

THE EVALUATION OF SELF-ADMINISTERING SPELLING TESTS

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A test to measure spelling that is not administered by the usual dictation method, but is "self-administering" seems to be desirable. Such a form has been used by Otis¹ in his "Classification Test" in the following form:

Sample.—Which one of the five words is wrongly spelled?

1. the 2. when 3. wil 4. same 5. and (3)

Gates² has also used a test which he calls "spelling recognition" in which the correct spelling is recognized and marked in a group containing four misspellings of the same word. The following is the form used:

mine nin nyme nine nein

It is the purpose of this article to examine the validity and reliability of tests of this nature. The two forms used which seem to give most promise are: First, the form used by Otis, sample of which is quoted above and which in this study will be known as Alpha; and second a form in which the correct spelling of a word with four misspellings of the word is given at the end of a completion sentence, requiring this word for the correct completion, to be known as Beta. The form is:

Sample.—The boy played _____ in the yard.

- (1. bol 2. bal 3. boll 4. ball 5. baul) (4)

The later form recognizes the fact that many people know a word as correctly spelled when they see it written instead of hearing it, and that they often write a word to see if it "looks all right." Just how common this is, is not known, but it is widely used, and has been completely neglected in spelling research. It is the problem of this study, then, to investigate the relative value of the Alpha and Beta forms given above. The criterion selected is the Morrison-McCall Spelling Scale.³ Kelley⁴ gives this test a "median rating" of one by five

¹ Otis, A. S.: "Classification Test." World Book Company, 1923, p. 1.

² Gates, A. I.: *Methods in Spelling.* *Journal of Educational Psychology*, 1926, Vol. XVII, p. 293.

³ McCall, W. A. and Morrison, J. C.: "Morrison-McCall Spelling Scale." World Book Company, 1923, List 1, p. 8.

⁴ Kelley, T. L.: "Interpretation of Educational Measurements." World Book Company, 1927, p. 245.

judges. Considerable statistical evidence also indicates the high general merit of this scale.

For this purpose the Alpha and Beta forms were made up using exactly the same words in list 1 of the criterion (there are fifty words in each list of the Morrison-McCall Scale). In the Beta form the sentences used were the same sentences as used in the Morrison-McCall Scale.

The Alpha and Morrison-McCall were given to eighty pupils in Grades VIA and VIB, and the Beta and Morrison-McCall were given to sixty-eight pupils in Grades VIA and VIB. In each case the Alpha and Beta forms were given first.

The mean, standard deviation and standard deviation of the mean of all the tests given are shown in Table I.

TABLE I.—THE MEAN, STANDARD DEVIATION AND STANDARD DEVIATION OF MEAN OF ALL TESTS

	Morrison-McCall 1	Alpha 2	Morrison-McCall 3	Beta 4
Mean.....	35.2	36.2	35.8	38.8
SD.....	6.3	6.1	5.8	5.4
SD of mean.....	.70	.68	.68	.65

The mean of the Morrison-McCall is in every case lower than that of the experimental forms, while the standard deviation remains essentially the same. Evidently the spelling of a word is harder than its recognition in the two forms of the experimental tests.

Applying the test for the significance of the difference between the means of the four tests, we get the following differences and reliabilities as shown in Table II.

TABLE II.—DIFFERENCES OF MEANS AND RELIABILITY

	Morrison-McCall and Alpha	Morrison-McCall and Beta	Morrison-McCall 1 and 2	Alpha and Beta
Difference of mean.....	1	3.0	.6	2.6
SD of difference.....	.95	.94	.95	.94
D/SD of difference.....	1.05	3.1	.63	2.60

The difference between the mean of the Morrison-McCall and the mean of Beta is evidently not due to chance fluctuations for it is 3.1

times the sigma of the difference. The difference between the means of the Morrison-McCall and the Alpha may be due to chance fluctuations, being only 1.05 times the sigma of the difference. The two groups tested do not differ significantly in their means on the Morrison-McCall, the difference being only .63 of the sigma of their differences. The two groups are equivalent so far as the criterion is concerned. But the two groups do differ significantly in the means of the Alpha and Beta Scores. This indicates that the spelling ability as measured by the Morrison-McCall Scale is only partially involved in these two tests. The validity and reliability of the Alpha and Beta forms are expressed in terms of the following correlations shown in Table III.

TABLE III.—CORRELATIONS SHOWING VALIDITY AND RELIABILITY OF ALPHA AND BETA FORMS

Forms	Self-correlation	Correlation with criterion	Correlation with criterion corrected for attenuation ¹
Alpha.....	.84 ± .022	.69 ± .039	.78 ± .029
Beta.....	.84 ± .024	.74 ± .037	.84 ± .024

¹ The coefficient of reliability for the Morrison-McCall is given by Kelley: *Op. cit.*, p. 315, as .93.

The amount of error present in an individual score is shown by the probable error of a raw score and the probable error of an estimated true score in Table IV.

TABLE IV.—RELIABILITY OF ALPHA AND BETA FORMS IN TERMS OF THE PROBABLE ERROR OF A TEST SCORE

Forms	PE (raw score)	PE (estimated true score)
Alpha.....	1.62	1.46
Beta.....	1.44	1.29

The correlations with the criterion as shown in Table III for such a narrow range of abilities (those represented in one year, Grades VIA and VIB) are rather higher than the usual correlations for group tests. Kelley¹ reports from a letter by G. M. Ruch from data submitted by C. L. Cushman, that the self-correlation of the Morrison-McCall

¹ Kelley: *Op. cit.*, p. 315.

Scale in grade VI is .86, N55. The Alpha and Beta forms are almost as high being .84.¹ The validity and reliability from this criterion seems to be satisfactory.

Another question arises in evaluating such tests against any criterion. If the criterion is considered a true test of spelling in what degree do the Alpha and Beta forms measure the same words as the criterion? This would answer an important question relative to the diagnostic values of such forms, length being considered equal with the criterion. In other words, if it is considered that the criterion is a true test, within the limits of the words in the list, how well do the Alpha and Beta forms measure the *same words* as the criterion, or what are the chances that a given word spelled correctly in the criterion will be spelled correctly in Alpha or Beta. For the purpose of measuring the degree of association in which Alpha and Beta measure the same words as the Morrison-McCall, four-fold association tables were computed. These are shown in Tables V and VI.

TABLE V.—ASSOCIATION OF WORDS IN ALPHA WITH MORRISON-McCALL

	Number of words correct Alpha	Number of words incorrect Alpha	Total
Number of words correct Morrison-McCall.....	2742	468	3210
Number of words incorrect Morrison-McCall.....	384	406	790
Total.....	3126	874	4000

TABLE VI.—ASSOCIATION OF WORDS IN BETA WITH MORRISON-McCALL

	Number of words correct Beta	Number of words incorrect Beta	Total
Number of words correct Morrison-McCall.....	2193	243	2436
Number of words incorrect Morrison-McCall.....	438	526	964
Total.....	2631	769	3400

¹ If this reliability of .86 is used instead of .93, the correlation with the criterion, corrected for attenuation, will be for Alpha .81 and for Beta .87 instead of .78 and .84 respectively, as given in Table III.

In Table V the Q^1 or coefficient of association is $+.72$ and in Table VI the Q is $+.83$. This means a high positive association between the ability to spell a word correctly as measured by the criterion and the ability to recognize the same word in the Alpha and Beta forms. We have in this experiment a technique for comparing the ability to recognize in its correct and incorrect form with the ability to write the word correctly from dictation. It is significant as well as quite logical that forty-eight per cent of the words missed on the Morrison-McCall were marked correctly in Alpha; and forty-six per cent of the words missed on the Morrison-McCall were marked correctly on the Beta. Common sense would tell us that there are quite a number of words on the periphery of our spelling ability whose correct spelling we recognize, but which we cannot spell correctly. It is somewhat more difficult to explain why pupils could not recognize the correct form of ten per cent of the words in Beta that they know how to spell, and to recognize as incorrect seventeen per cent of the words in Alpha that they know how to spell. It is likely that laxity in obeying directions, carelessness, and the suggestive misspellings used were responsible for a good share of these.

CONCLUSIONS

1. The correlations between the two experimental forms and the criterion are sufficiently high to claim for them validity and reliability as group spelling tests.
2. Form Beta is slightly superior to form Alpha both in correlation with the criterion and in the size of the probable error of an individual score.
3. Form Beta yields a considerably higher coefficient of association with the criterion.
4. It is believed that this is a reliable test of that part of spelling ability or word knowledge which involves recognition of the correct spelling of a word. It measures an ability which almost all individuals utilize. It offers a satisfactory technique of measuring spelling by a "self-administering" or non-dictation method.

¹ Yule, G. U.: "An Introduction to the Theory of Statistics." Griffin, London, 1924, p. 38.