Measurements of Accent and Attitude Toward Mexican–American Speech

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Three linguists reliably judged the accentedness of 32 Mexican–Americans and four Anglo male readers using a 7-point Preliminary Accentedness Scale. Next, the judges provided reliable assessments of the relative frequency of 18 types of accented pronunciation for nine of the speakers. An Accentedness Index was developed by averaging the relative frequencies over the 18 pronunciations. Accentedness measures produced by the linguists for the nine test speakers were compared with ratings of status, solidarity, and accent given by naive raters in another experiment (Brennan and Brennan, 1978). The Accentedness Index was a significant predictor of the Preliminary Accentedness Scale, of accentedness assessments by the naive listeners, and of status judgments. Pronunciation types were significant predictors both of accent and of status. Results are discussed in terms of validation of the concept of accentedness. Future use of accentedness measures to investigate spontaneous speech and attitudes of listeners toward their own speech is suggested.

INTRODUCTION

Like parts of an unfinished jigsaw puzzle, the findings of empirical studies about accented speech need to be fit together (see Sebastian and Ryan, in

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press). The present research was an attempt to provide some order for one corner of the picture of accented speech: the relationships among phonological assessments of expert linguists, estimations of accent by naive raters, and the social reactions of the naive raters to accented speech. Measurements of accentedness were developed by using scaling methods and phonological analysis with trained linguists during the investigation. The results of the measurement procedures were compared with social judgments given by naive subjects in another experiment (Brennan and Brennan, 1978), who also rated accent. In the following discussion *accent* is taken to mean a manner of pronunciation different from standard speech with the grammatical, syntactical, and lexical levels consistent with the standard (Giles and Powesland, 1975).

The present experiment is based upon two major areas of research: sociolinguistic studies analyzing the phonology and social character of speech, and social scaling investigations.

A powerful tool for constructing a reliable linguistic index of phonology was introduced by Labov (1963) in order to directly measure linguistic change in the context of the community life of Martha's Vineyard, Massachusetts. By counting the frequency and distribution of the phonetic variants of (/ay/) and (/aw/) produced by the islanders of Martha's Vineyard, Labov was able to quantify these phonological variables and relate them to attitudes toward the island, ethnic background, and other social variables.

Using Labov's techniques with Spanish-speaking subjects, Fishman *et al.* (1971) studied bilingual Puerto Ricans who lived in a New York barrio. Major phonological variables were identified for the speech community under study, and passages were designed to elicit maximum accentedness in readings. The passages were liberally salted with critical points where accented pronunciations could occur. Frequency counts of key variables were then taken by judges who independently transcribed the passages, and produced a reliable index of selected pronunciations in the speech of the bilinguals in the barrio studied. The phonological variables were then related to demographic characteristics and speech style.

In discussing his work, Fishman called for the development of an Accentedness Index for each speaker developed from that speaker's scores on phonological variables. He stated that lack of time due to the termination of the project prevented him from developing accentedness scores derived from objective and detailed phonological data. Such accentedness scores, he felt, would be superior to the overall ratings of accent which his associates used.

Ryan (1973) suggested that an accentedness score for each member of a speech group under investigation could be computed by summing the relative frequencies of accented pronunciations for a speaker. The resulting Accentedness Index could be explored as a suitable predictor for social evaluations and other measures of accentedness.

One attempt to determine overall perception of accentedness also investigated the possible linkage between subjective judgments of accent based on social scaling and phonological analysis. E. M. Brennan *et al.* (1975) found that two refined scaling methods provided reliable measures of the accentedness judgments of naive listeners. The first method, *magnitude estimation,* was originally developed for use with physical stimuli varying along one or more dimensions, and was later used to construct ratio scales for social variables (Stevens, 1972). In the magnitude estimation method, judges give numbers that reflect their estimations of the ratios that exist between members of a set of stimuli. The second scaling method used by the investigators, *sensory–modality matching,* requires the subjects to adjust some sensory intensity (for example, the loudness of a tone) to match their subjective judgments of test stimuli.

E. M. Brennan *et al.* (1975) had untrained listeners judge the accentedness of Spanish–English bilinguals using the magnitude estimation and sensory–modality matching techniques. The speakers were recorded while reading a standard passage in English. The taped readings were played for each undergraduate subject in an individual session. After listening to the voices each judge produced both magnitude estimations and sensory–modality matches of handgrip pressure to accentedness. Both methods of scaling produced accentedness judgments with highly significant interjudge agreement. In addition, significant interscale agreement was obtained when the geometric means of the magnitude estimations and of the sensory–modality judgments were correlated.

The investigators also looked for relationships among magnitude estimations, sensory–modality matching judgments, and the proportion of accented pronunciations found by two raters in the speech of Spanish–English bilingual readers. The assessments of accented pronunciations were found to be highly correlated with both of the other more global measurements.

In a related study Brennan and Brennan (1978) had linguistically naive adolescent subjects give social judgments and rate the accents of male Mexican–American readers. During the experiment 43 Mexican–American and 37 Anglo high school students listened to tape recordings of 9 accented speakers reading a standard passage. Each student was asked to give a magnitude estimation of the accentedness present in each of the

speech samples. Students also recorded their impressions of the personality of each speaker by filling out an Evaluative Reaction Questionnaire about him.

The questionnaire contained a set of eight 7-point rating scales for each speaker which had been developed by Ryan and Carranza (1975) to measure *status* and *solidarity* reactions. Each of the eight rating scales had at its poles one of a pair of bipolar adjectives. Four of the adjective pairs were categorized as status-stressing (educated–uneducated, wealthy–poor, successful–unsuccessful, and intelligent–unintelligent) while four were designated as solidarity-stressing (trustworthy–untrustworthy, friendly–unfriendly, good–bad, and kind–cruel).

The experimenters found that there was significant interjudge agreement for the magnitude estimations of the accent of each speaker. Results also showed that as the level of accentedness increased from speaker to speaker, the naive judges gave significantly lower status ratings. Solidarity ratings were not significantly related to accentedness judgments.

The present research had two major thrusts. First, the study attempted to develop an Accentedness Index based on phonological variables. Second, the relationships of the phonological variables and the Accentedness Index to evaluative reactions and to other judgments of accentedness were investigated.

In the first phase of the experiment linguists listened to tape recordings of Mexican–Americans and Anglos reading a standard passage. The linguists produced preliminary ratings of accentedness which formed the basis for selecting a small subset of the readings for detailed phonological analysis. The detailed analysis obtained in the second phase of the study yielded phonological variables, measurements of the relative frequency with which certain accented pronunciations occurred for a reader. The variables selected for the study were largely taken from the work of Ornstein (1971).

It was hypothesized that:

1. There would be significant agreement among linguists in their overall accentedness ratings of the readers.

2. Linguists would agree on their assessments of the occurrences of accented pronunciations for the selected phonological variables.

3. When the results of the investigation were viewed in the light of the previous study (Brennan and Brennan, 1978), it was expected that the Accentedness Index would be positively related to the overall magnitude estimations for each speaker.

METHOD

Subjects

Readers for the investigation were four male Anglo speakers (white native English speakers) who were judged by the first experimenter to have no Mexican–American accented features in their speech, and 32 male Americans of Mexican origin who pronounced English with an accent detectable by the experimenter. In order to control for regional differences in pronunciation, the readers were all adolescents living in or close to the same Midwestern metropolitan area.

Materials

A 570-word standard passage was prepared to be read and tape recorded by the Mexican–American and Anglo subjects. The standard passage, entitled "A New Dawn for Aspirin," was formal in style and was designed to be read in less than 5 min. Incorporated within the passage were the 18 phonological variables listed in Table I, for which accented pronunciations were of interest. There were 10 or more critical points in the passage for each of the 18 features under study. At each critical point the accented pronunciations could either occur or fail to be present. All linguists were provided with a scoresheet for each speaker which was a typed transcript of the passage on which all of the critical points for each feature were marked.

Stimulus tape recordings were made by having each of the 36 subjects read the standard passage prepared for that purpose.

Procedure

The tape recordings were judged by three doctoral candidates in the Department of Linguistics of the University of Kansas. The linguists were selected as raters because of their training in phonology and their familiarity with the English speech of the targeted metropolitan area. The raters listened to each reading on the source tape recordings and made judgments independent of each other. They all participated in a preliminary rating session which was followed by individual rating periods during which phonological variable scores were determined.

In the preliminary rating session each linguist listened to a 162-word excerpt of the standard passage as produced by each of the 36 readers.

Table I. Phonological Variables Included in Linguistic Analysis of Mexican–American Speakers

Variable	Designation
Suprasegmentals:	
1. Omission of middle accent in polysyllabic words (e ràd i cá tion, chàr ac ter ís tic, tèr min á tion).	~ middle accent
Vowels:	
2. Substitution of /a/ for /ae/ in stressed syllables of words such as "hat" and "happen."	/ae/
3. Substitution of /i/ for /I/ in stressed syllables of words such as "continue" and "bit."	/I/
4. Substitution of /o/ for /ɔ/ or /ə/ in stressed syllables of words such as "other" and "cot."	/ɔ/ or /ə/
5. Substitution of /u/ for /U/ in stressed syllables of words such as "good" and "could."	/U/
6. Epenthetic /e/ before initial /s/ followed by a consonant, as in "Spanish" and "scream."	/+e#/
Consonants:	
7. Substitution of voiceless /s/ for voiced /z/ in words such as "appeased" and "residence."	/z/
8. Substitution of /č/ for /š/ or /š/ for /č/ in words such as "sure" and "machine."	/č/ or /š/
9. Substitution of /b/ or /f/ for /v/ as in "rave" and "vain."	/v/
10. Replacement of interdental fricative /θ/ or /δ/ with interdental stop in words such as "this" and "with."	/θ/ or /δ/
11. Substitution of fricative for initial /h/ as in "happen" and "headache."	/h/
12. Omission of final /d/ when /d/ is not preceded by a consonant, such as in "read" and "handed."	/d/
13. Substitution of /n/ for /η/ in words such as "wrong" and "think."	/η/
14. Substitution of /ǰ/ for /y/ and /y/ for /ǰ/ in words like "you" and "just."	/ǰ/ or /y/
15. Simplification of final consonant clusters where initial consonant is nasal or liquid and final consonant is *voiced* stop, such as "world" and "word."	consonant cluster 1
16. Simplification of final consonant clusters where initial consonant is nasal or liquid and final consonant is *voiceless* stop, as in "help" and "don't."	consonant cluster 2
17. Simplification of final consonant clusters where the initial consonant is /s/ or /z/ and the final consonant is a stop, such as "first" and "caused."	consonant cluster 3
18. Simplification of final consonant clusters where the initial consonant is a stop and the final consonant is a stop or a fricative, such as "fact" and "attacks."	consonant cluster 4

The excerpt was approximately 1.5 min in duration and contained at least three critical points for each of the 18 pronunciation variables. Each linguist indicated his/her judgment of a speaker on a set of 7-point scales with poles: Spanish accent versus no Spanish accent. Average accentedness scores were computed across the three linguistic judges for each speaker. In a separate section of the scoresheet, the linguists gave free-form comments concerning unusual speech features for each reader.

On the basis of the preliminary session data, 9 test speakers were selected. Of the 36 readers, 5 speakers were eliminated due to being judged as dysfluent. Nine speakers were eliminated due to the judges' opinion that they evidenced extraneous pronunciation differences (e.g., Black English features, South Midlands accent, lisp). One speaker was omitted because of the poor quality of the tape recording of his reading. The 21 remaining speakers were ranked according to average accentedness scores, and 9 test speakers were chosen to represent the entire range of accentedness judgments present. All of the speakers selected were of Mexican origin.

Next, in individual rating sessons each of the three linguists listened to the nine test speakers reading the entire standard passage. Thee different randomized orders of the nine test speakers were recorded, one for each linguist. Each linguist listened to a test speaker and marked the typed manuscript of the passage for the occurrence of phonological variations detected for that speaker. The linguists were free to work at their own pace and to replay sections of the recording.

RESULTS

Preliminary Linguistic Analysis

The nine speakers selected by means of judgments given in the preliminary rating session had average accentedness scores ranging from 1.00 (heavy) Spanish accent to 7.00 (no Spanish accent) with overall $M =$ 4.11 (see Fig. 1). The range of the selected speakers covered the entire length of the Preliminary Scale, and all the speakers were at least 0.3 scale units apart.

Accentedness ratings for the nine test speakers were consistent from linguist to linguist. Accentedness scores had a Spearman correlation coefficient of ρ (8) = 0.891 for linguists 1 and 2, p (8) = 0.898 for linguist
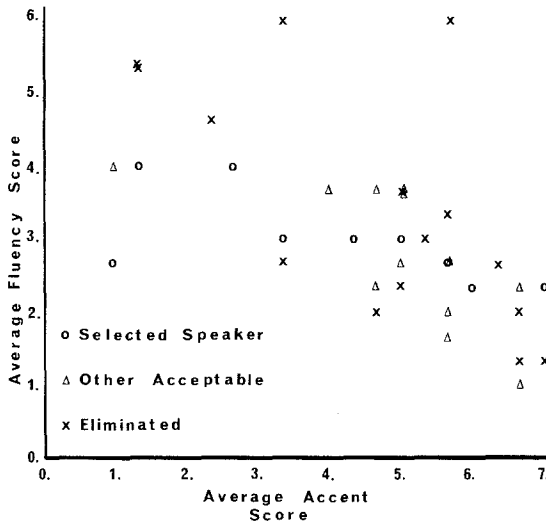
Fig. 1.

1 and linguist 3, and ρ (8) = 0.978 for linguists 2 and 3, all significant at the $p<$ 0.001 level. For all 36 speakers the judges showed similar consistency in accentedness ratings (overall M = 4.62). The Kendall coefficient of concordance corrected for ties was W = 0.841, $p<$ 0.001.

Phonological Linguistic Analysis

Relative frequency scores were computed from the raw data pro-vided by each linguist from the individual rating sessions. The relative frequency of occurrence of an accented pronunciation was determined for a speaker by counting the number of times he produced the pronunciation of interest and then dividing that number by the total number of critical points where the pronunciation could occur. The judgments of each linguist produced a separate relative frequency score for each speaker on all 18 variables.

In addition, an Accentedness Index was computed for each speaker by averaging the 18 relative frequency scores for that speaker. As illustrated in Table II, an overall Accentedness Index was obtained by averaging the accentedness indices over all three linguists for each speaker. Theoretically, the Accentedness Index could range from an overall score of 0.00 indicating no accented pronunciations to 1.00,

Table II. Relative Frequencies of Phonological Variables and Overall Accentedness Index of Three Linguists for Nine Mexican–American Test Speakers

No.	Variables	Speakers[a]									Overall average relative frequency
		1 (Highly accented)	2	3	4	5	6	7	8 (Low accented)	9	
1	~ middle accent	0.11	0.093	0.00	0.037	0.00	0.00	0.00	0.00	0.00	0.026
2	/ae/	0.16	0.096	0.00	0.00	0.0083	0.00	0.00	0.0043	0.00	0.030
3	/I/	0.20	0.22	0.031	0.020	0.0037	0.00	0.0077	0.0080	0.00	0.054
4	/ɔ/ or /ə/	0.46	0.22	0.00	0.019	0.00	0.00	0.00	0.013	0.00	0.079
5	/U/	0.20	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.053
6	/+e#/	0.30	0.30	0.00	0.12	0.00	0.030	0.00	0.00	0.00	0.083
7	/z/	0.57	0.51	0.026	0.021	0.021	0.012	0.0040	0.058	0.0080	0.14
8	/č/ or /š/	0.10	0.58	0.095	0.00	0.00	0.00	0.00	0.017	0.00	0.088
9	/v/	0.31	0.15	0.026	0.00	0.00	0.00	0.00	0.00	0.00	0.054
10	/θ/ or /ð/	0.26	0.11	0.011	0.14	0.19	0.057	0.072	0.053	0.050	0.10
11	/h/	0.76	0.069	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.092
12	/d/	0.32	0.34	0.14	0.19	0.064	0.054	0.028	0.12	0.00	0.14
13	/ŋ/	0.18	0.11	0.14	0.18	0.33	0.15	0.12	0.063	0.045	0.15
14	/ǰ/ or /y/	0.33	0.22	0.058	0.045	0.00	0.00	0.00	0.14	0.00	0.088
15	consonant cluster 1	0.57	0.32	0.26	0.27	0.12	0.20	0.057	0.099	0.022	0.21
16	consonant cluster 2	0.21	0.10	0.13	0.10	0.042	0.021	0.045	0.043	0.021	0.079
17	consonant cluster 3	0.46	0.43	0.65	0.37	0.26	0.17	0.26	0.31	0.037	0.33
18	consonant cluster 4	0.17	0.28	0.27	0.19	0.043	0.058	0.13	0.072	0.029	0.14
	Overall average accentedness index	0.316	0.247	0.102	0.095	0.060	0.042	0.040	0.049	0.009	0.106

[a]Order of speakers was set by scores on the Preliminary Accentedness Scale.

indicating the occurrence of accented pronunciations at every critical point. For the present sample of nine test speakers, Accentedness Index scores ranged from a low of 0.009 to a high of 0.316.

In order to determine the level of agreement among the three linguists on their judgments of phonological relative frequencies, a Kendall's coefficient of concordance ($df = 8$) was calculated for each variable. Of the 18 phonological variables, 12 had interjudge agreement at the $p < 0.01$ level. Variable 1 ($\sim$ middle accent) variable 7 (/z/), and variable 10 (/θ/ or /δ/) showed agreement at the $p < 0.05$ level, while variable 16 (consonant cluster 2) and variable 17 (consonant cluster 3) had agreement among linguistic raters at only the $p < 0.06$ level. Variable 13 (/η/) had agreement at the $p < 0.082$ level. As an overall measure, the linguists' Accentedness Indices agreed at the $p < 0.004$ level for Kendall's coefficient of concordance corrected for ties, $W = 0.948$, and χ^2 (8) $= 22.756$.

To explore the relationship among the 18 phonological variables and the Accentedness Index, correlations were computed for the relative frequency scores and the Index averaged across the three linguists, as shown in Table III. Of the 18 phonological variables only one, variable 13 (/η/), failed to be significantly related to the Accentedness Index ($r = 0.14$). Variable 13 was only significantly related to one of the other 17 features, variable 10 (/θ/ or /δ/) ($r = 0.68$, $p < 0.05$).

The Accentedness Index was found to be highly related to the Preliminary Accentedness Scale with $r = 0.90$, $p < 0.01$. Also, the Preliminary Accentedness scores averaged over the three linguists for the nine speakers were found to be highly correlated ($r = 0.91$) with the Accentedness Index scores. The coefficient of determination, r^2, reveals that 83% of the variance in the Preliminary Accentedness scores was accounted for by the Accentedness Index. Of the 18 phonological variables, 11 individual variables were highly significantly correlated with the overall Preliminary Accentedness scores, $p < 0.01$. Only four of the phonological variables showed no relationship to the Preliminary Accentedness scores: variable 8 (/č/ or /š/), variable 10 (/θ/ or /δ/), variable 11 (/h/), and variable 13 (/η/).

Predictions Involving the Accentedness Index and Accentedness Measures

When comparing the results of the linguistic analysis with those of the previous study (Brennan and Brennan, 1978) it was found that the Accentedness Index scores of each of the nine speakers, averaged over the three linguists, proved to be powerful predictors of the geometric

Table III. Matrix of Intercorrelations of 18 Psychological Variables with the Accentedness Index and the Preliminary Accentedness Index Given by Three Linguists ($N = 9$ Speakers)

	Variable																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Overall average accentedness index	0.96[a]	0.96[a]	0.95[a]	0.95[a]	0.90[a]	0.94[a]	0.96[a]	0.64[b]	0.95[a]	0.67[b]	0.80[a]	0.94[a]	0.14	0.99[a]	0.92[a]	0.87[a]	0.59[b]	0.68[b]
Preliminary accentedness scores	0.82[a]	0.76[b]	0.82[a]	0.74[b]	0.75[b]	0.82[a]	0.78[a]	0.62	0.77[a]	0.60	0.59	0.91[a]	0.33	0.84[a]	0.90[a]	0.87[a]	0.78[a]	0.79[a]
Variable																		
1		0.94[a]	0.95[a]	0.94[a]	0.92[a]	0.99[a]	0.96[a]	0.65[b]	0.92[a]	0.67[b]	0.77[a]	0.93[a]	0.06	0.96[a]	0.86[a]	0.77[a]	0.41	0.55
2			0.93[a]	0.99[a]	0.89[a]	0.91[a]	0.98[a]	0.56	0.99[a]	0.69[b]	0.88[a]	0.84[a]	0.09	0.98[a]	0.84[a]	0.76[a]	0.37	0.41
3				0.90[a]	0.99[a]	0.95[a]	0.98[a]	0.81[a]	0.90[a]	0.52	0.66[b]	0.92[a]	-0.02	0.95[a]	0.78[a]	0.71[b]	0.46	0.62[b]
4					0.84[a]	0.90[a]	0.95[a]	0.47	0.99[a]	0.70[b]	0.92[a]	0.82[a]	0.07	0.98[a]	0.87[a]	0.80[a]	0.38	0.39
5						0.93[a]	0.96[a]	0.86[a]	0.84[a]	0.47	0.58	0.87[a]	-0.04	0.89[a]	0.69[b]	0.59[b]	0.36	0.56
6							0.95[a]	0.71[b]	0.88[a]	0.62	0.69[b]	0.93[a]	0.05	0.93[a]	0.84[a]	0.72[b]	0.39	0.57
7								0.71[b]	0.95[a]	0.60[b]	0.77[a]	0.93[a]	0.00	0.97[a]	0.80[a]	0.72[b]	0.40	0.50
8									0.48	0.10	0.11	0.72[b]	-0.16	0.59[b]	0.39	0.33	0.38	0.66[b]
9										0.67[b]	0.92[a]	0.82[a]	0.07	0.98[a]	0.88[a]	0.82[a]	0.43	0.43
10											0.72[b]	0.56	0.68[b]	0.64[b]	0.67[b]	0.57	0.22	0.09
11												0.61[b]	0.15	0.86[a]	0.82[a]	0.78[a]	0.31	0.19
12													0.06	0.90[a]	0.87[a]	0.82[a]	0.65[b]	0.73[b]
13														0.05	0.24	0.16	0.15	-0.07
14															0.90[a]	0.86[a]	0.51	0.56
15																0.91[a]	0.63	0.59
16																	0.78[a]	0.71[a]
17																		0.86[a]
18																		

[a] $p < 0.01$.
[b] $p < 0.05$.

means of the magnitude estimations for the nine speakers taken over the 80 adolescent judges, $r = 0.83$. In fact, the Accentedness Index accounted for $r^2 = 69\%$ of the variance of the magnitude estimation scores.

The effectiveness of accentedness measures in predicting status and solidarity scores for each of the nine speakers was also analyzed. The Preliminary Accentedness scores, averaged over the three linguists, proved to be highly correlated with status ratings ($r = -0.90$), explaining 89% of the variance of the status scores. Status scores were also found to be moderately correlated with the Accentedness Index ($r = -0.73$, $p<$ 0.05). No accentedness measure was significantly correlated with solidarity scores.

Relationships between individual phonological variables and evaluative reaction scores were explored next. Correlation coefficients were computed for the 18 variables with status and with solidarity scores. Eight of the variables were found to be significantly correlated with status. The most important predictor of status scores was variable 15 (consonant cluster 1) which was highly correlated with status, $r = -0.78$, $p< 0.01$, and which accounted for 61% of the variance of status scores. Seven other variables (variables 1, 3, 6, 12, 14, 16, and 18) were found to be moderately correlated with status, and had correlation coefficients ranging from $r = -0.67$ to $r = -0.75$, $p< 0.05$. No phonological variable was significantly correlated with solidarity.

DISCUSSION

Measures of Accentedness

Both Ryan (1973) and Fishman et al. (1971) have called for the development of an index which would give an overall estimate of the accentedness of a speaker based on the relative frequency of certain phonological features in his speech. The present study has produced such an Accentedness Index and has demonstrated several major applications of the Index.

One of the most important uses of the Accentedness Index was the linking of estimations of accent made by trained linguists with those of naive subjects. When linguists' judgments of relative frequencies of individual phonological variables were combined for a speaker, the combined judgments correlated significantly with the magnitude estimations of accentedness given for that speaker by untrained high school students. The preceding result supports the findings of Brennan et al.

(1975) that magnitude estimations of the accentedness of speakers given by naive subjects were positively related to the frequencies of accented pronunciations found by linguistic judges.

Another major use of the Accentedness Index involved validation of the group administered magnitude estimation procedure. The adolescent raters of the prior study (Brennan and Brennan, 1978) produced consistent magnitude estimations of accentedness and those magnitude estimations were found to be significantly correlated with the Accentedness Index. Therefore, confidence in the usage of the briefer measurement procedure has been increased by finding its reliability to be comparable to individual administration and its demonstrated relationship to the more objective and detailed phonological analysis. The group procedure is evidently time-saving and convenient when a number of group administered instruments are given in conjunction with magnitude estimation.

The Accentedness Index has also provided validation for another simple measure of accentedness, the Preliminary Accentedness Scale. In the present research the Preliminary Accentedness Scale had highly significant reliability among the linguists tested. Since the Accentedness Index was highly correlated with the Preliminary Accentedness Scale, the index served to validate that scale as accurately reflecting the trained linguists' appraisal of the speech samples. This is especially useful since the Preliminary Accentedness Scale is a simple, brief, and direct measurement procedure which can be administered to a group of linguists or linguistically naive subjects.

An additional application of the Accentedness Index for future research concerns the measurement of accentedness found in spontaneous speech. A natural and unstilted example of a person's accented speech is perhaps best obtained in the situation of extemporaneous speaking. Content of the speech can often be controlled through the use of set topics (for example, by asking a speaker to tell about the family customs surrounding Christmas, or by requiring him to retell a story in his own words). Since the Accentedness Index has validated both the Preliminary Accentedness Scale and the group use of magnitude estimation, a simple assessment of spontaneous speech could also be obtained through the use of either technique.

Phonological variables

In her 1973 paper, Ryan suggested that individual phonological variables and indices composed of combined variables could be used to

predict overall linguistic ratings as well as social reactions of listeners to speakers in the Mexican–American community. Ryan's notion is an extension of the work of Labov (1966) who demonstrated that phonological features served as social markers for the population of New York City.

The present experimental results have demonstrated that the relative frequency of occurrence of certain phonological features can be used to predict social status reactions. It was found that 61% of the variance of status scores could successfully be predicted by variable 15 (consonant cluster 1) alone. An additional seven phonological variables were moderately related to status and individually accounted for between 45 and 52% of the variance in status scores. The Accentedness Index was also found to be a significant predictor of status scores. These results support the findings of Williams and Shamo (1972) that the frequency of certain nonstandard pronunciations correlated highly with teachers' downgrading (attributing cultural disadvantagement) of child speakers.

The outcome of the present investigation suggests further research involving phonological variables. Fishman *et al.* (1971) were able to characterize the English and Spanish speech styles of their Puerto Rican subjects in New York by performing a factor analysis on phonological variables of interest. Using factor analysis they were able to identify sets of linguistic traits which are characteristic of a particular type of expression or context. In future research samples of spontaneous speech and of readings such as those collected for the present study could be analyzed for factors of linguistic traits relevant to the speech styles of the accented speakers tested (for example, formal, conversational, or nonstandard).

Another variable which needs to be explored in the light of present data is the attitude of the listener-raters toward their own speech. Labov (1966) suggested that an index of linguistic insecurity can be formed by having speakers of the group of interest choose one of several pronunciations as being the "most correct" and then indicating which of the several pronunciations they themselves will use. In this way an index of perceived discrepancy of own-speech from standard speech can be formed and the relationship of linguistic insecurity to accentedness ratings explored. It can then be determined whether persons who perceive their speech as more nonstandard are more or less adept at judging accented speakers. Also, by using the Accentedness Index or other measures of accentedness developed here, the degree of accentedness in the raters' own speech could be determined and related to their accentedness ratings of other speakers and their perception of their own nonstandardness.

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