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Delivery and attention: An experimental investigation

John L. Vohs

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DELIVERY AND ATTENTION:

AN EXPERIMENTAL INVESTIGATION

by

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B.A. Montana State University, 1958

Presented in partial fulfillment of the requirements
for the degree of

Master of Arts

MONTANA STATE UNIVERSITY

1961

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AUG 1, 1961
Date
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CHAPTER I

STATEMENT OF THE PROBLEM

It is through the medium of communication that societies grow, cultures expand, knowledge is preserved and information is transmitted. The prominent role of communication is acknowledged in the Gray and Wise statement:

Communication through language, which may be thought of as a systematized code of arbitrary symbols, basically vocal, but reinforced by visible bodily activity, has enabled individuals to adjust themselves to their physical and social environment and to learn the customs, the background, the mores—in short, the culture—of the groups into which they have come. It has made it possible for groups to unite themselves into socially organic units and to carry on their normal activities with a minimum of friction and a maximum of effectiveness; it has provided a means by which one individual may exercise a measure of control over the behavior of those about him; . . .

Colin Cherry expresses similar views: "Communication renders true social life practicable, for communication means organization." 1

Communication may be generated through any of a multitude of systems, however as Cherry states: "Most prominent among all these systems of communication is, of course, human speech and language." 2 In examining the area of speech in relation to communication, Monroe observes:


3Ibid., p. 4.
As we study speech, therefore, we must be careful not to think of it as an isolated thing; we must think of speech in its functional setting, as a means of communication, as something going on between a speaker and a listener. We shall then be less concerned by what speech is than by what it does; its form and beauty will be important only in terms of the response it secures from those who hear it.

Implicit in the above remarks is the conception of communication as a prime instrument in exerting some degree of control over human beings. Man is a part of society formed through communication, he operates in his society by engaging in communication and he communicates in an attempt to affect the behavior of others. To quote Berlo: "Our basic purpose in communication is to become an affecting agent, to affect others... we communicate to influence—to affect with intent."

Regarded in light of the above, it follows that one way of assessing speaking effectiveness is in terms of the listener's behavior. Does the receiver act in accordance with what he hears—has his behavior been influenced as a result of his listening? The speaker is confronted with the problem of what measures he might take to make his speaking purpose most readily attainable. One step, regarded by many speech theorists as being of prime importance is expressed by Sandford and Yeager, "A speaker cannot expect to attain his purpose unless he is able to obtain and hold the attention of his hearer or audience." They feel, in the strictest

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sense, if the speaker doesn't have the attention of his listener, he doesn't have a listener.

**Attention**

Since human beings first engaged in advising their fellows on being successful as speakers, they have been sensitive to the role of attention. "Because of the sorry nature of an audience," Aristotle advised speakers to render their audience receptive, through the use of attention-demanding devices. He deplored the fact that the typical listener was so shallow the nature of the subject alone would not suffice to hold his attention. However, Aristotle was practical enough to know that if the speaker hoped to reach his potential listeners, attention would be an important factor.

Cicero advocated that the speaker "...open in such a way as to win the goodwill of the listener and make him receptive and attentive;..."8 and Quintilian observed, "For if I can secure goodwill, attention and readiness to learn on the part of my judge, I cannot see what else I ought to require;..."9 Quintilian was also sensitive to the role of speech in affecting a listener's behavior and felt that attention was a prerequisite:

Our opponent has spoken and perhaps convinced him; we must alter his opinion, and this we cannot do unless we render him attentive to what we have to say and ready to be instructed.10

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10Ibid., p. 29.
In his consideration of attention, William James went beyond a mere awareness and attempted to explain its nature: "It is the taking possession by the mind, in a clear and vivid form, of one out of what seems several simultaneously possible objects or trains of thought."

In an attempt to bring attention into the realm of the observable, Th. Ribot, active in the latter part of the nineteenth century, was one of the earliest psychologists to examine the concept. He viewed attention as fundamentally a motor phenomenon consisting largely in the accurate adaptation of the sense organs. His description of the act of paying attention is worthy of note:

Attention . . . contracts the occipitio-frontalis. This muscle, which occupies the whole region of the forehead, has its mobile point of insertion in the under surface of the skin of the eyebrow and its fixed point of insertion at the back part of the skull. In contracting, it draws to itself the eyebrow, lifts it, and produces a few transversal wrinkles on the forehead; consequently the eye is wide open and well illuminated. In extreme cases the mouth opens wide.

Ribot's statement demonstrates an attempt to uncover a more tangible aspect of attention and a willingness to go beyond a vague, mentalistic treatment of this factor.

A concern with regard to attention has continued to characterize the views of contemporary speech theorists, and the writers of texts seem to agree essentially on the necessity of attention; however, in this area, little progress has been made by way of furthering an understanding of


the concept. Gray and Wise point out the necessity of attention as follows:

In order for the speaker to be able to influence his listeners in any degree, he must secure and hold their attention. Unless the members of the audience will listen, any speech will be so much wasted effort so far as achieving any response is concerned. This conclusion is true regardless of the type of speaking situation, 13

Other authors as well have urged similar conclusions.14 Monroe concedes, "...we don’t know exactly what it is, but we do know what it does and what conditions bring it about."15

Although statements regarding the importance of attention such as the preceding are objectionably vague from an operational point of view, they appear to recognize that there is an infinite number of simultaneous events going on in the world, many of which are impinging on the senses of the listener. Presumably, a primary aim of the speaker is to take steps to increase the likelihood that he is the object of his listener’s attention, not any of the extraneous stimuli. (This point of view will be developed more extensively in the section on definition, below.)

Historically, attention has occupied a prominent position with respect to our attempts to understand and predict in the field of speech. Much of what has been said, however, is of a speculative and unverifiable nature.

13Gray and Wise, p. 414.


15Monroe, p. 249.
Although the views contained in the above cited sources appear plausible, it is when the matter of proceeding with verification arises that the need for an operationally satisfactory definition becomes apparent. That is, before any attempts can be made to verify statements about attention, it must be operationally defined.

**Definition of Attention**

Commenting on definition in his review of the theories of attention, F. C. Paschal remarks: "The most valid objection is to the use of the noun rather than the verb form. It is an act, not a state." Although Ribot, in his treatment of it assigns attention to the individual's mind, he feels that the physical manifestations of attention are more useful and of primary importance, for "...if we divest it of all physical concomitants that determine and give it substance, we remain in the presence of a pure abstraction, a phantom."

James' concern with the explanation of attention and Ribot's attempt to treat attention in terms of its physical manifestations perhaps reflected a desire to go beyond speculation; they might be regarded as precursors of an operational conception of attention. A suitable and operationally satisfactory definition of attention proceeds from the view that individuals operate in a multi-stimulational environment. Although we function in Woodworth and Schlosberg's "sea of potential

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17 Ribot, p. 2.
The multiplicity of stimuli that constantly assails the individual is far too many to be useful at one time, according to Kingsley, thus selection must be made with respect to those stimuli, and "The process of selection is attention." Hebb remarks, "In the simplest terms, 'attention' refers to a selectivity of response." Regarded in this light then, attention may be defined in terms of response selectivity under conditions of multiple stimulation.

This is a definitional conception that lends itself to empirical investigation and presents a satisfactory operational approach to the examination of the concept of attention. The experimental investigations reviewed in the following section have been conducted in accordance with this point of view.

A Review of the Empirical Evidence

Simon, in his appeal for the wider use of the methods of science for research in the field of speech, outlines some areas which merit

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investigation, including attention:

Attention; behavioral signs of extensity or intensity of selective response. Long held as an "intervening psychic mechanism," this aspect of speech response has been given treatment of the speculative variety with too little experimental investigation of the fluctuations in response of the organism as they may be occasioned by internal and external stimulation. 21

According to Paschal, the common methods used in the measurement of attention are (1) simultaneous disparate activities, (2) altering disparate activities, (3) distraction, (4) rate of discrimination, (5) rate of work (maintenance of efficiency) and (6) variations of limen. 22 It should be noted that each of these methods reported to be commonly employed in the measurement of attention is intimately related to the idea of man's multi-stimulational surroundings—the view held or implied by those sources previously mentioned. Various aspects of man's performance under competing stimuli have been examined by Broadbent, 23 Plutchick, 24 Chapman and Brown, 25 and Hovey, 26 to cite some examples.

22Paschal, p. 399.
Henneman, Lewis and Matthews investigated the multi-stimulational communicative situation comparing vision and audition as sensory channels for communication, in which they refer to "...the classical problem of 'divided attention' (i.e., multiple task performance)." They examined aurally presented versus visually presented messages transmitted to receivers who were engaged in a distracting task. It was discovered that a control group which had no distracting task found the visual presentation more intelligible, and the experimental groups, one with a visual-distracting task and the other with a manual-distracting task (non-visual) were better informed through auditory presentation. In the groups receiving auditory messages, there was no significant difference in intelligibility scores between the control and experimental groups. This finding is of interest here; the distracting-tasks did not have a significant effect on the information received.

Two possibilities might reasonably account for this factor; there is no mention in the report as to the quality of delivery in the message, and the nature of the distracting task may have been so simple it had no effect.

A follow-up investigation conducted by Henneman and Matthews, refers to the above study:

The problem of the mutual interference of competing task components (where message reception is considered as one component of the total task situation), or the proficiency of overall task performance in complex behavioral situations, has
long intrigued psychologists. Classically this problem was known as that of "divided attention." More recently both communications engineers and psychologists in the field of human engineering have investigated this problem as one phase of the larger question concerning the "information-handling capacity" of the human operator.

The purpose of this further investigation was an attempt to strengthen their earlier findings and examine two contributing variables, the difficulty of the distracting task and the message length. The relevant findings indicate that proficiency of performance decreased as either task complexity or message length increased. In other words, as the distracting task became more complex, more errors were found in the repetition of the message and as the message grew longer, the number of mistakes on the distracting task increased. Thus, the maximum number of errors was committed under conditions of a complex competing task and extreme message length.

In discussing the possibility of further research in this area, the authors introduce as one of the variables which would merit examination, "level and type of operator training." Although it is likely that by "operator training" they refer to the operator's proficiency level at the distracting task, this possibility spawns another, that of the level of proficiency of the transmitter of the message.

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29 Ibid., p. 15.
It has been empirically demonstrated that a speaker manifesting the behavioral characteristics of "good" delivery transmits more information than a speaker exhibiting the traits characterized by "poor" delivery. On an a priori basis, it can reasonably be argued that the speaker exhibiting "good" delivery characteristics, resulting in more information conveyed, competes successfully with extraneous stimuli to which his receiver is exposed. More simply, the listener tends to select a "good" speaker from the range of various stimuli to which he is exposed. The preference for the "good" speaker over a number of alternative stimuli would presumably hold true under conditions of the listener being engaged in a distracting task also. Conversely, a "poor" speaker would be expected to compete less effectively with extraneous stimuli.

A study conducted by Brissey examined the effect of a distracting task on message reception under conditions of "good" and "poor" speaking. The experimental groups, one listening to a "good" and one listening to a "poor" speaker performed an "e" cancellation task while they listened. It was found that the control groups (which had no distracting task) had a significantly greater number of items correct on the information test than did the experimental groups. It was also discovered that the groups listening to the "good" speaker received significantly more information than did the groups listening to the "poor" speaker.

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It is noteworthy that Brissey's first finding is in conflict with the results reported by Henneman, Lewis and Matthews\textsuperscript{32} concerning the effect of the distracting tasks on the reception of information. In addition to the factors previously mentioned that might account for the findings of Henneman, et al., the considerable discrepancy in message length of the two studies might further account for the difference in results.

The hypothesis that a "good" speaker would compete more successfully with a distracting task than a "poor" speaker is also supported by the Brissey study.\textsuperscript{33} This strengthens the assumption that the quality of the speaker's delivery is a factor in determining the listener's attention, or selectivity.

The results discussed above present some implications for further research. Certainly one possibility would be the previously mentioned divergence of findings concerning the effect of distracting tasks on the reception of information. Further, there are an infinite number of situations in which individuals are required to receive information while simultaneously engaged in some other activity. Examining how various types of additional activities serve to depress information, if at all, appears to have merit.

Related to the foregoing and in light of the conflicting findings cited above, it appears worthwhile to examine the factor of delivery

\textsuperscript{32}Henneman, Lewis and Matthews.

\textsuperscript{33}Brissey, \textit{op. cit.}
quality to determine if, under conditions of distraction or divided attention, quality of delivery makes a difference with respect to information received.

**A Statement of the Purpose**

As reported, it is generally agreed that the human communicative activity goes on in multi-stimulational surroundings. The individual who hopes to accomplish his purpose through speech is generally aware that to do so will require that his listener attend to him rather than the endless variety of other, competing stimuli. Although the evidence is inconclusive, there is reason to believe that the qualities of "good" delivery manifested by the speaker will more successfully compete with extraneous stimuli, thus it is likely that the receiver will be better informed, and it is assumed the listener will act according to the extent to which he is informed.

It is the intent of this study to examine the effect of various distracting tasks on the listener's response under conditions of good and poor speaking. The hypothesis governing this investigation is that speakers differing in delivery effectiveness will also differ in the amount of information transmitted under conditions of controlled, extraneous stimulation.
CHAPTER II

PROCEDURE

Briefly, to examine the effect of delivery quality under controlled, multi-stimulational conditions, the basic procedure required subjects to listen to a speech while simultaneously engaged in some other task. One control group and three experimental groups listened to a taped speech delivered by a "good" speaker and a second control group and three experimental groups listened to the same speech delivered by a "poor" speaker. All the listeners were given a test over the information in the speech and comparisons were made among groups treated for delivery effects and task effects.

The Information Speech

A speech of approximately 2200 words, requiring about twelve minutes' delivery time was prepared. In content, the speech was fictional, relating events occurring in a plausible setting, so that it may safely be assumed that any relevant information the listener received was as a result of hearing the speech and not attributable to previous knowledge. The information speech contained no terms of an extremely unfamiliar or technical nature and an attempt was made to avoid dealing with controversial topics or events. All speeches were recorded on a Magnecord recorder, model PT6–J at a speed of seven and one-half inches per second, full track, using an Altec 660B microphone. A copy of the information speech is found in Appendix A.
The Speakers

Six persons were asked to read the above described speech. Three of these individuals were selected for their academic and experiential background in public speaking or oral interpretation. Requisites for selection of the other three readers included a lack of public speaking experience and limited formal speech training. It was assumed that choice of speakers in this manner would result in differences in quality of delivery of the speech.

Each of the six speakers was given the same introductory instructions and asked to read the manuscript to the best of his ability for purposes of recording. None of the readers were familiar with the manuscript prior to recording.

A technique similar to that described by Thurstone and Chave\textsuperscript{34} and employed by Gonzales\textsuperscript{35} was used to obtain judgments of delivery effectiveness of the speeches. One minute was randomly selected from approximately the beginning, middle and conclusion of each of the six tape-recorded deliveries. Five ten-second segments were then taken from each of the one minute samples, so that each of the six readings was represented by fifteen ten-second specimens. The total ninety specimens were then randomly arranged on a single tape, each separated by a five-second interval of silence.

\textsuperscript{34}L. I. Thurstone and E. J. Chave, The Measurement of Attitude, Chicago: University of Chicago Press, 1929).

\textsuperscript{35}Gonzales, pp. 9-15.
To evaluate these samples of delivery, eleven students enrolled in a class in voice and diction at Montana State University were used as judges. A judging form was prepared and the following instructions were given the judges:

You will hear a series of specimens randomly selected from speeches that have been read by six speakers. Please listen to these specimens, then make a judgment regarding the overall effectiveness of vocal delivery of each specimen.

You are asked to use a nine-point scale, a diagram of which is provided below these instructions. There are 90 specimens with space provided below for you to write in a scale number. Please write a scale number for each specimen beside that specimen's number.

Using a nine-point scale, assign a scale value of ONE to those specimens you judge to be least effective in vocal delivery. Assign a scale value of NINE to the specimens you judge to be most effective. Assign appropriate intermediate scale values to those which you judge to be moderately effective in vocal delivery. The units of the scale represent equal distance. A scale value of THREE is considered to be as much more effective than a scale value of TWO as a value of FOUR is more effective than a value of THREE. Always write a full number for the scale value. Do not use fractions.

Following each specimen there will be a five-second pause for you to make and record your judgment. Before the next specimen you will be told its number in order that you will not lose your place. Make certain you assign each specimen a value. Are there any questions?

Following the above instructions, the judges were permitted to work five trial delivery specimens for purposes of familiarization. No explanation or definition was offered for the term "effectiveness of vocal delivery." A copy of the judging sheet will be found in Appendix B.

In this manner, eleven judgments were obtained for each of the ninety specimens. A median scale value and semi-interquartile range value was computed for each of the specimens and a mean for the fifteen medians and Q values for each speaker was calculated. The "t" test was used to
evaluate the observed differences in the means of the median values for
the speakers. The separation between the two speakers given the lowest
mean ratings is not statistically significant, nor is there a significa-
cant separation between the top two speakers on the scale. However,
the differences between the two speakers assigned the lowest mean rat-
ings and the two speakers rated highest is statistically significant.
The results of this aspect of the investigation will be treated more
completely in the following chapter.

For purposes of this study an example of "poor" delivery will be
that exhibited by the reader on the lower end of the judgment scale.
At the upper end of the scale, the difference between means for the two
highest-rated speakers is only .03 of a point, but the semi-interquartile
range values indicate a higher degree of agreement in favor of the second
highest-rated speaker. For this reason, the second highest-rated read-
er's performance was chosen to represent "good" delivery.

The Subjects

The subjects used in this investigation were taken from introduc-
tory speech classes at Montana State University during spring quarter,
1961. Nine classes took part in the investigation which was conducted
during class time. Prior to the investigation, each class was randomly
assigned either the "good" or "poor" reader, a class roll was obtained
for each class and each student was randomly assigned to one of four
listening conditions.

The Listening Conditions

The first listening condition (control) required that its subjects
simply listen to the message. The other three conditions (distracting tasks) required the subjects be engaged in some other activity in addition to listening to the speech. There were three distracting tasks: (1) cancellation of the letter "e" as it appeared on pages of randomly assorted letters, (2) simple sentences of instruction to be carried out on rows of geometric figures opposite the sentence, and (3) arithmetic problems of simple addition, subtraction, multiplication and division. Samples of the distracting tasks will be found in Appendices I, J, and K. Thus, approximately equal groups of subjects listened to either the "good" or "poor" delivery under one of the four listening conditions.

These tasks were selected on an \textit{a priori} basis as representative of three different levels of complexity. For these purposes, complexity is defined in terms of the number of units of the task completed in a given length of time. It was assumed that the cancellation task would be the least complex and the arithmetic task would reflect the greatest complexity.

Each class was instructed to listen to the speech and informed they would be given a test on the information contained therein at the conclusion of the speech. Those listeners who had been assigned additional tasks were instructed to work as rapidly as possible with efficiency as they listened to the information speech. They were informed their performance would be evaluated on both the task and the information test. Prior to hearing the experimental speech the following instructions were read to all subjects:
The purpose of this study is to investigate the process of listening. We want you to listen to a tape recording of a speech. You will be tested on the content of the speech when the recording is finished. Please do not take any notes. You, as an individual will not be evaluated as a result of this test. The results for individuals will be known only to the experimenter.

Those of you who have been given booklets: in addition to listening, you are asked to begin working in your booklet when the speech begins and proceed as rapidly as you can with efficiency.

If you have the word "cancel" written on your booklet, you will find it contains pages of randomly assorted letters. Your job is to draw a line through each "e" you see printed on the pages. Work from left to right, as you do when reading. (Demonstrate)

If you have the word "figures" written on your booklet, you will notice rows of geometric figures such as a triangle, square, circle, and so forth. Opposite each row of figures there is a brief sentence of instruction. You are to follow the instructions in the sentence regarding the geometric figures opposite the sentence. (Demonstrate)

If you have the word "mathematics" written on your booklet, you will find it contains simple addition, subtraction, multiplication and division problems. Your job is to work as many of these problems as you can during the time allotted.

Begin working in your booklets when the speech begins and stop when the speech ends. Those of you who have received no booklets are to simply listen to the speech.

You will all be tested on the content of the speech when the recording is finished. Are there any questions?

In an attempt to minimize the opportunity for exchange of information about the speech or the nature of the investigation, the experiment was completed during the regular class periods of one day. An effort was made to determine whether any subjects had difficulty hearing by adjusting the volume level during tape-recorded comments prior to the information speech. Since there were no indications of inability to hear clearly, none of the performance data was eliminated on these grounds. The only foreign students taking part in the investigation were Canadian
and their performance was included in the data.

The Criterion Test

Upon conclusion of the information speech, the same tape-recorded criterion test was administered to all subjects. The test was composed of fifty multiple-choice questions, each with four possible foils. The questions were designed to make each choice appear plausible to the uninformed and yet afford only one correct answer, however two questions (8 and 12) were eliminated on grounds of ambiguity after the test had been administered. A copy of the criterion test will be found in Appendix C.

Prior to the administration of the criterion test, the following was read to all subjects:

You will now be given a tape-recorded multiple-choice test, on the speech you have just heard. Listen very carefully to each statement and the four alternative choices. Indicate your choice of the correct answer by making a clear X through the appropriate number on the answer sheet.

If you do not know the answer, omit the question. Please do not guess at any answer. Answer only when you are reasonably sure you know what the answer is.

There are only five seconds between items so you must decide and record your answers quickly. Are there any questions?

This procedure resulted in three categories of response: (1) the number of items correct, which was assumed to be the extent to which the subjects were informed, (2) the number of items incorrect, which presumably represents the degree to which the subjects were misinformed, and (3) the number of items omitted, which may be assumed to represent the extent to which the subjects were uninformed.36

For all subjects the criterion tests were scored in the three response categories and for the experimental groups the performance on the distracting tasks was evaluated.

For the eight groups of subjects, differences among means for each response category were evaluated for statistical significance and the mean scores for the distraction tasks across delivery treatments were compared. The results of the scoring and the statistical analysis will be reported in Chapter III.
CHAPTER III

RESULTS

In operationally obtaining examples of "good" and "poor" delivery as described in the preceding chapter, fifteen samples were selected from readings of six different individuals. Each of the samples was judged for delivery effectiveness employing the equal-appearing interval scaling technique. A median scale value and semi-interquartile range value were calculated for each delivery specimen and a mean of the medians and a mean of the Q values for each speaker were computed. The means of both the medians and the Q values for each speaker are reproduced in Table 1.

Across all readers, the semi-interquartile range values demonstrate a relatively uniform agreement. The only marked departure is evidenced by the greater degree of agreement in the case of the speaker assigned the lowest mean value on the delivery effectiveness scale. The differences among means for semi-interquartile range values were not subjected to statistical analysis.

Since the purpose in utilizing this judgment technique was to obtain operational examples of "good" and "poor" delivery, for use in this study the investigator was primarily interested in performance rated at opposite ends of the delivery judgment scale. The "t" test

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Table 1

The Means of the Median Scale Values and the Means of the Semi-interquartile Range Values for Six Speakers Rated for Delivery Effectiveness on the Basis of Fifteen Ten-Second Specimens Randomly Selected from Each Presentation

<table>
<thead>
<tr>
<th>Speaker</th>
<th>S-1</th>
<th>S-2</th>
<th>S-3</th>
<th>S-4</th>
<th>S-5</th>
<th>S-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean scale value</td>
<td>2.19</td>
<td>2.50</td>
<td>4.32</td>
<td>6.32</td>
<td>7.54</td>
<td>7.57</td>
</tr>
<tr>
<td>Mean semi-interquartile range value</td>
<td>.75</td>
<td>.96</td>
<td>1.00</td>
<td>.90</td>
<td>.89</td>
<td>.96</td>
</tr>
</tbody>
</table>
was used to evaluate the statistical significance of differences among means for the two speakers selected from each extreme of the delivery effectiveness scale. The results of this analysis are presented in Table 2.

Table 2 indicates no significant difference between S-5 and S-6, the two experienced speakers rated highest for delivery effectiveness, and no significant difference between S-1 and S-2, the two speakers rated lowest for delivery effectiveness. The difference is statistically significant however, between speaker S-1 and speakers S-5 and S-6, and speaker S-2 and speakers S-5 and S-6. The analysis thus reflects no more than chance difference between the experienced speakers and similarly between inexperienced speakers. Comparing experienced with inexperienced speakers however, the differences are significant in every case. As reported in Chapter II, speaker S-1 was chosen as an example of "poor" delivery and speaker S-5 was selected to represent "good" delivery.

As stated in the preceding chapter, the subjects were randomly assigned to listening conditions prior to the investigation. At the time the experiment was conducted, some subjects assigned to various listening conditions were absent, resulting in unequal N's for a given listening condition across delivery treatments. In order to satisfy the demand for proportionality required in factorial analysis of variance, for all delivery treatments, subjects in the larger task groups were eliminated at random until the corresponding groups were of the same size. Thus, any given task condition contains the same number of subjects in both delivery treatments.
Table 2

Summary of Analysis of Differences Among the Means of Delivery Effectiveness for Two Highest-Rated Speakers and Two Lowest-Rated Speakers

<table>
<thead>
<tr>
<th>Speaker</th>
<th>S-2</th>
<th>S-5</th>
<th>S-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>.31</td>
<td>5.35*</td>
<td>5.38*</td>
</tr>
<tr>
<td>S-2</td>
<td>5.04*</td>
<td></td>
<td>5.07*</td>
</tr>
<tr>
<td>S-5</td>
<td></td>
<td>.03</td>
<td></td>
</tr>
</tbody>
</table>

*Indicates significance at the five per cent level. A value of \( "t" = 2.05 \) is required for significance at the five per cent level.
The Distracting Tasks

As outlined in Chapter II, three experimental groups were engaged in three different distracting tasks while listening to "good" delivery of the information speech and three experimental groups were subjected to parallel task conditions while hearing "poor" delivery of the information speech. Table 3 reports the mean task performance for all experimental groups and the statistical significance of the mean difference between the same tasks under different delivery treatments.

As read by the "poor" speaker, the speech was 14.30 minutes long and as delivered by the "good" speaker, the speech was 12.63 minutes long. Thus, the "good" speech was 11.7% shorter than the "poor" speech. As outlined in the Procedure, the subjects engaged in distracting tasks were required to work on their tasks only during the speech—that is, to begin work when the speech began and to stop working when the speech ended. Since there was a discrepancy in the lengths of delivery time, those listening to the "poor" delivery of the speech worked on their tasks 11.7% longer than those who heard the "good" speaker. Assuming that over this relatively brief period of time that there was no work decrement influencing performance, the distracting task scores for all subjects listening to the "poor" speaker were adjusted accordingly.

The mean task score for the group cancelling and listening to the "good" delivery differs only by chance from the score of the group cancelling and listening to the "poor" delivery. Similarly, there are only chance mean differences between the groups working with the instructions and figures while exposed to the two delivery treatments.
Table 3
The Mean Task Performance for Six Experimental Groups and the Statistical Significance of the Differences Between Task Means for Delivery Treatments

<table>
<thead>
<tr>
<th>Task</th>
<th>&quot;Good&quot; Delivery</th>
<th>&quot;Poor&quot; Delivery</th>
<th>Difference Between Means</th>
<th>&quot;t&quot; Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancelling</td>
<td>202.35</td>
<td>215.45</td>
<td>13.10</td>
<td>.92</td>
</tr>
<tr>
<td>Geometric figures</td>
<td>173.12</td>
<td>164.50</td>
<td>8.62</td>
<td>.66</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>53.05</td>
<td>44.44</td>
<td>8.61</td>
<td>2.20*</td>
</tr>
</tbody>
</table>

*Indicates significance at the five per cent level. A value of "t" = 1.96 is required for significance at the five per cent level.
However, in the case of the two groups working arithmetic problems while listening to the different delivery treatments, the mean differences are statistically significant.

The Criterion Test

As described in Chapter II, a criterion test was administered to all subjects and evaluated in three categories as a measure of their response to the speech of information. In each of the test response categories (correct, incorrect and omitted) a mean score for each group was calculated. Differences between means for each of the response categories were evaluated statistically by analysis of variance for which a factorial design was utilized.\textsuperscript{39}

The mean scores in the response category of items correct, which is presumably the extent to which the listeners were informed, are reproduced in Table 4 and the analysis of variance for items correct is summarized in Table 5. The interaction for items correct is not significant, indicating that the differences among simple effects for task categories may be presumed to differ only by chance.

Upon examination of the main effects, in light of the significant F ratios, there is evidence to reject the null hypothesis for the response category of informed. That is, these data indicate that the factor of delivery significantly affects the amount of information transmitted, regardless of listening conditions and that listening conditions also

Table 4

The Means for All Listening Groups in the Category of Items Correct on the Criterion Test

<table>
<thead>
<tr>
<th>Listening Conditions</th>
<th>&quot;Good&quot; Delivery</th>
<th>&quot;Poor&quot; Delivery</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening only</td>
<td>37.68</td>
<td>33.26</td>
<td>35.47</td>
</tr>
<tr>
<td>Listening and cancelling</td>
<td>34.00</td>
<td>30.41</td>
<td>32.21</td>
</tr>
<tr>
<td>Listening and figures</td>
<td>33.12</td>
<td>24.53</td>
<td>28.83</td>
</tr>
<tr>
<td>Listening and arithmetic</td>
<td>26.05</td>
<td>21.71</td>
<td>23.88</td>
</tr>
<tr>
<td>Mean</td>
<td>32.71</td>
<td>27.48</td>
<td>30.10</td>
</tr>
</tbody>
</table>
Table 5

Summary of Analysis of Variance for Testing Differences Among Listening Groups Means for Test Items Correct

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery (A)</td>
<td>1</td>
<td>985.97</td>
<td>985.97</td>
<td>19.65*</td>
</tr>
<tr>
<td>Tasks (B)</td>
<td>3</td>
<td>2922.31</td>
<td>974.10</td>
<td>19.41**</td>
</tr>
<tr>
<td>Interaction (AB)</td>
<td>3</td>
<td>133.15</td>
<td>44.42</td>
<td>89.89***</td>
</tr>
<tr>
<td>Within cells (w)</td>
<td>140</td>
<td>7025.15</td>
<td>50.18</td>
<td></td>
</tr>
</tbody>
</table>

Total 147 11066.68

*F = ms_A/ms_w The F required for significance at the five per cent level is 3.84

**F = ms_B/ms_w The F required for significance at the five per cent level is 2.60

***F = ms_AB/ms_w The F required for significance at the five per cent level is 2.60
significantly affect the amount of information transmitted, regardless of delivery treatments.

The differences among means for listening conditions were evaluated statistically by means of a "t" test\(^{40}\) and are presented in Table 6. The analysis reveals more than a chance difference between all pairs of means. It is apparent from inspection of Table 4, that the mean information scores for a given delivery treatment reveal an ordering, since each of the cells reflects a progressive decline in the number of items correct.

The mean scores for all groups in the response category of items incorrect is presented in Table 7 and the analysis of variance for these means is summarized in Table 8. Items incorrect is assumed to be an indication of the degree to which the subjects are misinformed. Again there is non-significant interaction and it may be assumed that, except for chance fluctuation, the increase in items incorrect under conditions of "poor" delivery is consistent across all tasks.

There is evidence to reject the null hypothesis for delivery treatments across listening conditions in the response category of misinformed, but across delivery effects for listening conditions, the F ratio is not significant and the null hypothesis cannot be rejected. According to these data, delivery influences the number of items the listener gets wrong, but the nature of the distracting task does not appear to be a significant factor. Since there is not a significant F for distracting

\(^{40}\text{ibid., p. 91.}\)
Table 6

A Summary of the Analysis of Differences Among Listening Condition Means for Items Correct on the Criterion Test

<table>
<thead>
<tr>
<th>Differences Between Means</th>
<th>Cancelling</th>
<th>Figures</th>
<th>Arithmetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening only</td>
<td>3.26*</td>
<td>6.64*</td>
<td>7.40*</td>
</tr>
<tr>
<td>Cancelling</td>
<td></td>
<td>3.38*</td>
<td>8.33*</td>
</tr>
<tr>
<td>Figures</td>
<td></td>
<td></td>
<td>4.95*</td>
</tr>
</tbody>
</table>

*Indicates significance at the five per cent level. A value of "t" = 1.96 is required for significance at the five per cent level.
Table 7

The Means for All Listening Groups in the Category of Items Incorrect on the Criterion Test

<table>
<thead>
<tr>
<th>Listening Conditions</th>
<th>&quot;Good&quot; Delivery</th>
<th>&quot;Poor&quot; Delivery</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening only</td>
<td>3.84</td>
<td>6.84</td>
<td>5.34</td>
</tr>
<tr>
<td>Listening and cancelling</td>
<td>4.65</td>
<td>8.18</td>
<td>6.42</td>
</tr>
<tr>
<td>Listening and figures</td>
<td>6.12</td>
<td>7.29</td>
<td>6.71</td>
</tr>
<tr>
<td>Listening and arithmetic</td>
<td>5.95</td>
<td>9.71</td>
<td>7.83</td>
</tr>
<tr>
<td>Mean</td>
<td>5.14</td>
<td>8.01</td>
<td>6.58</td>
</tr>
</tbody>
</table>
Table 8

Summary of Analysis of Variance for Testing Differences Among Listening Groups Means for Test Items Incorrect

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery (A)</td>
<td>1</td>
<td>315.25</td>
<td>315.25</td>
<td>19.38*</td>
</tr>
<tr>
<td>Tasks (B)</td>
<td>3</td>
<td>125.59</td>
<td>41.86</td>
<td>2.57**</td>
</tr>
<tr>
<td>Interaction (AB)</td>
<td>3</td>
<td>36.49</td>
<td>12.16</td>
<td>.75***</td>
</tr>
<tr>
<td>Within cells (w)</td>
<td>140</td>
<td>2277.94</td>
<td>16.27</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>147</td>
<td>2755.27</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*F = ms_A/ms_w, the F required for significance at the five per cent level is 3.84.

**F = ms_B/ms_w, the F required for significance at the five per cent level is 2.60.

***F = ms_AB/ms_w, the F required for significance at the five per cent level is 2.60.
tasks, the means for listening conditions were not subjected to further statistical analysis.

The number of items omitted is assumed to be the extent to which the subjects were uninformed. The mean scores for items omitted are reported in Table 9, and a summary of the analysis of variance is provided in Table 10. As before, there is no statistically significant interaction and, except for chance variation, the increase in number of items omitted is proportional for all tasks across delivery treatments.

The results of the analysis of variance for the response category of uninformed indicates that we are unable to reject the null hypothesis comparing delivery effects across listening conditions; however, the differences for listening effects across delivery conditions is clearly significant. In this case, the delivery variable appears not to affect significantly the number of items omitted, yet the difficulty of the distracting task is apparently a significant factor.

Again, since the data reflect a significant F for listening conditions, the differences between pairs of means were evaluated statistically utilizing the "t" test. These data, found in Table 11, indicate a statistically significant difference between all but two pairs of listening condition means for items omitted on the criterion test. The differences between the means of the subjects who listened only and those who listened while cancelling is attributable only to chance variation, and similarly for the comparison between the cancelling and figures listening groups. Thus, these data indicate that listening while cancelling does not bring about significantly more items omitted than listening alone. Neither does listening while working on geometric
Table 9

The Means for All Listening Groups in the Category of Items Omitted on the Criterion Test

<table>
<thead>
<tr>
<th>Listening Conditions</th>
<th>&quot;Good&quot; Delivery</th>
<th>&quot;Poor&quot; Delivery</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening only</td>
<td>6.47</td>
<td>7.89</td>
<td>7.18</td>
</tr>
<tr>
<td>Listening and cancelling</td>
<td>9.35</td>
<td>9.41</td>
<td>9.38</td>
</tr>
<tr>
<td>Listening and figures</td>
<td>8.76</td>
<td>16.08</td>
<td>12.47</td>
</tr>
<tr>
<td>Listening and arithmetic</td>
<td>16.00</td>
<td>16.57</td>
<td>16.29</td>
</tr>
</tbody>
</table>

| Mean                       | 10.15           | 12.51           | 11.33 |
### Table 10

Summary of Analysis of Variance for Testing Differences Among Listening Groups Means for Test Items Omitted

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery (A)</td>
<td>1</td>
<td>186.18</td>
<td>186.18</td>
<td>3.48*</td>
</tr>
<tr>
<td>Tasks (B)</td>
<td>3</td>
<td>1854.19</td>
<td>618.06</td>
<td>11.55**</td>
</tr>
<tr>
<td>Interaction (AB)</td>
<td>3</td>
<td>303.40</td>
<td>101.13</td>
<td>1.89***</td>
</tr>
<tr>
<td>Within cells (w)</td>
<td>140</td>
<td>7489.20</td>
<td>53.49</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>147</strong></td>
<td><strong>9832.97</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*F = ms_A/ ms_w*  The F required for significance at the five per cent level is 3.84.

**F = ms_B/ ms_w*  The F required for significance at the five per cent level is 2.60.

***F = ms_AB/ ms_w* The F required for significance at the five per cent level is 2.60.
Table 11

A Summary of the Analysis of Differences Among Listening Condition Means for Items Omitted on the Criterion Test

<table>
<thead>
<tr>
<th>Differences Between Means</th>
<th>Cancelling</th>
<th>Figures</th>
<th>Arithmetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening only</td>
<td>2.20</td>
<td>5.29*</td>
<td>9.11*</td>
</tr>
<tr>
<td>Cancelling</td>
<td>3.09</td>
<td></td>
<td>6.91*</td>
</tr>
<tr>
<td>Figures</td>
<td></td>
<td></td>
<td>3.82*</td>
</tr>
</tbody>
</table>

*Indicates significance at the five per cent level. A value of "t" = 1.96 is required for significance at the five per cent level.
figures appear to result in more omitted than listening and cancelling, even though the former task is apparently more complex. Inspection of Table 9 reveals a consistent trend of increase in the number of items omitted as a function of distracting task complexity, although the differences are not significant among all pairs of means.

The implication of the results of this study will be discussed in the following chapter.
Although the technique employed in selection of examples of "good" and "poor" delivery was incidental to the study, the method merits some discussion. The nature of the investigation dictated a primary concern with opposite extremes of the delivery effectiveness judgment scale, and as pointed out in Chapter III (Table 2, p. 25), the differences between the two speakers on the lower end of the judgment scale and the speakers on the higher end of the scale were statistically significant. Thus, the judgments support the investigator's a priori selection of the speakers. Since the two speakers rated highest had been selected for their experience and training in speech, these data offer further confirmation of what has long been regarded as being true: experience and delivery effectiveness are related—speakers with experience and training obtain higher ratings for delivery effectiveness than speakers lacking in experience and training.

Delivery specimens were randomly selected from the beginning, middle and concluding parts of the speech in an attempt to account for any variability that might have occurred in individual readings. It was felt the readers might "warm up" as they read the unrehearsed manuscript, and extracting samples from various parts of their readings would afford a more representative sample of their overall performance.

As a matter of expediency, the random segments method has merit.
since the judges are not required to sit in judgment of the six entire speeches, where fatigue and boredom could conceivably become a biasing factor. The use of randomly arranged delivery specimens also minimizes the possibility of the judges being influenced by the content of the speech, assuming speech content to be a potential influence on delivery judgment.

A fruitful line of research could be centered around delivery judgment techniques since there is much to be discovered concerning factors that may be at work in the judge's assessment of delivery. Length of delivery specimens is a question of possible interest and would appear to be a worthwhile approach in examining one aspect of the delivery concept.

The use of judges in addition to the investigator's a priori selection of speakers provides an extensionally more satisfactory way of obtaining examples of "good" and "poor" delivery than the investigator's subjective judgment. It was assumed that students enrolled in a voice and diction course, fairly naive with respect to generally accepted judgment standards, would demonstrate enough sensitivity to vocal presentations to have developed their own standards of what might represent effective delivery. The degree of agreement indicated by the mean semi-interquartile range values lends some support to this assumption.

The semi-interquartile range values indicate a fairly uniform level of agreement on the judgment scale across all speakers, although there was not an extremely high degree of agreement. It is difficult to determine at what point the Q value ceases to be useful; however for this
study, it was felt that they did demonstrate enough agreement to be utilized. Concerning delivery judgment, there is a need for further experimentation in the area of quantifying delivery effectiveness. Perhaps other, more reliable rating techniques might be devised that would enable judges to achieve at a greater degree of agreement.

It is noteworthy that the greatest agreement among the judges was demonstrated on the reader rated lowest on the delivery effectiveness scale. Although this might be attributable to the limitations of this scaling technique, the finding can be accounted for on the grounds that there may be a marked variation in the standards of judges concerning "average" or "good" vocal delivery, but they tend to agree on what constitutes "poor" delivery. In other words, judges may agree more in the case of a serious departure from "good" delivery, but may not exhibit agreement as to what "good" delivery is.

It was anticipated that the judges would recognize voices as they began to recur on the judgment tape. Prior to the judging, the judges were verbally instructed to assess each specimen separately, even though they would undoubtedly be aware that occasionally they were hearing the same voices. Due to the limited interval between delivery specimens, it is unlikely that the judges attempted to equate a given specimen with previous samples by the same reader, but the problem cannot be wholly discounted and must be regarded as one of the limitations for this adaptation of the judgment technique.

There was some question prior to the judgment session as to whether the five-second interval between specimens would afford enough time for the judge to make and record his decision, however during an informal
interview conducted at the conclusion of the judging session, the consensus of the judges was that five seconds provided ample time.

In light of the significant results obtained in speaker effects in the main investigation, it appears that this scaling approach was experimentally useful, at least within the context of this study. To the extent that this study is related to Gonzales', the data concerning "good" and "poor" speakers generally support his findings. In each case it was found that the "good" speaker, selected by the same technique, transmitted more information.

The Distracting Tasks

As described in Chapter II, the experimental groups of subjects were required to perform various tasks while listening to the speech of information. One of the secondary purposes of this study was to examine the effect, if any, of these tasks on the amount of information received by the subjects.

Each of the three tasks, (1) cancelling, (2) instructions and figures, and (3) arithmetic problems was assumed to be increasingly more complex, that is, it would require a greater length of time to accomplish a given number of units in the tasks, respectively. The hypothesis that the more complex the task, the less information the subject would receive is supported by the evidence (Table 4, p. 29). The results of this investigation indicate that all of the tasks significantly depressed the amount of information received and the more complex the task, the more information scores were depressed. This discovery is in conflict with the findings of

41 Gonzales, pp. 16-29.
Henneman, et al., that the distracting task did not have a significant effect on the information received.\textsuperscript{42} The discrepancy may be accounted for by the relative lack of complexity of the distracting task used in the study by Henneman, et al.

In the cases of cancelling and working on instructions and figures, performance on the tasks was not significantly affected as a result of listening to the "good" or "poor" delivery. Yet, those who worked arithmetic problems while listening to the "good" speaker solved significantly more problems than did those who heard the "poor" speaker while working arithmetic problems, and the former group received significantly more information. Attempts to account for this would be mere speculation, although it might be reasoned that the "good" delivery is easier to listen to than the "poor" delivery and the receiver is able to devote more of his efforts to the distraction task while affording himself maximal information. If this hypothesis is suitable, then performance on a complex task would vary as a function of delivery. This would occur only in the more complex tasks however, since there is evidence to indicate that performance on the less complex tasks does not appear to vary as a function of delivery. Perhaps the less complex tasks used in the present study are so simple they are not affected by delivery. To pursue the issue, it seems plausible, in the extreme case, that the tasks would not affect the amount of information transmitted. Carried to this end, these conclusions would agree with the results disclosed by Henneman, et al.\textsuperscript{43} It must be remem-

\begin{itemize}
\item \textsuperscript{42}Henneman, Lewis and Matthews, p. 14.
\item \textsuperscript{43}Ibid.
\end{itemize}
bered though, that this line of reasoning is only speculative, calling for substantiation through further research.

In light of the evidence, there is some reason for preferring "good" delivery if, under conditions of some relatively complex task, it were desirable to transmit information. There are numerous situations in day to day existence where men are engaged in some activity and simultaneously called upon to receive information. Further investigation into the area of task complexity and its effects on reception of information appears to be justified.

The Criterion Test

The relationship of delivery effectiveness to the amount of information transmitted under conditions of distraction was examined by means of a criterion test as described in the Procedure Chapter. Assessment of the amount of information transmitted was made in three categories of listener response: informed, misinformed, and uninformed, which were assumed to correspond to the test items correct, incorrect and omitted, respectively.

Tape recording the criterion test has the disadvantage of not permitting the subject to look over the questions at a later time during the test. It forces him to adapt his response to the speed of the tape-recorded questions. There is an advantage in this method however, with respect to the three response approach to the test, in that it tends to discourage guessing. If the subject knows the answer, he will immediately record it—if he does not know the answer, he is not afforded enough time to speculate about a possible answer, but must instead direct his atten-
The practice of informing the subjects they will be tested on the content of the speech will likely provide a different motivation than not telling them they will be tested, a factor which will be reflected in the criterion test scores. Either approach has parallel, everyday listening situations and further research comparing the two would appear to be warranted.

Informed

As indicated in Table 4 (p. 29), all subjects listening to the "good" speaker received on the average more information than all groups listening to the "poor" speaker. Moreover, in each listening condition, the groups that were exposed to "good" delivery received significantly more information than the group subjected to "poor" delivery. Further still, regardless of delivery, the assumption concerning the difficulty of the distracting task is supported. Those who listened and worked arithmetic problems received less information than those who listened and worked with instructions and figures, the latter groups received significantly less information than those who listened and cancelled "e"'s, and those who cancelled received significantly less information than the control group that was required to listen only.

Misinformed

The subjects who heard the "good" speaker across all tasks had significantly fewer items wrong than did the subjects who heard the "poor" speaker (Table 7, p. 33), but for a given speaker, the tasks
did not demonstrate any significant influence on the number wrong. Thus, delivery quality appears to be a factor associated with the amount of misinformation, but the difficulty of the distracting task does not. Since the F ratio for task effects was 2.57 and a value of $F = 2.60$ was required for significance at the five per cent level, it is possible that with a larger N or a repetition of the experiment a significant F ratio might have been obtained. Had this been the case, both delivery and tasks would have been associated with the number of items incorrect. Thus, task complexity also would be related to the extent to which subjects were misinformed.

**Uninformed**

The statistical analysis for the response category of uninformed summarized in Table 10 (p. 37) reveals that delivery is not a significant factor in accounting for items omitted; however, the level of distracting task does significantly influence the number of items omitted. Delivery did not affect the extent to which the subjects were uninformed but the tasks did.

Although the analysis of variance for items omitted indicates that distracting tasks significantly influenced the number of items omitted, further statistical evaluation (Table 11, p. 38) of these findings reveals that the differences between all the pairs of listening condition means were not significant. There was however, a consistent trend of increase in the number of items omitted as the distracting tasks became more complex.

Response categories of incorrect and omitted can be most advantageously discussed together. It is noted that the tasks did not signifi-
cantly influence the number of items incorrect. This may be accounted for by observing that as the task became more demanding, the subjects omitted more. Perhaps they were less certain of many answers and omitted those questions. Thus, the mean score for information was reduced as a function of task complexity while the mean score for misinformation remained relatively constant.

Concerning delivery, the fact that the subjects tended to be significantly more misinformed while listening to the "poor" speaker may indicate that those receiving the information under conditions of "poor" delivery received less information as a function of delivery, but because of a strong academic reinforcement for high scores and correct answers, they were reluctant to omit questions and more willing to guess, despite instructions to the contrary. However, it is also reasonable to assume that some quality of the "poor" delivery created the impression in the listeners that they were better informed than they actually were.

To the extent that these data may be generalized, they provide some noteworthy implications for the concept of delivery. It must be acknowledged though, that statistical examination of the three response categories for the same subjects violates the assumption of independence required by analysis of variance. Although it is assumed that examination of each of the three response categories using different groups of subjects would result in essentially the same findings, any conclusions drawn with respect to these data should be made with an awareness of this limitation.
The findings of Gonzales\(^44\) and these data support the view that speech training and experience are of some value in situations where it is desirable to transmit a maximum of information and minimum of misinformation. As evidenced by these findings, "poor" delivery informs less and misinforms more than "good" delivery.

As reported in Chapter III, the "poor" speech was 11.7 per cent longer than the "good" speech. In the study on delivery effectiveness by Gonzales,\(^45\) the speech from the extreme low end of the judgment scale was 21.4 per cent shorter than the speech at the extreme high end of the scale. Since the technique for determination of delivery quality was essentially the same for both investigations, there is some evidence to indicate that for this type of judgment technique, rate of delivery does not appear to be a significant factor in assessing delivery effectiveness.

As described in Chapter I, the purpose of this study was to examine an aspect of attention, specifically under conditions of distracting task situations, in light of the importance assigned to the concept by speech theorists, both classical and contemporary. The results disclosed herein raise some doubt as to the unqualified necessity of the speaker needing the attention of his listeners. These data indicate that the listener need not attend exclusively to the

\(^{44}\)Gonzales, pp. 16-29.

\(^{45}\)Ibid.
speaker—they are able to receive information while simultaneously attending to a distracting task. Although there are indications that "good" delivery results in the listener being better informed under conditions of distraction, the question arises as to whether the differences between "good" and "poor" speakers are of practical significance. The answer to this question depends largely on circumstances and the degree to which there is a premium placed on the amount of information transmitted, although the delivery aspect appears to merit further investigation.

Summarizing, in the context of this study, it is observed that both delivery quality and task complexity appear to be a significant influence on the amount of information received and that "good" delivery not only results in more test items correct, but also fewer questions incorrect. As the distracting task becomes more complex, there is some evidence indicating that in addition to getting more information under conditions of "good" delivery, more of the task may be accomplished also. Misinformation seems to be a function of speaker effectiveness; while listening to a "poor" speaker there is a tendency to get significantly more items wrong. In addition, there is some evidence to indicate that delivery does not affect the number of test items omitted. Items omitted appears to be related to the complexity of the distracting task.

The interesting hypotheses and implications for further research uncovered by the present study are perhaps some of its most noteworthy findings.
CHAPTER V

SUMMARY AND CONCLUSIONS

The central purpose of this investigation was to examine delivery effectiveness in relation to the concept of attention, under conditions of controlled distracting task situations.

Six readers tape-recorded a fictitious, experimental speech and samples of the delivery of each were rated, by an equal-appearing intervals scaling technique, for effectiveness of vocal delivery. Readers from opposite ends of the judgment scale were selected as examples of "good" and "poor" delivery.

For "good" and "poor" delivery alike, four listening conditions were provided: (1) listening only (control), (2) listening while cancelling "e"'s, (3) listening while following instructions concerning geometric figures and (4) listening while working simple arithmetic problems. Half the subjects heard "good" delivery of the speech under one of the four listening conditions and the other subjects heard "poor" delivery of the speech under one of the four listening conditions. To evaluate the amount of information transmitted, the same criterion test was administered to all subjects upon conclusion of the speech.

Three response categories were examined in evaluation of the test scores: items correct, items incorrect, and items omitted, which presumably indicated the degree to which the subjects were informed, misinformed and uninformed, respectively. Means of scores on the distracting tasks and means of test scores in all response categories were evaluated for statistical significance.
The following tentative conclusions are suggested by the data:

1. Speakers manifesting effective vocal delivery will transmit more information than speakers manifesting less effective vocal delivery under conditions of distraction.

2. When subjects are engaged in a relatively complex task while receiving information, they tend to perform better on the task and gain more information as a function of "good" delivery.

3. Certain distraction tasks depress the amount of information received and the amount of information lost is a function of the complexity of the task.

4. "Poor" delivery is related to the number of items wrong but not a significant factor in the number of test items omitted.

5. All groups were more informed than misinformed or uninformed.

6. Increased complexity of the distracting tasks is associated with an increase in the number of test items omitted, but does not appear to influence the number of test items wrong.
BIBLIOGRAPHY


APPENDIX A

The Experimental Speech

Copy of the Manuscript of the Speech of Information
The key to your financial security may lie in a small, distant island in the South Pacific. The proposition which I plan to present to you today concerns this island, and when I have finished my brief account of our plans—plans which could include you, I am sure you will consider the time you have devoted to hearing me as being well spent; and it will be clear to you why I consider Pacific Enterprises, Incorporated worthy of your investment.

I want to thank my lifelong friend, R. J. Driscoll, for inviting me to your weekly Merchants' Club Luncheon, and arranging for me to speak to you. I am confident that after listening to what I have to say in the next few moments, today, March 23, 1909 could be an important and profitable day in your life.

Pacific Enterprises, Incorporated is a young company. We received our articles of incorporation only one month ago. Much has happened during a short period of time resulting in the birth of this corporation but I assure you every step has been well planned. Permit me to start at the beginning and explain to you the circumstances that bring me here today.

I am the owner and captain of the salvage ship, Dolphin, and with my crew, I operate in the Pacific anywhere the demand may call. Our work consists primarily in raising sunken vessels for commercial shipping lines. When the salvage business is slow, we freelance over the Pacific in search of derelicts or unclaimed sunken ships. I have been engaged in this successful and profitable business for over six years.

Six months ago, we were contracted by the Italian Transport Lines to search for and to salvage if we found it, a cargo vessel, The Leopold.
Some of you may have read or remember hearing of her loss early last year in a violent storm that swept the South Pacific. There has been no clue as to the fate of the ship. The most likely explanation is that she went under during the storm. The only information the Italian Transport Lines was able to offer us to aid in our search was The Leopold's last point of contact by radio and her course of travel.

We roamed back and forth over the course of The Leopold in the South Pacific for two months with absolutely no sign of the ship. Prior to turning back empty-handed, we put in at a small island to take on some water and to stretch our legs for a day or so. I do not name or locate this island for reasons that will become clear as I go on. For the time being, let us simply refer to it as Midas Island.

Midas Island is small, as are most of the islands in this area. It is elliptical in shape, approximately eleven miles long and seven miles wide, covering roughly an area of eighty-five square miles. There is a great deal of treacherous reef in the waters around the island and there is evidence of wreckage of ships that have attempted to find an access. This is no doubt a principal reason why the island remains relatively unexplored even in the present day. The nature of our work calls for a good pilot and we have one of the best in the business. It was thanks to his talents that we were able to approach the island with safety. To go on with the description, there is a small, freshwater stream which seems to originate in some high hills at the upper end of the island, flowing almost the entire length of the island out to the ocean. Although there appears to be little sign of wildlife, tropical vegetation abounds.
In our casual exploration of Midas Island, the first mate, Bob Gordon, and I made an interesting discovery. We had stopped by the stream for a drink during our hike and in dipping out some water, Bob noticed what appeared to be gold in the stream. It was gold, in fact quite a lot of it, for in a half-hour's time, Bob was able to sift out an ounce of gold dust with his tobacco can. To say that we were thunderstruck by this discovery would be an understatement.

We immediately began a systematic exploration of the small island for two reasons: to see if there were any further signs of gold, and to see if the island had any inhabitants. Near the center of the island, about five miles upstream, we found a surface outcropping of a vein which looked as though it might be the source of the gold dust. From all indications it should be a sizeable vein and an easy one to work, with the proper tools. We also learned that there was no one living on the island at the time, but there were signs of some group having settled there years ago. There were no signs of violence or disease, in fact the signs indicated that the tribe had moved, probably to another island, so it is our guess that superstition or fear caused them to evacuate.

Realizing the possible consequence of revealing our findings to the crew, Bob and I were silent about our discovery on Midas Island, although we have done much planning and discussing in the privacy of my cabin during the journey home.

Since we have been in port, we have learned what country owns the island and Pacific Enterprises concluded transactions for mineral rights with them four days ago. We have also found two markets for the gold, once it is mined, one a jewelry concern here in the United States and
the other a small foreign country, desirous of building up its gold re-
serve. As many of you know, gold is currently selling at $26.50 per
ounce and there are indications that the price will go up. These markets,
however, are the least of our concern, for one rarely has trouble finding
a buyer for gold.

Now that I have sketched for you a picture of the circumstances
which have resulted in the origin of Pacific Enterprises, I would like
to outline our plans regarding the development of this venture.

For reasons of prudence and expediency, my ship **Dolphin** can be con-
verted with few modifications into a ship suitable for transporting
material to the island and carrying our precious product to market. The
corporation will pay the cost of the ship's modification and maintenance
and will lease it from me at below competitive rates. The ship is sea-
worthy and should need no major repair work for over a year.

Approximately thirty miles away from Midas Island there is a trio
of somewhat larger islands situated quite close to one another. This is
the closest land to Midas. These islands are all inhabited by friendly
natives whose sole means of support is fishing and some limited
agriculture. Of course further details are necessary, but in early negotiations with
them they expressed the wish to supplement their existence with some in-
come. Much of our labor force will be obtained from the natives on these
islands who are anxious to earn a few dollars for trading purposes. Ex-
cept for the dredge which we will bring in, most of the labor will be done
by hand. We plan to have a crew of ten of our men, three with mining
experience and the others to act as supervisors and foremen.

As soon as operations are well established and underway on the island,
we plan to begin further exploration of some of the other uninhabited
islands in the area. We plan to make no attempt to investigate any of the islands inhabited by natives, unless we are encouraged by them to do so. The success of our enterprise will depend on the cooperation of these natives and the government owning the islands in this area, and we will do nothing to incur the disfavor of either.

Our corporation does not intend to stop at mining, rather mining may just prove to be a good beginning. There is evidence that this region may be a source of pearls, the temperature of the water and the condition of the ocean floor is such that it would be conducive to planting oysters, if there are none there. A further possibility lies in engaging the natives in the copra trade. Copra is the meat of the coconut, from which coconut oil is derived, a product in great demand in this country. However, the development of the pearl and the copra possibilities lie in the future—I merely mention them to impress upon you the point that Pacific Enterprises is not just a gold-mining company. The potential of this region of the Pacific has yet to be even tapped.

Now, a discussion of business aspects, costs and expenses. It is estimated we will need two hundred thousand dollars to begin operations. This will cover the costs of mineral rights, modification on the Dolphin, tools, and will provide a working capital for wages and other immediate expenses.

We are offering for sale two thousand shares of Pacific Enterprises amounting to forty-nine percent of the corporation, at one hundred dollars per share. The minimum number of shares that will be offered to any buyer is ten, amounting to a thousand dollars. The maximum number shares a buyer may purchase is two hundred, amounting to a total of twenty thousand dollars invested.
We are realistic businessmen and willing to consider all possibilities. In the event the venture fails, Pacific Enterprises will liquidate all its assets and payment will be made to stockholders pro-rated by the number of shares he holds. I am so confident this venture will prove successful, however, that I will sell the Dolphin in the event of failure, the proceeds to be included in the repayment of investments.

Dividends will be paid twice yearly, on the first of June and the first of December. During the first year, dividends will be relatively low, since we plan to build up a financial reserve with which to carry on exploration, expansion and further development. For every year after the first we anticipate a handsome return on investments. A written progress report will be sent with the dividends, to keep you informed regarding our operations. A stockholders' meeting will be held once a year and I will return from Midas at that time and give you a first-hand account of our activities. Our account will be managed by the firm of Jones, Benson and Aldrich, the largest accounting firm in San Francisco, and a very reputable one.

Regarding transfer or sale of stock, the stockholder will be bound to keep the ownership of the shares within his immediate family for the first twenty-five years. We have adopted this restriction purely for the protection of all stockholders for the purpose of discouraging any attempts to gain some control of the corporation.

Time has not permitted me to go into any detail on the plan. I have simply attempted to outline for you the origin and nature of our business proposition and I know that those of you who are interested have many questions. A full, detailed legal account of the corporation can be obtained by writing Pacific Enterprises, Box 250, San Francisco. Also,
I will be very happy to discuss personally with you any further aspect of this venture. I can be reached at the Sierra Hotel, suite 414.

This opportunity will be closed in two months, on the last day of May, 1909, allowing you ample time to consider the proposition and investigate the corporation.

The *Dolphin* will sail for Midas Island in the middle of June. There is a fortune to be gained in this venture—and it could be your fortune.
APPENDIX B

The Judging Form
INSTRUCTIONS FOR JUDGES

You will hear a series of specimens randomly selected from speeches that have been read by six speakers. Please listen to these specimens, then make a judgment regarding the overall effectiveness of vocal delivery of each specimen.

You are asked to use a nine-point scale, a diagram of which is provided below these instructions. There are 90 specimens with space provided below for you to write in a scale number. Please write a scale number for each specimen beside that specimen's number.

Using a nine-point rating scale, assign a scale value of ONE to those specimens you judge to be least effective in vocal delivery. Assign a scale value of NINE to the specimens you judge to be most effective. Assign appropriate intermediate scale values to those which you judge to be moderately effective in vocal delivery. The units of the scale represent equal distance. A scale value of THREE is considered to be as much more effective than a scale value of TWO as a value of FOUR is more effective than a value of THREE. Always write a full number for the scale value. Do not use fractions.

Following each specimen there will be a five-second pause for you to make and record your judgment. Before the next specimen you will be told its number in order that you will not lose your place. Make certain you assign each specimen a value.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<th>6</th>
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</table>

Before beginning the actual judgment, we will work through five specimens in order that you might familiarize yourself with the procedure.

1.____ 2.____ 3.____ 4.____ 5.____

Are there any questions?

1.____ 11.____ 21.____ 31.____ 41.____ 51.____ 61.____ 71.____ 81.____
2.____ 12.____ 22.____ 32.____ 42.____ 52.____ 62.____ 72.____ 82.____
3.____ 13.____ 23.____ 33.____ 43.____ 53.____ 63.____ 73.____ 83.____
4.____ 14.____ 24.____ 34.____ 44.____ 54.____ 64.____ 74.____ 84.____
5.____ 15.____ 25.____ 35.____ 45.____ 55.____ 65.____ 75.____ 85.____
6.____ 16.____ 26.____ 36.____ 46.____ 56.____ 66.____ 76.____ 86.____
7.____ 17.____ 27.____ 37.____ 47.____ 57.____ 67.____ 77.____ 87.____
8.____ 18.____ 28.____ 38.____ 48.____ 58.____ 68.____ 78.____ 88.____
9.____ 19.____ 29.____ 39.____ 49.____ 59.____ 69.____ 79.____ 89.____
10.____ 20.____ 30.____ 40.____ 50.____ 60.____ 70.____ 80.____ 90.____
APPENDIX C

The Criterion Test Administered to All Subjects Who Listened to the Experimental Speech of Information
1. The speaker is
   1. an investment counselor.
   2. a mining engineer.
   3. a ship's captain.
   4. a stockbroker.

2. The amount needed to begin operations will be
   1. $10,000.
   2. $500,000.
   3. $200,000.
   4. $75,000.

3. The name of the corporation is
   1. Italian Enterprises.
   2. Merchant's Investments.
   3. Pacific Development.

4. The portion of the corporation being offered for sale is
   1. 51%.
   2. 75%.
   3. 90%.
   4. 49%.

5. The speaker gave the place in question the name of
   1. Midas Island.
   2. Dolphin Island.
   3. Copra Island.
   4. Pearl Island.
6. The island is located in
   1. the Mediterranean.
   2. the South Atlantic.
   3. the Azores.
   4. the South Pacific.

7. The dividends will be paid
   1. once a year.
   2. four times a year.
   3. three times a year.
   4. twice a year.

8. Most of the work on the island will be done by
   1. imported labor.
   2. crew members.
   3. native labor.
   4. all of these.

9. The captain and the first mate discovered
   1. gold.
   2. pearls.
   3. copra.
   4. diamonds.

10. The name of the captain's ship is
    1. The Leopold.
    2. Enterprise.
    3. Dolphin.
    4. The Copra.
11. One of the buyers for their principal product is
   1. a soap company.
   2. the U. S. government.
   3. an import house.
   4. a jewelry concern.

12. Pacific Enterprises is negotiating to
   1. buy an island.
   2. secure mineral rights.
   3. purchase a ship.
   4. hire some men.

13. The large piece of equipment the corporation will bring to the island is
   1. a steamshovel.
   2. a bulldozer.
   3. a dredge.
   4. a well driller.

14. The ship put in at the island in question for
   1. repairs.
   2. passengers.
   3. cargo.
   4. water.

15. The cost per share of the corporation's stock is
   1. $250.
   2. $100.
   3. $50.
   4. $1000.
Interested parties can reach the captain at
1. his hotel.
2. his office.
3. his ship.
4. his lawyer's.

The offer for sale of stock will be terminated
1. within the week.
2. after two months.
3. at the year's end.
4. after two years.

The ship that had been lost at sea and presumed sunk was
1. Dolphin.
2. The Leopold.
3. The Monterey.
4. Sierra.

The person making it possible for the speaker to address this group was
1. the first mate.
2. an accountant.
3. a lifelong friend.
4. a stockbroker.

The speech is being made to
1. the Rotary Club.
2. the Explorers' Club.
3. the Travelers' Club.
4. the Merchants' Club.
21. Dividends will be paid on
1. the first of June and December.
2. the first of July.
3. the first of January.
4. the first of March and August.

22. The corporation's accounts will be handled by
1. the first mate of the Dolphin.
2. the firm of Jones, Benson and Aldrich.
3. the firm of Gordon and Driscoll.
4. the Merchants' Association.

23. The captain's ship is
1. a cargo ship.
2. a salvage ship.
3. a passenger ship.
4. a fishing ship.

24. According to the speaker, additional income is available from
1. tourists.
2. diamonds.
3. pearls.
4. salvage.

25. The minimum amount of money that can be invested is
1. $1,000.
2. $10,000.
3. $20,000.
4. $5,000.
26. The maximum amount of money that can be invested is
   1. $1,000.
   2. $10,000.
   3. $20,000.
   4. $5,000.

27. The corporation has been in existence for
   1. three years.
   2. five years.
   3. six months.
   4. a few weeks.

28. The organization that had engaged the salvage crew to hunt for the lost ship was
   1. Pacific Enterprises.
   2. Italian Transport Lines.
   3. American Traders, Inc.
   4. The Midas Company.

29. The approximate size of the island is
   1. 150 square miles.
   2. 85 square miles.
   3. 500 square miles.
   4. 20 square miles.

30. The corporation will use the captain's ship for
   1. pearl diving.
   2. salvage operations.
   3. carrying passengers.
   4. carrying cargo.
31. Shareholders must keep the shares in their immediate families for
   1. 25 years.
   2. 10 years.
   3. 2 years.
   4. 40 years.

32. The occupants of the island in question are
   1. South Sea Islanders.
   2. white colonists.
   4. the island has no occupants.

33. The gold was found in
   1. a buried chest.
   2. a sunken ship.
   3. a stream.
   4. a cave.

34. The principal means of support of the natives on the other islands is
   1. fishing and pearl diving.
   2. fishing and agriculture.
   3. agriculture and pearl diving.
   4. agriculture and mining.

35. In expanding, the corporation plans to
   1. buy other islands.
   2. establish a resort area.
   3. plant pineapples.
   4. explore other islands.
36. The operations the corporation will immediately pursue are
   1. mining.
   2. colonization.
   3. salvage.
   4. exploring.

37. Mail will reach the corporation at
   1. Box 150, San Diego.
   2. Box 250, San Francisco.
   3. Box 300, San Diego.
   4. Box 150, San Francisco.

38. This event is taking place in
   1. 1939.
   2. 1929.
   3. 1909.
   4. 1919.

39. The speaker is attempting to sell
   1. a ship.
   2. an island.
   3. shares of stock.
   4. gold.

40. The island remains relatively unexplored because of
   1. a dangerous reef.
   2. treacherous tides.
   3. severe storms.
   4. an unbearable climate.
41. Interested parties can write the corporation for
   1. color photographs.
   2. legal documents.
   3. description of the ship.
   4. copra samples.

42. Modification and maintenance on the captain's ship will be paid for by
   1. the corporation.
   2. the captain.
   3. the government.
   4. the merchants.

43. At the time of the speech the price of gold is
   1. $20 per ounce.
   2. $34 per ounce.
   3. $26.50 per ounce.
   4. $18.50 per ounce.

44. The captain and the first mate explored the island to
   1. find a lost crew member.
   2. hunt for fresh meat.
   3. determine its size.
   4. see if it was inhabited.

45. In the event the venture fails, the captain will
   1. sell the island.
   2. leave the country.
   3. sell the Dolphin.
   4. declare bankruptcy.
46. In shape, the island is
   1. an ellipse.
   2. long and narrow.
   3. like an hour glass.
   4. like a triangle.

47. The operations of the salvage crew take them
   1. all over the world.
   2. into the South Seas.
   3. into the Mediterranean.
   4. all over the Pacific.

48. The goods will be sent to and from the island in question by
   1. steamship line.
   2. air transport.
   3. the captain’s ship.
   4. the navy.

49. The shareholders will become informed regarding their investment by
   1. a monthly report.
   2. a biennial report.
   3. a yearly summary.
   4. writing to the corporation.

50. The stockholders will meet
   1. once a year.
   2. every two years.
   3. twice a year.
   4. there will be no meetings.
APPENDIX D

The Median Scale Values and the Semi-Interquartile Range Values for Fifteen Ten-Second Specimens Randomly Selected from the Deliveries of Six Speakers
Table 12

The Median Scale Values and the Semi-Interquartile Range Values for Fifteen Ten-Second Specimens Randomly Selected from the Deliveries of Six Speakers

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<th>Speaker</th>
<th>S-1</th>
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<td>Mdn</td>
<td>Q</td>
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APPENDIX E

Individual Test Scores in the Response Category of Items Correct on the Criterion Test
Table 13

Individual Test Scores in the Response Category of Items Correct on the Criterion Test

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APPENDIX F

Individual Test Scores in the Response Category of Items Incorrect on the Criterion Test
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APPENDIX G

Individual Test Scores in the Response Category of Items Omitted on the Criterion Test
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APPENDIX H

Individual Performance Scores for Six Groups of Listeners Engaged in Distracting Tasks
### Table 16

Individual Performance Scores for Six Groups of Listeners Engaged in Distracting Tasks

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*Indicates adjusted task score. Adjusted task score is 88.3% of the original task score to compensate for longer time subjects hearing "poor" delivery were required to work. The "good" delivery took 11.7% less time than the "poor" delivery.
APPENDIX I

A Copy of a Page in the Cancellation Distraction Task
APPENDIX J

A Copy of a Page in the Geometric Figures

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<th>BAR</th>
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<tr>
<td><strong>Blacken the triangle</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Mark an X through the circle</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Blacken in the hexagon</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>Encircle the hexagon</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mark an X through the square</strong></td>
<td></td>
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</tr>
</tbody>
</table>
APPENDIX K

A Copy of a Page in the Mathematics Distraction Task
\[
\begin{array}{cccc}
1691 & -1369 & \frac{9}{9045} & 512 \\
& & \times 24 & 46 \\
& & \times 33 & 33 \\
& & \times 41 & 41 \\
& & \times 22 & 22 \\
\hline
3016 & 546 & \frac{3}{6936} & 2306 \\
-819 & 923 & & -1932 \\
& 209 & & \\
& 392 & & \\
\hline
1022 & 10/1090 & 364 & 46 \\
\times 96 & \times 13 & & 92 \\
& & 87 & 87 \\
& & 16 & 16 \\
\hline
4280 & 9023 & \frac{7}{6853} & 3750 \\
3630 & -3652 & & -1625 \\
2384 & & & \\
\hline
3066 & 5743 & \frac{8}{968} & 360 \\
\times 43 & \times 17 & & 428 \\
& & 876 & 876 \\
\hline
8633 & 72 & 3291 & \frac{7}{21021} \\
\times 92 & 93 & -1086 & \\
& 86 & & \\
\hline
373 & 1417 & 9104 & 447 \\
621 & \times 63 & -867 & 683 \\
884 & & & 901 \\
\end{array}
\]