

AN EXPERIMENTAL COMPARISON OF TWO FORMS OF LINGUISTIC LEARNING*

IGNACIO T. BRIONES

THE PROBLEM

The object of the present study is to compare the learning of a series of isolated words with a series of phrases or sentences. It was hoped that this comparison would throw light upon the acquisition of linguistic behavior, since the material consisted on the one hand, of mere verbal behavior, and an approach to actual speech adjustment, on the other.

The materials employed were chosen from the Iloko language, one of the leading Filipino dialects, which is the native language of the experimenter.

RELATED STUDIES

The problem of learning language through the use of either discrete words or through the formation of sentences has been studied with conflicting results. Libby (1) conducted an experiment in learning a foreign language in order to discover the relative value of making the words or the short sentences the unit in modern language instruction for different types of learners. He tried to follow as closely as possible the classroom technique of teaching language with the possible difference that each period only lasted for 20 minutes. He used the Italian language and had only 10 subjects. His results showed evidence of the superiority of the short sentence over the word as the unit of modern language instruction. He pointed out that 8 gained more by the sentence method. One might object to his conclusion on the ground that he used the Italian language. Although he claimed that none of his subjects knew Italian, it would have been very easy for them to find sources in learning. For this reason the study would not be very well controlled. His results may not be very conclusive, due to the fact that he only used 10 subjects. The replies to his introspective questions indicated that his subjects were aided considerably by visual imagery.

A very recent study and perhaps one of the most extensive of its kind is the experiment by Smith and Powers (2) on the relative value

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of vocabulary and sentence practice for language learning. These workers raised the question as to how we should go about to translate a foreign language, whether to memorize a vocabulary of discrete words or to form sentence habits.

What corresponded to foreign words in their study were the symbols of the English alphabet. They tested the relative effectiveness of the learning of separate symbols in sentence form with their English equivalents. In this experiment they used two separate vocabularies referred to as vocabulary A and vocabulary B, each containing 9 corresponding English words. A vocabulary consisted of three subject-nouns, 3 verbs, and 3 object-nouns. All words were monosyllables. Illustrations of some of the materials they used were as follows: Vocabulary A—R S Q — Ducks have nests, Y P M — Geese like bread; Vocabulary B—L J H — Boys want fires, F G V — Men find books. These materials were presented to the subjects orally; visual presentation was avoided.

From this experiment they concluded that the effect of discrete word practice was much greater than that of sentence practice. The value of vocabulary list learning was 28% greater than the value of sentence learning when the measure of learning was the number of words successfully translated from sentence dictation.

An objection to this type of experiment is the use of symbols in place of actual foreign words. The objection these authors make to the possible acquaintance of some of the subjects with any foreign words (European, of course) might be regarded as less serious than the use of totally non-analogical material.

The studies of Libby (1) and Smith and Powers (2) are contradictory in their results. Libby found that sentence had a decided advantage over detached words, while Smith and Powers drew the opposite conclusion.

To avoid any of the difficulties encountered above in the two studies mentioned, we tried to follow in our experiment Dr. J. R. Kantor's (3) conception of psychological language as a definite type of behavior adjustment. It was our hypothesis that language could be best learned if treated as a behavior pattern instead of as mere verbal behavior.

THE EXPERIMENT

The experiment consisted of two parts: (A) learning and (B) retesting a week later for retention.

THE MATERIALS

The accompanying lists show the ten Iloko words and ten sentences used, with their corresponding English equivalents. Although there are a great many Iloko words that are mixed with Spanish derivations, great care was taken to avoid using them in favor of purely Iloko words. The English translations constitute the most common, the simplest, and the most suitable.

SENTENCES

English	Iloko
1. Good morning. -----	Naimbag bigat mo
2. How are you? -----	Kasano ka?
3. Just fine. -----	Nasayaat latta.
4. Is there a letter for me? -----	Adda surat ko?
5. They are beautiful. -----	Napintas da.
6. That is true. -----	Pudno dayta.
7. Let us go to school. -----	Intan agbasa.
8. Let us go home now. -----	Agawid tayon.
9. I am hungry now. -----	Mabisin ak kon.
10. Good-bye. -----	Sinaan tan.

WORDS

English	Iloko
1. friend -----	gayyem
2. house -----	balay
3. love -----	ayaten
4. flowers -----	sabsabong
5. table -----	laminsaan
6. happy -----	naragsak
7. wish -----	tarigagay
8. study -----	agadal
9. joke -----	rabrabak
10. lady -----	balasang

THE INSTRUCTIONS

The following instructions were read to the subjects:

"The purpose of this experiment is to find out how people learn a new language. There are ten sentences (words) each having an English translation.

"I shall read one by one each sentence (word) and as I read each one, I shall read the foreign language equivalent, which you are to learn. When

I read the foreign sentence (word), repeat after me aloud. Your pronunciation need not be exact.

"I shall test your learning right after the first reading or series by reading the English sentence (word) and having you give the foreign sentence (word) equivalent. Then I shall give you again the second learning series and continue to alternate the learning or testing series until you can answer every sentence (word). Please do your best in order that the experiment may be a success."

Explanation of how the experiment was to be done was further given if required by the subject. But care was taken not to reveal the real object of the study nor to provide any advantage to one subject over another.

THE SUBJECTS

Thirty-six university students served as subjects. They were recruited from various schools of the university and represented all classes from freshman to graduates. Their ages ranged from seventeen to thirty-one.

Efforts were exerted to have an equal number of both sexes as subjects, but the men seemed to show less interest as shown by the fact that there were more who did not complete the experiment.

There were five nationalities represented in this study—one Chinese, one Korean, two Germans, and two Negroes, the rest being American whites. None of these subjects knew a single Iloko word.

The subjects were divided into two groups. The first learned the material in the order: sentences-words, while the other reversed this order.

A—LEARNING PROCEDURE

The material was orally presented to each subject. Each learning series was alternated with a testing series. E read to O the English translations of the Iloko equivalent. Then O was asked to repeat aloud the Iloko equivalent.

After E and O had gone once through the whole list from one to ten, the testing series followed. In testing, E read the English translations in their order and asked O to give the Iloko equivalent orally, allowing not more than 7 seconds for each sentence and 5 seconds for each word. The learning series followed again and was alternated with the test series. This process was continued until O learned the whole set of materials.

Each O was required to keep on repeating the Iloko equivalents until he was able to give the whole set. He was also required to

give all the foreign language translations at random to insure that he knew them all.

A sentence or word was considered learned when during the testing series a subject was able to pronounce each respectively within a maximum time of 7 or 5 seconds. If he did not know the foreign equivalent, he was allowed to say that he did not know, so that E could proceed to the next number.

The length of time for each period did not exceed forty minutes. One day each week for three consecutive weeks was required of every subject to finish the experiment. After an interval of a week, the subject was retested concerning what he had learned the previous week and asked to learn the second set of materials. Introspective questions were also asked for that experiment. In the third week the subject reported only for retest of the last material he learned and to answer some introspective questions concerning it.

In order to provide a strict rule for the presentation of material a uniform standardized time was followed by E. This was determined by preliminary experimentation. For the sentences it took approximately 2.5 seconds each to utter the English translations, 2 seconds interval before giving the foreign equivalent, 6 seconds for E and O to say the Iloko, and 3 seconds before starting again the whole set. The word material took E 1.5 seconds each to say, 2 seconds interval before giving the Iloko and 4 seconds for O and E to say the Iloko equivalent and 3 seconds interval before starting the whole set again.

In the testing series it took E 2.5 seconds to say each sentence and a maximum time of 7 seconds was allowed for O to say the Iloko equivalent for each sentence. For the words, it took E 1.5 seconds to utter each, and O was given a maximum time of 5 seconds to give the answer.

In conducting the experiment we had to take into account the difference in presentation time between the sentences and the words. Thirty seconds longer were required for presenting the former for each series. The same increment of time was required in the testing series, thus making a total of one minute for one presentation and one testing series.

B—RETESTING PROCEDURE

There were two retests made for each subject. The first was taken during the second week when a subject arrived to learn the second set of materials. The retest was conducted before starting the learn-

ing of the second material. The second took place during the third week when a subject reported for the last time for the experiment.

E did not ask O to remember the materials learned, nor did he mention that a retest was required.

Two methods were used in measuring retention. The first consisted of O pronouncing the Iloko sentences or words when the English equivalents were presented orally at random. In this case the accuracy of retention was determined by the total amount which O correctly reproduced.

The second method required O to identify the Iloko material. E read the foreign language equivalent and O gave the English translation for each. The amount of translation that O could give determined the correct amount retained.

RESULTS

Seventeen of the 36 subjects learned the words first, while 19 started out with the sentences. This alternation of learning was designed to check the influence of orientation. The number of trials required for learning ranged from 4 to 12 for words as over against 3 to 15 for sentences. The shortest time for words was 8.83 minutes against 7.25 minutes for sentences, while the longest for the words was 32.33 minutes against only 31.25 for the sentences.

There were three subjects who scored only 1 word each in the first retention test, while only 1 made such a poor score for sentences. Only 5 made a perfect score out of a possible 10 for words against 8 for sentences. One subject out of 36 scored as low as 4 in the second test, while only 18 made a perfect score for words. For sentences, on the other hand, 5 was the lowest number retained, while 22 made perfect scores. Thus in both tests the superiority of the sentences over the words appears clearly.

In Table I are indicated the general averages for the number of trials, learning time, and the two retention tests. The SD for the number of trials is 2.15 for words and 2.51 for sentences. In learning time the SD for words is 5.82 and for sentences 5.42. In the first retention test words have an SD of 2.61 and sentences 2.74. In the second retention test the SD for words is 1.66 and for sentences 1.75. The computation of the sigmas provided us another way of showing the differences between words and sentences. The differences as indicated above corresponded closely with our general averages.

The coefficient of correlation between words and sentences for the number of trials is $.64 \pm .11$, for learning time $r. 70 \pm .09$, for the first retention test $r. 73 \pm .09$, and for second retention test $r. 77 \pm .07$. These correlations show the consistency of our results between words and sentences.

TABLE I
Averages, SD, r, PE_r, and Reliability of differences for Words and Sentences.

	Trials		Learning Time		First Retention Test		Second Retention Test	
	W	S	W	S	W	S	W	S
Mat Ave.	7.86	8.11	20.48'	19.40'	6.66	7.30	8.83	9.16
SD	2.15	2.51	5.82'	5.42'	2.61	2.74	1.66	1.98
r	.64		.70		.73		.77	
PE _r	.11		.09		.09		.07	
D	.47		.82		1.03		.82	
σ diff.								

In the same table are shown the critical ratios between the averages of words and sentences. For the number of trials the ratio is .47 for learning time .82, for first retention 1.03, and for second retention .82. Although the average of the sentences for the number of trials is higher than that of the words the difference is of insignificant value, while the rest are all significant in favor of the sentences.

The effect of orientation to one material upon another is evident. This is true for the number of trials, learning time, and retention. It is only in the case of word retention in the second test that orientation did not greatly affect the subjects' learning.

Further analysis of our data provides us materials for the consideration of differences between length of the two materials used. Although inessential from the viewpoint of psychological linguistics, we can consider the number of words and syllables in our adjustmental type of material as compared with the isolated forms. The first or adjustmental type of material (sentences) contains 23 words as compared with 10 for the isolated forms (words). Numbered in syllables there are 48 in the case of our pattern form and only 30 in the words.

It is to be noted that a greater difference exists between the two materials when both are reduced to words than when they are cal-

culated for the number of syllables. This is true because the sentences contain $2\frac{1}{3}$ times as many words as the other material, while when both are reduced to syllables there is only a difference of $1\frac{1}{3}$ times in favor of the sentences. This variability is due to the nature of the Iloko language, which is morphologically classified as agglutinative (4). One feature of this language is that it resorts to the method of reduplication of syllables to modify its meanings, as in the case of the examples sabsabong (flowers), rabrabak (joke) and naragsak (happy). In these cases the first syllables in each may be removed and yet we get practically the same contextual meanings.

These points are significant only if we treat language learning in the conventional grammatical method, but not as referential language.

SUMMARY AND CONCLUSION

In the present experiment the learning of isolated words was compared with the development of actual speech adjustments.

Our results show that learning favors the pattern form, except for the slight advantage word learning has over the sentences in number of trials.

In learning time and in both retention tests the sentences gave better results.

We conclude then that according to our procedure and technique of study, language learning is favored when the material resembles actual speech adjustments. Even in the matter of number of learning trials, the sentences had an advantage if we take into account the actual number of words and syllables that each type of material contains. There were 23 words and 48 syllables in the sentences against 10 words and 30 syllables in the detached materials. Even if we do not consider such differences, the reliability of the difference is not very significant.

When we correct for amount of material in the presentation and testing series, the results show that as far as learning time is concerned the pattern material took much less time. Disregarding such actual differences would give but little advantage for the words over the sentences. For both tests of retention the actual speech adjustments had an advantage over the words.

In one of the studies mentioned above (2), the authors stated that they used symbols instead of actual foreign language in order to get rid of the difficulty embodied in perceiving relationships, which

they contended was a weakness in learning a foreign language. To get rid of this difficulty, although perception is one factor involved in learning, we suggest on the basis of our study that language acquisition should be treated as a higher form of configurational response to a definite situation.

Among the minor observations incidental to the present experiment the following may be briefly summarized:

1. No significant correlation exists between the number of foreign languages the subjects had studied with their learning ability in the case of the language we used. Only 7 out of 36 subjects admitted that they were in some way helped by their previous language study.
2. Scholarship as indicated by general school averages and language averages in high school and college of each subject did not favor the brighter students.
3. There is no correlation between college year and scores in learning our materials. The upper classmen did not do better than the freshmen.
4. A comparison of learning between both sexes may not be very conclusive, due to the smaller number of men. On the average the women required a smaller number of trials, learned faster, and retained more. This result suggests the superiority of women in memory and language learning.
5. A comparison of the learning ability of the 5 nationalities represented would be unreliable because of the small number of foreign group members participating; however, all the foreign students as a group stood at the average and 1 scored far above most of the other subjects.
6. Interest of the subjects determined by their general reactions during the learning situation played a large part, since those who took an optimistic "attitude" learned the materials better than those who stated at the beginning of the experiment that they always had great difficulty with their foreign language courses.
7. Age, if considered as a factor in learning, favored the younger subjects.
8. The women were more interested in general than the men in learning this language.

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