The Effect of Recorded Lateral Lisping on Listener Comprehension

Leslie Gene Adkins

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THE EFFECT OF RECORDED LATERAL LISPING ON LISTENER COMPREHENSION

by

Leslie Gene Adkins

A Thesis Presented to the Graduate Faculty of Western Michigan University in Partial Fulfillment of the Requirements for the Degree of Master of Arts

Western Michigan University
Kalamazoo, Michigan
July 1959
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Special acknowledgment is due Mrs. Elizabeth Loring Walker for her aid during the testing situation.

Further appreciation is expressed to Miss Amy Louise Bricker, who served as consulting statistician.
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THE EFFECT OF RECORDED LATERAL LISPING ON LISTENER COMPREHENSION

CHAPTER I

The Problem

This experiment was designed to test the effect of misarticulation on listener comprehension. Of the many authorities who suggest that poor speaking reduces comprehension, Knowles, Phillips, and Koeppl\(^1\) state:

"Poor speaking seems to be the least effective method of presenting informative materials. There is a direct relationship between the quality of speaking performance and the amount of material recall."

One of the important factors which contributes to effective speaking is correct articulation. According to Van Riper and Irwin\(^2\):

"If you misarticulate your speech sounds, it interferes with communication, and your speech is judged as abnormal."

Articulation defects are the major abnormality of speech.


Hall\(^1\) and Irwin\(^2\) write that the functional articulation defectives represent between 75 and 80 per cent of the speech defectives in the school population. Hall\(^3\) concludes:

"Articulation problems have long been recognized as the most prevalent of all the disorders of speech."

Hall\(^4\) defines articulation and disorders of articulation in this manner:

"Articulation can be defined as the production of speech sounds by the stopping or constricting of the vocalized or non-vocalised breath stream by movements of the lips, tongue, velum, or pharynx. Disorders of articulation are faulty placement, timing, direction, pressure, speed or integration of these movements, resulting in absent or incorrect speech sounds."

After viewing these statements, it was believed that a test of the following null hypothesis could throw some light upon the importance of misarticulation in the reception and comprehension of a spoken message. The null hypothesis can be stated in these terms:


\(^3\)Travis, op. cit., p. 707.

\(^4\)Ibid.
Null hypothesis: Recorded misarticulation as opposed to recorded correct articulation does not affect the comprehension of listeners.

Review of the literature: If misarticulation can interfere with the reception of a spoken message and cause speech to be judged abnormal, three questions arise: "What type of response does misarticulation produce in the listener?", "Does this response interfere with the listener's comprehension?" and "What type of misarticulation makes speech less intelligible?". Estes\(^1\) reports:

"The result of a period during which a disturbing stimulus is associated with the stimuli which normally act as an occasion for the occurrence of the response is a depression in strength of the response during subsequent periods of extinction very similar to that produced by a period of actual punishment of the response."

In other words, a disturbing stimulus arouses a changed state in the organism of the sort commonly termed "emotional" and a great part of the initial effect of punishment is due to this sort of conditioning\(^2\).

---

\(^1\)Estes, W. K., "An Experimental Study of Punishment," *Psychological Monographs*. LVIII (1944), 35.

\(^2\)op. cit., p. 36.
According to Homann¹:

"We may then say that when stuttering (the disturbing stimulus) accompanies speech (the stimulus which normally act as an occasion for the occurrence of the response) there will be an interference effect in listening comprehension (depression of the strength of the response)."

Translating this into the frame of reference of this study, one may say that misarticulation is poor speaking and lacks intelligibility which interferes with listener's comprehension.

According to the editors of Webster's Collegiate Dictionary², intelligibility is defined as possessing the quality of being understood or being comprehensible. Therefore, for the purpose of this study, comprehension and intelligibility will be considered to be synonymous.

Some research on the listener reaction to articulatory defects is reported by Dietze³. After submitting seven samples of recorded defective speech to a listening panel, he found that faulty articulation reduces intelligibility in proportion to the number of errors.


Hall\textsuperscript{1} reported that:

"Errors on one or two sounds, while often conspicuous and inattractive, do not usually affect seriously the intelligibility of the individual's speech."

Hall\textsuperscript{2} concludes:

"Intelligibility is related to the number of sounds defective and the particular sounds which are defective."

Kleffner\textsuperscript{3} supports these two studies with his study of group reaction to recorded examples of defective and non-defective articulation. He found that there was a reaction to many errors rather than few errors. But a single, consistent error on a sound which occurred frequently produced a negative response.

Garwood\textsuperscript{4}, in a study of defective articulation and intelligibility, found that there was a direct relationship between the number of speech errors and the misperception of the words used in his experimental situation. The listening group was most consistent in

\begin{itemize}
\item \textsuperscript{1}Travis, op. cit., p. 711.
\item \textsuperscript{2}ibid.
\end{itemize}
their judgment when perceiving consonantal errors.

There are some other opinions and studies on the
effect on intelligibility of many articulation errors
versus few articulation errors. Hall¹ adds:

"The degree of articulatory defect, therefore,
has to be evaluated in terms of the degree of
misarticulation, the consistency of misarticu-
ation, the importance for intelligibility of
the specific sounds involved, and the number of
different sounds involved."

Thus it would seem that there are many factors to be con-
sidered. Van Riper and Irwin² conclude:

"It seems quite reasonable, therefore,
to expect that when the misarticulation
occurs on a frequently used sound it will
cause a greater listener evaluation than
when it occurs on a sound used very rarely."

This study is concerned with the misarticulation of
a specific, frequently used sound, the sound of the letter
"s" which is written phonetically /s/. According to
Dewey³, this sound, /s/, is fourth in the relative
frequency of occurrence of the 24 consonants of the
English language. In Van Riper's⁴ study of the persistence

¹Travis, op. cit., p. 712.
³Dewey, G., Relative Frequency of Occurrence of English
Phonemes. Cambridge, Massachusetts: Harvard University
Press, 1923, pp. 125.
⁴Van Riper, Charles, "Persistence of Baby Talk Among
Children and Adults." Elementary School Journal, XXXVIII,
672-675.
of baby talk among children and adults, he found that the
most frequently missed single consonant was /s/. Therefore,
the misarticulation of this sound would seem to be suitable
for this study.

What error of the /s/ phoneme would be most noticeable?

Van Riper and Irwin remarked:

"Some errors are more noticeable than others. The substitution of an unvoiced /l/, blown out in
a spray of saliva, will call attention to itself much more quickly than will the distorted, low-
pitched /s/ that is produced with the upper and lower teeth too far apart."

The production of the defective sound is explained by

Swerzbin in this manner:

"When the pressure of the tip of the tongue, or the part just behind the tip comes into com-
plete contact with the tooth ridge, preventing the formation of a central aperture for the
emission of the breath, the breath is then forced out over one or both sides of the tongue. The
thick mushy sound thus produced is called a lateral emission lisp. Its phonetic symbol is /l/.

Van Riper gives this sample of the lateral lisp:

"Other children shwirt the air stream over the
side of the tongue and are shed to have a later-
al lisp."

---


University, Kalamazoo, Michigan, May 1956, p. 5.

3 Van Riper, Charles, Speech Correction, Principles and Methods, Third Edition. Englewood Cliffs, New Jersey:
Hall comments on the acoustic result:

"The lateral lisp is so named because of this essential characteristic of unilateral or bilateral rather than central emission of breath. The acoustic result is conspicuous and highly unpleasant. It has a 'slushy' sound as though an excess of saliva were present."

Because of this conspicuousness and unpleasantness, the author chose this defective sound for this study in order to determine how it might affect listener comprehension.

Nichols, in his experiments to discern the factors present in listening comprehension, concludes:

"There was evidence to indicate that the following factors influenced the listening comprehension of the students who served as subjects in the study: intelligence, reading comprehension, recognition of correct English usage, size of the listener's vocabulary, ability to make inferences, ability to structuralize a speech (that is, to see the organizational plan and the connection of the main points), listening for the main ideas as opposed to specific facts, use of special techniques while listening to improve concentration, real interest in subject discussed, emotional adjustment to the speaker's thesis, ability to see significance in the subject discussed, physical fatigue of the listener, audibility of the speaker."

It would seem that any combination of these and other features would affect the comprehension of the listener and one would expect lateral lisping to decrease comprehension.

---

1 Travis, op. cit., pp. 719-20.

But Miller\textsuperscript{1} reports some unusual findings on the distortion of speech sounds and its affect on listener comprehension.

"Under some conditions he (the talker) can be understood satisfactorily even when his voice is turned off more than half the time.

"In one experiment the listener was prevented from hearing the first fractional portion of the nonsense syllable spoken by the talker. A voice relay was used that did not complete the communication circuit to the listener until some fixed interval after the talker's voice had begun. When the first .06 seconds of a consonant was lopped off, the listener still got the sound right about one-half as often as they did when none of the consonant was missing. If meaningful words were used in complete sentences, the whole consonant might be eliminated without disturbing the listener's response. Even in the absence of these contextual clues, the listeners were able to discriminate individual consonants half the time when half the consonant was present.\textsuperscript{2}

"It is not until ninety per cent of the speech wave is blanked out that none of the words can be discriminated. With only twenty-five per cent of the speech wave present, it is possible to discriminate about sixty-five per cent of the monosyllabic words.\textsuperscript{3}

"Apparently, under otherwise optimal conditions, we could double our normal rate of talking without becoming unintelligible.\textsuperscript{4}

"When larger units — phrases or sentences — are used, the listener is set to supply certain blanks in certain ways according to the words preceding and following the blanks. Here again


\textsuperscript{2}op. cit., p. 70.

\textsuperscript{3}op. cit., p. 71.

\textsuperscript{4}op. cit., p. 74.
an extravagant supply of discriminative clues is provided for the recipient. Whole words can often be replaced correctly when they are missing from a sentence."

Considering these findings that speech can be so mutilated and still be understood increases one's respect for the resilience and dependability of vocal signaling systems. We can throw away completely large portions of speech without altering the listener's correct comprehension. If this is true, one would expect that even large, consistent amounts of lateral liping would not significantly decrease communication. The testing of the null hypothesis should ascertain whether or not this is indeed the case.

\footnote{op. cit., p. 77.}
CHAPTER II

The Method

The test. An appropriate means for testing the null hypothesis that recorded lateral lisping as opposed to recorded correct articulation does not affect the comprehension of listeners, is the Brown-Carlsen Listening Comprehension Test. The test has two comparable and equivalent forms, Am and Bm. The test, according to the authors¹, "has been constructed to measure the ability of students to comprehend spoken language." The two comparable forms, Am and Bm, have 76 test items. These test items are divided under five parts, each measuring a listening skill:

"Part A. Immediate recall, which measures the ability to keep a sequence of details in mind until a question is asked which requires thinking back over the sequence;

"Part B. Following directions, which measures the ability to follow oral directions;

"Part C. Recognizing transitions, which measures awareness of the functions of transitional words and phrases within sentence contexts;

"Part D. Recognizing word meanings, which measures the ability to recognize the meanings of words from context;

"Part E. Lecture comprehension, which measures the ability to listen for details, get the central idea, draw inferences, understand the organization, and note degree of relevancy in a brief lecture."

For the purposes of this study, only part E of forms Am and E were used. Homann\(^2\), in his study of the effect of recorded stuttering on listener comprehension, found these two forms, E\(_{AM}\) and E\(_{BM}\), to be equal in difficulty. Tape recordings were made of each selection by the same speaker. He recorded both forms, E\(_{AM}\) and E\(_{BM}\), using a Revere Electromagnetic Tape Recorder (model T-1100, serial number 87983) and Scotch magnetic, plastic tape (Minneapolis-Moline Manufacturing Company), with correct, normal articulation on form E\(_{AM}\) and lateral lisping on form E\(_{BM}\). In order to obtain as accurate and characteristic a sample of the lateral lisping as possible, the tape-recordings were recorded by an experienced speech therapist who trained himself to produce the defective sound consistently.

Analysis of the recording containing the lateral lisping. After the recording was completed, form E\(_{BM}\) was analyzed to determine the number and percentage of words lisped upon. Table I presents this analysis compared with the same analysis from the study by Homann.\(^3\)

---

1 op. cit., pp. 2-3
2 op. cit., pp. 30-1.
3 loc. cit., p. 10.
Table I
ANALYSIS OF TAPE-RECORDINGS OF FORM EBM
of the
BROWN-CARLSEN LISTENING COMPREHENSION TEST
ADKINS AND HOMANN

<table>
<thead>
<tr>
<th>Number of words in passage</th>
<th>Number of defective words</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adkins: 1687</td>
<td>292</td>
<td>15.47</td>
</tr>
<tr>
<td>Homann: 1687</td>
<td>292</td>
<td>15.47</td>
</tr>
</tbody>
</table>

As Table I presents, both studies used the same reading passage with the same number of words in the passage, the same number of defective words, and the per cent of defective words in the passages is identical.

Severity of misarticulation. In order to determine the severity of misarticulation, the tape-recording of form EBM was analyzed on the basis of Milisen's\(^1\) scale of error severity. Here are the seven steps of that scale as listed by Van Riper and Irwin\(^2\):

1. Sound is made correctly.
2. Sound is mildly indistinct and will probably be recognized as such by a speech teacher.


\(^2\)op. cit., 16.
or someone else who is particularly interested in the English language, but possibly will not attract the attention of the average layman.

3. Sound is moderately indistinct and perhaps will attract the attention of the average layman to the speech of the individual, but will not be particularly annoying to him.

4. Sound is sufficiently indistinct to clutter the speech and to distract the average listener's attention from the speech content and occasionally cause him to misunderstand the words in which the sound occurs.

5. Sound is so severely indistinct that the average listener will not recognize it and will therefore fail to recognize many words in which the sound is used.

6. Sound is substituted by another sound.

7. Sound is omitted."

According to the scale, the error severity of the misarticulation on the tape-recording would be six (6) since for the normal sibilant another sound was substituted, the /l/ for /s/.

**Consistency of misarticulation.** The incorrect substitution, /l/ for /s/, occurred in every word in which the "s" phoneme normally occurs. The exceptions were those words in which the /s/ occurred more than once. In those instances, the correct sound was inserted for the initial /s/ sound in the word but the remaining /s/ sounds were pronounced correctly. The total number of words involved
was 291. One additional word, "has", was pronounced with the incorrect sound, /h/, so that the total number of words involved in form $E_{BM}$ would exactly equal the number of words involved in that form in the study by Homann\(^1\). This was done to make it possible to compare these two studies in order to determine the difference, if any, between the results of recorded misarticulation and recorded stuttering on listener comprehension. The words misarticulated in form $E_{BM}$ will be found in Appendix A.

Method of administration. Since the forms $E_{AM}$ and $E_{BM}$ were equal in difficulty, the lisped form $E_{BM}$ and the correctly articulated form $E_{AM}$ were administered to two groups of college students in the following manner:

**Table II**

**The Method With Which a Group of College Students Were Tested With the Brown-Garlsen Listening Comprehension Test, Forms $E_{AM}$ and $E_{BM}$**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Class Period</th>
<th>Tape-Recordings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Lisped, $E_{BM}$</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>Correct, $E_{AM}$</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Correct, $E_{AM}$</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Lisped, $E_{BM}$</td>
</tr>
</tbody>
</table>

\(^1\)op. cit., p. 10.
Two class periods of 30 minutes were used to play each tape-recording for each group of subjects. The order in which the tape-recordings were administered was reversed (see Table III) to allow for fatigue, test sophistication, and familiarity with the types of material used. In order to see the effect, if any, of lateral lisping on the comprehension of listeners, the results of these four testing situations were then statistically evaluated.

The subjects. The twenty-eight subjects were volunteers from graduate classes in Education, Speech, Special Education, and Business. There were twelve males and sixteen females. Their ages ranged from 28 to 52 with 30.8 being the mean of their ages. The ages of the subjects will be found in Appendix B.

The testing situation. The tests were administered in two class rooms in the Health Services Building of Western Michigan University. The two tape-recordings were presented in the same manner. An answer sheet and pencil was given each student. The test, instructions, lecture, and questions, was tape-recorded and played for each class with the volume and tone setting at a constant level. The tape was not stopped once it had been started except as directed in the instructions given before the questions in the Brown-Carlsen Listening Comprehension Manual of
Directions. These instructions are:

"In this part I shall read you a fairly lengthy selection entitled 'Improving Your Reading Ability.' Listen carefully as I read because, after I have finished, you will be required to answer questions about the selection. Do not take notes on what I read. Just listen carefully.

Lecture

"That is the end of the lecture. Now turn over your answer sheet. Look at the sample. The question is, 'What is the title of the lecture?' Decide which of the five choices given is correct. Choice 'c', 'Improving Your Reading Ability' is the correct title. Therefore, the answer space under 'c' has been filled in on the answer sheet. Are there any questions? Listen carefully; I shall read each question only once."

The subjects, so far as could be ascertained, had no difficulty and followed the instructions with ease. None of the subjects or scores were omitted from the analysis.

---

1 op. cit., 10-12.
CHAPTER III

The Results

Method of evaluation. The raw scores of all individuals in each group were grouped and their means computed. An analysis of variance was then carried out to determine whether the differences between the means were significant or not. For this purpose, t-scores were procured for all the samples. The t-score is defined as the ratio of a standard deviation to a standard error. It measures the validity of the difference between two means by taking into account the probable amount of variation from those means which might be expected to occur on the basis of a normal distribution. We can, therefore, determine by use of the t-scores whether the differences between the means of the groups tested are statistically significant or not. By translating these t-values into confidence levels, we can also determine the degree of significance. If the t-scores are high enough, we can be more confident that there is a significant difference between the means and that this difference has not occurred by random sampling errors. If the t-score reaches a five per cent level of confidence, this means that the difference between the means is a significant difference and that we would probably find this result again in ninety-five cases out of a hundred (five
per cent), there is likely to be no difference. We can be sure that in a t-score that reaches the one per cent confidence level, in ninety-nine cases out of a hundred the difference would probably occur again were the experiment to be repeated.

The greater the number of cases used in an investigation, the lower the t-score would need to be in order to be significant. This is because a greater freedom of variation in the differences is allowable. This "freedom to vary" is called a degree of freedom and it is the number of subjects used in an investigation minus one. The greater the degrees of freedom (the greater the number of cases) the more the deviations can be scattered about the mean and still let the difference be significant. Therefore, with more cases the t-score can be lower to come within the one or five per cent confidence levels.

The formulae for computing the standard error of the deviations and the t-scores are:

\[ \delta_{Ed} = \sqrt{\delta^2_{m1} + \delta^2_{m2}} \]
\[ T = \frac{M_a - M_b}{\delta_{Ed}} \]

---

Results of groups one and two. The results of groups one and two were compiled in the following manner:

Table III

COMPREHENSION SCORES FROM GROUPS ONE AND TWO GIVEN THE CORRECTLY ARTICULATED FORM EACH OF THE BROWN-CARLSEN LISTENING COMPREHENSION TEST

<table>
<thead>
<tr>
<th>Scores</th>
<th>Frequency</th>
<th>d</th>
<th>( d^2 )</th>
<th>( \overline{fd}^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>1</td>
<td>-6</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>-5</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>-4</td>
<td>16</td>
<td>64</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>-3</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>-2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>-1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>13.1 = Mean</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>15</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>16</td>
<td>6</td>
<td>3</td>
<td>9</td>
<td>56</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>4</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

\[ N = 28 \]

Mean = 13.1

Standard Deviation = \( \sqrt{\overline{fd}^2 / N} = 2.8 \)

As Table III shows, the mean comprehension score of the subjects was 13.1 and the standard deviation from that mean was 2.8.
Table IV

COMPREHENSION SCORES FROM GROUPS ONE AND TWO GIVEN THE LISPED FORM BHM OF THE BROWN-CARLSEN LISTENING COMPREHENSION TEST

<table>
<thead>
<tr>
<th>Scores</th>
<th>Frequency</th>
<th>d</th>
<th>d²</th>
<th>rd²</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>-6</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>-5</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>-4</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>-3</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>-2</td>
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<td>12</td>
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<td>11</td>
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<td>-1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>12.2</td>
<td>Mean</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>3</td>
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<td>3</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>15</td>
<td>5</td>
<td>3</td>
<td>9</td>
<td>45</td>
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<td>16</td>
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<td>4</td>
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<td>32</td>
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<td>1</td>
<td>6</td>
<td>36</td>
<td>36</td>
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</table>

N = 28
Mean = 12.2
Standard Deviation = $\sqrt{\frac{\sum d^2}{N}} = 3.1$

As Table IV shows, the mean comprehension score of the subjects was 12.2 and the standard deviation from that was 3.1.
Comparison of lisped and correctly articulated forms.

The results of this testing were compiled and statistically evaluated for the equality of lisped form $E_{BM}$ and correctly articulated form $E_{AM}$ of the Brown-Carlsen Listening Comprehension Test. An analysis of the significant difference as described on pages 27 and 28 was performed with the following results:

Table V

A STATISTICAL EVALUATION OF CORRECTLY ARTICULATED AND LISPED FORMS $E_{AM}$ AND $E_{BM}$ OF THE BROWN-CARLSEN LISTENING COMPREHENSION TEST

<table>
<thead>
<tr>
<th>Test Form</th>
<th>Mean</th>
<th>S.D.</th>
<th>$\delta m$</th>
<th>$\delta p$</th>
<th>t</th>
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<td>2.8</td>
<td>59</td>
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<td>12.2</td>
<td>3.1</td>
<td>60</td>
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<td></td>
<td>0.84</td>
<td>1.07</td>
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</table>

The mean raw score on the correctly articulated form of the Brown-Carlsen Listening Comprehension Test was 13.1 and the standard deviation from that mean was 2.8 with an error of the mean of .59. The mean raw score on the lisped form of the Brown-Carlsen Listening Comprehension Test was 12.2 and the standard deviation from that mean was 3.1 with an error of the mean of .60. The standard error of the means was .84 and the $t$-score was 1.07.
According to Guilford\(^1\), to have a statistically significant difference between the two forms \(E_{AM}\) and \(E_{BM}\), it was necessary to have t-values in excess of 2.771. Since the t-value obtained was 1.07, which is far below this value, it can be concluded that there is no statistically significant difference in the ability of subjects to comprehend the misarticulated and correctly articulated forms \(E_{BM}\) and \(E_{AM}\) of the Brown-Carlsen Listening Comprehension Test.

In terms of the null hypothesis, recorded misarticulation as opposed to recorded correct articulation does not affect the comprehension of listeners.

\(^1\) op. cit., p. 609.
CHAPTER IV
Conclusions and Recommendations

Conclusions. The t-value obtained from comparison of performances of the subjects on the correctly articulated and lisped forms $E_{AM}$ and $E_{BM}$ of the Brown-Carleen Listening Comprehension Test is 1.07. This t-value is far below the value needed to show significant difference. The results of this experiment reveal that recorded lateral lisping of this severity and frequency, as opposed to recorded normal articulation, does not have a statistically significant effect in altering the comprehension of listeners. In terms of the null hypothesis, misarticulation as opposed to recorded correct articulation does not affect the comprehension of listeners.

Discussion of the results. There are several implications of this research. The most important significant finding is the possibility that lateral lisping may not be a disorder of communication. Although the lateral lisping may be considered abnormal, the correction of such misarticulation should probably not be stated in terms of a goal of increasing listener comprehension. In other words, the opinion that lateral lisping impairs listener comprehension may not be necessarily true.
Since this study is similar to Homann's\(^1\) study of the effect of recorded stuttering on listener comprehension, it seems appropriate to comment on the two studies. These two studies were similar in that the number of subjects, testing instrument, and the percentage of words involved were identical. Although the misarticulation seemed to have a slightly greater effect on listener comprehension than did the stuttering, the results of the two studies seemed to be similar. Stuttering and lateral lisping, as presented in these studies, did not have a statistically significant effect in altering the comprehension of listeners.

**Recommendations for further study.** Foremost among the implications brought forth by this study is the need to test the null hypothesis in person-to-person communication. In such an experimental design the effects of the communicative interaction between two individuals could be determined. It might also be possible to carry this further by experimenting with the effect of misarticulation on listener comprehension in conversation as opposed to the present use of reading material. It is also recommended that researchers compare the effects of misarticulation on different groups of listeners. Would a group of non-college subjects, for example, be less affected by

\(^{1}\text{op. cit., pp. 44-5.}\)
misarticulation than a group of college students? Would a group of speech therapists, for example, be more affected by misarticulation than a group of laymen who were not so particularly interested in the role of good speaking in oral communication? Finally, a repetition of the present study could be performed using either a greater number of substitutions of the misarticulated sound, or using the lateral lisp for all the sibilant sounds. It is tenable that other articulatory errors might have a greater effect upon listener comprehension than would the lateral lisp error which after all is a sibilant fairly similar to the "s" and "z" phonemes.
CHAPTER V
The Summary

The problem: The purpose of this study was to determine the effect of recorded lateral lisping as opposed to recorded correct articulation on listener comprehension.

The method: The Brown-Carlson Listening Comprehension Test, forms EAM and EBM, was selected as the testing instrument. In order to perform the experiment, forms EAM and EBM were administered to two classes of college students. The twenty-eight college students were divided into two equal groups. One section was given one form of the test first, and then after an appropriate interval, the second form of the test was administered. The other section was given the two forms of the test in reverse order. This procedure was followed so as not to introduce such errors as fatigue, test sophistication, and familiarity with the types of material used in the test.

The results: Through appropriate analysis of variance, it was found that when the reading passages were spoken with a percentage of 15.47 lisped words, the recorded lateral lisping as opposed to recorded correct articulation did not have a statistically significant effect on listener comprehension.
BIBLIOGRAPHY


Estes, W. K., "An Experimental Study of Punishment." Psychological Monographs, LVII (1944), No. 3 (Whole, No. 263).


APPENDICES
### APPENDIX A

A list of the words containing the lateral lisp on form EEM of the Brown-Carlsen Listening Comprehension Test

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### APPENDIX B

**INDIVIDUAL RAW SCORES ON FORMS EAM AND EBM on the BROWN-CARLSEN LISTENING COMPREHENSION TEST**

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APPENDIX C

FORM EAM
of the
BROWN-CARLSEN
LISTENING COMPREHENSION TEST

Increasing Your Vocabulary

A good vocabulary is important for several reasons. First, words win arguments -- they persuade, they convince.

Once Lincoln, having failed to make a stubborn opponent see the error of his reasoning, said, "Well, let's see. How many legs has a cow?"

"Four, of course," came the ready answer.

"That's right," said Lincoln. "Now suppose we call the cow's tail a leg, how many legs would the cow have?"

"Why, five, of course."

"Now that's where you're wrong," said Lincoln. "Simply calling a cow's tail a leg doesn't make it a leg."

Second, you need a good vocabulary to make clear, concise explanations. Sometimes one word, provided it is the right one, explains everything. For example, once when Paderewski played before Queen Victoria, the sovereign exclaimed with enthusiasm, "Mr. Paderewski, you are a genius!"

"Ah, your Majesty," he replied, "perhaps; but before I was a genius I was a drudge."

Words are important for a third reason -- to illuminate
experience. Max Eastman, writing about how to enjoy poetry, says, that most Americans, confronted with a poem, mistake it for a conundrum. They think their part is to dodge the simple impact of the words, and sneak behind them in search of a moral, or a piece of extra-subtle information.

Poetry is using words, not to record or convey information, but to cherish or illuminate experience. If the poet can communicate to you the refined, essential quality of any genuine moment of his life, or any imagined life, that is enough. Don't ask for more. If you get something more, it is so much velvet. But if you are anxiously on the watch for it, you will miss the whole thing.

Eastman then goes on to mention a poem of his called "Egrets," which attempts to give something more. He says: "I once had a friend in Texas who loved to paddle around marshy islands taking wonderful pictures of these slender, broad-winged, snowwhite birds. One day while we were looking at his pictures, my friend's tall, slim daughter, the most beautiful thing I saw in Texas, sat silently on the arm of her father's chair, attentive yet remote. In my feelings, her beauty merged in some subtle way with that of the birds and furnished the inspiration for my poem "Egrets," which describes her as being 'kin to their slim hauteur,' as being 'gentle and yet far away as wings upon wild water.'"
Finally, words make the difference between boring or interesting someone. You may have fascinating things to tell, but you need the right words if you want to make them truly interesting. Notice how the right words make this an interesting story.

The country is India. At a dinner party the talk had turned to poise and self-control, and the old dispute: Which was more reliable in a crisis, man or woman? The males present, army officers and civil servants, agreed that women were the masterpieces of creation; their one defect was that they went into hysterics in a crisis. That was when you needed men.

All the ladies placidly concurred, except the hostess. At the height of the discussion she called a native boy.

"Ali! Kindly fetch a bowl of milk at once and put it on the floor."

With a terrified roll of his eyes the boy ran to obey, placing a jade bowl on the flagstone, close to the mistress of the house. Then he stood back, holding a looped whip in his hand, as, from under the white napery of the table, there alithered a long bleated thing, yellowish-brown with black and white marks. The cobra approached the milk and the native boy fell on it and killed it.

"Well," puffed a red-faced colonel, "how on earth did you know that snake was under the table?"
"It was coiled," replied the hostess, "around my ankle."

Now let's see how we may increase our vocabulary. In other words, since vocabulary is so all-important, how can we build one that will convince, explain, or interest others more effectively?

In the first place, what about the G.I. way of building a foreign-language vocabulary? Wouldn't that work equally well with strange English words?

Take Fernandez, a shy Mexican from one of the big sheep ranches of the southwest. When the Army picked him up at 18 and started him on basic training, he was desperately homesick. He couldn't write home. And when anyone sent him a letter, he couldn't read it.

At Fort Riley they put him in the Special Training Troop with other representatives of our nation's 4,000,000 illiterates. After 8 weeks he was able to sign the payroll and was crazy with happiness. At the end of 13 weeks he was following the news and writing letters home.

Such "go-devil" teaching is common in the Army and Navy.

Think of the 2 or 4 years usually spent in studying French or Spanish. In the Army they teach you the bread-and-butter essentials of a language in 8 to 12 hours.

Suppose our schools take up the Army-Navy technique. You'll find the class around a phonograph, learning as a child learns his own language--by listening to and imitating
a native speaker. After 15 to 20 minutes' work with records, the teacher fires simple questions at the students. All questions, all answers, even from the first lesson, are in the foreign tongue.

This language technique emphasizes the importance of using the words added to your vocabulary.

Then, there is the dictionary-study way. The dictionary has had a fascinating history in this country, from the time Noah Webster first got interested in preparing one.

At the end of his first year's work, Webster estimated that his dictionary would require the incessant labor of 5 years more. It required 18, and it was in 1828 that his American Dictionary of the English Language was published. It contained 70,000 entries.

But $20 was a high price, and many of the 5500 original sets were still unsold in 1840, when Noah brought out a revised edition at $15. This went badly, too. After Webster's death, the Merriams, small job printers, obtained his copyrights and began a new revision of the dictionary.

Its publication in 1847 -- one volume, $6 -- was an immediate success. Slightly more than a hundred years later the big Webster's New International Dictionary, Second Edition, appeared. Its editor-in-chief, Nielson, was assisted by 207 special editors, expert in such diverse fields as astrophysics, locksmithing, and archery.
Now how should this invaluable reference book be used as a vocabulary-building aid? Well, we can learn a few things from Uncle George, who was as fond of words as an entomologist is of ants. The first thing he did when he came to pass the winter with us was to have the big dictionary brought into the dining room. Hardly a meal was finished without some of us children jumping up to consult that dictionary. We found we could have as much fun with it as with any game we played.

One morning Uncle George asked if we knew what exiguous meant. "Well, I sort of half know," I said.

"If you don't know exactly," Uncle George replied, "you can't use it properly. It's like recognizing a man by his clothes. You can identify him, but you don't know much about his character."

After I'd consulted the big dictionary, Uncle George said, "Now repeat the word aloud three times."

He insisted that we must use each new word in a sentence at least three times a day. Somehow the new words made us feel mentally richer. When we talked we had a feeling of confidence, the way you do when you have money.

Uncle George would also show us what interesting stories the dictionary contained. He had us look up the word nice and read the dictionary story of a word that insisted on being a compliment instead of an insult.
"Give me three words derived from the names of three cities," he used to say in another of his dictionary word-games. And so it went. That's how Uncle George showed us the fun of using the dictionary.

Suppose we use a concise statement by Funk to summarise this approach. He says, when you read or hear an unfamiliar word, make a note of it and look it up later in the dictionary. If you think it will be useful to you, write it down with its pronunciation and its simple definition. Then say the new word out loud several times and use it as soon as possible in your conversation or in a letter. Be sure to review your list from time to time for new words slip easily from the mind.

Then there is the synonym-study way. A study of synonyms is one of the surest ways of enriching your vocabulary. But very few words are exactly alike. For instance, hate, loathe, despise, abhor, detest, and abominate are synonyms, but each shows a slightly different facet of one central idea. Watch the car cards, the billboards, the advertisements in magazines and newspapers. Pick out the striking words and see how many synonyms you can think of for each of them.

And don't overlook the derivation or word-history approach. Searching out the history of a word often helps clarify and fix its meaning. When we find, for instance,
that crestfallen refers to the drooping coxcomb of a rooster that has been beaten in a fight, and that sediment really signifies something that "sits" on the bottom, these words become more vivid. Word histories are both fascinating and helpful.

The word-a-day plan, the last of the five methods to be recommended, stresses regularity and orderliness. You may loaf along at a one-a-day rate or step along at a five-a-day speed, depending on how ambitious you feel. It has been proved again and again that if you will regularly add new words to your vocabulary, and use them accurately and aptly in your conversation, you will increase your self-confidence, and gain wider social acceptance and greater influence in your community.

So much for the separate methods. Whichever method or combination of methods you decide to use, remember that the important thing is to tailor it to your own needs. A method that suits some people may not suit you, although you can probably modify it to do so.
Good reading is important for several reasons. First, reading gives power to learn.

When Edison was six years old, he came home from school with a note from his teacher, saying that he was too stupid to learn.

"Why?" his mother asked the teacher.

"He can't learn to read," replied the teacher.

"I will teach him myself," answered the mother. And she produced an inventor.

Second, you may gain inspiration for your entire life through reading. For example, Lincoln's stepmother was just a homebody, but she inspired and taught the son of her husband and guided his reading. In later years, Lincoln wrote, "The greatest book I ever read, you asked me? My mother."

Reading is important for a third reason — to help you understand your own experience. Louis Untermeyer, writing about how to enjoy poetry, says that most young people confronted with a poem make it an academic exercise. They think their part is to figure out the rhyme scheme and to notice the figures of speech.
Reading poetry is reading not to get information or to notice how words are used, but to understand your own experience. If the reading can convey to you something about life that you have already felt or something new to you that you have not thought, that is enough. Don’t ask for more. If you get the rhyme scheme and the figures of speech, well and good. But if you concentrate on these, you will miss the whole thing.

Here, for instance, is a poem written by Walt Whitman. He called it "When I Heard the Learned Astronomer." Perhaps Walt Whitman had been to a lecture given by one of the famous astronomers of his day. He had looked at charts and pictures of the myriads of stars in the heavens looking like intricate designs of pin pricks in a piece of blue-black paper. The sky searcher had told the audience how large various ones of the pin pricks were in reality, and how many years it would take a ray of light from one of them to reach the earth. The lecturer had speculated on the origin of the universe and the number of years before it would be destroyed. The room was hot and stuffy, and people moved restlessly in their chairs. Whitman had the feeling that all of this knowledge of the lecturer did not seem very profound. And so he wandered out into
the clear night air. Later he wrote:

"When I heard the learned astronomer,
When the proofs, the figures, were ranged in columns before me,
When I was shown the charts and diagrams, to add, divide, and measure them,
When I sitting heard the astronomer where he lectured with much applause in the lecture-room,
How soon unaccountable I became tired and sick,
Till rising and gliding out I wandered off by myself,
In the mystical moist night-air, and from time to time,
Looked up in perfect silence at the stars."

Finally, reading often will mean the difference between being a boring or an interesting person. Often you may find yourself with a group of strangers and cast about for a subject of conversation. Usually the person who has the most interesting things to talk about is the person who has read widely. The story is told of a shoe salesman who found himself at a dinner party in the home of a prospective client. His hostess seated him on her right and, during the dinner, tried one subject after another to interest him.

"Did you see the exhibit of paintings in the museum?"

No he had not seen the exhibit.
"What do you think the Dodgers will do this season?"
He replied that he seldom followed the sport pages of
the daily papers.
"Isn't it appalling about the new income taxes?"
the hostess asked.
The salesman was still silent. He had not been fol-
lowing very closely what the new taxes were to be. The
hostess was getting a little desparate.
"Have you read about the new varieties of flowers
that are being introduced this season?"
Finally, the salesman turned to her and said, "Madame,
you have been trying to find something to talk about with
me. Why don't you try shoes? That is the only subject I
really know about."

Now just what can you do in order to improve your
reading? What methods will help you to gain skill so that
you can be inspired, or interested, or knowing?

Well, first of all, there is the forcing method. You
can do something to improve yourself simply by making your-
self speed up in your reading. Take the case of John
Patterson, a farmer in Minnesota. He didn't read much
except his agricultural journals. Most of that reading
had to be done slowly because he wanted to figure out
from the writing and diagrams just exactly how to plow his
field or how to construct a chicken brooder. Thus, when
he read a paper or a magazine story, he tried to read it in the same way. One day he came across a magazine in a barber shop that gave the number of minutes it should take the average reader to complete each article or story. John found that he took far longer than the average. He decided to try and see if he couldn't beat his own record. So he borrowed the magazine. At first he forced his eyes to move so fast that he was not understanding what he read. But soon he could whip through an article and still understand most of what was in it. He discovered also that he could read his agricultural journals more rapidly and still follow the detailed descriptions given. You can do quite a bit to improve your reading just by forcing yourself to read faster.

Then there is the observation approach. To read well, you need to know just what happens to your eyes as you read. Sometime sit on the floor in front of someone who is reading and watch them to see what happens to his eyes. You will observe that they jump, stop, jump, stop, jump, stop, and suddenly swing back to the beginning of a new line. Some students have said that the eye movements remind them of a typewriter carriage as it moves along and then swings back to start a new line. You can see that the fewer stops the eyes make on a line, the faster you will read. So it is wise to practice making your eyes see
groups of words instead of looking at each by itself. One reading expert suggests that you draw three or four lines down a page of print, and that you practice reading the printing by fixing your eyes where each line crosses the line of type. After a while you will be able to reduce the number of lines you read as you increase the number of words your eyes can see with a single stop.

Another thing to practice is a kind of game you can play with billboards or license plates as you are driving. As you glance at a billboard when you pass it, see how much of it you can repeat at a glance. We were playing this game one time when we got into an argument. One person had read, "Use McClessen’s aromatic..." And that was as much as he had seen. Another got the next word, which he said was soap. But a third member in the car was sure that the word at the end was soup ... not soap. Finally, after a heated argument, the driver had to turn the car around and go back so that the two could check the answer. Such a game is fun; but, more important, it trains you to read things quickly and accurately. You usually have someone to check your mistakes when you are not right.

One summer an ex-schoolteacher lived with us who helped us learn to get the general idea of a piece of reading. Miss Gavigan would come to the dinner table with a lot of short articles all cut from daily newspapers.
She had cut off the headline from each article and put these in a separate pack. While Dad was serving, she would have each of us read one of the articles quickly and then make up a headline for it. Then we would check to see how close we had come to the original headline. In that way she forced us to read rapidly and to pick out the most important idea in the piece of reading as a whole. After a while Miss Gavigan moved to another device. She cut off not only the headline, but also the first sentence. If an article is a typical news story, the first sentence, known as the lead, is supposed to summarize all the important information in the rest of the story. After we had read the clipped article, she would ask us the traditional lead questions: who? what? when? where? why? This drill trained us not only in picking out the major ideas, but in exactness of detail. It was surprising how much our ability in reading improved through this game that Miss Gavigan had taken the trouble to prepare.

The last of the five methods that sometimes help improve your reading is through the use of machines. To use machines, you have to be able to go to a reading clinic. The most elaborate of the machines is the Metronoscope. It has an opening that will expose one line of print at a time with three shutters that close the opening. These shutters open and close alternately across the line.
The length of time a shutter is open can be controlled by the machine so that the reader bit by bit, shortens the time it takes him to read a line. The machine has a speed range of from fifteen to fifty lines per minute. Often, through practice on machines, the reader is able to speed up his eye movements and his reading speed tremendously.

Machines are expensive and are not readily available to most people. It should be remembered, also, that they help those students who are not having really serious reading difficulties. They will increase the speed of the accurate but slow readers, but they will not increase the accuracy of the inaccurate reader. In working with them it is important that you test yourself on the accuracy of your reading as well as drill yourself on the speed of your reading.

So much for the individual methods. You may want to use just one of them, though it is probably that you should use a combination. It is important, always, to remember that you must use the methods that will give you help with your particular difficulty. If you read slowly, you use one set; if you read inaccurately, you must use another. When you are dissatisfied with the way you read, and most of us are, be sure that you try to find out just what troubles you are having before starting to practice.