaciones y Ediciones Spes, S.A., 1961.

Winer, B.J. Statistical Principles in Experimental Design. New York: McGraw Hill, Inc., 1962.

## APPENDIX I

### SYMBOLS

**Complex Variables:** E = Expression: word or phrase  
D = Denotation  
C = Context  
R = Response

**Variable Components for E, D, C, R:**

l = listen  
r = read  
+ = in sequence, followed by  
/ = simultaneously  
t = target language  
n = native language  
p = picture

Mn = meaningfulness in the native language  
Mt = meaningfulness in the target language  
Coor = coordinate

s = speak  
w = write

APPENDIX II

VOCABULARY ITEMS

A. Experiment I.

List A.

Mode: r + 1 ("read and listen")

	<u>Expression</u>	<u>Denotation</u>
1.	brega	strife
2.	coctél	cocktail
3.	lucro	riches
4.	adalid	chief
5.	marcador	marker
6.	repulsa	refusal
7.	cabrío	goatish
8.	obseso	besetting
9.	embeber	to imbibe
10.	bancarrota	bankruptcy
11.	comisura	suture
12.	incorrupción	incorruption
13.	polizonte	policeman
14.	extremista	extremist
15.	amadrinar	to couple
16.	suplementar	to supplement
17.	exguardabosque	ex-forester
18.	improrrogable	not-renewable
19.	meditabundo	pensive
20.	curiosamente	curiously

List B.

Mode: 1 + r ("listen and read")

<u>Expression</u>	<u>Denotation</u>
1. cimbreo	bending
2. lezna	awl
3. hurgar	to stir
4. desmoche	lopping off
5. muérdago	mistletoe
6. redaño	fetus membrane
7. fúlgido	radiant
8. sidéreo	starry
9. enjuagar	to rinse
10. atarraya	casting net
11. desajuste	maladjustment
12. palomero	pidgeon-seller
13. sobrepeso	overweight
14. coronario	coronary
15. desempolvar	to clean
16. chocolatera	chocolate pot
17. intolerancia	intolerance
18. gelatinoso	gelatinous
19. quincuagésimo	fiftieth
20. delicadamente	delicately

List C.

Mode: l/r ("listen and read simultaneously")

<u>Expression</u>	<u>Denotation</u>
1. hangar	airplane hangar
2. rotén	rattan tree
3. saltón	leaping
4. alcurnia	ancestry
5. oropel	tinsel
6. pudrición	rottenness
7. ultramar	overseas continent
8. realengo	royal
9. relajar	to relax
10. arsénico	arsenic
11. cavatina	lyric composition
12. malignidad	malignity
13. tapatío	person from Guadalajara
14. contentivo	containing
15. acaparar	to monopolize
16. vaticinar	to foretell
17. pisapapeles	paperweight
18. encapullado	closed, as a bud
19. jaculatorio	ejaculatory
20. esclarecimiento	enlightenment

List D.

Mode: ("read only")

<u>Expression</u>	<u>Denotation</u>
1. cripta	crypt
2. parva	light breakfast
3. granjear	to gain
4. dozavo	twelfth
5. peleona	quarrel
6. sordina	mute (Mus.)
7. feriado	applied to legal holiday
8. terciario	third
9. arandela	socket pan of a candlestick
10. campanazo	bell stroke
11. condolencia	condolence
12. pertinacia	pertinaciousness
13. tobillera	young girl
14. transandino	trans-Andean
15. averiarse	to suffer damage
16. estreñimiento	obstruction
17. agonizante	dying
18. insatisfecho	unsatisfied
19. preeleccionario	predestinarian
20. detalladamente	in detail



List E.

Mode: 1 ("listen only")

<u>Expression</u>	<u>Denotation</u>
1. flúor	flourine
2. miaja	crumb
3. ladear	to tilt
4. andurrial	by-road
5. profusión	profusion
6. semblanza	biographical sketch
7. hirviente	boiling
8. reventón	bursting
9. anualidad	condition of being annual
10. bocamanga	cuff of a sleeve
11. espumajo	froth
12. neurastenia	neurasthenia (Med.)
13. triplicidad	triplicity
14. momentáneo	momentary
15. discriminar	to discriminate
16. beneficiario	beneficiary
17. carbonífero	carboniferous
18. infatigable	indefatigable
19. envalentonar	to encourage
20. vicecomandante	vice-major

## B. Experiment II.

The list of words used in Experiment II was comprised of those 75 items known on Test 1 or the pre-test by less than 6 subjects participating in Experiment I and 25 new words taken from the master list. The 25 new words are indicated by an \* beside them below.

### List A.

Mode: E + D ("word followed by meaning")

<u>Expression</u>	<u>Denotation</u>
1. lucro	earnings
2. cimbreo	bending
3. letal*	mortal
4. quilate*	carat
5. cabildeo*	lobbying
6. semblanza	biographical sketch
7. dozavo	twelfth
8. oropel	tinsel
9. realengo	of royal domain
10. relajar	to relax
11. tramitación*	procedure
12. desmembración	dismemberment
13. desajuste	maladjustment
14. tapatío	person from Guadalajara
15. tobillera	anklet
16. represivo*	repressive
17. desempolvar	pulverize
18. encapullado	closed, as a bud
19. meditabundo	pensive
20. detalladamente	in detail

List B.

Mode: D + E ("meaning followed by word")

<u>Expression</u>	<u>Denotation</u>
1. brega	strife
2. flúor	flourine
3. ladear	to tilt
4. chispazo*	electric spark
5. bamboleo*	reeling
6. andurrial	by-road
7. sordina	mute (MUS.)
8. cabrío	goatish
9. reventón	blow out
10. aquejar*	to complain
11. parricida*	patricide
12. sobrepeso	overweight
13. anualidad	annuity
14. jaculatorio	ejaculatory
15. comisura	corner
16. contentivo	containing
17. acaparar	to monopolize
18. pisapapeles	paperweight
19. preeleccionario	predestinarian
20. esclarecimiento	enlightenment

List C.

Mode: E/D ("word and meaning simultaneously")

<u>Expression</u>	<u>Denotation</u>
1. hangar	airplane hangar
2. miaja	crumb
3. saltón	leaping
4. nereida*	sea nymph
5. alcanfor*	camphor
6. redaño	fetus membrane
7. ultramar	overseas continent
8. gástrico*	gastric
9. hirviente	boiling
10. extractar*	to summarize
11. trilobites*	extinct insect
12. cigarrero*	cigar maker
13. bocamanga	cuff of a sleeve
14. cavatina	musical composition
15. pertinacia	pertinaciousness
16. inquietante*	disquieting
17. vaticinar	to foretell
18. chocolatera	chocolate pot
19. quincuagésimo	fiftieth
20. envalentonar	to encourage

List D.

Mode: E./D. ("word and meaning simultaneously - slower timing")

<u>Expression</u>	<u>Denotation</u>
1. rotén	rattan tree
2. seise*	choir boy
3. granjear	to gain
4. consultor*	consultant
5. desmoché	lopping off
6. pudrición	putrefaction
7. peleona	quarrel
8. feriado	applied to legal holidays
9. obseso	besetting
10. mediados*	about the middle of
11. polígono*	many-sided
12. palomero	pidgeon-seller
13. espumajo	froth
14. campanazo	bell-stroke
15. bancarrota	bankruptcy
16. transandino	trans-Andean
17. averiars	to suffer damage
18. estreñimiento	constipation
19. embarazada*	pregnant
20. carbonífero	carboniferous

List E.

Mode: E/D... ("word and meaning simultaneously - voice delayed")

<u>Expression</u>	<u>Denotation</u>
1. parva	heap of unthrashed corn
2. lezna	awl
3. hurgar	to stir
4. escarpe*	steep slope
5. muérdago	mistletoe
6. alcurnia	ancestry
7. adalid	chief
8. sidéreo	starry
9. fúlgido	radiant
10. enjuagar	to rinse
11. humorada*	joke
12. atarraya	casting net
13. neurastenia	neurasthenia
14. arandela	washer, flat disk
15. polizonte	policeman
16. momentáneo	momentary
17. amadrinar	to be godmother to
18. exguardabosque	ex-forester
19. improrrogable	not renewable
20. superintendencia*	superintendency



C. Experiments III, IV.

From Experiment III on, five sets of materials were prepared for each experiment so that every word would be exposed to every mode. In other words, for Experiment III, List A was presented in mode 'rn' (denotation read in the native language) to the first five subjects, in mode 'rt' (denotation read in the target language) for the next five subjects, in mode rn/p (denotation read in the native language simultaneously with a picture) for the next five subjects, and so on.

List A.

<u>Expression</u>	<u>Denotation</u> (native language)	<u>Denotation</u> (target language)
1. baldón	stigma	deshonra
2. labial	labial	de los labios
3. boyar	to buoy	flotar una embarcación
4. chingolo	kind of sparrow	clase de gorrión
5. garlopa	long plane (Carp.)	instrumento de carpintería
6. querube	cherub	ángel
7. retranca	wagon-brake	freno de carruaje
8. sitiador	beseiger	bloqueador
9. catarral	pertaining to a cold	perteneciente a un resfriado
10. perpetrar	to commit a crime	cometer un crimen
11. altruismo	altruism	filantropía
12. coalición	coalition	confederación
13. oráculo	oracle	respuesta en nombre de los dioses
14. malárico	malarial	de la malaria
15. descuartizar	to cut into pieces	hacer pedazos
16. corazonada	premonition	presentimiento
17. habilitación	habilitation	aprovisionamiento

List A. (cont'd)

<u>Expression</u>	<u>Denotation</u> (native language)	<u>Denotation</u> (target language)
18. pintiparado	closely resembling	muy semejante
19. concretamente	concretely	de modo concreto
20. desacreditado	discredited	de mala reputación

List B.

1. elfo	elf	duende
2. feraz	fertile	fértil
3. anamú	a Cuban grass	planta de Cuba
4. estopa	burlap	fibras de cáñamo o lino
5. higuana	iguana	reptíl de las Américas
6. mostaza	mustard	salsa picante
7. espinal	spinal	de la espina dorsal
8. irrumpir	to erupt	entrar violentamente
9. sonsacar	to inquire deviously	sacar un secreto astutamente
10. tiritar	to shiver	temblar de frío
11. arreglador	repairman	componedor
12. engranaje	gear (Mech.)	mecanismo de ruedas dentadas
13. polémica	polemics	controversia
14. ciclónico	cyclonic	de los ciclones
15. caballero	groom in charge of a stable	el que cuida del establo
16. escaramuza	skirmish	pequeña batalla
17. palafrenero	stable-boy	mozo de caballos

List B. (cont'd)

<u>Expression</u>	<u>Denotation</u> (native language)	<u>Denotation</u> (target language)
18. obedecedor	obeying	dócil
19. graciosamente	humorously	humorísticamente
20. alborozadamente	merrily	alegremente

List C.

1. hulla	soft-coal	carbón fósil
2. tusa	cigarette	cigarrillo
3. blandear	to soften	ablandar
4. dolamas	hidden defects of animals	enfermedades ocultas de los animales
5. leñazo	blow with a club	golpe con un palo
6. modorra	drowsiness	sueño muy pesado
7. rehoyo	deep ravine	hoyo profundo
8. crecido	grown	desarrollado
9. innoble	ignoble	infame
10. rompible	breakable	frágil
11. friccionar	to rub	restregar
12. conspirador	conspirator	intrigante
13. preámbulo	preamble	prefacio
14. superación	improvement	mejoramiento
15. beatificar	to make happy	hacer a uno feliz
16. deslumbramiento	glare	turbación de la vista por la luz
17. pediculosis	infestation with lice	enfermedad de piojos
18. metabólico	metabolic	cambio celular

List C. (cont'd)

<u>Expression</u>	<u>Denotation</u> (native language)	<u>Denotation</u> (target language)
19. vanagloriarse	to boast	ser presuntuoso
20. abundantemente	abundantly	con abundancia

List D.

1. seseo	pronunciation of 's' as 'c'	pronunciación de la 's' por 'c'
2. asquear	to nauseate	causar repugnancia
3. flechazo	arrow-wound	herida de flecha
4. lodazal	muddy-place	terreno lleno de barro
5. recría	repasturing	engordar el ganado
6. sedición	sedition	insurrección
7. implume	unfeathered	sin plumas
8. inerte	inert	sin vida
9. destripar	to disembowel	sacar los intestinos
10. antiparras	spectacles	gafas
11. inconsciencia	unconsciousness	pérdida del sentido
12. procedencia	origin	origen
13. actualizar	to update	modernizar
14. manuscibir	to make a manuscript	escribir un manuscrito
15. excondenado	ex-convict	ex-convicto
16. afroantillano	afro-Caribbean	africano-antillano
17. vertiginoso	giddy	que causa vértigo
18. exteriormente	externally	externamente
19. apretujamiento	squeezing	apretar mucho
20. automáticamente	automatically	de manera automática

List E.

<u>Expression</u>	<u>Denotation</u> (native language)	<u>Denotation</u> (target language)
1. treta	trick	artificio
2. tenso	tense	rígido
3. hablar	to speak with ease	hablar con facilidad
4. caporal	chief	jefe
5. enagua	petticoat	falda interior
6. mazapán	marzipan	pasta de almendras y azúcar
7. proyectil	projectile	bombas, balas, etc.
8. talismán	talisman	amuleto
9. deforme	deformed	deformado
10. dimanar	to spring from	proceder
11. rastrillar	to rake	limpiar de hierbas el jardín
12. camaranchón	garret	cuarto para guardar cosas viejas
13. culminación	climax	cima
14. reposición	replacement	substitución
15. salesiano	Salesian	religioso de San Juan Bosco
16. combatividad	combativeness	espíritu guerrero
17. entremetido	intruder	intruso
18. intermediario	mediator	mediador
19. tragicómico	tragicomical	de la tragicomedia
20. negativamente	negatively	de ningún modo

D. Experiments V, VI.

The same list of words used in Experiments III and IV was used for Experiments V and VI. (cf. Appendix II-C)

E. Experiment VII.

The \* after the word indicates those words presented together in the coordinate mode when the coordinate label was the same.

List A.

<u>Expression</u>	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
1. hu	a cheer	hurray!	hu
2. palio	cloak	pallium	palio
3. tracción	pulling power	traction	traer + -ión
4. electrificación	power installation	electrification	electrificar + -ión
5. chiflar	to pare (leather)	to <u>chafe</u> (leather)	chiflar
6. asunción	elevation	assumption	a- + sumir + -ión
7. cobija	blanket	cover	cubrir + -ija
8. óbolo	small coin	obolus	óbolo
9. felino	of the cat family	feline	felino
10. salobre	brackish	salty	sal + -obre



List A. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
11. escamar	to clean fish	to <u>scale</u> fish	escama + -ión
12. diputación	legation	deputation	diputar + -ión
13. izquierdista	leftist	schismatic	izquierda + -ista
14. secuestrador	confiscator	sequestrator	secuestrar + -dor
15. laciniado	segmented	lacinated	lacinia + -ado
16. quejumbroso	complaining	querulous	quejarse + -umbroso
17. sobrecargar	to overload	to <u>overcharge</u>	sobre + cargar
18. estratagema	military plan	stratagem	estratagia + -ma
19. inexorable	not flexible	inexorable	in- + exorar + -able
20. sexagésimo	60th	sixtieth	seis + -gésimo

List A.

<u>Expression</u>	<u>CD</u> (Contextual clue)	<u>Coor.</u> (Coordinate)
1. hu	Los marinos saludaron gritando ¡ <u>hu!</u>	SOUND
2. palio	Los romanos llevaban <u>palios</u> largos.	VESTMENTS
3. tracción*	La tracción del motor mueve el coche.	PHYSICS
4. electrificación*	La <u>electrificación</u> alivia el trabajo de los obreros.	PHYSICS
5. chiflar	El zapatero <u>chiflaba</u> los pieles con cuidado.	CRAFT
6. asunción	Las <u>asunción</u> de Maria es un dogma católico.	RELIGION
7. cobija	Sus padres <u>tienen</u> una cobija eléctrica.	PROVISION
8. óbolo	Los arqueólogos encontraron <u>óbolos</u> griegos.	ARCHAEOLOGY
9. felino	El león pertenece a la familia <u>felina</u> .	ZOOLOGY
10. salobre	El agua del mar es <u>salobre</u> .	CHEMISTRY
11. escamar	La tienda vendía el pescado <u>escamado</u> .	COMMERCE
12. diputación	El senador ejerce la <u>diputación</u> del pueblo.	MISSION
13. izquierdista	Los <u>izquierdistas</u> luchan por un cambio social.	POLITICS
14. secuestrador	Los comunistas son <u>secuestradores</u> de la propiedad privada.	LAW
15. laciniado	Algunas hojas están bellamente <u>laciniadas</u> .	BOTANY

List A. (cont'd)

<u>Expression</u>	<u>CD</u> (Contextual clue)	<u>Coor.</u> (Coordinate)
16. quejumbroso*	La madre de mi esposa es muy <u>quejumbrosa</u> .	DISPOSITION
17. sobrecargar	<u>Sobrecargar</u> el camión es peligroso.	WEIGHT
18. estrategia	La <u>estratega</u> del general sorprendió el enemigo.	ARMED FORCES
19. inexorable*	El juez era <u>inexorable</u> en sus juicios.	DISPOSITION
20. sexagésimo	El colegio celebró el <u>sexagésimo aniversario</u> .	NUMBER

List B.

<u>Expression</u>	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
1. beldad	pretty woman	belle	bello + -dad
2. lego	secular person	laic	lego
3. crespo	wavy	crisp	crespo
4. carabao	water-buffalo	carabao	carabao
5. moldura	architectural wood-work	molding	molde + -ura
6. maquina	automatic	mechanical	máquina + -al
7. enhebrar	to string	to <u>thread</u>	en- + hebra + -ar
8. recular	to fall back	to recoil	re- + culo + -ar
9. avante	forward	ahead	avante
10. alumrado	student body	alumni	alumno + -ado
11. cervecero	beer master	server of beer	cerveza + -ero
12. granadillo	red-ebony	granadilla tree	granada + -illo
13. precocidad	early maturation	precocity	precoz + -dad
14. fructífero	very fruitful	fructiferous	fruto + -fero
15. agigantar	to enlarge	to make <u>gigantic</u>	a- + gigante + -ar
16. conservatorio	music school	conservatory	conservar + -tor- + -io

List B. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
17. exdirigente	former manager	ex-director	ex- + dirigir + -ente
18. incontestable	not to be disputed	incontestable	in- + contestar + -able
19. comercialización	trade	commercialization	comercio + -al + -izar + -ión
20. antituberculoso	contra-consumptive	antituberculous	anti- + tubérculo + -oso

List B.

<u>Expression</u>	<u>CD</u> (Contextual clue)	<u>Coor.</u> (Coordinate)
1. <u>beldad*</u>	Esta mujer es una verdadera <u>beldad</u> .	APPEARANCE
2. <u>lego</u>	La iglesia se compone de sacerdotes y <u>legos</u> .	RELIGION
3. <u>crespo*</u>	Cecilia tiene el pelo <u>crespo</u> .	APPEARANCE
4. <u>carabao</u>	El <u>carabao</u> transporta cargas pesadas.	ZOOLOGY
5. <u>moldura</u>	El palacio tiene <u>molduras</u> elaboradas.	CONSTRUCTION
6. <u>maquinal</u>	La industria hace a los hombres <u>maquinales</u> .	INSTRUMENT
7. <u>enhebrar</u>	La abuela no puede <u>enhebrar</u> la aguja.	SEWING
8. <u>recular</u>	El ejército enemigo <u>reculó</u> en el ataque.	MOVEMENT
9. <u>avante</u>	El general dijo a los soldados, <u>¡avante!</u>	DIRECTION
10. <u>alumnado</u>	El <u>alumnado</u> es numeroso.	EDUCATION
11. <u>cervecero</u>	El <u>cervecero</u> sirve la cerveza fresca.	OCCUPATION
12. <u>granadillo*</u>	Con el <u>granadillo</u> se hacen muebles magníficos.	BOTANY
13. <u>precocidad</u>	Mozart manifestó gran <u>precocidad</u> musical.	CHARACTER
14. <u>fructífero*</u>	California es una tierra muy <u>fructífera</u>	BOTANY
15. <u>agigantar</u>	El hambre se ha <u>agigantado</u> con la guerra.	DIMENSION

List B. (cont'd)

Expression	CD (Contextual clue)	Coor. (Coordinate)
16. conservatorio	José estudiaba piano en el <u>conservatorio</u> .	MUSICOLOGY
17. exdirigente	Juan es <u>ex-dirigente</u> del banco.	BUSINESS ADMINISTRATION
18. incontestable	Los argumentos del abogado son <u>incontestables</u> .	LOGIC
19. comercialización	No hay <u>comercialización</u> entre los Estados Unidos y la China Roja.	ECONOMICS
20. antituberculoso	Juan toma <u>medicinas antituberculosas</u> .	MEDICINE



List C.

Expression	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
1. bledo	a care	a bit	bledo
2. hache	'H'	aitch	hache
3. poción	medicinal drink	potion	poción
4. psiquiátrico	dealing with mental disorders	psychiatric	psiquiatría + -ico
5. varar	to be at a standstill	to be <u>barred</u>	vara + -ar
6. delator	informer	delator	delatar + -tor
7. mausoleo	sepulcher	mausoleum	mausoleo
8. aprehender	to take into custody	to apprehend	a- + prender
9. encabar	to put a handle on	to <u>encase</u>	en- + cabo + -ar
10. Brahmanismo	Hindu caste system	Brahmanism	Brahmán + -ismo
11. retronar	to make a loud noise	to thunder	re- + tronar
12. meteórico	atmospheric	meteoric	meteoro + -ico
13. desagrado	nausea	disagreeable feeling	des- + agradar + -ado
14. movilidad	fluidity	mobility	movible + -dad
15. anchuroso	very wide	ample	ancho + -oso

List C. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
16. florentino	Italian	Florentine	Floren <del>cia</del> + -ino
17. acusativo	direct object	accusative	acusar + -ivo
18. personalismo	doctrine of individuality	personalism	personal + -ismo
19. impresionable	sensitive	impressionable	impresionar + -able
20. razonablemente	sensibly	reasonably	razón + -able + -mente

List C.

<u>Expression</u>	<u>CD</u> (Contextual clue)	<u>Coor.</u> (Coordinate)
1. bledo	No me importa un <u>bledo</u> .	CONCERN
2. hache	La <u>hache</u> ne se pronuncia en español.	ALPHABET
3. poción*	Al enfermo no le gustaba la <u>poción</u> .	MEDICINE
4. psiquiátrico*	Juan recibe tratamiento <u>psiquiátrico</u> .	MEDICINE
5. varar	Se <u>vararon</u> muchos negocios por la depresión.	STATE
6. delator	El criminal tuvo muchos <u>delatores</u> .	CHARACTER
7. mausoleo	El <u>mausoleo</u> de Kennedy está en Arlington.	MONUMENT
8. aprehender	La policía <u>aprehendió</u> pronto al ladrón.	LAW
9. encabar	El carpintero <u>encaba</u> algunos instrumentos.	CARPENTRY
10. Brahmanismo	En la India la mayoría profesa el <u>Brahmanismo</u> .	RELIGION
11. retronar*	El rayo <u>retronó</u> por toda la región.	WEATHER
12. meteórico	El reporte <u>meteórico</u> no es favorable.	WEATHER
13. desagrado	El pescado le causa gran <u>desagrado</u> .	EMOTION
14. movilidad	El agua tiene mucha <u>movilidad</u> .	PHYSICS
15. anchuroso	El río Misisipí es <u>anchuroso</u> .	DIMENSION
16. florentino	Miguel Ángel fué un escultor <u>florentino</u> .	ORIGIN

List C. (cont'd)

<u>Expression</u>	<u>CD</u> (Contextual clue)	<u>Coor.</u> (Coordinate)
17. acusativo	Los verbos transitivos llevan <u>acusativo</u> .	GRAMMAR
18. personalismo	En el examen me preguntaron sobre <u>personalismo</u> .	PHILOSOPHY
19. impresionable	Juan tiene un carácter <u>impresionable</u> .	DISPOSITION
20. razonablemente	Debemos actuar <u>razonablemente</u> .	LOGIC

List D.

<u>Expresión</u>	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
1. caución	warning	caution	cauto + -ión
2. pipo	small fly-eating bird	peeper	pipo
3. sopor	deep sleep	sopor	sopor
4. buscapié	clue	*bus*cap*yes*	buscar + pie
5. deslealtad	faithlessness	disloyalty	des- + leal + -tad
6. sulfato	corrosive liquid	sulfate	sulfato
7. coreano	Asian	Korean	Corea + -ano
8. tampiqueño	Mexican	of Tampico	tampico + -eño
9. entroncar	to descend from the same stock	to trunk	en- + tronco + -ar
10. titilar	to amuse	to titillate	titilar
11. exsargento	former enlisted man	ex-sargeant	ex- + sargento
12. reinstalación	act of establishing again	reinstallation	re- + instalar + -ión
13. Vía Crucis	Calvary	via the cross	vía + cruz
14. donjuanesco	libertine	of Don Juan	donjuán + -esco

List D. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
15. <b>producente</b>	yielding	producing	producir + -ente
16. <b>repartimiento</b>	further division	repartition	repartir + -miento
17. <b>maleducado</b>	ill-bred	ill-educated	mal- + educar + -ado
18. <b>immortalizar</b>	to give lasting fame to	to immortalize	in- + mortal + -izar
19. <b>desvanecimiento</b>	getting lost	vanishing	desvanecer + -miento
20. <b>académicamente</b>	scholarly	academically	académico + -mente

List D.

<u>Expression</u>	<u>CD</u> (Contextual clue)	<u>Coor.</u> (Coordinate)
1. <u>caución*</u>	En la carretera hay signos de <u>caución</u> .	DISPOSITION
2. <u>pípo</u>	El <u>pípo</u> tenía el nido en el árbol.	ZOOLOGY
3. <u>sopor</u>	Las bebidas alcohólicas me causan <u>sopor</u> .	STATE
4. <u>buscapié</u>	El muchacho comprendió el <u>buscapié</u> de la carta.	COMMUNICATION
5. <u>deslealtad*</u>	Los amigos le acusan a Pedro de <u>deslealtad</u> .	DISPOSITION
6. <u>sulfato</u>	El labrador mataba los insectos con <u>sulfatos</u> .	CHEMISTRY
7. <u>coreano*</u>	En la guerra <u>coreana</u> murieron muchos.	ORIGIN
8. <u>tampiqueño*</u>	Los <u>tampiqueños</u> son gente alegre.	ORIGIN
9. <u>entroncar</u>	Está <u>entroncado</u> con la familia real.	GENEALOGY
10. <u>titilar</u>	Con solo tocarle, el niño <u>titilaba</u> .	EMOTION
11. <u>exsargento</u>	Roberto es un <u>exsargento</u> de la Armada.	MILITARY
12. <u>reinstalación</u>	La <u>reinstalación</u> de la calefacción fué costosa.	PLACEMENT
13. <u>Viá Crucis</u>	Los peregrinos visitan el <u>Viá Crucis</u> en Jerusalén.	CHARACTER
14. <u>donjuanesco</u>	José vive una vida <u>donjuanesca</u> .	ECONOMICS
15. <u>producente</u>	Florida es una tierra <u>producente</u> de naranjas.	



List D. (cont'd)

Expression	<u>CD</u> (Contextual clue)	<u>Coor.</u> (Coordinate)
16. repartimiento	El padre hizo el <u>repartimiento</u> de sus bienes.	DISTRIBUTION
17. maleducado	El niño está muy <u>maleducado</u> .	MANNERS
18. inmortalizar	Don Quijote <u>inmortalizó</u> a Cervantes.	PHILOSOPHY
19. desvanecimiento	El <u>desvanecimiento</u> de Juan alarmó a la familia.	LOCATION
20. académicamente	El professor hablaba muy <u>académicamente</u> .	EDUCATION

List E.

<u>Expression</u>	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
1. cupé	kind of carriage	cupé	cupé
2. pareo	coupling	pairing	par + -eo
3. balar	to make the cry of a sheep	to baa	balar
4. albacea	executor	arbiter	albacea
5. lotero	raffle dealer	<u>lottery</u> dealer	lote + -ero
6. peñador	hair-dresser	*pane*door*	peñar + -dor
7. ganoso	desirous	gainful	gana + -oso
8. versatilidad	competence in many things	versatility	versátil + -dad
9. roñoso	oxidized	rusty	roña + -oso
10. ubicar	to be situated	ubiquity	ubicar
11. camillero	stretcher-bearer	cot-bearer	cama + -illa + -ero
12. hipérbole	exaggeration in speech	hyperbole	hipérbole
13. navajero	kind of receptacle	<u>knife</u> -case	navaja + -ero
14. esplendente	lustrous	splendent	esplender + -ente

List E. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Mn</u> (Meaningfulness in the native language)	<u>Mt</u> (Meaningfulness in the target language)
15. orejano	unbranded	not <u>ear</u> -marked	oreja + -ano
16. condecorar	to bestow honors	to <u>decorate</u>	con- + decorar
17. arrobamiento	ecstatic rapture	<u>rob</u> the <u>mind</u>	a- + robar + -miento
18. desembarazo	relief from annoyance	disembarrassment	des- + embarazo
19. interrogante	questioning	interrogative	interrogar + -ante
20. teóricamente	ideally	theoretically	teórico + -mente

List E.

Expression	CD (Contextual clue)	Coord. (Coordinate)
1. cupé	La marquesa tenía un <u>cupé</u> .	TRANSPORTATION
2. pareo	El carpintero hizo unos <u>pareos</u> perfectos.	CONSTRUCTION
3. balar	Los ovejas <u>balan</u> cuando tienen hambre.	SOUND
4. albacea	El testamento nombró a Juan <u>albacea</u> .	LAW
5. lotero	El <u>lotero</u> vendió muchos billetes.	GAMBLING
6. peinador	La muchacha tiene <u>peinador</u> particular.	OCCUPATION
7. ganoso*	Pepe está <u>ganoso</u> de buenas notas.	DISPOSITION
8. versatilidad*	Da Vinci era un genio de gran <u>versatilidad</u> .	DISPOSITION
9. roñoso	Los tubos de la calefacción están muy <u>roñosos</u> .	CHEMISTRY
10. ubicar	Los gitanos no <u>ubican</u> en un lugar fijo.	LOCATION
11. camillero	El <u>camillero</u> transporta los enfermos con cuidado.	MEDICINE
12. hipérbole	El escritor evitaba las <u>hipérbolas</u> al escribir.	RHETORIC
13. navajero	Regalé a Roberto un <u>navajero</u> de plata.	CONTAINER
14. esplendente	Los rayos del sol son <u>esplendentes</u> .	QUALITY
15. orejano	En el monte encontraron ovejas <u>orejanas</u> .	RANCHING
16. condecorar	El presidente <u>condecoró</u> al general MacArthur.	REWARD

List E. (cont'd)

Expression	CD (Contextual clue)	Coor. (Coordinate)
17. arrobamiento	El poeta está en <u>arrobamiento</u> continuo.	STATE OF MIND
18. desembarazo*	El <u>desembarazo</u> del exámen le tranquilizó.	RESPONSE
19. interrogante*	Los niños son muy <u>interrogantes</u> .	RESPONSE
20. teóricamente	El filósofo estudia los problemas <u>teóricamente</u> .	SCIENCE

F. Experiments VIII and IX.

The same list of words used in Experiment VIII was used again in Experiment IX, with a re-entry of the denotation read in the native language plus picture as the modality carried over from VIII.

List A.

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Place</u>	<u>Association with a Geographical Name</u>
1. abarrotar	to overcrowd	"closet"	*Havana
2. apabullar	to flatten	"cockroach"	*Appalachia
3. brigada	body of persons	"soldier brother"	*Britain
4. cacha	drinking horn	"water"	*Kashmir
5. cinegético	art of hunting	"picture of the fox-hunt"	*Cincinnati
6. cutáneo	pertaining to the skin	"nail scissors"	*Cusco
7. deserción	defection	"friend"	*Des Plaines
8. desordenadamente	unsystematically	"studies"	*Des Moines
9. dualismo	state of being two-fold	"mother-in-law"	*Dublin
10. escopetazo	shotgun	"security"	*Scotland
11. funcional	operative	"silverware"	*Fujiyama
12. hocicar	to dig up with the snout	"dog"	*Ocean City
13. inflamatorio	tending to ignite	"gas"	*Indonesia

List A. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Place</u>	<u>Association with a Geographical Name</u>
14. libertario	licentious	"The Untouchables"	*Liberia
15. panacea	cure-all	"aspirin"	*Panama
16. pescada	kind of fish	"meal"	*Peru
17. pitillo	cigarette	"relaxation"	*Pittsburg
18. quite	impediment	"bills"	*Quito
19. sota	hussy	"night club"	*De Soto
20. tomatera	tomato plant	"ketchup"	*Tokyo



List A.

Suspense Story

1. Unos ladrones libertarios vivían en los montes.
2. Vivían en una cueva abarrotada.
3. Con ellos vivían sotas.
4. Unos cultivaban una tomatera.
5. Otros criaban cerdos que hocicaban por los montes.
6. Los expertos en artes cinagéticas mataban animales salvajes.
7. Sacaban muchas pescadas del río.
8. Bebían el vino en cachas.
9. Una brigada de policía atacó a los ladrones.
10. Había un dualismo de opiniones sobre el ataque.
11. Por fin acordaron un plan funcional.
12. Primero atacaron con sustancias inflamatorias.
13. Después atacaron a escopetazos.
14. Los ladrones contraatacaron desordenadamente.
15. La policía tuvo algunas deserciones.
16. También tuvieron quites de diversos órdenes.
17. No obstante la policía apabulló a los ladrones.
18. Recibieron algunas heridas cutáneas.
19. Las curaron con panaceas que lo curan todo.
20. La policía satisfecha se fumó un pitillo para descansar.

List A.

Factual Sequence

1. Unas personas libertarias siempre quieren una revolución.
2. Algunas viven en barrios abarrotados.
3. Algunas cultivan una tomatera.
4. Los expertos en artes cinagéticas matan animales salvajes.
5. Algunos crían cerdos que hocican por los montes.
6. Sacan pescadas del río.
7. Beben el vino en cachas.
8. Sotas viven con ellos.
9. Forman una especie de brigada entre ellos.
10. Hay dos grupos con dualismo de opiniones.
11. A veces atacan desordenadamente.
12. A veces tienen planes más funcionales.
13. Generalmente tienen deserciones.
14. Tienen quites de varias clases.
15. Apabullan al que se opone a sus planes.
16. Atacan generalmente a escopetazos.
17. A veces reciben heridas cutáneas.
18. Llevan siempre panaceas para curarse sus heridas.
19. Fuman pitillos después de un ataque.
20. Con materias inflamatorias queman todo lo que les compromete.

List B.

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Place</u>	<u>Association with a Geographical Name</u>
1. adepto	sympathetic	"politics"	*Addis Ababa
2. amansar	to tame	"pets"	*America
3. arcada	series of arches	"doorway"	*Arabia
4. aterciopelado	velvety	"overcoat"	*Atlantic City
5. comparativo	contrastive	" <u>Vogue</u> "	*Compton
6. corpus	data	"library"	*Corpus Christi
7. desapego	detachment	"step-mother"	*Des Moines
8. embotar	to blunt	"knife"	*Evanston
9. estropajo	mop	"cleaning"	*Estonia
10. festinar	to hasten	"home-work"	*Ferrysourg
11. hartazgo	satiety	"banquet"	*Arlington
12. insípido	dull	"cafeteria"	*Innsbruck
13. maltraer	to abuse	"maid"	*Malaga
14. miliciano	guard	"father"	*Milan
15. multiplicidad	great number	"wardrobe"	*Munich
16. pomo	apple	"dessert"	*Pompei

List B. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Place</u>	<u>Association with a Geographical Name</u>
17. rebajador	photographic weakener	"camera"	*Reno
18. sociabilidad	affability	"club"	*Somalia
19. transfusión	transfusion	"illness"	*Transjordan
20. en un tris	in imminent danger	"accident"	*England

List B.

Suspense Story

1. Los duques tenían un hermoso palacio con arcadas.
2. El duque se daba todos los días hartazgos de comida.
3. Le gustaba sobre todo pasta de pomo con helado.
4. En los ratos libres hacía estudios comparativos de heráldica.
5. Analizaba corpus de inscripciones nobiliarias.
6. Su esposa tenía multiplicidad de caprichos.
7. Llevaba abrigos aterciopelados.
8. Tenía un rebajador para revelar fotografías de sí misma.
9. Tenía gran sociabilidad con los ricos.
10. Pero maltraía a las criadas.
11. Les hacía limpiar la casa todos los días con estropajos.
12. Les daba unas comidas insípidas.
13. Mostraba un total desapego hacia ellas.
14. Comían tan mal las criadas que estaban casi en un tris de la muerte.
15. Varias tuvieron que recibir transfusiones de sangre.
16. Indignadas las criadas se hicieron milicianas comunistas.
17. Encontraron criadas adeptas en otras casas ricas.
18. Los ricos trataron primero de amansarlas con promesas.
19. Pero las criadas festinaron a hacer una revolución.
20. Los ricos no pudieron defenderse con sus espadas embotadas.

List B.

Factual Sequence

1. En algunas ciudades hay edificios con arcadas.
2. En el jardín de alguno hay árboles de pomo.
3. Al recogerlos los obreros se dan hartazgos.
4. A un señor de un edificio le gustaba la lingüística comparativa.
5. Analizaba corpus de lenguas indoeuropeas.
6. Otro señor es adepto de la monarquía.
7. Su espada está embotada.
8. Su esposa tiene multiplicidad de cosas.
9. Lleva abrigos aterciopelados.
10. Tiene un rebajador fotográfico.
11. La esposa es de gran sociabilidad para con los ricos.
12. Sus criadas sin embargo son maltraídas.
13. Los señores tienen desapego hacia ellas.
14. Limpian los pisos con estropajos.
15. Comen comidas insípidas.
16. Alguna estuvo en un tris de la muerte.
17. Recibió transfusiones de sangre.
18. Algunas criadas se hacen milicianas comunistas.
19. Tratan de festinar la revolución.
20. Las promesas de los ricos no las amansan.

List C.

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Place</u>	<u>Association with a Geographical Name</u>
1. accesibilidad	approachability	"front door"	*Acapulco
2. anexionista	territorial expansionist	"brother"	*Andes
3. bergante	ruffian	"sister"	*Berkeley
4. cardíaco	pertaining to the heart	"doctor"	*Caracas
5. coexistir	to live together	"siblings"	*Colombia
6. detestable	hateful	"spinach"	*Detroit
7. disentir	to disagree	"mother-in-law"	*District of Columbia
8. esquiador	skier	"sports"	*Escorial
9. folklore	traditional customs, tales, sayings	"phonograph"	*Folkestone
10. impugnar	to argue	"neighbor	*Innsbruck
11. incumbencia	obligation	"washing dishes"	*Inca
12. jarcia	heap of things	"attic"	*Harrisburg
13. lupa	magnifying glass	"grandfather"	*Louisiana
14. monocotiledóneo	having one seed leaf	"garden"	*Monaco



List C. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Name</u>	<u>Association with a Geographical Name</u>
15. pelviano	pertaining to the pelvis	"skeleton"	*Peloponnesos
16. prolífico	productive	"family"	*Providence
17. reedificar	to rebuild	"kitchen"	*Redding
18. rubor	shyness	"baby"	*Rumania
19. tarima	wooden platform	"piano"	*Takoma
20. uncinariasis	hookworms	"drinking water"	*United States

List C.

Suspense Story

1. En una casa de difícil accesibilidad vivía una extraña familia.
2. Tenían en casa una jarcia de cosas raras.
3. El mayor era un bergante que se pasaba la vida divirtiéndose.
4. Tenía un carácter realmente detestable.
5. El segundo era un anexionista.
6. El tercero tenía una enfermedad cardíaca.
7. Estudiaba plantas monocotiledóneas.
8. El cuarto era un esquiador de primera clase.
9. En un gran salto tuvo una fractura pelviana.
10. El quinto era un autor muy prolífico.
11. Como estaba casi ciego, escribía con lupa.
12. El sexto médico, estudiaba uncinariasis.
13. El séptimo, carpintero, hacía tarimas para el teatro.
14. La única hermana decía que se dedicaba al estudio del folklore.
15. Pero tenía tal rubor que apenas salía de casa.
16. El más pequeño, un arquitecto, reedificaba la misma casa vieja cada año.
17. Esta era su extraña incumbencia.
18. Los nueve hermanos trataban de coexistir sin resultado.
19. Nadie podía decir algo que el otro no impugnara.
20. Siempre disentían en sus opiniones.

List C.

Factual Sequence

1. Hay casas de difícil accesibilidad.
2. En una casa hay una jarcia de cosas.
3. A veces vienen bergantes a robar.
4. Estos son de carácter detestable.
5. Alguno es anexionista.
6. Uno es un autor prolífico sobre esta teoría.
7. Para leer usa una lupa.
8. Mucha gente disiente de sus opiniones.
9. Él impugna a los que le atacan.
10. Tiene una enfermedad cardíaca.
11. De comer carne de cerdo contrajo uncinariasis.
12. En los tiempos libres estudia plantas monocotiledóneas.
13. Su esposa tiene mucho rubor.
14. Es una esquiadora.
15. El año pasado tuvo una fractura pelviana.
16. Estudiaba el folklore del país.
17. Cree que es incumbencia suya darlo a conocer.
18. Tiene un teatro con tarima para representaciones de este arte.
19. Los esposos no se entienden pero tratan de coexistir amigablemente.
20. Este año piensan reedificar la casa.

List D.

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Place</u>	<u>Association with a Geographical Name</u>
1. agraviar	to offend	"taxes"	*Augusta
2. articular	to utter	"baby"	*Antarctica
3. bañadera	bath tub	"plumbing"	*Barcelona
4. cedrón	medicinal plant	"medicine cabinet"	*Ceylon
5. confesionario	place of confession	"church"	*Congo
6. demagogia	tyrannic domination	"politician"	*Denmark
7. envoltorio	bundle	"shopping"	*Evanston
8. ex-jockey	former jockey	"older brother"	*Exeter
9. gravoso	burdensome	"homework"	*Greece
10. iberoamericano	Latin-American	"music"	*Ivory Coast
11. lanar	woolly	"sweater"	*Lancaster
12. marihuana	narcotic	"vice"	*Marianas Islands
13. ocasional	occasional	"job"	*Oklahoma
14. pasote	kind of tea	"spices"	*El Paso
15. pagnar	to fight	"pets"	*Puerto Rico
16. relegar	to exile	"uncle"	*Remington

List D. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Place</u>	<u>Association with a Geographical Name</u>
17. sanador	healer	"doctor"	*Santander
18. significancia	meaning	"dictionary"	*Cincinnati
19. sureño	southern	"vacation"	*Sweden
20. veintiséis	twenty-six	"birthday"	*Venezuela

List D.

Suspense Story

1. El grupo de mis amigos iberoamericanos es muy curioso.
2. Uno de ellos es un famoso ex-jockey.
3. Ganó veintiséis medallas en sus buenos tiempos.
4. Ahora...tiene un negocio de ganado lanar.
5. Otro de mis amigos es un sureño socialista.
6. Se dedicaba a la demagogia peligrosa.
7. Pugnaba por las ideas socialistas revolucionarias.
8. El gobierno, asustado, le consideró gravoso al país.
9. Por eso le relegó a los Estados Unidos.
10. Ahora...para ganarse la vida...repara confesionarios.
11. ¡Otro tiene un gran negocio de bañaderas!
12. Cuando me visita, trae siempre un misterioso envoltorio.
13. Yo le pregunto secretamente que si es de marihuana.
14. Él se agravia siempre con estas preguntas.
15. Y por un rato no articula palabra.
16. Tengo otro amigo ocasional, un lingüista famoso.
17. Está interesado en la significancia de las palabras.
18. Siempre que me visita, me trae pasote.
19. También me trae semillas de cedrón.
20. Dice que esta planta es sanadora de muchas enfermedades.

List D.

Factual Sequence

1. Entre los estudiantes hay varios iberoamericanos.
2. Uno de ellos es ex-jockey.
3. Tiene veintiséis años.
4. Su padre tiene ganado lanar.
5. Hay otro de la parte sureña.
6. Se dedica a la demagogia.
7. Pugna contra el gobierno.
8. Le consideraba gravoso al país.
9. El gobierno lo relegó al extranjero.
10. No articula las palabras bien.
11. Siempre pregunta por la significancia de las palabras.
12. Ahora está muy agraviado.
13. Otro amigo le dejó un envoltorio en casa.
14. Dijo que contenía marihuana, pero no es cierto.
15. No tiene dinero y ha buscado un trabajo ocasional.
16. Por el día trabaja en una carpintería donde hacen confesionarios.
17. Por la noche trabaja en una fábrica de bañaderas.
18. A mis amigos les gusta tomar pasote.
19. Muchos de ellos traen siempre cedrón.
20. Dicen que es sanador de muchas enfermedades.



List E.

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Place</u>	<u>Association with a Geographical Name</u>
1. aletargar	to cause stupor	"sleeping pills"	*Alexandria
2. avinagrado	bitter	"salad"	*Aberdeen
3. bohardilla	small garret	"storage"	*Bohemia
4. canallada	scoundrelism	"friend"	*Canada
5. contorsión	contortion	"exercise"	*Constantinople
6. crochet	type of knitting	"grandmother"	*Croatia
7. chucho	dog	"pet"	*Cusco
8. encausar	to indict	"parking ticket"	*England
9. enmascarado	masked	"Batman"	*Ensenada
10. faceta	side	"jewelry"	*Fatima
11. generar	to beget	"father"	*Geneva
12. intrepidez	boldness	"brother"	*Interlaken
13. mejido	beaten up with eggs and milk	"meat"	*Mexico
14. nigua	sand tick	"flea-powder"	*Nicaragua
15. ornitológico	pertaining to the study of birds	"canary"	*Oregon

List E. (cont'd)

<u>Expression</u>	<u>Denotation</u>	<u>Association with a Familiar Place</u>	<u>Association with a Geographical Name</u>
16. <i>pregonero</i>	town-crier	"news"	*Prussia
17. <i>requinto</i>	fife	"hobby"	*Reno
18. <i>revivificar</i>	to return to life	"food"	*Riverside
19. <i>semidiós</i>	demigod	"Lincoln"	*Selma
20. <i>ternilloso</i>	containing gristle	"dog food"	*Tehran

List E.

Suspense Story

1. Había una misteriosa mujer de carácter avinagrado.
2. Se creía llena de intrepidez.
3. No tenía bastante con los hijos que había generado.
4. Hacía crochet para sus hijos, y pensaba en su plan.
5. Trató de entusiasmar al pregonero del pueblo con su plan.
6. Y entusiasmó al músico que tocaba el requinto en la banda municipal.
7. Esta mujer se creía un semidiós.
8. Se presentó en el parque zoológico con la cara enmascarada.
9. Fingía hacer estudios ornitológicos, pero un pájaro le picó en la cara.
10. Hacía contorsiones de dolor.
11. Cuando vino la ambulancia, estaba como aletargada.
12. ¿Qué le pasaría ahora a su querido chucho?
13. ¡Le darían comer carne ternillosa!
14. ¡Nadie le daría carne mejida!
15. ¿Quién le haría la cama en la bohardilla?
16. ¿Y quién lo lavaría todos los días para quitarle las niguas?
17. Para ella todo tenía mala faceta.
18. Todos le harían canalladas.
19. Todos deberían ser encausados.
20. Creía que sólo ella podría revivificar al perrito.

List E.

Factual Sequence

1. Un policía necesita mucha intrepidez.
2. Cualquier ladrón hace una canallada.
3. El policía investiga todos las facetas del crimen.
4. Hace todo lo posible por encausar al criminal.
5. Sabe cómo revivificar a las víctimas.
6. Un policía puede tener el carácter avinagrado.
7. La esposa puede hacer crochet para sus hijos.
8. Puede leer tratados ornitológicos.
9. Puede haber generado muchos hijos.
10. En pueblos pequeños un policía es el pregonero.
11. Algún policía puede tocar el requinto en la banda municipal.
12. Cuando hay un robo el policía es como un semidiós.
13. A veces no puede dormir y está como aletargado.
14. Sufre del estómago y tiene contorsiones.
15. Pasa el tiempo acariciando su chucho negro.
16. Se entretiene en quitarle las niguas.
17. Le da de comer carne ternillosa.
18. A veces le prepara una carne mejida.
19. El perro duerme en la bohardilla.
20. Hay pocos ladrones enmascarados por las calles.

G. Sample Pictures.

tenso



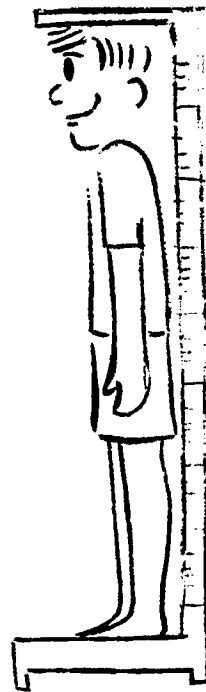
titilar



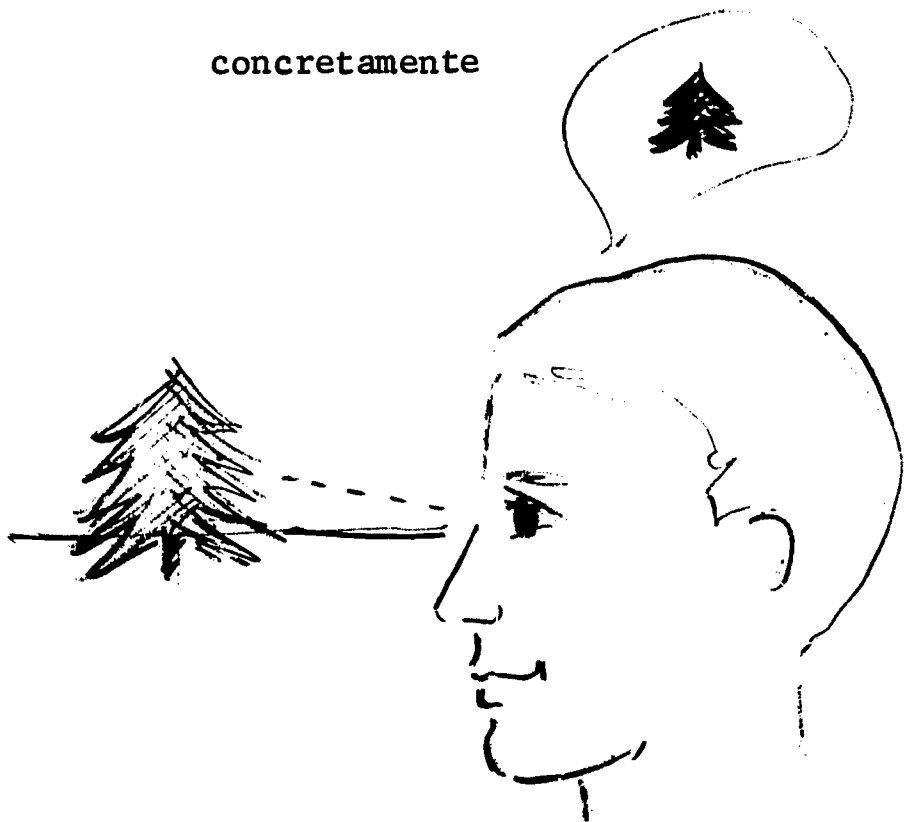
roñoso



crecido



concretamente



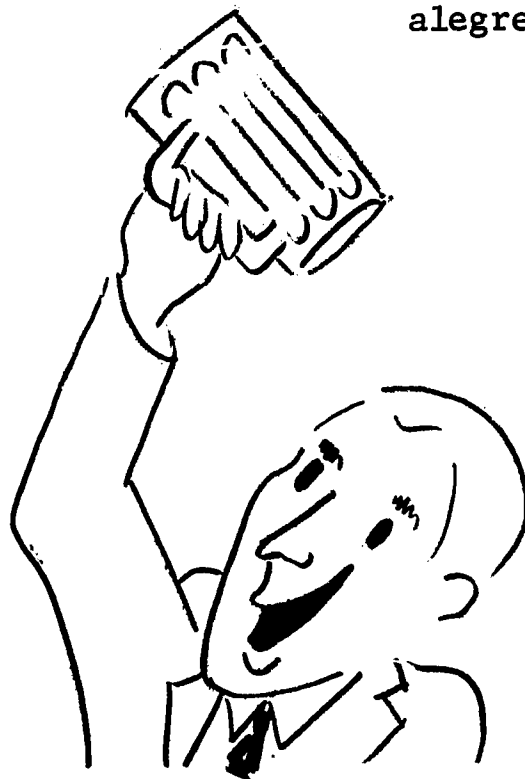
ganoso



izquierdizta



alegremente



## APPENDIX III

### INSTRUCTIONS AND ADMINISTRATION FORMAT\*

#### A. Experiment I.

The purpose of this experiment is to study the effects of five ways of presenting Spanish vocabulary items for learning. The entire experiment will consist of four rounds. For round 1, you will be tested to find out how many of the words you already know. During rounds 2 and 3, you will be taught the words; and for round 4, you will be tested again to see how many you have learned.

Before beginning, we would like you to record your name and "round 1" on your tape; please do that now.

#### Round 1 (pre-test).

One hundred words will be presented to you on the screen. Your task is to try to give the meaning in English on your tapes. Two examples will be given for practice. A new word will appear on the screen every 5 seconds and you are to give your response during that same interval. You will hear the number of each slide over your ear-phones. Two easy words are given as examples; give the meaning of these and proceed in the same manner. There will be a brief pause to change the slide tray.

Do you have any questions?

Please try to speak clearly and loud enough for your response to be recorded. You are not expected to know the meanings of all the words as they are taken from beyond a very high frequency; you will not be penalized for guessing. Relax and try to do your best.

Please start your tapes.

PRE-TEST.

---

\*Whenever possible the aptitude and attitude questionnaires were administered prior to the experimental run, either in their language classroom, the language laboratory or another room in which the experiment was conducted. On occasion, they were administered after the experiment because of a particular Ss class schedule. It was noticed that Ss seemed to prefer the former pattern and great effort was made to follow it.



Rounds 2 and 3 (teach).

For the next two rounds, you will be taught the same words you were just tested on. For this, you will not need your tapes, but you will need your earphones. There will be two brief pauses to change the slide trays.

TAPE: The words to be learned will be presented in five different ways; try to give the meaning orally after you hear the beep (beep). Here are examples of the different ways.

- a. Read and listen.  
Example 1 (casa)  
Example 2 (rojo)
- b. Listen and read.  
Example 3 (hombre)  
Example 4 (venir)
- c. Listen and read simultaneously.  
Example 5 (hablar)  
Example 6 (verde)
- d. Read only.  
Example 7 (sombrero)  
Example 8 (lejos)
- e. Listen only.  
Example 9 (bueno)  
Example 10 (gato)

Now begin. Read and listen (#1-5)  
Listen and read (#6-10)  
Listen and read simultaneously (#11-15), and so on.

Round 4 (post-test).

The last round is a repetition of the first. You will be tested in the same manner as before. You will need both your tapes and your earphones.

Please start your tapes and record your name.

POST-TEST.

DEBRIEFING QUESTIONNAIRE.

## B. Experiment II.

This experiment will deal with the order to presentation of Spanish vocabulary items and their meanings. There will be a total of three rounds. First you will be tested to see how many of the words you already know; next you will be taught the words; and finally you will be tested again to see how many of the words you have actually learned.

### Round 1 (pre-test).

One hundred words will be projected on the screen. Four choices of meaning will be given beside the word on the slide. You are to mark on the answer sheet before you the letter of the correct meaning. If you don't know the meaning, mark (e). You will not be penalized for guessing and please try to answer every item, even if you mark (e).

The slide will change every 8 seconds and you are to mark your answer during the same interval. The number of each slide will be given aurally to help you keep your place. Two examples will be given for practice. There will be a brief pause to change the slide tray.

Do you have any questions?

PRE-TEST.

### Round 2 (teach).

Now you will be taught the words you were just tested on. There will be two brief pauses to change the trays.

TAPE: The words to be learned will be presented in five different ways. Repeat the Spanish word with the speaker whose voice you will hear on the tape and associate with it the meaning given. Your task is to learn the meaning of each word. Here are examples of the different ways.

- a. Word followed by meaning.  
Example 1 (casa)  
Example 2 (rojo)
- b. Meaning followed by word.  
Example 3 (hombre)  
Example 4 (venir)
- c. Word and meaning simultaneously.  
Example 5 (hablar)  
Example 6 (verde)
- d. Word and meaning simultaneously - slower timing.  
Example 7 (sombrero)  
Example 8 (lejos)

- e. Word and meaning simultaneously - voice delayed.  
Example 9 (bueno)  
Example 10 (gato)

Now begin. Word followed by meaning (#1-5)  
Meaning followed by word (#6-10), etc.

Round 3 (post-test).

You will now be tested in the same manner as before. You are to mark on the new answer sheet the letter of the correct meaning. If you don't know the meaning, mark (e). Again you will not be penalized for guessing and please try to answer every item.

POST-TEST.

DEBRIEFING QUESTIONNAIRE

C. Experiment III.

Round 1 (teach).

In this experiment, we are interested in determining the most effective of several different ways of presenting to you the meaning of Spanish vocabulary items. Instructions and examples will be given to you on the tape.

TAPE: The meaning of the words to be learned will be presented in five different ways. Here are examples of the different ways the meaning will be presented.

- a. In English.  
Example 1 (gato)  
Example 2 (lejos)
- b. In Spanish.  
Example 3 (rojo)  
Example 4 (venir)
- c. In English and in Spanish.  
Example 5 (bueno)  
Example 6 (verde)
- d. In English plus picture.  
Example 7 (casa)  
Example 8 (sombrero)

e. In English and in Spanish plus picture.

Example 9 (hombre)

Example 10 (vacca)

Now begin.

Rounds 2 and 3 (two post-tests).

Go through the test once rapidly and answer all those items that you are sure of; then go back to answer those that you were unsure of and check. It is important that you get through the entire test at least once. You will have 10 minutes for the first test.

TEST 1.

Again be sure you get through the entire test at least once. You have 15 minutes.

TEST 2.

DEBRIEFING QUESTIONNAIRE.

D. Experiment IV.

Round 1 (teach).

A hundred words will be presented on the screen. The meaning will be given sometimes in English, sometimes in Spanish, sometimes in both. At times the words will be accompanied by pictures. Your task is to learn the meaning of as many words as you can.

(No examples were given and the modes were not identified.)

ADMINISTRATOR STARTS PRESENTATION TAPE.

Rounds 2 and 3 (post-tests).

Go through the test once rapidly and answer all those items that you are sure of; then go back to answer those that you were unsure of and check. It is important that you get through the entire test at least once. You will have 10 minutes for the first test.

TEST 1.

Again be sure you get through the entire test at least once. You have 15 minutes.

TEST 2.

DEBRIEFING QUESTIONNAIRE.

E. Experiment V.

Round 1 (teach).

In this experiment, we are interested in the most productive way of presenting meaning. One hundred words will be presented on the screen. Sometimes the meaning will be given visually and sometimes it will be given aurally. A picture will accompany every word. Your task is to learn the meaning of as many words as you can.

(No examples were given and the modalities were not identified.)

ADMINISTRATOR STARTS PRESENTATION TAPE.

Rounds 2 and 3 (post-tests).

Go through the test once rapidly and answer all those items that you are sure of; then go back to answer those that you were unsure of and check. It is important that you get through the entire test at least once. You will have 10 minutes for the first test.

TEST 1.

Again be sure you get through the entire test at least once. You have 15 minutes.

TEST 2.

DEBRIEFING QUESTIONNAIRE.

F. Experiment VI.

Round 1 (teach).

This experiment is concerned with the order of visual and aural presentation of meaning. Sometimes you will be given the meaning visually alone, sometimes aurally alone, and other times in different combinations of these - simultaneously, before or after each other. Your task is to learn the meaning of as many words as you can.

(No examples were given and the modalities were not identified.)

ADMINISTRATOR STARTS PRESENTATION TAPE.

Rounds 2 and 3 (post-tests).

Go through the test once rapidly and answer all those items that you are sure of; then go back to answer those that you were unsure of

and check. It is important that you get through the entire test at least once. You will have 10 minutes for the first test.

TEST 1.

Again be sure you get through the entire test at least once. You have 15 minutes.

TEST 2.

DEBRIEFING QUESTIONNAIRE.

G. Experiment VII.

Round 1 (teach).

The purpose of this experiment is to test the effectiveness of five ways of presenting vocabulary for learning. Examples will be given before we start the experiment so that you will understand what it is all about. Let me explain to you the labels and what they stand for: 'Meaning given twice' = two slides, one following the other, will be given for every Spanish word, and both will have the meaning in English and a picture on it. 'Meaningfulness in the native language' = underneath the meaning in English, another English word, similar in form and meaning to the Spanish vocabulary word, will be given; occasionally the English word will be similar in form to the Spanish but not exactly the same in meaning. 'Meaningfulness in the target language' = in addition to the meaning in English, a morphological cut of the Spanish word will be given. 'Contextual clue' = besides the meaning in English, a sentence in Spanish will be added. 'Coordinate' = in addition to the meaning in English, a concept under which the Spanish word can be classified or associated will be given to you.

Your task is to learn as many words as you can.

Here are examples of the different ways.

TAPE: a. Meaning given twice.

1. (tenso)
2. (negativamente)

b. Native language clue.

3. (automóvil - car - automobile)
4. (respirar - to breathe - to respire)

c. Contextual clue.

5. (ladrón - Los empleados no eran ladrones.)
6. (maduro - El maíz estaba maduro.)

d. Target language clue.

7. (apartamento - a- + partir + -miento)
8. (ocupación - ocupar + -ión)

e. Coordinate.

9. (naranja, manzana - FRUIT)
10. (verde - COLOR)

Now begin. Meaning given twice (#1-5)  
Native language clue (#6-10), etc.

Rounds 2 and 3 (post-tests).

Go through the test once rapidly and answer all those items that you are sure of; then go back and answer those that you're unsure of and check your answers. It is important that you get through the entire test at least once. You will have 10 minutes for the first test.

In answering the test items, give the meaning taught or a synonym; in other words do not write in the target language clue (morphological cut).

TEST 1.

Again, be sure you get through the entire test at least once. You have 15 minutes.

TEST 2.

DEBRIEFING QUESTIONNAIRE.

H. Experiment VIII.

Round 1 (teach).

The purpose of this experiment is to investigate the effectiveness of five ways of presenting vocabulary for learning. For some words there will be two slides, one following the other, both with the Spanish word, the meaning in English and a picture. Some words have been incorporated into a "suspense story;" do not expect a Hitchcock mystery! Others are identified as "association with a familiar place;" some psychologists have advanced the theory that association of a vocabulary item with a familiar place or with things you come in contact with in your day to day life helps you to remember the word. We would like to find out if this modality might be more productive than the other ways of presenting vocabulary for learning. "Association with a geographical name" means that in addition to the Spanish word and English meaning, the name of a city or country which starts with



sounds similar to the Spanish word being taught will appear on the bottom of the slide. "Factual sequence" is similar to the "suspense story;" the only difference is that the story is just a sequence of facts.

Here are examples of the different modalities. Your task is to learn as many words as you can.

TAPE: a. Meaning given twice.

1. (ter so)
2. (izquierdista)

b. Suspense story.

1. (calvo - Tengo un amigo casi calvo)
2. (tener - Tiene solamente unos cuantos pelos)
3. (peluquería - Cierta día fué a la peluquería)
4. (barbero - El barbero no sabía qué hacer con ellos)
5. (planchar - Mi amigo le dijo: plánchemelos)

c. Association with a familiar place.

1. (cama - "room")
2. (diccionario - "library")

d. Association with a geographical name.

1. (televisión - \*Tennessee)
2. (filología - \*Philadelphia)

e. Factual sequence.

1. (presidente - Lincoln fué presidente de los Estados Unidos.)
2. (unificación - Luchó por la unificación del país.)
3. (esclavitud - Abolió la esclavitud en el sur.)
4. (odiar - Fué amado de unos, odiado por otros.)
5. (asesinar - Fué asesinado en un teatro.)

## I. Experiment IX.

(Each subject was handed a sheet of instructions - p.129). Twenty-five examples were given, five per response modality, and after the examples were run through, the machine was stopped and the administrator asked whether the subject understood his task. The instructions or identification of response mode preceded every five items and overlapped with the intertrial interval between the fifth item for one mode and the first item of the next mode.

A typical trial consisted of an intertrial interval of 8 seconds followed by 6 seconds of visual display with the audio coming on simultaneously after a 3 second delay. The subject then had a preset interval of 4 seconds in which to respond. When the response latency was picked up, the tape recorder came on again automatically and the unit went into intertrial interval and repeated.)



A sample of the instruction sheet follows.

EXPERIMENT IX - GROUP \_\_\_\_\_ NAME \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONS: In this experiment, you will be presented 100 words in Spanish. Your task is to learn the meaning of as many words as you can. After the presentation of each word, you will be given (4) seconds in which to respond according to the instructions you will hear on the tape. Sometimes you will be asked to 'repeat aloud the Spanish word;' sometimes to 'repeat aloud the meaning;' sometimes to 'write the meaning;' sometimes to 'repeat aloud the meaning and then write it;' and sometimes to 'repeat aloud the Spanish word and then say the meaning.' The instructions of how you are to respond will be given before every five words. For those words where you are asked to write the meaning, you will use the attached sheets. Examples will be given for practice.

EXAMPLES:

11. \_\_\_\_\_

12. \_\_\_\_\_

13. \_\_\_\_\_

14. \_\_\_\_\_

15. \_\_\_\_\_

—

16. \_\_\_\_\_

17. \_\_\_\_\_

18. \_\_\_\_\_

19. \_\_\_\_\_

20. \_\_\_\_\_

Please turn the page.

Sample of Administrator's Sheet:

NAME \_\_\_\_\_ DATE \_\_\_\_\_ EXP. IX - \_\_\_\_\_

GUIDE: Est = Repeat aloud the Spanish word.  
Dsn = Repeat aloud the meaning.  
Dwn = Write the meaning.  
Dsn + Dwn = Repeat aloud the meaning and then write it.  
Est + Dsn = Repeat aloud the Spanish word and then say  
the meaning.

Est - 1. _____	Est + Dsn -
2. _____	21. _____
3. _____	22. _____
4. _____	23. _____
5. _____	24. _____
Dsn - 6. _____	25. _____
7. _____	Dwn - 26. _____
8. _____	27. _____
9. _____	28. _____
Dwn - 10. _____	29. _____
11. _____	30. _____
12. _____	Dsn - 31. _____
13. _____	32. _____
14. _____	33. _____
15. _____	34. _____
Dsn + Dwn -	35. _____
16. _____	Est - 36. _____
17. _____	37. _____
18. _____	38. _____
19. _____	39. _____
20. _____	40. _____
	etc.

APPENDIX IV

TESTING MATERIALS

A. Experiment I.

The stimulus for testing was the Spanish word on a slide. The subjects were instructed to say the English meaning they had learned for each word. The time allotted for each slide and concurrent subject response was 5 seconds. Each subject had his own individual tape onto which his answers were recorded.

B. Experiment II.

The pre-and post-test for Experiment II was multiple choice. The materials used consisted of slides with the number, the word and five choices on it. In addition, each subject had a mimeographed answer sheet (p.140). Eight seconds were allowed for each slide and concurrent response.

1. List of multiple choice items:

Example A.      casa    a. case  
  b. property  
  c. casket  
  d. house  
  e. (don't know)

Example B.      gato    a. gate  
  b. jet  
  c. cat  
  d. kite  
  e. (don't know)

1. lucro
  - a. early
  - b. earnings
  - c. funny
  - d. lucky
  - e. (don't know)
2. cimbreo
  - a. symbol
  - b. bending
  - c. hat
  - d. stamp
  - e. (don't know)
3. letal
  - a. legal
  - b. leather
  - c. mortal
  - d. spool
  - e. (don't know)
4. quilate
  - a. quilt
  - b. quite
  - c. jewel
  - d. carat
  - e. (don't know)
5. cabildeo
  - a. cable car
  - b. hall
  - c. cabinet
  - d. lobbying
  - e. (don't know)
6. brega
  - a. strong
  - b. brave
  - c. break
  - d. strife
  - e. (don't know)
7. flúor
  - a. flourine
  - b. floor
  - c. flowered
  - d. flowing
  - e. (don't know)
8. ladear
  - a. ladder
  - b. to praise
  - c. to tilt
  - d. to broaden
  - e. (don't know)
9. chispazo
  - a. cheapness
  - b. loud cry
  - c. electric spark
  - d. crisped
  - e. (don't know)
10. bamboleo
  - a. reeling
  - b. fishing
  - c. bamboo
  - d. drunken
  - e. (don't know)
11. hangar
  - a. coat hanger
  - b. to hang
  - c. airplane
  - d. airplane hangar
  - e. (don't know)
12. miaja
  - a. bread
  - b. major
  - c. myopia
  - d. crumb
  - e. (don't know)
13. saltón
  - a. assault
  - b. leaping
  - c. dance
  - d. saltish
  - e. (don't know)
14. nereida
  - a. sea nymph
  - b. Neronian
  - c. sea weed
  - d. neural
  - e. (don't know)

15. alcanfor  
 a. odorous  
 b. camphor  
 c. comfort  
 d. alkaline  
 e. (don't know)
16. rotén  
 a. rough  
 b. rattan tree  
 c. rotten  
 d. broken  
 e. (don't know)
17. seise  
 a. seizure  
 b. sixty  
 c. six  
 d. choir boy  
 e. (don't know)
18. granjear  
 a. to grow  
 b. to enlarge  
 c. grange  
 d. to gain  
 e. (don't know)
19. consultor  
 a. consultant  
 b. consulate  
 c. reference  
 d. consultation  
 e. (don't know)
20. desmoche  
 a. messy  
 b. lobbying  
 c. fly  
 d. dismount  
 e. (don't know)
21. parva  
 a. turkey  
 b. gypsy pavilion  
 c. heap of unthrashed corn  
 d. poverty  
 e. (don't know)
22. lezna  
 a. awl  
 b. lazy  
 c. linen  
 d. drill  
 e. (don't know)
23. hurgar  
 a. stirrup  
 b. to stir  
 c. urge  
 d. to hurry  
 e. (don't know)
24. escarpe  
 a. carp  
 b. steep slope  
 c. carpet  
 d. declivity  
 e. (don't know)
25. muérdago  
 a. mistletoe  
 b. mortician  
 c. thistle  
 d. mortar  
 e. (don't know)
26. redaño  
 a. year ago  
 b. redundant  
 c. fetus membrane  
 d. harm  
 e. (don't know)
27. ultramar  
 a. ultra  
 b. overseas continent  
 c. ocean  
 d. ultimate  
 e. (don't know)
28. gástrico  
 a. expensive  
 b. ghastly  
 c. gastric  
 d. stomach  
 e. (don't know)

29. hirviente  
 a. boiling  
 b. grassy  
 c. fervent  
 d. herb  
 e. (don't know)
30. extractar  
 a. to summarize  
 b. to track  
 c. to extradict  
 d. to attract  
 e. (don't know)
31. andurrial  
 a. by-road  
 b. ancient  
 c. walk  
 d. andante  
 e. (don't know)
32. sordina  
 a. sordid  
 b. sardine  
 c. mute  
 d. filthy  
 e. (don't know)
33. cabrío  
 a. taxicab  
 b. goatish  
 c. capers  
 d. opening  
 e. (don't know)
34. reventón  
 a. loud sound  
 b. blow out  
 c. returned  
 d. revenge  
 e. (don't know)
35. aquejar  
 a. to complain  
 b. to sharpen  
 c. water jar  
 d. to query  
 e. (don't know)
36. semblanza  
 a. biographical sketch  
 b. similarity  
 c. assemblance  
 d. expression  
 e. (don't know)
37. dozavo  
 a. dozen  
 b. twelve-sided  
 c. twelfth  
 d. dozing  
 e. (don't know)
38. oropel  
 a. tinsel  
 b. dance  
 c. pencil  
 d. horrible  
 e. (don't know)
39. realengo  
 a. reliable  
 b. of royal domain  
 c. realized  
 d. majestic  
 e. (don't know)
40. relajar  
 a. to relate  
 b. to relax  
 c. to realize  
 d. to relinquish  
 e. (don't know)
41. alcurnia  
 a. alchemy  
 b. archpriest  
 c. ancestry  
 d. ancient  
 e. (don't know)
42. adalid  
 a. marshal  
 b. chief  
 c. addition  
 d. dahlia  
 e. (don't know)

43. sidéreo  
 a. to desire  
 b. side-road  
 c. sedative  
 d. starry  
 e. (don't know)
44. fúlgido  
 a. lightening  
 b. flash  
 c. full  
 d. radiant  
 e. (don't know)
45. enjuagar  
 a. to engage  
 b. to play with  
 c. to rinse  
 d. to enjoy  
 e. (don't know)
46. pudrición  
 a. powerful  
 b. perdition  
 c. putrefaction  
 d. shame  
 e. (don't know)
47. peleona  
 a. stick  
 b. strike  
 c. paleness  
 d. quarrel  
 e. (don't know)
48. feriado  
 a. fair person  
 b. country fair  
 c. fairy  
 d. applied to legal holidays  
 e. (don't know)
49. obseso  
 a. besetting  
 b. fat  
 c. sane  
 d. obscene  
 e. (don't know)
50. mediados  
 a. married  
 b. meddled with  
 c. about the middle of  
 d. mediating  
 e. (don't know)
51. trilobites  
 a. praying mantis  
 b. wolf  
 c. trilobal  
 d. extinct insect  
 e. (don't know)
52. cigarrero  
 a. cigar  
 b. cigar maker  
 c. cigarette holder  
 d. ash tray  
 e. (don't know)
53. bocamanga  
 a. mouth wash  
 b. sleeve  
 c. boatman  
 d. cuff of a sleeve  
 e. (don't know)
54. cavatina  
 a. musical composition  
 b. little cave  
 c. poem  
 d. cavity  
 e. (don't know)
55. pertinacia  
 a. pertinence  
 b. relatibility  
 c. belonging  
 d. pertinaciousness  
 e. (don't know)
56. tramitación  
 a. procedure  
 b. tramway  
 c. trepidation  
 d. legislature  
 e. (don't know)



57. desmembración  
 a. loss of membership  
 b. embarrassment  
 c. dismemberment  
 d. loss of memory  
 e. (don't know)
58. desajuste  
 a. maladjustment  
 b. disgust  
 c. injustice  
 d. upheaval  
 e. (don't know)
59. tapatío  
 a. Chilean  
 b. person from Tampa  
 c. person from Guadalajara  
 d. tapestry  
 e. (don't know)
60. tobillera  
 a. towel rack  
 b. tabulator  
 c. antlers  
 d. anklet  
 e. (don't know)
61. polígono  
 a. polyglot  
 b. many-sided  
 c. polygamous  
 d. angle  
 e. (don't know)
62. palomero  
 a. palomino  
 b. pidgeon-seller  
 c. pal  
 d. dove  
 e. (don't know)
63. espumajo  
 a. waves  
 b. scum  
 c. froth  
 d. spasm  
 e. (don't know)
64. campanazo  
 a. bell  
 b. campaign  
 c. bell-stroke  
 d. countryman  
 e. (don't know)
65. bancarrota  
 a. bankruptcy  
 b. carrot  
 c. banker  
 d. banquet  
 e. (don't know)
66. parricida  
 a. seeming  
 b. patricide  
 c. fatherly  
 d. cannibal  
 e. (don't know)
67. sobrepeso  
 a. above ground  
 b. supposed  
 c. over a dollar  
 d. overweight  
 e. (don't know)
68. anualidad  
 a. annoyance  
 b. nothingness  
 c. annuity  
 d. annulment  
 e. (don't know)
69. jaculatorio  
 a. jokingly  
 b. juggler  
 c. ejaculatory  
 d. fighter  
 e. (don't know)
70. comisura  
 a. camera shutter  
 b. commission  
 c. commissary  
 d. corner of the mouth  
 e. (don't know)

71. humorada  
 a. joke  
 b. humid  
 c. smoky  
 d. yoke  
 e. (don't know)
72. atarraya  
 a. array  
 b. casting net  
 c. behind  
 d. attack  
 e. (don't know)
73. neurastenia  
 a. nervous  
 b. pneumonia  
 c. disease  
 d. neurasthenia  
 e. (don't know)
74. arandela  
 a. washing machine  
 b. washer, flat disk  
 c. around  
 d. arranged  
 e. (don't know)
75. polizonte  
 a. policeman  
 b. polite  
 c. dusty  
 d. apology  
 e. (don't know)
76. represivo  
 a. pressure  
 b. censure  
 c. responsive  
 d. repressive  
 e. (don't know)
77. desempolvar  
 a. to dirty  
 b. to dust  
 c. to pulverize  
 d. to employ  
 e. (don't know)
78. encapullado  
 a. incapable  
 b. beheaded  
 c. capitalized  
 d. closed, as a bud  
 e. (don't know)
79. meditabundo  
 a. pensive  
 b. meanwhile  
 c. abundance  
 d. mediation  
 e. (don't know)
80. detalladamente  
 a. tailored  
 b. in detail  
 c. entailed  
 d. in a fitting way  
 e. (don't know)
81. inquietante  
 a. uncaring  
 b. inquisitor  
 c. disquieting  
 d. nuisance  
 e. (don't know)
82. vaticinar  
 a. to vaccinate  
 b. to foretell  
 c. to forego  
 d. to evacuate  
 e. (don't know)
83. chocolatera  
 a. chocolate pot  
 b. chocolate factory  
 c. chocolate  
 d. chocolate shop  
 e. (don't know)
84. quincuagésimo  
 a. fifth  
 b. fifty year old man  
 c. fifty  
 d. fiftieth  
 e. (don't know)

85. envalentonar  
 a. to make one brave  
 b. to evaluate  
 c. to encourage  
 d. to invalidate  
 e. (don't know)
86. momentáneo  
 a. temporal  
 b. simultaneous  
 c. momentary  
 d. momentous  
 e. (don't know)
87. amadrinar  
 a. to mother  
 b. to be godmother to  
 c. to dawn  
 d. to give birth to  
 e. (don't know)
88. exguardabosque  
 a. woods  
 b. ambush  
 c. ex-forester  
 d. ex-warden  
 e. (don't know)
89. improrrogable  
 a. not refundable  
 b. not renewable  
 c. improbable  
 d. unbreakable  
 e. (don't know)
90. superintendencia  
 a. intention  
 b. attempt  
 c. superior  
 d. superintendency  
 e. (don't know)
91. contentivo  
 a. contented  
 b. filled  
 c. conscientious  
 d. containing  
 e. (don't know)
92. acaparar  
 a. to be prepared  
 b. to behead  
 c. to monopolize  
 d. to capitalize  
 e. (don't know)
93. pisapapeles  
 a. linoleum  
 b. paperweight  
 c. piece of paper  
 d. door mat  
 e. (don't know)
94. preeleccionario  
 a. predestinarian  
 b. dictionary  
 c. predecessor  
 d. candidate  
 e. (don't know)
95. esclarecimiento  
 a. enlightenment  
 b. nobility  
 c. dawn  
 d. secularization  
 e. (don't know)
96. transandino  
 a. trans-Indian  
 b. transcendent  
 c. trans-Andean  
 d. transcient  
 e. (don't know)
97. averiarse  
 a. to suffer damage  
 b. to warn  
 c. avarice  
 d. to verify  
 e. (don't know)
98. estreñimiento  
 a. estrangement  
 b. strangely  
 c. narrowness  
 d. constipation  
 e. (don't know)

99. embarazada

- a. erasure
- b. embrace
- c. pregnant
- d. embarrassed
- e. (don't know)

100. carbonífero

- a. carbon paper
- b. carboniferous
- c. carbon
- d. fireplace
- e. (don't know)

2. Answer sheet (and key to subsequent multiple-choice tests for each experiment).

NAME \_\_\_\_\_ DATE \_\_\_\_\_ EXPERIMENT II-TEST \_\_\_\_\_

INSTRUCTIONS: Circle the letter which corresponds to the correct choice of meaning on the slide. If you do not know the meaning, circle letter 'e'. Be sure to answer every item.

Example A. a b c (d) e

Example B. a b (c) d e

- |                 |                 |
|-----------------|-----------------|
| 1. a (b) c d e  | 19. (a) b c d e |
| 2. a (b) c d e  | 20. a (b) c d e |
| 3. a b (c) d e  | 21. a b (c) d e |
| 4. a b c (d) e  | 22. (a) b c d e |
| 5. a b c (d) e  | 23. a (b) c d e |
| 6. a b c (d) e  | 24. a (b) c d e |
| 7. (a) b c d e  | 25. (a) b c d e |
| 8. a b (c) d e  | 26. a b (c) d e |
| 9. a b (c) d e  | 27. a (b) c d e |
| 10. (a) b c d e | 28. a b (c) d e |
| 11. a b c (d) e | 29. (a) b c d e |
| 12. a b c (d) e | 30. (a) b c d e |
| 13. a (b) c d e | 31. (a) b c d e |
| 14. (a) b c d e | 32. a b (c) d e |
| 15. a (b) c d e | 33. a (b) c d e |
| 16. a (b) c d e | 34. a (b) c d e |
| 17. a b c (d) e | 35. (a) b c d e |
| 18. a b c (d) e | 36. (a) b c d e |

37. a b (c) d e  
38. (a) b c d e  
39. a (b) c d e  
40. a (b) c d e  
41. a b (c) d e  
42. a (b) c d e  
43. a b c (d) e  
44. a b c (d) e  
45. a b (c) d e  
46. a b (c) d e  
47. a b c (d) e  
48. a b c (d) e  
49. (a) b c d e  
50. a b (c) d e  
51. a b c (d) e  
52. a (b) c d e  
53. a b c (d) e  
54. (a) b c d e  
55. a b c (d) e  
56. (a) b c d e  
57. a b (c) d e  
58. (a) b c d e  
59. a b (c) d e  
60. a b c (d) e  
61. a (b) c d e  
62. a (b) c d e  
63. a b (c) d e  
64. a b (c) d e  
65. (a) b c d e  
66. a (b) c d e  
67. a b c (d) e  
68. a b (c) d e  
69. a b (c) d e  
70. a b c (d) e  
71. (a) b c d e  
72. a (b) c d e  
73. a b c (d) e  
74. a (b) c d e  
75. (a) b c d e  
76. a b c (d) e  
77. a b (c) d e  
78. a b c (d) e  
79. (a) b c d e  
80. a (b) c d e  
81. a b (c) d e  
82. a (b) c d e  
83. (a) b c d e  
84. a b c (d) e

- 85. a b (c) d e
- 86. a b (c) d e
- 87. a (b) c d e
- 88. a b (c) d e
- 89. a (b) c d e
- 90. a t c (d) e
- 91. a b c (d) e
- 92. a b (c) d e

- 93. a (b) c d e
- 94. (a) b c d e
- 95. (a) b c d e
- 96. a b (c) d e
- 97. (a) b c d e
- 98. a b c (d) e
- 99. a b (c) e e
- 100. a (b) c d e

C. Experiments III, IV.

The test items were organized on the test sheet in groups of five, each representing a single modality. This allowed for greater ease in tabulating the results.

1. Test 1

NAME \_\_\_\_\_ GROUP \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONS: Write in the meaning of each word in either English or Spanish.

- |                         |                       |
|-------------------------|-----------------------|
| 1. oráculo _____        | 19. procedencia _____ |
| 2. altruismo _____      | 20. manuscibir _____  |
| 3. descuartizar _____   | 21. culminación _____ |
| 4. coalición _____      | 22. rastrillar _____  |
| 5. malárico _____       | 23. salesiano _____   |
| 6. polémica _____       | 24. camaranchón _____ |
| 7. arreglador _____     | 25. reposición _____  |
| 8. caballero _____      | 26. boyar _____       |
| 9. engranaje _____      | 27. baldón _____      |
| 10. ciclónico _____     | 28. garlopa _____     |
| 11. preámbulo _____     | 29. labial _____      |
| 12. fricción _____      | 30. chingolo _____    |
| 13. beatificar _____    | 31. anamú _____       |
| 14. conspirador _____   | 32. elfo _____        |
| 15. superación _____    | 33. higuana _____     |
| 16. actualizar _____    | 34. feraz _____       |
| 17. inconsciencia _____ | 35. estopa _____      |
| 18. excondenado _____   | 36. blandear _____    |



- |                           |                           |
|---------------------------|---------------------------|
| 37. hulla _____           | 61. metabólico _____      |
| 38. leñazo _____          | 62. deslumbramiento _____ |
| 39. tusa _____            | 63. abundantemente _____  |
| 40. dolamas _____         | 64. pediculosis _____     |
| 41. flechazo _____        | 65. vanagloriarse _____   |
| 42. seseo _____           | 66. exteriormente _____   |
| 43. recría _____          | 67. afroantillano _____   |
| 44. asquear _____         | 68. automáticamente _____ |
| 45. lodazal _____         | 69. vertiginoso _____     |
| 46. hablar _____          | 70. apretujamiento _____  |
| 47. treta _____           | 71. intermediario _____   |
| 48. enagua _____          | 72. combatividad _____    |
| 49. tenso _____           | 73. negativamente _____   |
| 50. caporal _____         | 74. entremetido _____     |
| 51. pintiparado _____     | 75. tragicómico _____     |
| 52. corazonada _____      | 76. sitiador _____        |
| 53. desacreditado _____   | 77. querube _____         |
| 54. habilitación _____    | 78. perpetrar _____       |
| 55. concretamente _____   | 79. retranca _____        |
| 56. obedecedor _____      | 80. catarral _____        |
| 57. escaramuza _____      | 81. irrumpir _____        |
| 58. alborozadamente _____ | 82. mostaza _____         |
| 59. palafrenero _____     | 83. tiritar _____         |
| 60. graciosamente _____   | 84. espinal _____         |

85. sonsacar \_\_\_\_\_ 93. antiparras \_\_\_\_\_  
86. crecido \_\_\_\_\_ 94. implume \_\_\_\_\_  
87. modorra \_\_\_\_\_ 95. destripar \_\_\_\_\_  
88. rompible \_\_\_\_\_ 96. talismán \_\_\_\_\_  
89. rehoyo \_\_\_\_\_ 97. mazapán \_\_\_\_\_  
90. innoble \_\_\_\_\_ 98. dimanar \_\_\_\_\_  
91. inerte \_\_\_\_\_ 99. proyectil \_\_\_\_\_  
92. sedición \_\_\_\_\_ 100. deforme \_\_\_\_\_

## 2. Test 2

Since the meaning in both these experiments was presented in English and/or in Spanish, the choices in Test 2 were given in English for those words taught in all modes except "rt" (read in the target language) and in Spanish for those words taught in "rt". Each group of five subjects were taught the same list of words but the modality per word was rotated so that for 25 subjects, each word had been exposed to every mode. Therefore, the recognition test was different for each group of five subjects insofar as each group had been taught a different group of words in the modality "rt".

To make tabulation easier, the test sheet was compiled so that all those items taught in any one mode would fall on the same page. Thus, for one group, the multiple choices would be in English on pages 1-4 (p.1=rn; p.2=rn/p; p.3=rn/rt/p; p.4=rn/rt) and on page 5 (representing rt) they would all be in Spanish; for the next group of subjects, the choices in English would fall on pages 2-5 and those in Spanish on p.1 and so on for each group of five subjects.

The test items follow:

NAME \_\_\_\_\_ GROUP \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONS: Circle the letter next to the correct choice of meaning for each word. The choices will be in Spanish for those words of which you were taught the meaning in Spanish only.

### EXAMPLES:

gato	or	rojo
a. far		a. llegar
b. good		b. bondadoso
c. green		(c.) color de sangre
(d.) cat		d. color verdoso

---

### TEST ITEMS - ENGLISH

1. irrumpir
  - a. drowsiness
  - b. to erupt
  - c. ignoble
  - d. conspirator

### TEST ITEMS - SPANISH

1. irrumpir
  - a. sueño muy pesado
  - b. entrar violentamente
  - c. infame
  - d. intrigante

- |  |  |
|--|--|
| <p>2. mostaza</p> <ul style="list-style-type: none"> <li>a. to erupt</li> <li>b. mustard</li> <li>c. repairman</li> <li>d. cyclonic</li> </ul> <p>3. tiritar</p> <ul style="list-style-type: none"> <li>a. muddy-place</li> <li>b. unfeathered</li> <li>c. to shiver</li> <li>d. spectacles</li> </ul> <p>4. espinal</p> <ul style="list-style-type: none"> <li>a. stable-boy</li> <li>b. merrily</li> <li>c. to soften</li> <li>d. spinal</li> </ul> <p>5. sonsacar</p> <ul style="list-style-type: none"> <li>a. to make happy</li> <li>b. metabolic</li> <li>c. pronunciation of 's' for 'c'</li> <li>d. to inquire deviously</li> </ul> <p>6. obedecedor</p> <ul style="list-style-type: none"> <li>a. skirmish</li> <li>b. humorously</li> <li>c. obeying</li> <li>d. cigarette</li> </ul> <p>7. escaramuza</p> <ul style="list-style-type: none"> <li>a. closely resembling</li> <li>b. skirmish</li> <li>c. elf</li> <li>d. burlap</li> </ul> <p>8. alborozadamente</p> <ul style="list-style-type: none"> <li>a. improvement</li> <li>b. infestation with lice</li> <li>c. merrily</li> <li>d. abundantly</li> </ul> <p>9. palafrenero</p> <ul style="list-style-type: none"> <li>a. stable-boy</li> <li>b. spinal</li> <li>c. to shiver</li> <li>d. polemics</li> </ul> | <p>2. mostaza</p> <ul style="list-style-type: none"> <li>a. entrar violentamente</li> <li>b. salsa picante</li> <li>c. comenedor</li> <li>d. de los ciclones</li> </ul> <p>3. tiritar</p> <ul style="list-style-type: none"> <li>a. terreno lleno de barro</li> <li>b. sin plumas</li> <li>c. temblar de frío</li> <li>d. gafas</li> </ul> <p>4. espinal</p> <ul style="list-style-type: none"> <li>a. mozo de caballos</li> <li>b. alegremente</li> <li>c. ablandar</li> <li>d. de la espinal dorsal</li> </ul> <p>5. sonsacar</p> <ul style="list-style-type: none"> <li>a. hacer a uno feliz</li> <li>b. cambio celular</li> <li>c. pronunciación de la 's' por 'c'</li> <li>d. sacar un secreto astutamente</li> </ul> <p>6. obedecedor</p> <ul style="list-style-type: none"> <li>a. pequeña batalla</li> <li>b. humorísticamente</li> <li>c. dócil</li> <li>d. cigarrillo</li> </ul> <p>7. escaramuza</p> <ul style="list-style-type: none"> <li>a. muy semejante</li> <li>b. pequeña batalla</li> <li>c. duende</li> <li>d. fibras de cáñamo o lino</li> </ul> <p>8. alborozadamente</p> <ul style="list-style-type: none"> <li>a. mejoramiento</li> <li>b. enfermedad de piojos</li> <li>c. alegremente</li> <li>d. con abundancia</li> </ul> <p>9. palafrenero</p> <ul style="list-style-type: none"> <li>a. mozo de caballos</li> <li>b. de la espina dorsal</li> <li>c. temblar de frío</li> <li>d. controversia</li> </ul> |
|--|--|

10. graciosamente  
a. humorously  
b. blow with a club  
c. grown  
d. to rub

11. anamú  
a. stigma  
b. kind of sparrow  
c. wagon-brake  
d. a Cuban grass

12. elfo  
a. to speak with ease  
b. elf  
c. marzipan  
d. deformed

13. higuana  
a. concretely  
b. fertile  
c. breakable  
d. iguana

14. feraz  
a. fertile  
b. garret  
c. Salesian  
d. mediator

15. estopa  
a. to commit a crime  
b. oracle  
c. premonition  
d. burlap

16. polémica  
a. to rake  
b. replacement  
c. intruder  
d. polemics

17. arreglador  
a. to update  
b. afro-Caribbean  
c. repairman  
d. squeezing

10. graciosamente  
a. humorísticamente  
b. golpe con un palo  
c. desarrollado  
d. restregar

11. anamú  
a. deshonra  
b. clase de gorrión  
c. freno de carruaje  
d. planta de Cuba

12. elfo  
a. hablar con facilidad  
b. duende  
c. pasta de almendras y azúcar  
d. deformado

13. higuana  
a. de modo concreto  
b. fértil  
c. frágil  
d. reptil de las Américas

14. feraz  
a. fértil  
b. cuarto para guardar cosas viejas  
c. religioso de San Juan Bosco  
d. mediador

15. estopa  
a. cometer un crimen  
b. respuesta en nombre de los dioses  
c. presentimiento  
d. fibras de cáñamo o lino

16. polémica  
a. limpiar de hierbas el jardín  
b. substitución  
c. intruso  
d. controversia

17. arreglador  
a. modernizar  
b. africano-antillano  
c. componedor  
d. apretar mucho

18. caballero  
a. pertaining to a cold  
b. coalition  
c. to cut into pieces  
d. groom in charge of a stable

19. engranaje  
a. gear  
b. tense  
c. petticoat  
d. talisman

20. ciclónico  
a. negatively  
b. cyclonic  
c. to buoy  
d. cherub

Page 2

21. inerte  
a. cherub  
b. pertaining to a cold  
c. coalition  
d. inert

22. sedición  
a. sedition  
b. talisman  
c. to rake  
d. replacement

23. antiparras  
a. burlap  
b. spinal  
c. spectacles  
d. to shiver

24. implume  
a. intruder  
b. negatively  
c. unfeathered  
d. to buoy

18. caballero  
a. perteneciente a un resfriado  
b. confederación  
c. hacer pedazos  
d. el que cuida del establo

19. engranaje  
a. mecanismo de ruedas dentadas  
b. rígido  
c. falda interior  
d. amuleto

20. ciclónico  
a. de ningún modo  
b. de los ciclones  
c. flotar una embarcación  
d. ángel

- 21 inerte  
a. ángel  
b. perteneciente a un resfriado  
c. confederación  
d. sin vida

22. sedición  
a. insurrección  
b. amuleto  
c. limpiar de hierbas el jardín  
d. substitución

23. antiparras  
a. fibras de cáñamo o lino  
b. de la espina dorsal  
c. gafas  
d. temblar de frío

24. implume  
a. intruso  
b. de ningún modo  
c. sin plumas  
d. flotar una embarcación

25. destripar  
 a. to disembowel  
 b. to cut into pieces  
 c. closely resembling  
 d. elf
26. exteriormente  
 a. externally  
 b. combativeness  
 c. tragicomical  
 d. labial
27. afroantillano  
 a. externally  
 b. trick  
 c. afro-Caribbean  
 d. chief
28. automáticamente  
 a. malarial  
 b. automatically  
 c. habilitation  
 d. discredited
29. vertiginoso  
 a. projectile  
 b. giddy  
 c. to spring from  
 d. climax
30. apretujamiento  
 a. squeezing  
 b. long plane  
 c. besieger  
 d. altruism
31. flechazo  
 a. arrow-wound  
 b. pronunciation of 's'  
 for 'c'  
 c. muddy-place  
 d. unfeathered
32. seseo  
 a. to soften  
 b. drowsiness  
 c. pronunciation of 's'  
 for 'c'  
 d. ignoble

25. destripar  
 a. sacar los intestinos  
 b. hacer pedazos  
 c. muy semejante  
 d. duende
26. exteriormente  
 a. externamente  
 b. espíritu guerrero  
 c. de la tragicomedia  
 d. de los labios
27. afroantillano  
 a. externamente  
 b. artificio  
 c. africano-antillano  
 d. jefe
28. automáticamente  
 a. de la malaria  
 b. de manera automática  
 c. aprovisionamiento  
 d. de mala reputación
29. vertiginoso  
 a. bombas, balas, etc.  
 b. que causa vértigo  
 c. proceder  
 d. cima
30. apretujamiento  
 a. apretar mucho  
 b. instrumento de  
 carpintería  
 c. bloqueador  
 d. filantropía
31. flechazo  
 a. herida de flecha  
 b. pronunciación de la 's'  
 por 'c'  
 c. terreno lleno de barro  
 d. sin plumas
32. seseo  
 a. ablandar  
 b. sueño muy pesado  
 c. pronunciación de la 's'  
 por 'c'  
 d. infame

33. *recria*  
 a. repasturing  
 b. squeezing  
 c. tense  
 d. petticoat
34. *asquear*  
 a. conspirator  
 b. to make happy  
 c. to nauseate  
 d. metabolic
35. *lodazal*  
 a. spectacles  
 b. to update  
 c. afro-Caribbean  
 d. muddy-place
36. *actualizar*  
 a. to rub  
 b. improvement  
 c. to update  
 d. infestation with lice
37. *inconsciencia*  
 a. polemics  
 b. unconsciousness  
 c. skirmish  
 d. humorously
38. *excondenado*  
 a. ex-convict  
 b. to disembowel  
 c. origin  
 d. negatively
39. *procedencia*  
 a. cigarette  
 b. blow with a club  
 c. grown  
 d. origin
40. *manuscribir*  
 a. abundantly  
 b. arrow-wound  
 c. to make a manuscript  
 d. sedition

33. *recria*  
 a. engordar el ganado  
 b. apretar mucho  
 c. rígido  
 d. falda interior
34. *asquear*  
 a. intrigante  
 b. hacer a uno feliz  
 c. causar repugnancia  
 d. cambio celular
35. *lodazal*  
 a. gafas  
 b. modernizar  
 c. africano-antillano  
 d. terreno lleno de barro
36. *actualizar*  
 a. restregar  
 b. mejoramiento  
 c. modernizar  
 d. enfermedad de piojos
37. *inconsciencia*  
 a. controversia  
 b. pérdida del sentido  
 c. pequeña batalla  
 d. humorísticamente
38. *excondenado*  
 a. ex-convicto  
 b. sacar los intestinos  
 c. origen  
 d. de ningún modo
39. *procedencia*  
 a. cigarrillo  
 b. golpe con un palo  
 c. desarrollado  
 d. origen
40. *manuscribir*  
 a. con abundancia  
 b. herida de flecha  
 c. escribir un manuscrito  
 d. insurrección



41. sitiador  
a. sedition  
b. to disembowel  
c. origin  
d. besieger
42. querube  
a. grown  
b. to rub  
c. improvement  
d. cherub
43. perpetrar  
a. chief  
b. to commit a crime  
c. projectile  
d. to spring from
44. retranca  
a. wagon-brake  
b. infestation with lice  
c. abundantly  
d. arrow-wound
45. catarral  
a. ex-convict  
b. pertaining to a cold  
c. externally  
d. trick
46. pintiparado  
a. closely resembling  
b. glare  
c. to boast  
d. to nauseate
47. corazonada  
a. obeying  
b. soft-coal  
c. premonition  
d. hidden defects of animals

41. sitiador  
a. insurrección  
b. sacar los intestinos  
c. origen  
d. bloqueador
42. querube  
a. desarrollado  
b. restregar  
c. mejoramiento  
d. ángel
43. perpetrar  
a. jefe  
b. cometer un crimen  
c. bombas, balas, etc.  
d. proceder
44. retranca  
a. freno de carruaje  
b. enfermedad de piojos  
c. con abundancia  
d. herida de flecha
45. catarral  
a. ex-convicto  
b. perteneciente a un resfriado  
c. externamente  
d. artificio
46. pintiparado  
a. muy semejante  
b. turbación de la vista por la luz  
c. ser presuntuoso  
d. causar repugnancia
47. corazonada  
a. dócil  
b. carbón fósil  
c. presentimiento  
d. enfermedades ocultas de los animales

48. desacreditado  
a. discredited  
b. to make a manuscript  
c. giddy  
d. automatically

49. habilitación  
a. deep ravine  
b. habilitation  
c. breakable  
d. preamble

50. concretamente  
a. repasturing  
b. concretely  
c. inert  
d. unconsciousness

51. boyar  
a. elf  
b. to buoy  
c. burlap  
d. spinal

52. baldón  
a. to buoy  
b. stigma  
c. cherub  
d. pertaining to a cold

53. garlopa  
a. humorously  
b. cigarette  
c. long plane  
d. blow with a club

54. labial  
a. coalition  
b. to cut into pieces  
c. closely resembling  
d. labial

55. chingolo  
a. kind of sparrow  
b. to shiver  
c. polemics  
d. skirmish

48. desacreditado  
a. mala reputación  
b. escribir un manuscrito  
c. que causa vértigo  
d. de manera automática

49. habilitación  
a. hoyo profundo  
b. aprovisionamiento  
c. frágil  
d. prefacio

50. concretamente  
a. engordar el ganado  
b. de modo concreto  
c. sin vida  
d. pérdida del sentido

51. boyar  
a. duende  
b. flotar una embarcación  
c. fibras de cáñamo o lino  
d. de la espina dorsal

52. baldón  
a. flotar una embarcación  
b. deshonra  
c. ángel  
d. perteneciente a un resfriado

53. garlopa  
a. humorísticamente  
b. cigarrillo  
c. instrumento de carpintería  
d. golpe con un palo

54. labial  
a. confederación  
b. hacer pedazos  
c. muy semejante  
d. de los labios

55. chingolo  
a. clase de gorrión  
b. temblar de frío  
c. controversia  
d. pequeña batalla

56. oráculo  
a. altruism  
b. malarial  
c. oracle  
d. habilitation

57. altruismo  
a. climax  
b. altruism  
c. combativeness  
d. tragicomical

58. descuartizar  
a. to inquire deviously  
b. repairman  
c. to cut into pieces  
d. groom in charge of a stable

59. coalición  
a. labial  
b. coalition  
c. long plane  
d. besieger

60. malárico  
a. discredited  
b. a Cuban grass  
c. mustard  
d. malarial

Page 4

61. crecido  
a. mustard  
b. grown  
c. to inquire deviously  
d. gear

62. modorra  
a. beseiger  
b. altruism  
c. malarial  
d. drowsiness

63. rompible  
a. hidden defects of animals  
b. deep ravine  
c. iguana  
d. breakable

56. oráculo  
a. filantropía  
b. de la malaria  
c. respuesta en nombre de los dioses  
d. aprovisionamiento

57. altruismo  
a. cima  
b. filantropía  
c. espíritu guerrero  
d. de la tragicomedia

58. descuartizar  
a. sacar un secreto astutamente  
b. componedor  
c. hacer pedazos  
d. el que cuida del establo

59. coalición  
a. de los labios  
b. confederación  
c. instrumento de carpintería  
d. bloqueador

60. malárico  
a. de mala reputación  
b. planta de Cuba  
c. salsa picante  
d. de la malaria

61. crecido  
a. salsa picante  
b. desarrollado  
c. sacar un secreto astutamente  
d. mecanismo de ruedas dentadas

62. modorra  
a. bloqueador  
b. filantropía  
c. de la malaria  
d. sueño muy pesado

63. rompible  
a. enfermedades ocultas de los animales  
b. hoyo profundo  
c. reptil de las Américas  
d. frágil

64. rehoyo  
 a. deep ravine  
 b. habilitation  
 c. discredited  
 d. a Cuban grass
65. innoble  
 a. groom in charge of a stable  
 b. ignoble  
 c. obeying  
 d. soft-coal
66. metabólico  
 a. premonition  
 b. concretely  
 c. metabolic  
 d. fertile
67. deslumbramiento  
 a. mediator  
 b. glare  
 c. stigma  
 d. kind of sparrow
68. abundantemente  
 a. cyclonic  
 b. stable-boy  
 c. merrily  
 d. abundantly
69. pediculosis  
 a. wagon-brake  
 b. to commit a crime  
 c. oracle  
 d. infestation with lice
70. vanagloriarse  
 a. iguana  
 b. to erupt  
 c. to boast  
 d. repairman
71. blandear  
 a. trick  
 b. to soften  
 c. chief  
 d. projectile

64. rehoyo  
 a. hoyo profundo  
 b. aprovisionamiento  
 c. de mala reputación  
 d. planta de Cuba
65. innoble  
 a. el que cuida del establo  
 b. infame  
 c. dócil  
 d. carbón fósil
66. metabólico  
 a. presentimiento  
 b. de modo concreto  
 c. cambio celular  
 d. fértil
67. deslumbramiento  
 a. mediador  
 b. turbación de la vista por la luz  
 c. deshonra  
 d. clase de gorrión
68. abundantemente  
 a. de los ciclones  
 b. mozo de caballos  
 c. alegremente  
 d. con abundancia
69. pediculosis  
 a. freno de carruaje  
 b. cometer un crimen  
 c. respuesta en nombre de los dioses  
 d. enfermedad de piojos
70. vanagloriarse  
 a. reptil de las Américas  
 b. entrar violentamente  
 c. ser presuntuoso  
 d. compondor
- 71 blandear  
 a. artificio  
 b. ablandar  
 c. jefe  
 d. bombas, balas, etc.

72. hulla
- a. arrow-wound
  - b. sedition
  - c. to disembowel
  - d. soft-coal
73. leñazo
- a. tragicomical
  - b. labial
  - c. blow with a club
  - d. long plane
74. tusa
- a. origin
  - b. ex-convict
  - c. cigarette
  - d. externally
75. dolamas
- a. to spring from
  - b. climax
  - c. combativeness
  - d. hidden defects of animals
76. preámbulo
- a. unconsciousness
  - b. to make a manuscript
  - c. giddy
  - d. preamble
77. friccionar
- a. preamble
  - b. glare
  - c. to rub
  - d. to boast
78. beatificar
- a. deformed
  - b. to make happy
  - c. garret
  - d. Salesian
79. conspirador
- a. conspirator
  - b. to nauseate
  - c. repasturing
  - d. inert
72. hulla
- a. herida de flecha
  - b. insurrección
  - c. sacar los intestinos
  - d. carbón fósil
73. leñazo
- a. de la tragicomedia
  - b. de los labios
  - c. golpe con un palo
  - d. instrumento de carpintería
74. tusa
- a. origen
  - b. ex-convicto
  - c. cigarrillo
  - d. externamente
75. dolamas
- a. proceder
  - b. cima
  - c. espíritu guerrero
  - d. enfermedades ocultas de los animales
76. preámbulo
- a. pérdida del sentido
  - b. escribir un manuscrito
  - c. que causa vértigo
  - d. prefacio
77. friccionar
- a. prefacio
  - b. turbación de la vista por la luz
  - c. restregar
  - d. ser presuntuoso
78. beatificar
- a. deformado
  - b. hacer a uno feliz
  - c. cuarto para guardar cosas viejas
  - d. religioso de San Juan Bosco
79. conspirador
- a. intrigante
  - b. causar repugnancia
  - c. engordar el ganado
  - d. sin vida

80. superación  
a. improvement  
b. automatically  
c. to speak with ease  
d. marzipan

Page 5

81. talismán  
a. marzipan  
b. deformed  
c. talisman  
d. garret
82. mazápan  
a. marzipan  
b. inert  
c. unconsciousness  
d. to make a manuscript
83. dimanar  
a. kind of sparrow  
b. to spring from  
c. wagon-brake  
d. to commit a crime
84. proyectil  
a. giddy  
b. projectile  
c. automatically  
d. to speak with ease
85. deforme  
a. deformed  
b. Salesian  
c. mediator  
d. stigma
86. intermediario  
a. afro-Caribbean  
b. squeezing  
c. mediator  
d. tense
87. combatividad  
a. metabolic  
b. pronunciation of 's'  
for 'c'  
c. muddy-place  
d. combativeness

80. superación  
a. mejoramiento  
b. de manera automática  
c. hablar con facilidad  
d. pasta de almendras y azúcar

81. talismán  
a. pasta de almendras y azúcar  
b. deformado  
c. amuleto  
d. cuarto para guardar cosas viejas
82. mazápan  
a. pasta de almendras y azúcar  
b. sin vida  
c. pérdida del sentido  
d. escribir un manuscrito
83. dimanar  
a. clase de gorrión  
b. proceder  
c. freno de carruaje  
d. cometer un crimen
84. proyectil  
a. que causa vértigo  
b. bombas, balas, etc.  
c. de manera automática  
d. hablar con facilidad
85. deforme  
a. deformado  
b. religioso de San Juan Bosco  
c. mediador  
d. deshonra
86. intermediario  
a. africano-antillano  
b. apretar mucho  
c. mediador  
d. rígido
87. combatividad  
a. cambio celular  
b. pronunciación de la 's'  
por 'c'  
c. terreno lleno de barro  
d. espíritu guerrero

88. negativamente  
a. replacement  
b. intruder  
c. ex-convict  
d. negatively

89. entremetido  
a. intruder  
b. unfeathered  
c. spectacles  
d. to update

90. tragicómico  
a. petticoat  
b. talisman  
c. tragicomical  
d. to rake

91. hablar  
a. to speak with ease  
b. soft-coal  
c. hidden defects of animals  
d. deep ravine

92. treta  
a. a Cuban grass  
b. trick  
c. mustard  
d. to inquire deviously

93. enagua  
a. to boast  
b. to nauseate  
c. repasturing  
d. petticoat

94. tenso  
a. gear  
b. tense  
c. groom in charge of a stable  
d. obeying

95. caporal  
a. chief  
b. breakable  
c. preamble  
d. glare

88. negativamente  
a. substitución  
b. intruso  
c. ex-convicto  
d. de ningún modo

89. entremetido  
a. intruso  
b. sin plumas  
c. gafas  
d. modernizar

90. tragicómico  
a. falda interior  
b. amuleto  
c. de la tragicomedia  
d. limpiar de hierbas el jardín

91. hablar  
a. hablar con facilidad  
b. carbón fósil  
c. enfermedades ocultas de los animales  
d. hoyo profundo

92. treta  
a. planta de Cuba  
b. artificio  
c. salsa picante  
d. sacar un secreto astutamente

93. enagua  
a. ser presuntuoso  
b. causar repugnancia  
c. engordar el ganado  
d. falda interior

94. tenso  
a. mecanismo de ruedas dentadas  
b. rígido  
c. el que cuida del establo  
d. dócil

95. caporal  
a. jefe  
b. frágil  
c. prefacio  
d. turbación de la vista por la luz

- |  |   |
|--|---|
| <p>96. culminación</p> <ul style="list-style-type: none"> <li>a. repairman</li> <li>b. cyclonic</li> <li>c. climax</li> <li>d. stable-boy</li> </ul> <p>97. rastrillar</p> <ul style="list-style-type: none"> <li>a. to rake</li> <li>b. cracle</li> <li>c. premonition</li> <li>d. concretely</li> </ul> <p>98. salesiano</p> <ul style="list-style-type: none"> <li>a. ignoble</li> <li>b. conspirator</li> <li>c. to make happy</li> <li>d. Salesian</li> </ul> <p>99. camaranchón</p> <ul style="list-style-type: none"> <li>a. fertile</li> <li>b. iguana</li> <li>c. garret</li> <li>d. to erupt</li> </ul> <p>100. reposición</p> <ul style="list-style-type: none"> <li>a. merrily</li> <li>b. replacement</li> <li>c. to soften</li> <li>d. drowsiness</li> </ul> | <p>96. culminación</p> <ul style="list-style-type: none"> <li>a. componedor</li> <li>b. de los ciclones</li> <li>c. cima</li> <li>d. mozo de caballos</li> </ul> <p>97. rastrillar</p> <ul style="list-style-type: none"> <li>a. limpiar de hierbas el jardín</li> <li>b. respuesta en nombre de los dioses</li> <li>c. presentimiento</li> <li>d. de modo concreto</li> </ul> <p>98. salesiano</p> <ul style="list-style-type: none"> <li>a. infame</li> <li>b. intrigante</li> <li>c. hacer a uno feliz</li> <li>d. religioso de San Juan Bosco</li> </ul> <p>99. camaranchón</p> <ul style="list-style-type: none"> <li>a. fértil</li> <li>b. reptil de las Américas</li> <li>c. cuarto para guardar cosas viejas</li> <li>d. entrar violentamente</li> </ul> <p>100. reposición</p> <ul style="list-style-type: none"> <li>a. alegremente</li> <li>b. substitución</li> <li>c. ablandar</li> <li>d. sueño muy pesado</li> </ul> |
|--|---|



D. Experiments V to IX.

The basic format for both Tests 1 and 2 for all subsequent experiments was the same as that of Experiments III and IV. Since Drt (meaning read in the target language) was eliminated as the least productive in both III and IV, the only difference in subsequent tests was that the subjects were not asked to write the meaning in "either English or Spanish" on the production test (Test 1) and no choices in Spanish were given on the recognition test (Test 2).

For Test 2, the format of all test items representing one mode and falling on a single page (used in Experiments III and IV) was discarded from Experiment V on. While the items continued to be in an order different from that in which they were taught, each page of the test was so organized that every five items on the test represented a single mode in the teaching phase. The rationale for this was based on possible loss of results for one modality from Ss failure to answer one whole page. With the revised format, if a subject didn't have time to get through the entire test at least once ( despite the instructions, p.125) or for some other reason neglected to answer the last page, 25 points (5 per mode) could be subtracted from the total scores, and thereby guard against total loss of results for a single subject.

APPENDIX V

QUESTIONNAIRES

A. Aptitude Questionnaire.

The aptitude questionnaire was a memory test, parallel to Part V of the Modern Language Aptitude Test. It was prepared by David L. Horton of the University of Kentucky and secured for us through the kindness of Dr. John B. Carroll.

Horton's adaptation differs from the MLA form in that all the instructions are given at the beginning rather than separately. The student is asked to read them and indicate that he understands them.

Kjeldergaard's shortened times - 3 minutes to take the test rather than the standard 8 minutes - were employed, because they have proved to provide a better correlation between the test and paired-associate tasks.\*

\*P.M. Kjeldergaard. (1962)

B. Attitude Questionnaire.

Please print:

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
(Last First Middle)

Class: \_\_\_\_\_ Major: \_\_\_\_\_ Minor: \_\_\_\_\_

Native language: \_\_\_\_\_

Is a language other than your mother tongue spoken in your home? \_\_\_\_\_

If so, which language? \_\_\_\_\_

What Foreign languages have you had contact with? (Start with the most recent).

Language	For how long (in years or fraction of year)	
	yr.	mos.
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

---

---

Instructions: Place an "x" in one of the marked-off slots to indicate your position with regard to the statements below. Work rapidly but carefully. We are interested in honest, sincere responses. Your answers will not be seen by anyone other than the staff of the research project.

Example: I think English is beautiful. \_ : \_ : X : \_ : \_ : \_ : \_ : \_ I think English is ugly.

Begin:

- |  |                           |   |
|--|---------------------------|---|
| 1. Spanish is my favorite course.  | _ : _ : _ : _ : _ : _ : _ | Spanish is my least favorite course.                                  |
| 2. I prefer Spanish to any other foreign language.                           | _ : _ : _ : _ : _ : _ : _ | I prefer any other foreign language to Spanish.                       |
| 3. I have a facility for Spanish.  | _ : _ : _ : _ : _ : _ : _ | I don't have a facility for Spanish.                                  |
| 4. I spend a lot of time studying Spanish.                                   | _ : _ : _ : _ : _ : _ : _ | I don't spend a lot of time studying Spanish.                         |
| 5. I try to use Spanish whenever I can.                                      | _ : _ : _ : _ : _ : _ : _ | I never try to use Spanish unless I have to.                          |
| 6. I could not fulfill my professional aspirations without studying Spanish. | _ : _ : _ : _ : _ : _ : _ | I could fulfill my professional aspirations without studying Spanish. |

- |  |                           |                |  |                 |
|--|---------------------------|----------------|--|-----------------|
|  |                           | most<br>of all |  | least<br>of all |
| a. I would like to teach Spanish.  | _ : _ : _ : _ : _ : _ : _ |                |  |                 |
| b. I would like to use Spanish as an interpreter or translator.                          | _ : _ : _ : _ : _ : _ : _ |                |  |                 |
| c. I would like to teach Spanish literature, civilization, or linguistics.               | _ : _ : _ : _ : _ : _ : _ |                |  |                 |
| d. I would like to use it in my profession or job, which is not a., b., c., above.       | _ : _ : _ : _ : _ : _ : _ |                |  |                 |
| e. Spanish is required for my degree.  | _ : _ : _ : _ : _ : _ : _ |                |  |                 |
| f. I enjoy Spanish for its own sake.   | _ : _ : _ : _ : _ : _ : _ |                |  |                 |
| g. I enjoy learning in general.  | _ : _ : _ : _ : _ : _ : _ |                |  |                 |
| h. I would like to continue my study of Spanish after this course, even if not required. | _ : _ : _ : _ : _ : _ : _ |                |  |                 |

7. Knowing Spanish will help me better understand the culture and mentality of Spanish-speaking people.

Knowing Spanish will not help me understand their culture and mentality.

\_ : \_ : \_ : \_ : \_ : \_ : \_

- |   | most<br>of all            | least<br>of all |
|---|---------------------------|-----------------|
| a. I would like to travel in Spanish-speaking countries.  | _ : _ : _ : _ : _ : _ : _ |                 |
| b. I enjoy conversing with Spanish-speaking people.   | _ : _ : _ : _ : _ : _ : _ |                 |
| c. I would enjoy reading Spanish newspapers, journals, and literature.  | _ : _ : _ : _ : _ : _ : _ |                 |
| d. Spanish will allow me to meet more and varied people.  | _ : _ : _ : _ : _ : _ : _ |                 |
| e. I would like to live in a Spanish-speaking country for a year or more.   | _ : _ : _ : _ : _ : _ : _ |                 |
| f. Study of a foreign language makes one a more broad-minded, enlightened individual.   | _ : _ : _ : _ : _ : _ : _ |                 |
| g. Contact with Spanish-speaking people and their culture is more important to me than contact with any other foreign language group. | _ : _ : _ : _ : _ : _ : _ |                 |
| h. Contact with Spanish-speaking people and their culture is more important to me than contact with my native language group.         | _ : _ : _ : _ : _ : _ : _ |                 |

C. Debriefing Questionnaire.

Name \_\_\_\_\_ Date \_\_\_\_\_ Experiment No. \_\_\_\_\_

In this questionnaire, we are interested in getting your honest reactions to the Experiment you participated in on (date) : i.e., the ways by which you tried to learn and any aspect of the presentation of the material which you felt was a help or a hindrance in learning.

LEARNING:

1. Was there a particular way or ways by which you tried to learn the vocabulary items? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Was there a particular way or ways by which you tried to remember them? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PRESENTATION:

3. Was there any particular aspect of the presentation that helped you most to learn or remember the items? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Was there anything in the presentation which bothered you most in trying to learn or remember the items? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

OTHER:

5. Any other comments, suggestions, or criticisms you would like to make:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

APPENDIX VI

GENERAL BIBLIOGRAPHY

- Archer, E.J. "Re-evaluating the Meaningfulness of all Possible CVC Trigrams." PSYCHOL. MONOGRAM, 1960, 10 (whole No. 497).
- Astington, E. "Vocabulary Selection in French Teaching." MODERN LANGUAGE (London), 1958, 102-107.
- Ausubel, David P. Psychology of Meaningful Verbal Learning. Grune and Stratton, 1963.
- Beaton, A.E., Jr. The Use of Special Matrix Operators in Statistical Calculus. Unpublished Doctoral Dissertation, Harvard University, 1964.
- Bousfield, Weston. "The Occurrence of Clustering in the Recall of Randomly Arranged Associates." J. GEN. PSYCHOL., 1953, 49, 229-240.
- Bousfield, W.A., and Cohen, B.H. "Masculinity-femininity in the Free Recall of a Categorized Stimulus Word List." PERCEPTUAL MOTOR SKILLS, 1956, 6, 159-165.
- Bousfield, W.A., Whitmarsh, G.A., and Danick, J.J. "Partial Response Identities in Verbal Generalization." PSYCHOL. REPORT, 1958, 4, 703-713.
- Brown, G.I., and Hodgkinson, H.L. "A Note Concerning an Application of Recent Developments in Psychology to the Teaching of German." HARVARD EDUC. REVIEW, 1958, 28, 156-157.
- Brown, R.W. "Language and Categories." In J.S. Bruner et al., A Study of Thinking. New York: Wiley, 1956, 247-312.
- Bruner, J.S., Goodnow, J.J., and Austin, G.A. A Study of Thinking. New York: Wiley, 1956.
- Bugelski, B.R. "Presentation Time, Total Time, and Mediation in Paired-associate Learning." J. EXPER. PSYCHOL., 1962, 63, 409-412.
- Carlin, J.E. Word-association Strength as a Variable in Verbal Paired-Associate Learning. Unpublished Doctoral Dissertation, University of Michigan, 1959.
- Carroll, J.B., Kjeldergaard, P.M., and Carton, A. "Number of Opposites vs. Number of Primaries as a Response Measure in Free Association Tests." J. VERB. LEARN. VERB. BEHAV., 1962, 1, 22-30.



- Carroll, J.B., and Burke, M.L. "Parameters of Paired-associate Verbal Learning: Length of List, Meaningfulness, Rate of Presentation and Ability." J. EXPER. PSYCHOL., 1965, 69, 543-553.
- Carroll, J.B., and Sapon, Stanley, M. Modern Language Aptitude Test. New York: Psychological Corporation, 1955.
- Chapman, F.L., and Gilbert, L.C. "A Study of the Influence of Familiarity with English Words upon the Learning of their Foreign Language Equivalents." J. EDUC. PSYCHOL., 1937, 28, 621-628.
- Chomsky, Noam. "Review of B.F. Skinner's Verbal Behavior." LANG., 1959, 35, 26-58.
- Cohen, B.H., Bousfield, W.A., and Whitmarsh, G.A. Cultural Norms for Verbal Items in 43 Categories. Technical Report No 22, ONR Contract Nonr-631 (00), University of Connecticut, 1957.
- Coleman, Algernon. (Comp.) Experiment and Studies in Modern Language Teaching. Chicago, Illinois: University of Chicago Press, 1934.
- Cook, J.C., and Kendler, T.S. "A Theoretical Model to Explain Some Paired-associate Learning Data." In G. Finch and F. Cameron (Eds.), Symposium on Air Force Human Engineering, Personnel, and Training Research. Washington, D.C.: NAS-NRC Publication 455, 1956, 90-98.
- Dale, Edgar, and Razik, Taber. Bibliography of Vocabulary Studies, (2nd Revised Ed.). A Payne Fund Communication Project. Columbus, Ohio: Bureau of Educational Research and Service, Ohio State University, 1963.
- Deese, James. "On the Structure of Associative Research." PSYCHOL. REV., 1962, 49, 161-175.
- Deese, James. The Structure of Associations in Language and Thought. Baltimore, Md.: The John Hopkins Press, 1965.
- Dowling, R.M., and Braun, H.W. "Retention and Meaningfulness of Material." J. EXPER. PSYCHOL., 1957, 54, 213-217.
- Ebbinghaus, H. Memory: A Contribution to Experimental Psychology. (Tr. by H.A. Ruger and C.E. Bussenius). Columbia University Coll. Educ. Reprints, No. 3. New York: Teachers College, Columbia University, 1913.
- Edwards, A.L. Experimental Designs in Psychological Research. New York: Rinehart, 1960.
- English, E.B., and English, A.C. A Comprehensive Dictionary of Psychology and Psychoanalytic Terms. New York: Longman, Green, 1958.



- Epstein, W., Rock, I., and Zucherman, C.B. "Meaning and Familiarity in Associative Learning." PSYCHOL. MONOGRAM, 1960, 74 (4 - Whole No. 491).
- Essa, Shirley H. An Investigation of the Relationship Between Vocabulary Level and Three Aspects of English Language Skill of International Students. Master's Thesis, Ohio State University, Columbus, Ohio, 1955-56.
- Fattu, N.A. "Training Devices." In C.W. Harris (Ed.), Encyclopedia of Educational Research (3rd Edition). New York: MacMillan, 1960, 1529-1535.
- Finney, D.J. The Theory of Experimental Design. Chicago: The University of Chicago Press, 1960.
- Fisher, R.A. The Designs of Experiments. New York: Hafner Publishing Co., 1960.
- Forlang, G., and Hoffman, M.N.H. "Guessing and Telling Methods of Learning Words of a Foreign Language." J. EDUC. PSYCHOL., 1937, 28, 632-636.
- Fries, C.C. Teaching and Learning English as a Foreign Language. Ann Arbor: University of Michigan Press, 1945.
- Gagne, Robert M. "The Acquisition of Knowledge." PSYCHOL. REVIEW, July 1962, 69, 355-365.
- Georgetown University School of Foreign Service. Report of the Sixth Annual Round Table Meeting on Linguistics and Language Teaching. Washington: Georgetown University Press, 1955.
- Glaze, J.A. "The Association Value of Nonsense Syllables." J. GENET. PSYCHOL., 1928, 35, 255-269.
- Glanzer, M. "Grammatical Category: A Rote Learning and Word Association Analysis." J. VERB. LEARN. VERB. BEHAV., 1962, 1, 31-41.
- Grinstead, W.J. "An Experiment in the Learning of Foreign Words." J. EDUC. PSYCHOL., 1915, 6, 242-245.
- Hellerkson, Henry M. An Experimental Study in Association Involving a Comparison of Two Methods of Learning Latin Vocabulary. Master's Thesis, Grand Forks, North Dakota: University of North Dakota, 1934.

- Higa, Masanori. "Interference Effects of Intralist Word Relationships in Verbal Learning." J. VERB. LEARN. VERB. BEHAV., 1963, 2 (2), 170-175.
- Higa, Masanori. "The Psycholinguistic Concept of 'Difficulty' and the Teaching of Foreign Language Vocabulary." (Private circulation, ditto).
- Hilgard, E.R. Theories of Learning, (2nd Edition). New York: Appleton-Century-Crofts, Inc., 1956.
- Hovland, C.I. "Experimental Studies in Rote-learning Theory: VII - Distribution of Practice of Paired-associates with Varying Rates of Presentation." J. EXPER. PSYCHOL., 1949, 39, 714-718.
- Hull, C.L. "The Meaningfulness of 320 Selected Nonsense Syllables." AMER. J. OF PSYCHOL., 1933, 45, 730-734.
- Jenkins, J.J., Russell, W.A., and Suci, C.J. "A Semantic Table of Distances for the Semantic Atlas." AMER. J. PSYCHOL., 1959, 72, 623-625.
- Johnson, J.W. "Methods of Acquiring a Spanish Vocabulary." MOD. LANG. FORUM, 1928, 13, 19-20.
- Kale, S.V., and Grosslight, J.H. Learning and Retention of English-Russian Vocabulary under Different Conditions of Motion Picture Presentation. Pennsylvania State University, 1953.
- Kale, S.V., and Grosslight, J.H. Exploratory Studies in the Use of Pictures and Sound for Teaching Foreign Language Vocabulary. Technical Report SDC 269-7-53. Port Washington, L.I., U.S. Navy Special Devices Center, 1955.
- Kerlinger, F.N. Foundations of Behavioral Research. New York: Holt, Rinehart, and Winston, 1964.
- Kjeldegaard, P.M. "Variables Affecting Recall in One-trial Learning." Paper read at Eastern Psychological Association, Atlantic City, April, 1962.
- Kjeldegaard, P.M. "Commonality Scores Under Instructions to Give Opposites." PSYCHOL. REPORT, 1962, 11, 219-220.
- Kopstein, F.F., and Roshal, S.M. "Learning Foreign Vocabulary from Pictures vs. Words." AMER. PSYCHOLOGIST, 1954, 9, 407-408.

- Kopstein, F.F., and Roshal, S.M. "Methods of Presenting Word Pairs as a Factor in Foreign Vocabulary Learning." AMER. PSYCHOLOGIST, 1955, 10, 354.
- Lado, Robert. "Patterns of Difficulty in Vocabulary." LANG. LEARN., 1955, 6, 1-2.
- Lado, Robert. Language Teaching: A Scientific Approach. New York: McGraw-Hill Book Co., 1964.
- Lado, Robert. Language Testing. London: Longmans, Green and Co., 1961.
- Lambert, Wallace. "Psychological Approaches to the Study of Language. Part I: On Learning, Thinking and Human Abilities. Part II: On Second Language Learning and Bilingualism." MOD. LANG. J., 1963, 47 (2-3), 51-62, 114-21.
- Lenneberg, F.H., and Roberts, J.M. "The Language of Experience." MEMOIR OF THE INTERNATIONAL J. OF LING., 1956, 12 (13).
- Lumley, F.H., and Calhoun, E.W. "Memory Span for Words Presented Auditorily." J. APPL. PSYCHOL., 1934, 13, 773-784.
- Lumsdaine, A.A., and Glaser, R. (Eds.). Teaching Machines and Programmed Learning: A Source Book. Washington, D.C.: Department of Audio-Visual Instruction, National Education Association, 1960.
- Marx, Melvin H. (Ed.). Theories in Contemporary Psychology. New York: The MacMillan Company., 1963.
- McGeogh, John, and Irion, Arthur. The Psychology of Human Learning. New York: Longmans, Green, and Company, 1952.
- Miller, George A. Language and Communication. New York: McGraw-Hill Book Company, 1951.
- Miller, G.A. "The Magical Number Seven, Plus or Minus One or Two: Some Limits on our Capacity for Processing Information." PSYCHOL. REV., 1956, 63, 81-97.
- Ministry of Education. Summary of the Textbook Surveys. Tokyo: Ministry of Education, 1958.
- Ministry of Education. Teacher's Guide to Foreign Language Instruction in Junior High School. Tokyo: Ministry of Education, 1959.

- Morikawa, Y. "Studies in Paired-associate Learning of Stimulus and Response on Learning and Recall." JAP. J. PSYCHOL., 1959, 30, 166-175.
- Noble, C.E., and McNeely, D.A. "The Role of Meaningfulness (m) in Paired-associate Verbal Learning." J. EXPER. PSYCHOL., 1957, 53, 16-22.
- Noble, D.E., and Stockwell, F.E. "Stimulus vs. Response Meaningfulness in Paired-associate Verbal Learning. AMER. PSYCHOL., 1957, 12, 425.
- Norstand, Howard Lee, et al. Research on Language Teaching: An Annotated International Bibliography for 1945. Seattle: University of Washington Press, 1962.
- Northeast Conference. Language Learning: The Intermediate Phase. Report of the Working Committees, 1963 Northeast Conference on the Teaching of Foreign Languages. William F. Bottiglia, (Ed.).
- Oinas, F.J. Language Teaching Today. Bloomington, Indiana: Indiana University Research Center in Anthropology, Folklore, and Linguistics. 1960, 14.
- Orbison, W.E. The Relative Efficiency of Whole and Part Methods of Learning Paired-associates as a Function of the List. Unpublished Doctoral Dissertation, Yale University, 1944.
- Osgood, Charles E., and Sebeok, Thomas A. (Eds.). Psycholinguistics: A Survey of Theory and Research Problems. Indiana University Press, 1965.
- Peterson, Lloyd R., and Peterson, Margaret Jean. "Short-term Retention of Individual Verbal Items." J. EXPER. PSYCHOL., Sept., 1959, 58, 193-98.
- Pimsleur, P. Report of the NDEA Conference on Psychological Experiments Related to Second Language Learning. Los Angeles: University of California, 1961.
- Postman, Leo. "One-trial Learning." In Charles N. Cofer (Ed.), Verbal Behavior and Learning: Problems and Processes. New York: McGraw-Hill Book Company, 1963.
- Postman, Leo, and Adams, Pauline A. "Studies in Incidental Learning. VIII - The Effects of Contextual Determination." J. EXPER. PSYCHOL., March, 1960, 59, 153-64.

- Postman, Leo. "The Present Status of Interference Theory." In Charles N. Cofer (Ed.), Verbal Learning and Verbal Behavior. New York: McGraw-Hill Book Company, 1961, 152-78.
- Rock, Irving. "The Role of Repetition in Associative Learning." AMER. J. PSYCHOL., June, 1957, 70, 186-93.
- Rosenberg, S. (Ed.) Directions in Psycholinguistics. New York: The Macmillan Company, 1965.
- Russell, David H., and Henry R. Fea. "Research on Teaching Reading." In N. L. Gage (Ed.) Handbook of Research of Teaching. Chicago: Rand McNally and Co., 1963, 865-928.
- Russell, W.A., and Jenkins, J.J. The Complete Minnesota Norms for Responses to 100 Words from the Kent-Rosanoff Word Association Test. Technical Report No. 11, ONR Contract N8 onr-66216, University of Minnesota, 1954.
- Saporta, Sol. (Ed.) Psycholinguistics: A Book of Readings. New York: Holt, Rinehart and Winston, 1961.
- Seiberg, Louise C. "A Study of the Practice of Guessing Word Meanings from Context." MCD. LANG. J., 1945, 29, 296-322.
- Sheffield, F.D. The Role of Meaningfulness of Stimulus and Response in Verbal Learning. Unpublished Doctoral Dissertation, Yale University, 1946.
- Skinner, B.F. Science and Human Behavior. New York: Macmillan, 1953.
- Skinner, B.F. Verbal Behavior. New York: Appleton Century-Crofts, Inc., 1957.
- Solomon, R.L., and Postman, L. "Frequency of Usage as a Determinant of Recognition Thresholds for Words." J. EXPER. PSYCHOL., 1952, 43, 195-201.
- Suppes, Patrick C., and Ruth H. Weir. Application of Learning Theory to Problem of Second Language Acquisition by Quantitative Analysis. Project No. 9, 514. NDEA, Title VI, June 15, 1961 to June, 1963. Stanford University, Stanford, California.
- Thorndike, E.L. Language Learning: Summary of a Report to the International Auxiliary Language Association in the United States, Inc. New York: Bureau of Publications, Teachers College, Columbia University, 1933.

- Thurstone, L.L. "The Relation between Learning Time and Length of Task." PSYCHOL. REV., 1930, 37, 44-58.
- Titone, Renzo. Studies in the Psychology of Second Language Learning. Zurich, Schweiz: Pas Verlag, 1964.
- Underwood, Denton J. "Studies in Verbal Learning." In Ernest R. Hilgard (Ed.) Theories of Learning and Instruction. 63rd Yearbook of the National Society for the Study of Education, Part I. Chicago: University of Chicago Press, 1964, 6, 133-152.
- Underwood, B.J. and Richardson, J. "The Influence of Meaningfulness, Intra-list Similarity, and Serial Position." J. EXPER. PSYCHOL., 1956, 52, 119-126.
- Underwood, B.J. and Schulz, R.W. Meaningfulness and Verbal Learning. New York: Lippincott, 1960.
- Williams, J.P. "Supplementary Report: A Selection Artifact in Rock's Study of the Role of Repetition." J. EXPER. PSYCHOL., 1961, 62, 627-628.
- Witmer, L.R. "The Association Value of Three-place Consonant Syllables." J. GENET. PSYCHOL., 1935, 47, 337-359.
- Young, C.W. and Supa, M. "Mnemonic Inhibition as a Factor in the Limitation of the Memory Span." AMER. J. PSYCHOL., 1941, 54, 546-552.