

THE RELATION OF SPEECH TEST SCORES
TO GRADE POINT AVERAGE

AN HONORS THESIS

BY

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THE RELATION OF SPEECH TEST SCORES
TO GRADE POINT AVERAGE

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I. PROBLEM

The purpose of this study was to discover what correlation, if any, exists between speech pronunciation and success in college as determined by grade point average. The rationale behind the study in the form of a question to be answered by its results is as follows: could a speech test have as strong a predictive power in terms of college success as a verbal aptitude test? The tape recorded speech test used in the study was the test administered to freshmen upon their entrance to Ball State in the year 1960. Verbal aptitude scores were obtained from permanent records of the School and College Aptitude Test (SCAT) administered to these same students as in-coming freshmen. The tests of 250 students were employed in the study, but 15 of this number were eliminated at the time SCAT scores were procured. Ten persons had taken complete entrance examinations but had not registered in the Fall. The verbal scores of the remaining five were doubtful or nonexistent. The grade point averages used were those of these students at the beginning of their junior year. If for some reason students were no longer in college at the time they would have been juniors, their grade point averages at the time of drop-out were found. Pronunciation on the speech test was standardized by this writer, and scores based upon 100 possible points were given each student. Individual SCAT test verbal and speech scores were then compared statistically with grade point averages to discover which held the highest correlation.

II. REVIEW OF RELATED LITERATURE

The School and College Aptitude Test is administered to every freshman class as a part of entrance examinations. Tests are conducted by qualified persons in the counseling and testing area; however, the test is so constructed that an untrained individual could administer it providing the simple manual instructions were followed exactly. The purpose of the test is to estimate the capacity of the student to undertake academic work of the next higher school level.¹ It measures developed abilities and the educational aptitudes most related to success in school learning.²

Three scores are obtained from the test: a quantitative, a verbal, and a total score. The test itself contains four parts or subtests: tests I and III measure developed verbal ability, and tests II and IV measure quantitative abilities. Test number I of the verbal test evaluates sentence understanding, and number III tests for knowledge of word meanings.³ The SCAT in its entirety is used mainly for the five following purposes; to identify advanced or retarded students; to discover the level of instruction suitable for students; to identify over and under-achievers; to group students for specific instruction; and to find information usable in guiding students toward academic goals.

¹School and College Aptitude Test--Manual for Interpreting Scores. Educational Testing Service, Princeton, New Jersey, 1957, p. 5.

²Ibid., p. 6.

³Ibid., p. 5.

⁴Ibid., p. 6.

The 1958 SCAT-Step Supplement contains the latest validity scale issued by the publishers. A validity of 42.55 was averaged from the verbal scores of five colleges using the test in various departments for end-of-the-year evaluations.¹

Information of this kind being limited, a reliability score of .93 was estimated from the verbal scores of 10,672 elementary and high school students in grades 5,7,9,11, and 13 in the 1957 SCAT Technical Report.²

A similar study to the one being discussed by this writer was conducted on the graduate level in speech and hearing therapy in 1961; however, the tests of only 18 students were analyzed. The predictive power of speech pronunciation proved superior to the SCAT by a standard error of difference of .50 as compared with .472 for verbal test scores.

¹SCAT-Step Supplement, Educational Testing Service, Princeton, New Jersey, 1958, p. 13.

²SCAT Technical Report, Educational Testing Service, Princeton, New Jersey, 1957, pp. 10-11.

III. METHOD

1. Method of Defining the Speech Standard

The study involved analyzing the speech tests of 235 students. The method of selection was a random sample of every fourth test beginning with the first test of the 1960 series. An additional information sheet was filled out by the student at the time of his testing. Included in the general information about family background that was required of the student, he was to indicate on a map of Indiana where he lived and below where he was born and had lived previously. (See Appendix) Since it was the intention of the author to test General American, not Eastern or Southern speech, in some cases persons were eliminated when their backgrounds indicated that they might have been influenced by other regional differences. The following are two speech maps, one indicating the three major speech areas of the United States and the other showing the ten major regional speech areas. The second map is included to illustrate more specifically what regional areas are represented in the term "General American speech." It must be noted that, although substandard General American speech was being judged in the study, the areas illustrated on the maps are not so clear-cut as to eliminate some substandard Southern and Eastern forms.



Figure I. The Three Major Speech Areas of the United States

¹Thomas, Charles K., An Introduction to the Phonetics of American English, 2nd ed., The Ronald Press Co., 1958, p. 232.

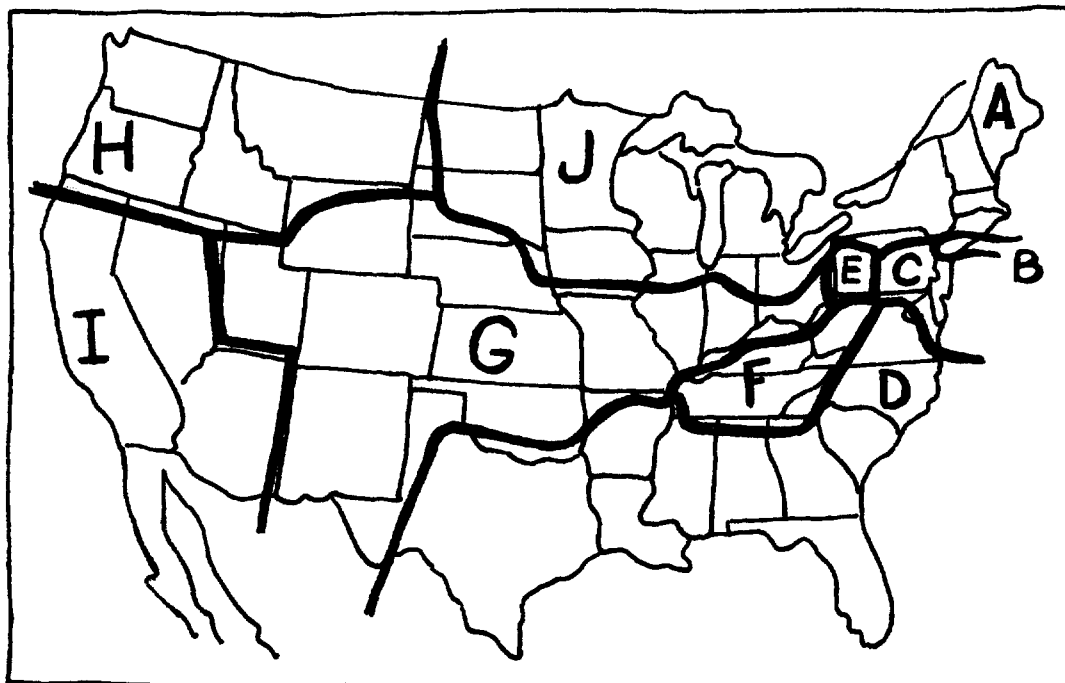


Figure II. Ten Major Regional Speech Areas

A. Eastern New England; B. New York City; C. Middle Atlantic;
 D. Southern; E. Western Pennsylvania; F. Southern Mountain;
 G. Central Midland; H. Northwest; I. Southwest; J. North
 Central¹

¹Thomas, Charles K., An Introduction to the Phonetics of American English, 2nd ed., The Ronald Press Co., 1958, p. 232.

2. Levels of Speech

The standard used as a basis for the judgment of what was and was not acceptable speech was what might be called "cultivated, colloquial, General American English." The term "colloquial" is often misinterpreted to mean that which is unacceptable. Colloquial usages are not synonymous with localisms. Kenyon and Knott describe colloquial pronunciation as "the conversational and familiar utterance of cultivated speakers when speaking in the normal contact of life and concerned with what they are saying, not how they are saying it."¹ This style of speech has been called, "the speech of well-bred ease."² It possesses characteristics of speech common to the classroom, the business conference, the dinner table, and the everyday situations in which we conduct our affairs. It differs from formal usage and speech in its more liberal use of unstressed syllables and contractions. It is grammatically correct and is the style of speech common to all except the most uneducated levels of society. Its pronunciations and enunciations are those found in our dictionaries. New pronunciations find their way more easily into informal colloquial speech than they do into formal speech; nevertheless, it forms with formal speech the "standard" for the language.³

¹John S. Kenyon and Thomas A. Knott, A Pronouncing Dictionary of American English, p. xvi--Introduction.

²John S. Kenyon, American Pronunciation, p. 16.

³Arthur Bronstein, The Pronunciation of American English, p. 10.

are held to a minimum. The precision of this style of speech necessitates restrictions of the use of many unstressed forms, and the speaker assumes a careful and deliberate manner. This style of speech is used by the platform speaker and reader in a formal situation. ¹It is formal, deliberate, and educated.¹

Since the standard speech of a region has been defined as the cultivated speech of that region, substandard speech may be defined as the uncultivated. More accurately, substandard pronunciation forms pertain to forms which do not measure up to a standard, not to the individual's speech as a whole. Certainly the speech of a given individual may generally measure up to the given standard but may contain a few pronunciations at the substandard level. This is largely true of General American speech where the substandard forms are only slightly different from those of the standard.² As with all substandard speech, there are some characteristics in substandard General American which can be explained by a lack of education of the speaker. Often these are problems of faulty grammar which go hand in hand with substandard pronunciation.³

Strong and valid arguments exist against depicting these forms of speech as levels, especially if the reader will then assume that "very good" speech is at one end of the continuum, "very bad" speech at the other, and the colloquial pattern somewhere in between. Formal and informal speech are used by the same people, and either is as "good" as the other. Colloquial speech is neither "worse" than formal speech, nor is it lacking in any aspect of social acceptability. Each is merely used in different situations. It is also important to note that in most cases both make use of identical forms. It might be useful, therefore, to think of these differently described patterns as "varieties" of speech rather than levels.⁴

¹Ibid., p. 10.

²Claude Merton Wise, Applied Phonetics, p. 189.

³Ibid., p. 190.

⁴Bronstein, op. cit., pp. 9-10.

3. The Theory of Standardization

The "reasons why" for the usage of substandard speech are closely bound with the rationale behind this study. If correlations were to be found in further studies among the other aspects of speech such as voice, rate, and diction and college success, could not a speech test, because of what it measures, become a better predictor of college success than a written test on which knowledge may be simply recalled but not practiced?

The question to be answered now is--what exactly are you measuring when you analyze speech in general or pronunciation specifically? We feel that three very important aspects of adjustment and success in college are being measured in speech: the first is motivation, the second is discrimination, and the third is environment.

There are no studies to confirm the fact that motivation plays a greater role in college success than intellect, because motivation in its pure form is probably impossible to measure; nevertheless, this is a fact known to every student whether he be bright or dull. Almost daily the student is confronted with the knowledge that only what he "wills" will "be." Under the severe social and academic pressure of college life, only what a student desires to learn will he actually learn. Students with few or no outside activities are seldom among the best students or among the most interesting. Are these not all a part of motivation? It must be noted that these are not facts but observations made while observing, knowing, and listening to other students.

When discussing motivation in regard to speech, it might be best to also consider the matter of discrimination. What is higher education but a matter of discrimination--discriminating right from wrong, war from peace, good books from bad, historical truths from untruths, acceptable from unacceptable social behavior, and the

adequate from the inadequate individual in one's society. In other words, motivation spurs the use of discrimination toward the goal of refining a framework of values in which the individual functions as a human being. This discrimination also applies to speech. If the motivation is present and he "cares," even an individual from an area in which substandard speech is the rule rather than the exception will begin to hear "differences." If he is entering college, he has obviously come into contact with professional people such as teachers, doctors, and clergymen who have not had his same environment and talk "differently." It is in this sense that we are sampling in our testing of speech the student's motivation and his ability to discriminate.

As it stands to reason, we are also sampling his environment: how much education his parents have, how much he has been encouraged to read, and to what extent he has been taught to feel a desire for self-improvement. If we are to assume that a student's attempt at college work indicates a desire for self-improvement, we may also be testing indirectly whether or not academic motivation is sufficient for pulling a student out of environmental speech patterns into which he has fallen.

4. The Freshman Speech Test

The following is the 1960 freshman speech test. It was constructed by the head of the speech and hearing department, Dr. Alan W. Huckleberry, from a list of the most commonly mispronounced words. He selected words for the test according to what insights they gave into the various categories and levels of American speech and culture. Words were selected in some cases because of difficult consonant, consonant-vowel, or vowel combinations which are especially subject to mispronunciation and in others because of their cultural values. The purpose of tests of this kind is to discover speech problems in need of correction: pronunciation, distinctness, time, loudness, inflection, quality, and pitch being among those things considered. Every phonetic sound found in American English is represented in three positions in each test: initial, medial, and final. The ten underlined words were those analyzed in this study. The basis on which they were chosen will be explained in the next section.

Do you remember Mary Alice Sink who taught nuclear physics? Well, at length, after a merry courtship, she married Burt Budge, an interesting athlete from Greasy Creek near Philadelphia. They now own three hundred United National Stores where you can get such items as: films, magazines, television sets, pens, washing machines, linoleum, garage supplies, paste, dishes, toy fire engines, power mowers, catcher's mitts, wheel barrows, and even a bushel of wheat.

When they visited us last Tuesday, we took Bert to the roof garden for the chef's speciality: fish egg sandwiches, cherry or pumpkin pie, and fresh buttermilk. He rather resented the idea of it, and I can't blame him, but he smiled when they suggested that the pie crust might well be used for cement in the chimneys of our new school library.

On this page is a copy of the complete form which is filled out for each student by an examiner.

PLEASE PRINT

BALL STATE TEACHERS COLLEGE
MUNCIE, INDIANA

**SPEECH AND HEARING
CRITICISM SHEET**

Name _____ Hometown _____ Date _____
LAST FIRST MIDDLE INITIAL

	POOR		FAIR		ADEQUATE	GOOD	SUPERIOR
PRONUNCIATION	15 ERRORS		12		9	6	3
DISTINCTNESS	15 ERRORS		12		9	6	3
TIME	MUCH TOO FAST TOO SLOW		SLIGHTLY TOO FAST TOO SLOW		JERKY	SMOOTH	NOTHING DETRACTS
LOUDNESS	EXTREMELY HIGH LOW		NOTICEABLY HIGH LOW		FITS THE PERSON	ADAPTS TO THE ROOM	NOTHING DETRACTS
INFLECTION	MONOTONE	PEDANTIC	PATTERN		SOME VARIETY	VARIETY IN MOST INSTANCES	USES PITCH STRESS AND VOLUME CHANGE
QUALITY	NASAL	HARSH	THIN	SOMEWHAT DISAGREEABLE	DISAGREEABLE ON CERTAIN SOUNDS	NOTHING DETRACTS	ENFORCING
PITCH	EXTREMELY HIGH LOW		NOTICEABLY HIGH LOW		FITS THE PERSON	WELL PLACED	PLEASANT

RECOMMENDATIONS:

1. SPEECH

- ACCEPTABLE SPEECH _____
- ENROLL IN SPEECH CLINIC _____
- ENROLL IN SPEECH CLASS _____
- ED. 268 _____

2. HEARING

- PASS AT 15DB _____
- COMPLETE AUDIOGRAM _____

CRITERIA FOR

**RECOMMENDATIONS
TO CLASS OR CLINIC**

- 1. ONE OR MORE ITEMS
MARKED POOR
- 2. TWO OR MORE ITEMS
MARKED FAIR

Signed _____
EXAMINER

SPEECH CLINIC
Ball State Teachers College

ORIGINAL

5. The Phonetic Analysis

As was mentioned previously, the tests were taken from tape recordings. Ten words were analyzed--success being defined as a perfect score of 100 points. Points were given below the perfect score of 10 according to how seriously and how often the pronunciation deviated phonetically from what will later be defined as "correctness." For example, 7 words were given scores of 10, 6, 3, and 1, 2 were given scores of 10, 6, and 1, and one was scored 10, 3, and 1. Below is the phonetic reference form used as the tests were being scored.

Correct pronunciations are from Kenyon and Knott, A Pronouncing Dictionary of American English. The purpose of the dictionary according to the authors is "to show the pronunciation of cultivated colloquial English in the United States."¹ It is a dictionary of the "usage" of cultivated speakers of American English--that pronunciation which belongs to the rather nebulous area of "standard speech."

1 nuclear

10 nuklɪə
6 nukɔlə
3 nuklə
1 anything else

2. length

10 lenkθ
3 lenθ
1 lɛɪθ or
anything else

¹John S. Kenyon and Thomas A. Knott, A Pronouncing Dictionary of American English, p. xv--Introduction.

3. hundred

10 hundrød
 6 handrød
 3 hanrød
 1 hanrøt or
 anything else

4. pen

10 pen
 6 pin
 3 pæn
 pen
 1 anything else

5. washing

10 wɔʃɪŋ
 wɑʃɪŋ
 6 wɔɪʃɪŋ
 wæɪʃɪŋ
 3 wɔrʃɪŋ
 wærʃɪŋ
 1 worʃɪŋ
 wærʃɪŋ
 anything else

6. fire

10 fair
 faɪə
 6 far
 faə
 3 fær
 far
 1 anything else

7. power

10 paʊr
 paʊə
 6 par
 pə
 3 par
 pær
 1 anything else

8. bushel

10 buʃəl
 6 buʃət
 1 anything else

9. fish

10 fɪʃ
 6 fiʃ
 1 anything else

10. chimney

10 tʃɪmniː
 6 tʃɪmənɪ
 3 tʃɪmlɪ
 1 tʃɪmblɪ
 tʃæmblɪ

A score of six was given to its most standard mispronunciation lenθ and a score of one to leɪθ because of the vowel change and the omission of "ngk." The situation under which the first deviation takes place may be explained as follows. When excrescent plosives (superfluous exploded sounds like "k, p, and b") develop with close juncture after nasals, they are usually made at the same port of articulation as the nasal they succeed and develop to help smooth the pathway between the nasal and the following sound which is made at another place in the mouth. For example, note the "k" which is heard in strength and length, the "p" which is heard in something, or the "b" which for this reason developed in the substandard pronunciation of fambly for family. Note again that each intrusive plosive is made at the same port of articulation as the preceding nasal--"k" after "ng", "p" after "m", and "b" after "m". In the case of "length and strength," if the excrescent "k" fails to develop to form the sequence "ngk", the "th" will usually demand that the "ng" change to "n" which is made more nearly at its same point of formation producing "len'th and stren'th."¹ "Len'th and stren'th" are used only by the aged or unlettered in most of the United States. In the South, and to a lesser degree in the East, this pronunciation is more widespread. Note that "length" is derived by umlaut from "long" and "strength" from "strong," so the "ng" is properly retained.²

¹Ibid., p. 164

²Ibid., p. 202.

(3) hundred hʌndrəd

Kenyon and Knott give the above pronunciation but also state that its first deviation hʌndəd (six points) "has been correct from the 14th century to Tennyson and King George V."¹ In their pronouncing dictionaries, Mawson, Phyte, and Bender confirm the standard of hʌndrəd. Mawson also states that the word came from the Anglo-Saxon "hund"--hundred and "red"--number--hence the pronunciation.² The "re" is commonly reversed because it is part of the difficult consonant combination "dr" as it follows the nasal "n". A score of three was given the pronunciation hʌnəd because of the reversal of "er" and the omission of "d", A score of one was given to hʌnət because of the reversal of "er", the omission of "d", and the changing of the final "d" to its voiceless counterpart "t".

(4) pens pɛnz

In parts of the South the sound "e" before "m, n, or g" is replaced by a short "i" ɪ. For example, "stem, men, and length" go to "stim, min, and lɪnθ."³ ɛ also becomes ɪ in less educated speech in words like "get-git, ten-tin, cents-cints, many-miny, and any-iny" where ɛ precedes an alveolar consonant. This pronunciation occurs as a result of anticipating the alveolar consonant and placing the tongue higher in the mouth toward the alveolar ridge (directly behind the upper front teeth).⁴

¹John S. Kenyon and Thomas A. Knott, A Pronouncing Dictionary of American English, p. 210.

²C.O. Sylvester Mawson, The Dictionary Companion, p. 160.
William H. Phyte, 20,000 Words Often Mispronounced, p. 384.
James F. Bender, Handbook of Pronunciation, p. 199.

³Bronstein, The Pronunciation of American English, p. 43.

⁴Ibid., p. 154.

The following chart of vowels as they are produced in the mouth will illustrate the vowel shift which takes place.

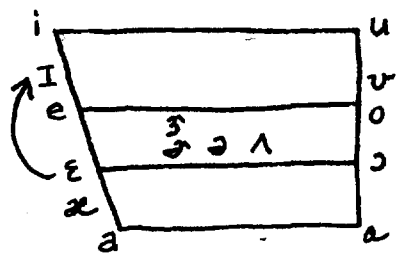


Figure IV.

A score of six was given to the deviation pinz and a score of three was given to pænz or peinz because of the tendency in both pronunciations for the pure vowel ɛ to become diphthongized. The tendency for ɛ to go to I is fairly common all over the United States, but Wise states that it is a form found in a mixed speech along the border of the Southern and General American speech regions--being substandard to both.¹

¹Wise, Applied Phonetics, p. 193.

(5) washing wɔʃɪŋ wɑʃɪŋ wɒʃɪŋ

It can be noted above that three pronunciations are acceptable for the vowel ɔ: the ɑ or the ɒ as in "watch" (half-way between ɔ and ɑ). The most obvious variation of this sound occurs when either ɔ or ɑ replaces the ɔ in the short o or "wa" words like "foreign, gone, and wash." Regional preferences dictate, but either is considered correct.¹ The first variation, given a score of six, was wɔɪʃɪŋ or wɑɪʃɪŋ as the ɔ or ɑ became diphthongized. Scores of three were given its second variations, wɔrʃɪŋ or wɑrʃɪŋ as intrusive "r" appeared, and one was given to wɔrʃɪŋ and wɑrʃɪŋ as vowel changes occurred in addition to the intrusive consonants. Other words which are affected by this same sequence of phenomena are "wash and washes, Washington, squash, precaution, and Joshua." Wise classifies all three deviations as substandard General American speech.²

¹Bronstein, The Pronunciation of American English, p. 166.

²Wise, Applied Phonetics, p. 190.

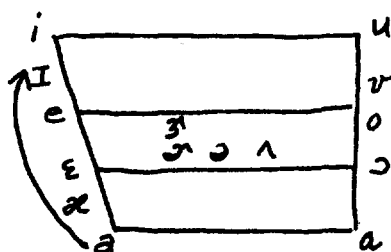
(6) fire fair

Figure V.

The aɪ in "fire" is one of those diphthongs which is strongly influenced by the following consonant. The consonants "r" and "l" especially tend to have a powerful effect on diphthongs. They may change some to different diphthongs or cause the speaker to drop the second or unaccented part of the diphthong.¹ The initial position of the glide varies between a and ɛ--both aɪ and ɛɪ being part of the educated, standard pattern. The diphthong is the common educated form, even in the South--the use of the monophthongal variety increasing as the educational level decreases.²

The form far was given a score of six. The diphthong had been changed to a monophthong, but the initial part of the glide was nevertheless present (as illustrated by the following vowel chart).

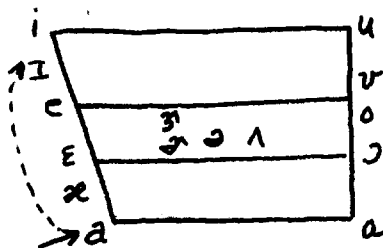


Figure VI.

¹Alan W. Huckleberry, Beginning Phonetics, p. 101.

²Bronstein, op. cit., p. 195.

The variations far or far were given scores of three as the vowel fronted, which was most common, or dropped. The more greatly the vowel was fronted, as in the case of the first and third variations, the more nasalized it tended to become. The raising and nasalizing of certain vowels is another characteristic of substandard Southern speech which people call, with negative implication, typical.¹

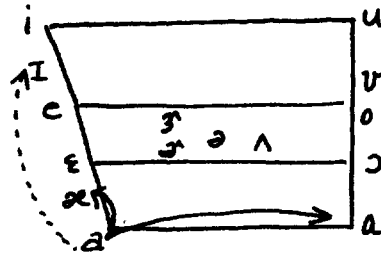


Figure VII.

(7) power paur

As with the previous word, "fire," the consonant "r" has a strong tendency to shift the diphthong av to a, a, æ when following the diphthong.² The first chart indicating the correct vowel positions, it is easy to see by the second how the first change to take place is the dropping out of the second element of the diphthong. This pronunciation was given a score of six.

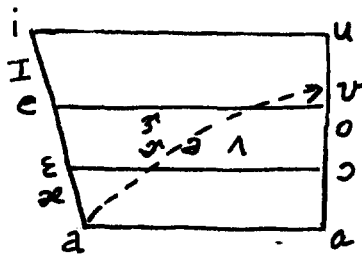


Figure VIII.

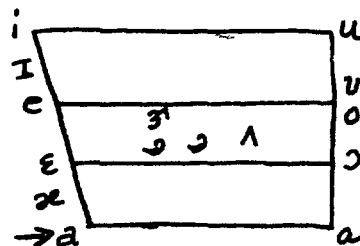


Figure IX.

¹Wise, op. cit., p. 216.

²Huckleberry, op. cit., p. 101.

The forms pær or pævr and par were given scores of three as their vowels became progressively more flattened and nasalized. Thomas states that in the North, æv is usually considered substandard, but in the Midland and Southern areas, it is less likely to attract unfavorable attention.¹ The vowel æ in place of the initial element of the diphthong av may not be favored, but it cannot be wished away and may soon have to be acceptable.² Wise labels the frequently nasalized pævr̄ as a feature of mountain speech held in common with substandard General American, Southern, and Eastern speech.³

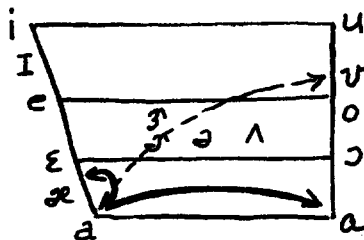


Figure X.

(8) bushel bvʃət

As has been previously stated, the most common factor operating in a vowel shift resulting in mispronunciation is the influence of the adjacent consonant.⁴ This cause is prominent in the most common deviation of this word from its standard pronunciation. The fronted consonant "sh" causes the vowel v to raise and front slightly to u (see vowel chart on next page). The variation bvʃət was given a score of six. Other changes were scored as one.

¹Charles K. Thomas, Phonetics of American English, p. 212.

²Bronstein, op. cit., p. 198.

³Wise, op. cit., p. 306.

⁴Huckleberry, op. cit., p. 101.

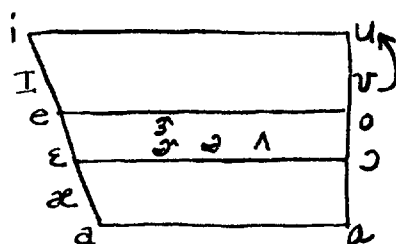


Figure XI.

(9) fish fɪʃ

In substandard speech there is a growing tendency to substitute i for I in the stressed syllables of such words as "initiate, tradition, Patricia, and suspicion."¹ The vowel I may be raised and fronted to i commonly before the front consonant ʃ, but this phenomenon also occurs before the consonants ŋ, ʒ, and r. Other words mispronounced in this way are "fish fɪʃ, vision, vɪʒən, sing sɪŋ, and near nɪr."² Speakers of standard English tend to avoid this error.³ Thomas confirms this statement when he says, "Well-fronted allophones for the front vowel phonemes I and i are a mark of good speech."⁴ A score of six was given to the mispronunciation fɪʃ, and scores of one were given other variations.

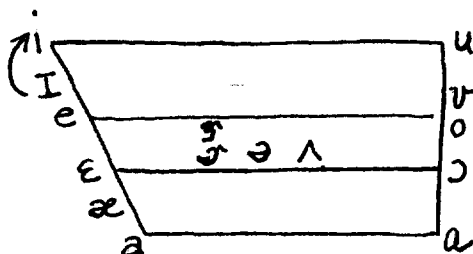


Figure XII.

¹Thomas, op. cit., p. 63.

²Huckleberry, op. cit., p. 101.

³Bronstein, op. cit., p. 151.

⁴Thomas, op. cit., p. 63.

(10) chimney ʃimnɪ

There are certain consonant combinations that are difficult for the human being to produce easily. Some of these combinations are: "sts, sps, sks, skt, mn, lm, and ngth." When an individual is not agile of speech, he may omit or change one of the consonants in the combination, or he may insert a new sound between the two sounds of the difficult combination in order to make it easier to say.¹ This same problem was pointed out in connection with the word "length" where the increscent "k" appears even in standard speech to help bridge the gap between "ng" and "th."

This compensatory method, however, is not always considered acceptable. An example of when it is not is found in mispronunciations of the word "chimney." A score of six was given to the variation ʃimənɪ as an unstressed syllable was added to help smooth the pathway between the m and the n. Scores of three and one were given consecutively for the mispronunciations ʃimlɪ and ʃimblɪ as in one case one element of the combination was changed, and in the other one changed and another sound was added. The pronunciation ʃimblɪ was termed a "gross vulgarism" by Phyte², and Van Riper indicated that the deviation ʃimlɪ was definitely considered substandard.³

¹Huckleberry, op. cit., p. 101.

²Phyte, 20,000 Words Often Mispronounced, p. 188.

³Charles Van Riper and Dorothy E. Smith, An Introduction To General American Phonetics, pp. 211 and 213.

IV. FINDINGS

The computing of statistics was done in two separate operations using the following formula for finding correlation between X and Y from ungrouped data--X and Y being original raw scores. One operation computed the correlation between SCAT verbal scores (X) and grade point averages (Y), and the other computed the correlation between speech test scores (X) and grade point averages (Y).

$$r^2_{xy} = \frac{[N \sum XY - (\sum X)(\sum Y)]^2}{[N \sum X^2 - (\sum X)^2][N \sum Y^2 - (\sum Y)^2]} \quad 1$$

¹J. P. Guilford, Fundamental Statistics in Psychology and Education, p. 204.

The following table, taken from the first 10 items of one set of data, has been set up in brief form to illustrate the statistical procedures employed based on the previous formula. The identical procedure was performed with speech scores (X-- based on 100) and grade point averages (Y).

TABLE 1

SCAT VERBAL SCORES AND GRADE POINT AVERAGES OF 10 STUDENTS

Student No.	SCAT X	G. P. A. Y	X^2	Y^2	XY
6	99	4.000	9801	16.00	396.00
10	45	2.218	2025	4.92	99.81
14	57	3.114	3249	9.70	177.50
22	41	1.469	1681	2.16	60.23
26	45	1.989	2025	3.96	89.51
30	.07	1.872	.0049	3.50	.13
34	60	3.156	3600	9.96	189.36
38	45	1.448	2025	2.10	65.16
42	67	2.214	4489	4.51	142.31
46	86	2.933	7396	8.60	252.24
Sums	545.07	24.323	36291.0049	65.41	1372.25
	ΣX	ΣY	ΣX^2	ΣY^2	ΣXY

The following are the completed test formulae.

$$\begin{aligned}
 r^2_{xy} &= \frac{[N \sum xy - (\sum x)(\sum y)]^2}{[N \sum x^2 - (\sum x)^2][N \sum y^2 - (\sum y)^2]} \\
 &= \frac{[235 \times 33,149.01 - (13,407.46)(509.01)]^2}{[235 \times 934,966.60 - (13,407.46)^2][235 \times 1447.06 - (509.01)^2]} \\
 &= \frac{(779,0017.35 - 6,824,531.22)^2}{(194,473,041 - 179,759,983.65)(34,0059.10 - 259,091.18)} \\
 &= \frac{(965,486.13)^2}{(14,713,057.35)(80,967.92)} \\
 &= \frac{932,163,467,222.38}{1,191,285,650,470.21} \\
 &= .78248 \\
 &= \sqrt{.78248} \\
 r_{xy} &= .27972 \\
 r_{xy} &= .28
 \end{aligned}$$

Figure XIII. SCAT Scores and Grade Point Averages

$$\begin{aligned}
 r^2_{xy} &= \frac{[N\sum XY - (\sum X)(\sum Y)]^2}{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]} \\
 &= \frac{[235 \times 46973.46 - (19938)(549.84)]^2}{[235 \times 1703938 - (19938)^2][235 \times 1386.35 - (549.84)^2]} \\
 &= \frac{(11038763.10 - 10,962,709.92)^2}{(400,425,430 - 397523844)(325792.25 - 302324.03)} \\
 &= \frac{(76053.80)^2}{(2901586)(23468.22)} \\
 &= \frac{5,784,086,188.11}{68,095,058,596.92} \\
 &= .084941 \\
 r^2_{xy} &= \sqrt{.084941} \\
 r_{xy} &= .029144 \\
 r_{xy} &= .03
 \end{aligned}$$

Figure XIV. Speech Scores and Grade Point Averages

The results of this study indicate a .28 correlation between SCAT verbal scores and grade point averages and a .03 correlation between speech scores and grade point averages. According to the random sample of 235 used in this study, neither of these measurements is an accurate predictor of college success--speech pronunciation scores negligibly so and SCAT verbal scores only slightly.

The findings imply that neither a student's "knowing what is correct" in an academic verbal sense nor his practical application of what he knows is a real indication of how he will succeed in college.

As far as speech is concerned, the safest of conclusions to draw is that when we test speech pronunciation, we are testing "something else" besides the potential for academic progress. Exactly "what" we are testing could arouse some hypotheses that would require further study. Perhaps we are testing environment--how people talk at home--and observing the relative helplessness of the individual within his environmental limits. In regard to motivation, the implication might be drawn that motivation may be personal and not academic or academic and not personal--acceptable speech being defined as possibly a result of personal motivation.

The greatest uncontrolled variable in this study involved the limitations of the human ear. Sound impulses never strike two ears in exactly the same manner. Neither are they registered in the same way within the brain--psychological, environmental, social, and intellectual differences being taken into consideration. The judgments one makes concerning "what one hears" depend upon what one has learned is right or true and the kinds of standards one holds for himself and others. What sounds incorrect to one individual may sound perfectly acceptable to another.

Another problem with which an individual is faced when making numerous judgments is the gradual negation or dulling of personal prejudices as he makes more and more similar decisions. In other words, what sounded unacceptable at the beginning of the study (for example, test number 15) would possibly not have sounded unusual if the test had appeared as number 200. The only possible control over these variables involved the author's knowledge of their existence.

V. SUMMARY AND CONCLUSIONS

The purpose of the study was to discover if a speech pronunciation test could possibly be a better predictor of college success (as determined by grade point averages) than a verbal aptitude test. Scores on the SCAT verbal aptitude test and the speech pronunciation scores of 235 students were compared statistically with grade point averages to determine which held the higher correlation. Results indicated a negligible correlation between speech and college success and only a slight correlation between the SCAT and grade point averages (.03 and .28 respectively). Conclusions were that something other than the motivation for potential academic success is being tested in speech pronunciation.

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VII. APPENDIX

PHONETIC ALPHABET

Consonants

Symbol	Key Word	Symbol	Key Word
1. p	pie--- paɪ	18. hu	who--- hu
2. b	buy--- baɪ	19. w	we--- wi
3. t	tie--- taɪ	20. m	what-- mat
4. d	day--- deɪ	21. r	red--- red
5. k	cat--- kæt	22. l	lamp-- læmp
6. g	go--- goʊ	23. j	you--- ju
7. m	me--- mi	24. tʃ	cheap-- tʃip
8. n	knee--- ni	25. dʒ	jump--- dʒʌmp
9. ŋ	sing--- sɪŋ	26. ʒ	huge--- ʒudʒ
10. f	fine--- faɪn	27. ts	tents-- tents
11. v	vine--- vaɪn	28. d	beds--- bedz
12. θ	three-- θri	29. ɲ	canyon-- kæɲən
13. ð	there-- ðeə	30. ŋ	Amvets-- æŋvets
14. s	see--- si	31. ɹ	tree--- tri
15. z	zoo--- zu	32. ɫ *	very--- vɛɫɛ
16. ʃ	shoe--- ʃu	33. ʌ	William-- wɪlɔm
17. ʒ	Hoosier-- huʒɔ	34. t̚	sell--- sɛt̚

*Eastern

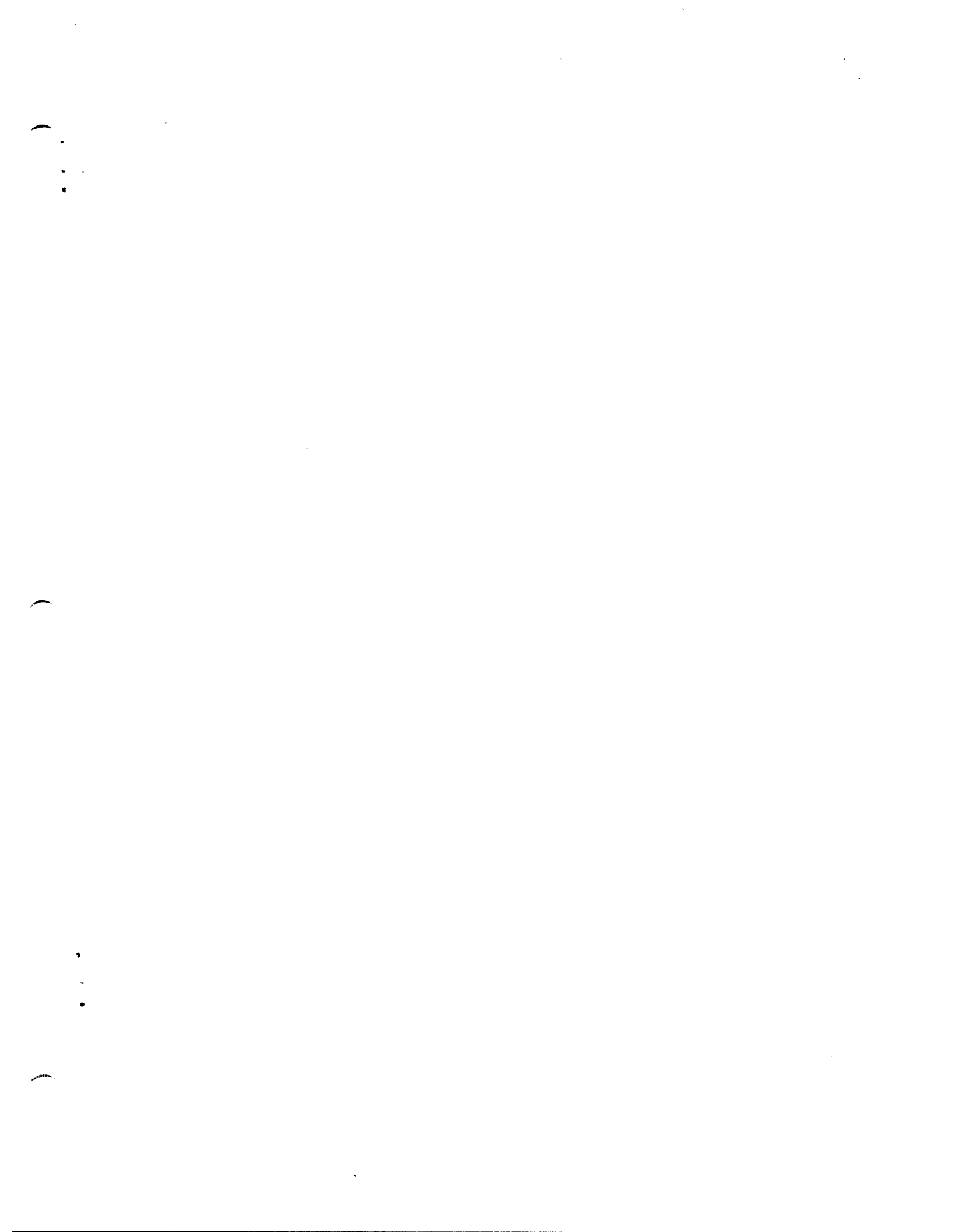
PHONETIC ALPHABET

Vowels and Diphthongs

1.	i	key--	ki	12.	ɒ *	watch--	wɒtʃ
2.	I	hit--	hit	13.	a *	bath---	bɑθ
3.	ɛ	bed--	bed	14.	u	food--	fud
4.	æ	sad--	sæd	15.	ʊ	full--	fʊl
5.	ɛ	Teddy--	tɛdɪ	16.	ɔɪ	boy--	bɔɪ
6.	ə	Lena--	lɪnə	17.	aɪ	high--	haɪ
7.	ʌ	cup--	kʌp	18.	ɑv	cow--	kɑv
8.	ɜ	bird--	bɜd	19.	ov	slow--	sloʊ
9.	ɝ	runner--	rʌnɝ	20.	eɪ	gate--	geɪt
10.	a	top--	tɑp	21.	ju **	using--	juzɪŋ
11.	ɔ	Paul--	pɔt	22.	ɪu **	fuse---	fiuz

* Eastern

** Eastern and
Southern



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