

THE RELATIVE VALUE OF VOCABULARY AND SENTENCE PRACTICE FOR LANGUAGE LEARNING*

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How should we go about learning to translate a foreign language? Should we commit to memory a vocabulary of discrete words or should we form sentence habits? Under the conditions of the experiment which is here reported, the results indicate that discrete vocabulary learning is the more effective method.

There is an opinion current among language teachers that it is better for the student to commit to memory foreign words in serial form, that is, in the form of sentences, than to commit to memory the old fashioned vocabulary lists. The examination of recent foreign language texts would seem to show that this opinion is growing.

If the learning of a discrete vocabulary can be shown to be as effective as the learning of prose in creating the ability to make literal translations, then vocabulary lists are, as practice material, to be preferred to prose except where idioms are encountered.

When the vocabulary method is employed words may be listed according to the frequency of their use, and more practice may be given to those words which occur more frequently. If, to be learned properly, words must be learned in all their possible combinations, the task of language learning would be enormous and the amount of practice given to each word could not be made proportional to the importance of this word.

In many special cases the relative value of various methods of learning has been attacked experimentally. For example, the comparative efficiency, for the purpose of rapid reading, of silent and oral methods of reading has been determined. The laboratory and teacher-demonstration techniques of teaching have been subjected to objective measurement to determine the superiority of one over the other. There is, however, very little well controlled experimentation upon any method of language learning.

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Before 1915 a group of studies appeared upon the successive increases in vocabulary from month to month and year to year. These paid small regard to the method employed in learning or the possibility that some other method than the one employed might give better results. Such recent work upon language, as that of Piaget, has not done a great deal to clarify the situation with regard to the best method of language acquisition.

Grinstead (2) tested himself upon the learning of German by the context and list methods. The context method in this case consisted of reading for meaning and looking up unknown words in a dictionary as they were encountered. The list method consisted in listing unknown words and looking them up later. Grinstead says of the experiment: "The factor really tested was the associational influence of the context in fixing the meaning of the new words encountered." Results showed a "3 per cent advantage" in favor of the context method. "That is, according to these results, 3 per cent more of the total number of new words encountered will be recognized when next seen, if the new words were encountered in context, than would be the case if they were listed and looked up." It would seem in an experiment of this sort that a gain of but 3%, with a number of uncontrolled variables operative, is not wholly conclusive.

Henmon (4) describes an interesting experiment conducted in the Madison High School upon the value of word study. The exact method of presenting the words was not described, but it appears to have been one variation of the use of the list or discrete-word vocabulary. Three hundred and fifty sophomores were paired, mainly on the basis of freshman grades. One group was given word study as such, the other group studying words only as encountered in ordinary work in English. At the end of the semester both groups were given: (a) Terman Vocabulary Test (100 words), (b) Thorndike Visual Vocabulary, (c) Trabue Completion Scale L, (d) Tests 1a, 1b of the Thorndike Intelligence Examination, and (e) a special list of 25 words. The results indicate a decided advantage for the study of formal word lists. Differences in most cases were four times the *P.E.* of the difference.

Libby (6) states that "The special purpose of the study (his own) was to discover the relative value of making the word and the short sentence the unit in modern language instruction for various types of learners." Italian was the language used. There were 10

subjects. In addition to tests, introspective reports were taken. General results gave the balance of superiority to the short sentence method. Eight of the 10 subjects gained more by this method. The two who profited most by the vocabulary method were judged the weakest students. Introspective reports indicated that in order to learn detached words the subjects formed sentences of them. To the extent to which this occurred, the proposed difference between methods was lost, all learning being by the sentence method.

McKee (7, 8, 9) has studied the teaching of spelling by column and context forms. His general conclusions are quoted:

"1. As determined in this investigation, pupils who studied and were tested by the column form seemed to have acquired a greater amount of spelling ability than did the pupils who studied and were tested by the phrase form.

"2. The pupils of the Column Group procured better scores than the Phrase Group when tested in their ability to spell words previously studied.

"3. The two groups seemed possessed of approximately equal ability to spell words previously studied when the words were used in a new phrase form."

Shuh Pan (10) has tested the general influence of environmental context upon recall. He concludes that recall of any material is favored by the presence of an environmental factor which has some associative connection with the material. A word context logically related to the response word exerted a beneficial effect upon learning. The variation of such a context during learning, however, lessened learning. These results indicate that context associations facilitate vocabulary learning if the context remains the same, but when the context is varied, as in ordinary conversation, the efficiency of learning is lessened. This general principle applies to all vocabulary learning wherein the word appears in context.

Hawley (3) in 1922 studied the list *vs.* sentence method of teaching spelling in 10 schools in Rochester, New York. The test covered 30 lessons in the regular text. Initial tests were given to determine ability. Hawley says of the work, "The chief conclusion to be drawn . . . is that there is no advantage in having children write their spelling words in sentences. . . . It is evident that if teachers are to have words written into sentences they must see values in that procedure other than spelling values."

Hunkins (5) confesses that "it was hoped that the theory that

children spell better when given a list of words than when confronted with the normal writing situation might be verified." His conclusions seem to bear out his expectation. He found that children spell more poorly in 'sentence dictation than in word dictation.

In summing up the foregoing evidence, it may be said that the results of experiment are somewhat ambiguous and contradictory. Most of the more recent and best-controlled experiments, however, seem to indicate some advantage for detached word learning over sentence or multiple word learning.

The experiment herein reported was designed to test the relative effectiveness of the learning of separate symbols with their English word equivalents, and the learning of these symbols in sentence form with their English sentence equivalents. What corresponded to foreign words were in this case the symbols of the English alphabet. These were chosen rather than actual foreign words, and rather than nonsense syllables, for several reasons.

Almost any foreign language words are likely to be known to certain of the subjects. Because of their varying length, it is difficult to select a list of foreign words and their English equivalents all of which offer equal ease of learning. The disadvantages of employing nonsense syllables are that it is impossible so to devise them that they carry no associated meaning, and that they are likely to be wrongly perceived as sounds when spoken by the experimenter owing to the subject's unfamiliarity with them. The symbols of the English alphabet were employed to overcome these objections and because of certain advantages that their use entails. The first of these advantages is that the subject requires no practice in perceiving these symbols prior to their use in the experiment. Properly selected, they are unambiguous and are not confused with each other. Though, unlike the nonsense syllable, letters of the alphabet are not supposed to be devoid of significance, they are so general as associative cues as to discourage somewhat the use by the students of the mnemonic method. The speed at which stimulus word and response word were given and repeated was such as further to discourage the borrowing of some previous meaning from the symbols.

Two separate vocabularies, each consisting of nine letters and nine corresponding English words, were arranged. A vocabulary consisted of three subject nouns, three verbs, and three object nouns. All of the words were monosyllabic. Care was taken that the alpha-

TABLE 1

Vocabulary B		Vocabulary A	
Subject		Subject	
R	ducks	L	boys
Y	geese	F	men
C	hens	N	girls
Verb		Verb	
S	have	J	want
P	like	G	find
T	seek	B	keep
Object		Object	
X	fun	K	homes
Q	nests	H	fires
M	bread	V	books

betical symbols did not directly suggest the words which they were to represent. The two vocabularies are presented in Table 1.

Each of the two vocabularies was arranged in two forms for presentation. One form of each vocabulary consisted of the individual symbols each followed by its English equivalent. The second form of each vocabulary consisted in sets of three symbols corresponding to noun, verb, and object followed by their noun, verb, and object English equivalents in sentence form.

The separate combinations of three subjects, three verbs, and three objects are 27 in number. As shown later, 18 of these combinations were used for practice and 9 were used as a final test series to measure the amount of the subjects' learning.

A single rehearsal of the 18 practice sentences with English equivalents involves the repetition of each symbol and each word six times. An equal amount of practice on the discrete words and their symbols was obtained by going through the discrete word list six times for each time through the sentence list. After one rehearsal of the sentence list, or after six rehearsals of the discrete word list, there was an interval of one minute. This was found necessary for the avoidance of excessive fatigue on the part of the subjects. Thus the sentence list was rehearsed five times by each subject and an exactly equal amount of practice was had on the word list, the latter being rehearsed 30 times.

After the word practice, and after the sentence practice, the subjects took pencils and blanks provided for the purpose and the experimenter read the test list composed of nine "sentences," each con-

taining three unfamiliar combinations. These, as in the practice series, were spoken at three-fifths-of-a-second intervals. Ten seconds elapsed between the beginning of successive presentations, during which time the subjects attempted to write down the English equivalent of the three symbols.

The same test series was used whether the practice had been on discrete words or on sentences. Subjects who learned Vocabulary A as discrete words learned Vocabulary B as sentences. Those who learned Vocabulary B as discrete words learned Vocabulary A as sentences.

There were, then, four sets of materials: Vocabulary A in discrete words and in sentence form, and Vocabulary B in discrete word form and in sentence form. Each subject was given two forms of material for practice and was tested for his retention of each immediately after practice. The giving of the two forms was separated by an interval of one week, the practice occurring at corresponding hours. The order of combination of the two sets of material practiced by each group of subjects was such as to compensate for any effect from the order of priority of the two vocabularies and from the order of priority of word and sentence learning. This arrangement is indicated in Table 2.

In order further to control two variables, namely, order of presentation and relative difficulty of the two vocabularies, an empirical correction for these factors was determined. Vocabulary A was found to be 1.07 times as difficult as Vocabulary B, and the practice effect of the first week was found to be .87 that of the second week. For final computation, the raw data were corrected by means of these two coefficients. This was necessary in calculating the corre-

TABLE 2

Subjects	Form 4 Vocab. A words	Form 2 Vocab. A sentences	Form 3 Vocab. B words	Form 1 Vocab. B sentences
Group 1				
Subgroups A and E	2nd week			1st week
Group 2				
Subgroups D and H	1st week			2nd week
Group 3				
Subgroups B and C		1st week	2nd week	
Group 4				
Subgroups F and G		2nd week	1st week	

lation between the discrete word learning and the sentence learning of all the subjects.

There were 176 subjects in the experiment. These were students in an introductory course in psychology. There were approximately equal numbers of men and women. The experiment was conducted on eight separate subgroups that averaged 22 subjects each (Table 2).

The material was presented to the subjects orally. Visual presentation was avoided in order to discourage the subjects' rehearsing the material in an irregular way.

MATERIALS FOR THE EXPERIMENT

Directions for Giving Practice Series, Forms 1 and 2. (Vocabulary B sentence practice and Vocabulary A sentence practice.)

"Today the experiment consists in finding out how people learn a new language. Your grade in the course will not be affected by the amount you learn. Do your best, however, in order that the experiment may be a success. Certain letters of the alphabet will stand for certain words. We shall rehearse over and over again various combinations of letters and the sentences for which they stand. For example, I might say D-E-A-cats-climb-trees, keeping time with this metronome (100 per minute). Now let's practice this together. First I shall say the letters and words, and then, without any pause, you will say them. (Experimenter and subjects do this five times.) That's good. The words that we are going to use are all one-syllable words. (Read and spell the entire vocabulary that is to be used, e.g., "ducks, d-u-c-k-s", etc.) Be as careful as you can and try to keep perfect time with the metronome."

(Practice series 1 or 2 is now given 5 times. One minute interval between series and before test series. Jazz phonograph music played during interval.)

<i>Practice Series, Form 1</i>		<i>Practice Series, Form 2</i>	
R S Q	Ducks have nests	L J H	Boys want fires
Y P M	Geese like bread	F G V	Men find books
C T X	Hens seek fun	N B K	Girls keep homes
R P Q	Ducks like nests	L G H	Boys find fires
Y T M	Geese seek bread	F B V	Men keep books
C S X	Hens have fun	N J K	Girls want homes
R T Q	Ducks seek nests	L B H	Boys keep fires
Y S M	Geese have bread	F J V	Men want books
C P X	Hens like fun	N G K	Girls find homes
R S M	Ducks have bread	L J V	Boys want books
Y P X	Geese like fun	F G K	Men find homes
C T Q	Hens seek nests	N B H	Girls keep fires
R P M	Ducks like bread	L G V	Boys find books
Y T X	Geese seek fun	F B K	Men keep homes
C S Q	Hens have nests	N J H	Girls want fires
R T M	Ducks seek bread	L B V	Boys keep books
Y S X	Geese have fun	F J K	Men want homes
C P Q	Hens like nests	N G H	Girls find fires

Directions for Giving Practice Series Forms 3 and 4. (Vocabulary B word practice and Vocabulary A word practice.)

"Today the experiment consists in finding out how people learn a new language. Your grade in the course will not be affected by the amount you learn. Do your best, however, in order that the experiment may be a success. Certain letters of the alphabet will stand for certain words. We shall rehearse over and over again the letters and the words for which they stand. For example, I might say Z-hat, and then you would say Z-hat, keeping time with this metronome (100 per minute). Now let's practice this together. First I shall say the letter and word, and then, without any pause, you will say them. (Experimenter and subjects do this five times.) That's good. The words that we are going to use are all one syllable words. (Read and spell the entire vocabulary that is to be used, e.g., "ducks, d-u-c-k-s", etc.) Be as careful as you can and try to keep perfect time with the metronome."

(Practice series 3 or 4 is now given 5 times. One minute interval between series and before test series. Jazz phonograph music played during interval.)

Practice Series, Form 3

R Ducks
Y Geese
C Hens
S Have
P Like
T Seek
X Fun
Q Nests
M Bread
R Ducks
Y Geese
C Hens
S Have
P Like
T Seek
X Fun
Q Nests
M Bread
R Ducks
Y Geese
C Hens
S Have
P Like
T Seek
X Fun
Q Nests
M Bread

R Ducks
Y Geese
C Hens
S Have
P Like
T Seek
X Fun
Q Nests
M Bread
R Ducks
Y Geese
C Hens
S Have
P Like
T Seek
X Fun
Q Nests
M Bread
R Ducks
Y Geese
C Hens
S Have
P Like
T Seek
X Fun
Q Nests
M Bread

Practice Series, Form 4

L Boys
F Men
N Girls
J Want
G Find
B Keep
K Homes
H Fires
V Books
L Boys
F Men
N Girls
J Want
G Find
B Keep
K Homes
H Fires
V Books
L Boys
F Men
N Girls
J Want
G Find
B Keep
K Homes
H Fires
V Books

Directions for Giving Test Series, Forms 1, 2, 3, and 4. Immediately after practice is finished distribute tests blanks of the following form:

- | | | | |
|----|-------|-------|-------|
| 1. | _____ | _____ | _____ |
| 2. | _____ | _____ | _____ |
| 3. | _____ | _____ | _____ |
| 4. | _____ | _____ | _____ |
| 5. | _____ | _____ | _____ |
| 6. | _____ | _____ | _____ |
| 7. | _____ | _____ | _____ |
| 8. | _____ | _____ | _____ |
| 9. | _____ | _____ | _____ |

The experimenter says:

"I am about to read you certain letter combinations that stand for sentences. Do not write down the letters I say but only the words that these letters mean. This is very important. Be careful not to write down the letters I say. To do so would spoil the experiment. You may find that you do not know what these letters mean. If this is the case just write down whatever comes to your mind. What you write in this way is very likely to be correct. The blanks are numbered 1-2-3-4 down to 9" (10-second intervals between the beginning of stimulus letters).

Test Series, Forms 1 and 3

1. R S X
2. Y P Q
3. C T M
4. R P X
5. Y T Q
6. C S M
7. R T X
8. Y S Q
9. C P M

Test Series, Forms 2 and 4

1. L J K
2. F G H
3. N B V
4. L G K
5. F B H
6. N J V
7. L B K
8. F J H
9. N G V

Collect papers immediately.

Bundle these together and mark according to section, day, hour, and week.

RESULTS

It will be remembered that each subject learned one vocabulary by the discrete word method and another vocabulary by the sentence method. The order in which the two forms of learning occurred and the order in which the two vocabularies occurred was compensated by the procedure that is indicated in Table 2. Correction was further made for difficulty of vocabulary and for first and second week practice effects. Thus the variable to be measured is well isolated.

Table 3 indicates the relative practice value of the two methods of presentation, discrete word and sentence, in terms of the number of single words translated and the number of complete sentences translated.

The effect of discrete word practice is here shown to be much

TABLE 3

	By discrete word learning	By sentence learning	r	Difference	$\frac{Diff.}{\sigma_{diff.}}$	Reliability of difference (P)	Number of subjects
Mean (and sigma) of <i>words</i> correct in test series	17.64 (.44)	13.76 (.57)	.25	3.88	5.7	.999	176
Mean (and sigma) of <i>sentences</i> correct in test series	3.6 (.21)	2.3 (.23)	.19	1.3	4.4	.999	176

greater than that of sentence practice. The value of vocabulary list learning was 28% greater than the value of sentence learning where the measure of learning is the number of words successfully translated from sentence dictation. This value rises to 57% where the measure of learning is the number of whole sentences successfully translated from sentence dictation.

If a hypothetical explanation is demanded of the fact that vocabulary practice was found to be more profitable than sentence practice, two principles may be considered.

The first of these is that the longer the interval between substituted stimulus and conditioned response, the greater is the amount of practice necessary for a given degree of conditioning. In the practice of our three-word sentences two terms separated each symbol from its corresponding word, whereas in vocabulary practice each symbol was followed immediately by its corresponding word. Thus the time interval between substituted stimulus and conditioned response was shorter in the vocabulary practice.

The second principle is that when a number of diverse responses follow the substituted stimulus, inhibitory conditioning results. In our sentence practice each symbol was immediately followed by any one of three other symbols or (in the case of the object symbols) by any one of three words. In the vocabulary practice each symbol was immediately followed by only one word.

The foregoing results tend only to indicate the superiority of the discrete word learning method over the sentence learning method for purpose of translating such a "foreign language" as is comprised

by our symbols when this language is presented orally. When a language is presented visually for the purpose of learning, or when the amount of practice is different, or when such a language differs in kind or in complexity from that used in this experiment, or when the language is idiomatic, or when the ability to converse rather than to translate is sought, then the relative value of word and sentence learning might not be properly predicted from the results of this experiment.

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LA VALEUR RELATIVE DES EXERCICES DE VOCABULAIRE ET DE PHRASES DANS L'APPRENTISSAGE D'UNE LANGUE

(Résumé)

Cent soixante-seize sujets ont employé chacune de deux méthodes pour apprendre des symboles et des mots correspondants. Une méthode a employé la suite immédiate du symbole et de la signification, comme dans les listes des vocabulaires, et l'autre méthode a employé les symboles en groupes de trois en forme de phrase suivis par les phrases correspondantes de trois mots. Il y a eu deux vocabulaire séparés, chacun de neuf mots. Les sujets ont pratiqué un vocabulaire en forme de phrases et l'autre en forme de mots séparés. Ils ont répété chaque mot, ou en forme de phrase ou en forme de mots séparés, trente fois. L'ordre des deux formes de l'appren-

tissage et l'ordre des deux vocabulaires ont été compensés en divisant les sujets en quatre groupes et en variant ces ordres convenablement. On a fait aussi une correction empirique pour la difficulté relative du vocabulaire et pour les erreurs de pratique. On a testé la quantité de l'apprentissage par la traduction rapide des symboles en forme de phrases. Ces phrases de test ont été des combinaisons non pratiquées auparavant. La valeur de la pratique des mots séparés a été plus grande de 28% que celle de la pratique des phrases, mesurée par le nombre de mots traduits dans la série de test, et plus grande de 57%, mesurée par le nombre de phrases complètes traduites dans la série de test. La constance moyenne de ces différences (P) a été de 0,66.

SMITH ET POWERS

DER RELATIVE WERT DER WORTSCHATZ- UND SATZKONSTRUKTIONSÜBUNGEN IM SPRACHUNTERRICHT

(Referat)

176 Versuchspersonen lernten Symbole und entsprechende Wörter nach zwei verschiedenen Methoden. Nach der einen Methode lernte man die einzelnen Symbole unmittelbar mit ihrer Bedeutung, wie in einem Vokabularium, nach der andern Methode drei Symbole in einen Satz vereinigt mit dem aus drei Wörtern bestehenden Satz. Man hatte zwei getrennte Vokabularien, jedes mit je neun Wörtern. Die Versuchspersonen übten eines der Vokabularien in Satzform und das andere in Wortform. Jedes Wort, ob im Satz oder isoliert, wurde dreimal wiederholt. Die Reihenfolge der beiden Lernarten und Vokabularien wurde kompensiert, indem man die Versuchspersonen in vier Gruppen teilte und die Ordnung entsprechend variierte. Es wurden ferner empirische Korrekturen hinsichtlich der relativen Schwierigkeit und der Übungsfehler vorgenommen. Das Erlernete wurde mittels schneller Übersetzung der Symbole in Satzform geprüft. Diese Prüfungssätze bestanden aus Kombinationen, die vorher nicht geübt wurden. Das Ergebnis der Einzelwortübung war um 28% grösser als das der Satzübung, wenn man es nach den in den Testserien übersetzten Wörtern bemisst, aber um 57% grösser, wenn man es nach der Anzahl der in den Testserien übersetzten ganzen Sätzen bemisst. Das Mittel der Zuverlässigkeit dieser Differenzen (P) war 0.66.

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