DOCUMENT RESUME

ED 090 604 CS 500 666

AUTHOR Arrasjid, Harun; Razik, Taher A.
TITLE A Summary and Papers from the July-August Conversations in the Disciplines, State University College at Buffalo, On Listening and Audio Tutorial Systems.
PUB DATE 73
NOTE 34p.

EDRS PRICE MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS Audio Passive Laboratories; *Aural Learning; Bibliographies; Communication (Thought Transfer); Conference Reports; Language Arts; *Listening; *Listening Comprehension; Listening Habits; *Listening Skills; Literature Reviews; *Oral Communication; Speech Compression; Teaching Techniques

ABSTRACT

This report summarizes the major features of a 1973 summer conference (at the New York State University at Buffalo) on listening as an essential feature of communication and problems relating to students' listening skills. The conference was held because of an awareness that little attention is being paid to listening comprehension in the educational process, even though students spend much of their educational time in listening activities. Conference participants discussed current research on time-compressed speech, listening comprehension, current audio-tutorial programs, and the possibilities for future emphases on listening instruction. The authors have included copies of the papers they presented as well as an extensive bibliography entitled "Listening and Technology." (RN)

A SUMMARY AND PAPERS FROM THE JULY-AUGUST CONVERSATIONS IN THE DISCIPLINES STATE UNIVERSITY COLLEGE AT BUFFALO

ON LISTENING AND AUDIO TUTORIAL SYSTEMS

FROM

HARUN ARRASJID and TAHER A. RAZIK

CONVERSATION IN THE DISCIPLINE

Listening and Audio Tutorial System: An Analysis

"Listening - A Neglected Mode" was the title of the conversation's first presentation which covered the discrepancy between student's present performance and desired performance in the area of listening. This was given by Harun Arrasjid, the project coordinator. The objectives were;

1. To describe research findings in the area of listening comprehension
2. To analyze the role of listening as a communicative process
3. To describe research findings on the effect of listening training

Dr. Arrasjid also explained the purposes of the conversation.

1. To promote a familiarity of the participants with other campuses' efforts towards the improvement of learning through the use of Audio Tutorial system
2. To improve college students' achievement by promotion of audio tutorial system
3. To improve college students' listening skills
4. To bring together State University of New York faculty in academic conversation in the specific area - listening and audio tutorial systems
5. To analyze listening.

The specific objectives of the conversation were then presented.

1. To analyze the physical and psychological aspects of listening. To discuss listening skills and their effect on listening comprehension, specifically on recall of information, concepts, principles and inferences.
2. To analyze research findings in the area of listening comprehension. To discuss supporting studies in various disciplines.
3. To promote further research by conversation participants in listening comprehension and audio-tutorial approach.
4. To discuss the implementation of research findings concerning listening comprehension within the institutional system.
5. To analyze the improvement of listening comprehension, its efficiency and effectiveness and the raising of incentives and the capabilities of the instructional system.
6. To discuss the role of technology in the improvement of listening comprehension, and analyze the cybernatic principle of learning. To analyze the establishment of the audio tutorial system.
7. To discuss the current impact of the audio tutorial approach at the level and the development of a conceptual framework based on an analysis-synthesis sequence. To analyze the audio-tutorial system as a self-contained instructional package. To analyze the conceptual framework for planning, orderly consideration of functions and resources, including facilities. To analyze a way of checking on the relationship of all components' performance. To analyze various successful, audio tutorial systems of various levels and complexity.
8. To evaluate existing audio-tutorial programs within the SUNY system based on reports by participants.

9. To discuss the implementation of compressed audio tape at the college level. To present audio tape compression techniques and equipment. To explore the system's view, the mediated audio tutorial system with compressed audio tape, and tactics used in the strategy of instruction. To analyze the effect of alternating audio stimuli.
10. To discuss "Listening and Technology" as a potential course at the college level, the course's relevance to and primary role in instruction.

Then the project director presented the reasons for holding the conversation:

1. The area of listening comprehension has been neglected by educational scholars.
2. College students spend most of their educational time listening.
3. Predictor measurements of college success based on listening comprehension needed to be analyzed.
4. Many studies have been done on reading but few have been done on listening.
5. There are hearing specialists but no listening specialists.
6. There is an increased trend towards independent study through use of audio tutorial systems.
7. There has been an increase in the availability and accessibility to various audio tutorial systems.
8. There has been increased accessibility to high speed cassette duplicating machines, and portable audio cassette playback machine and altered duplication machines.
9. The results of many studies regarding compressed speech have proven its value for instructional application.
10. Research has proved that the listening rate, like the reading rate, can be increased.

"Why the Pigeon Does Not Fit the Hole" was presented by August Root, of Syracuse University. The speaker demonstrated and explained the formula 7 ± 2 as a guide to the ability of the listener to recall through audio mode. As Root explained the human brain can only store and handle 7 ± 2 pieces of information. Root stated three basic principles for designing effective audio information.

1. The material should be preorganized. The audience should be told what is intended beginning with a simple organization of central concepts, and then move onto complex concepts that can be explained from the central concepts.
2. Stop regularly, especially if information is given through an audio tutorial system. The information should be designed based on several segments of information. 3. The "chunk" technique plays an important role in designing the presentation. Root stressed that the important emphasis should not be on training to listen, but on the design of the message. He also explained five scales of measuring the degree of listening skills which are to be identified from the levels of response to the speaker. These levels of responses towards the speaker include:

1. The listener's critisism of the speaker.
2. The introduction of irrelevant responses to the message by the listener.
3. The listener responds only to part of the message.
4. The listener understands the speaker, knows the message well so he responds accordingly.
5. The listener intergrates all the information he has been received including which has happened before his response.

In conclusion, Root emphasized that the reception, sorting, organizing and accepting or rejecting the information is the listening process.

Sarah H. Short, of the International Audio Tutorial Congress, explained the use of self-instructional methods at Syracuse University and the Upstate Medical Center in Syracuse, New York. Courses are taught by means of audio tapes intergrated with slides, 8mm films, CAI, and workbooks. Video tape is used for observing learners' attitudes and study activities during the learning process. A portion of Dr. Short presentation was a playback of an audio tape in which music was used for illustration and to stimulate listening.

The systematic approach as applied to the development of an Audio Tutorial System was described by Tahir Razik, of State University of New York at Buffalo, Buffalo, New York. He explained five system's models under current consideration. All five models, he said, fall into three catagories: action that helps define the problem and organize a means to solve the problem, action that helps analyze and develop solutions to the problem, action that serves to evaluate the solutions. All of these are inter-related by feedback built into the models. He explained that the provision for feedback allows the instructional system to be refined and its effect enhanced.

A highlight of the conversation was when Emerson Foulke, of the Rate Controlled Recording Center, University of Louisville, Louisville, Kentucky, discussed "The Role of Time Compressed Speech in Aural Reading". As Foulke said, When a person listens to the recorded oral reading of another person, he is resorting to an alternative means of obtaining the information that might otherwise be obtained by reading the printed page, and he is therefore reading by listening. Some of the behaviors that enhance the performance of the visual reader are not ordinarily available to the aural reader. One of these is the ability to choose and vary word rate in accordance with the reader's objectives and the demands imposed on

him by the reading matter. The recent availability of relatively inexpensive equipment for the time compression of speech, and the imminent availability of even less expensive equipment, confronts the aural reader with the opportunity to wrest control of reading rate from the oral reader and manage it for himself. This opportunity confronts the researcher with interesting questions. How should the aural reading rate be managed? Should management strategies developed through research, be taught to the aural reader, or should the aural reader be allowed to forge a management strategy from his own experience?

Subgroup meetings were scheduled and each guest speaker participated in their discussion. The purpose of the subgroups' discussion was to respond regarding areas needing clarification or elaboration, areas of disagreement, and problems of practical application.

During the last phase of the conversation, two faculty members from the SUNY system campuses presented short papers. Brombach, of State University College at Postdam presented "Time Expansion on Music Analysis" and Richard D. Kelly of SUNY at Albany discussed the Audio Tutorial system used during the six week summer session in Biology at his campus.

The results of theconversation's ranked evaluation showed that 86 percent of the participants felt strongly that similar meetings should be held annually, 74 percent supported the offering of a course of Listening and Technology at the college level. Participants felt attendance at the conversation was worthwhile and they intended to implement what was discussed during the conversation. They indicated that the meeting fullfiled their expectations, met the objectives, and the speakers were appropriate.

The conversation was sponsored by the State University of New York, New York.

The meeting was attended by 11 SUNY campuses and other institutions and was held on August 4, 1973 at the State University College at Buffalo, New York. Dr. Gene H. Steffen, the director of Instructional Resources represented the college president welcomed the conversations' participants.

HARUN ARRASHID, Ed. D.
Instructional Resources
State University College at Buffalo
1300 Elmwood Avenue
Buffalo, New York 14222

LISTENING: A NEGLECTED MODE

Harun Arrasjid, Ed.D.

During the past decade and a half educators have become more interested in listening as a component of the communication-learning process. Listening is one of the most neglected areas of education. As reported in the Third Mental Measurements Yearbook in 1949, no references to a single test of listening ability were listed.

Pratt found there were no more than 175 titles on listening in 1952 and only about 50 articles of these can be classified as research. Even today there is no measurement of listening as a predictor of students' success, although there are reading specialists, there are no listening specialists.

A clear relationship exists between the performance of listening and the arts of reading and writing. As listening skills improve the listener's understanding increases and consequently, communication skills improve.

Our purpose in speaking is usually to influence, to persuade or to inform another person. As we listen to another speaker, we experience change within ourselves. We are motivated towards discussion and find ourselves learning.

Listening deserves attention at all learning levels. Continuous improvement in the art of listening unquestionably goes hand in hand with progress in speaking, because conversation depends on communication interaction. Good conversation is impossible without critical listening.

Understanding of instructions given through the aural mode requires critical listening. We must listen with discrimination because of the constant barrage of audio stimuli from our environment.

Opportunities for listening to listen occur whenever the spoken word is used. There are many situations arising constantly in the life of every individual which call for critical and discriminating listening and for the mental responsiveness that is real thinking.

Readiness for listening is as important as readiness for reading. At all age levels, physical conditions conducive to good listening need to be provided. Preparation for listening paves the way for thoughtful concentrated listening. In the primary grades a definite time is set aside almost daily for appreciative listening. The work of the intermediate grades calls for more of analytical listening. Guidance can develop more mature listeners. Listening plays an important role in learning and achievement.

LISTENING AND COMMUNICATION

Communication, involving as it does both transmission and reception, is by nature a two-way process. Broad definitions of speaking and writing encompass the transmittal phase of verbal communication. Reception of communication is commonly thought of as the work of the visual and aural senses. Of course, other senses such as touch and smell play a role, but the major portion of the reception

of verbal communication depends on reading and listening, if these terms are used in their broadest sense.

Language communication consists of four major components. Listening and reading, the input components, and speaking and writing, the output components. Only listening occurs almost all of the time. Our ears are always receiving sensations of sound. The listening skill seems to be the most important factor for success in school. We sometimes say children listen but they do not hear. The instructor can help the child use his listening skills more effectively by providing guidance and practice. For a child to listen well, he must be able to discriminate among sounds, get meaning from context, interpret, draw conclusions and predict.

Listening depends on hearing but must be distinguished from it, just as reading depends on, but encompasses more than seeing. Both listening and reading involve an intellectual or mental action. The term used for the result of this action is comprehension. Comprehension implies the attachment of meaning to the message seen or heard and comprehension involves interpretation and evaluation. When we listen we attend; we organize a maximum concentration or our sensory receptors upon the communicative stimulus consisting of audible and visible symbols. Only after we attend do we perceive. Then we respond after we both attend and perceive. One can listen to speech, to music, or to other sounds, and the essential act remains the same.

Listening plays an important role in the process of communication. Various studies have indicated that in terms of the amount of time the four communications skills are employed, listening is the most important skill. In a study of adults, Rankin found that 45% of the total time they devoted to communication was spent in listening, 30% in speaking, 16% in reading and 9% in writing. A similar study by Bird with female college students revealed that 42% of their time was spent by listening, 25% in speaking, 15% in reading and 18% in writing. A study carried out by Wilt on 530 elementary school children from grades 1 through 6 in 19 classrooms showed that children were expected to listen 57-½% of the time they spent in the classroom, the median daily time being 158 minutes. Wilkinson found that elementary school students spend more than one half of their school day listening, and high school students range as high as 90%.

But quite apart from evidence of this kind, which cannot be properly evaluated without some assessment of the relative importance of the content that is communicated, it is obvious that listening is a significant medium of learning at all stages of education as well as in post school life. And the need for effective listening in the higher grades of the elementary school and in high school and college, is likely to become more pronounced as instructional technological audio devices are used increasingly to supplement formal lessons and lectures. At the adult level, listening opportunities have been extended spectacularly in the present century with the development of such mass media as radio, television and film. One study found that adults received about 60% information through modern technological devices. We cannot argue Zeno's statement: "We have two ears and one mouth that we may listen more and talk the less."

CAN PEOPLE BE TRAINED TO LISTEN?

Various studies show that training in listening is possible. In separate studies, Bird, Brown, Erickson, Nichols and Lewis found that experimental groups

gain in listening comprehension after training in listening. That low listening ability subjects benefit from training more than subjects of high listening ability has been found by Bird, Ericson and also by Irvin. Results from the Penfield study in the area of learning to listen showed that training in listening was most effective at grades two and five, with very little impact at grades eight and eleven.

Taylor's studies showed gains in student listening efficiency even after brief exposure to listening exercise. Kervin found that systematic instruction in listening comprehension benefited all intermediate grade students. As reported by Wilkinson, various investigators have found in almost all cases that experimental groups of college freshman who have received systematic training have achieved higher scores on listening comprehension tests than students who do not have training.

Taher A. Razik, Ph. D.
Professor of Education
SUNY at Buffalo

"A Systematic Approach"

Systemic development of instruction vary from simple models to very complex specifications of step-by step approaches to developing instructional materials. Regardless of the simplicity or complexity of a particular "Systems Approach" is, in listening and audio tutorial to developing instruction, all models have many similarities. This presentation will present five "systems approach" models and describe some of the similarities and differences between them. The models under considerations are:

1.	Teaching Research System	Hamreus	1968
2.	Michigan State University Instructional Systems Development Model	Barson	1967
3.	Systems Approach for Education	Corrigan	1966
4.	Instructional Systems Design	Tracey	1967
5.	Banathy Instructional Development System	Banathy	1968

Each of the above models include actions that fall into three major categories. 1.) Actions that help define the problem and organize a means to solve the problem, 2.) and actions that help analyze and develop solutions to the problem, 3.) and actions that serve to evaluate the solutions. All of these actions are inter-related by feedback built in the model. The provision of feedback allows the instructional system to be refined and its effect enhanced. Feedback is critical dynamic of instructional development approaches:

Feedback

Problem Definition and Organization	System Analysis Development	System Evaluation

Problem definition and Organization:
- a. Identification of problem
- b. Analysis of setting
- c. Organization of management

Systems Analysis and Development:
- a. Identification of Objectives
- b. Specification of methods
- c. Construction of prototypes

Systems Evaluation:
- a. Testing of prototype
- b. Analysis of results
- c. Implementation/recycling

Instructional Development System

Any instructional development system should include the following:

STAGE I: DEFINE

IDENTIFY PROBLEM	ANALYZE SETTING	ORGANIZE MANAGEMENT
Assess Needs	Audience	Tasks
Establish Priorities	Conditions	Responsibilities
State Problem	Relevant Resources	Time Lines

STAGE II: DEVELOP

IDENTIFY OBJECTIVES	SPECIFY METHODS	CONSTRUCT PROTOTYPES
Terminal	Learning	Instructional Materials
Enabling	Instruction Media	Evaluation Materials

STAGE III: EVALUATION

TEST PROTOTYPES	ANALYZE RESULTS	IMPLEMENTATION
Conduct Tryouts	Objectives	Review
Collect Evaluation Data	Methods	Decide
	Evaluation Techniques	Act

ADDENDA

Conversation in the Discipline
An Analysis of Listening and Audio-Tutorial System
State University College at Buffalo

Purposes and Goals

The goals will be: to promote a familiarity of the participants with other campuses' efforts towards the improvement of learning through listening, to improve college students' achievement by promotion of audio-tutorial systems and ~~to improve college students' achievement by promotion of audio-tutorial systems and~~ to improve college students' listening skills.

Generally, the conversation will bring SUNY faculty to a peak of academic conversation in the specific area--Listening and Audio-Tutorial System.. The area of listening which has been heretofore neglected will be analyzed.

Specific Objectives:

1. To analyze the physical and psychological aspects of listening. To discuss listening skills and their effect on listening comprehension, specifically on recall of information, concepts, principles and inferences.

2. To analyze research findings in the area of listening comprehension. To discuss supporting studies in various disciplines.

3. To promote further research by conversation participants in listening comprehension and audio-tutorial approach.

4. To discuss the implementation of research findings concerning listening comprehension within the institutional system.

5. To analyze the improvement of listening comprehension, its efficiency and effectiveness and the raising of incentives and the capabilities of the instructional system.

6. To discuss the role of technology in the improvement of listening comprehension, and analyze the cybernatic principle of learning. To analyze the establishment of the audio-tutorial system.

7. To discuss the current impact of the audio-tutorial approach at the level and the development of a conceptual framework based on an analysis-synthesis sequence. To analyze the audio-tutorial system as a self-contained instructional package. To analyze the conceptual framework for planning, orderly consideration of functions and resources, including facilities. To analyze a way of checking on the relationship of all components' performance. To analyze various successful audio-tutorial systems of various levels and complexity.

8. To evaluate existing audio-tutorial programs within the SUNY system based on reports by participants.

9. To discuss the implementation of compressed audio tape at the college level. To present audio tape compression techniques and equipment. To explore the system's view, the mediated audio-tutorial approach with compressed audio tape, and tactics used in the strategy of instruction. To analyze the effect of alternating audio stimuli.

10. To discuss "Listening and Technology" as a potential course at the college level, the course's relevance to and primary role in instruction.

CONVERSATIONS IN THE DISCIPLINE

An Analysis of Listening and Audio-Tutorial Systems

Directions

a) It is expected that the participants will respond regarding:

1. areas needing clarification
2. areas of disagreement
3. areas needing elaboration
4. problems of practical application

b) Interaction will occur during the subgroup meetings. Two participants should be assigned, one as a moderator, another as reporter to the large group meeting. Questions should be listed and asked of the guest speakers and the panel discussion.

CONVERSATIONS IN THE DISCIPLINE

An Analysis of Listening and Audio-Tutorial Systems

EVALUATION

1. The conversation fulfilled my expectations.
2. The objectives of the conversation were attained.
3. The guest speakers were appropriate.
4. The A-T system was well presented.
5. Compressed Speech was well presented.
6. Listening as a mode and the A-T approach as a means were well presented.
7. Listening was well discussed.
8. I prefer the conversation be an annual event.
9. In the future the conversation should be lengthened to two days.
10. Elementary and secondary school teachers should be included as participants in future conversations.
11. A college level course covering "Listening and Technology" should be offered.
12. I intend to implement what was discussed in the conversation.
13. Attendance at the conversation was worthwhile.

BIBLIOGRAPHY

LI ST NING AND T CHNOLOGY

Complied by

Dr. Harun Arrasjid

Instructional Resources

State University College at Buffalo, N.Y.

July, 1973

Introduction

The purpose of this bibliography is to provide a compendium of references in the area of LISTENING and TECHNOLOGY.

Included in the bibliography are a broad range of references, a mixture of all levels and types of techniques.

Hopefully, the bibliography will answer many questions from educators and researchers in this area. For information on compressed speech, we suggest the:

"Proceedings of the Second Louiville Conference on

Rate and/or Frequency-Controlled Speech"

published by the University of Louisville, Center for Rate Controlled Recording", Louisville, Kentucky, 40208.

Abrams, A. G. "Comprehension in Listening-Relation of Listening and Reading Comprehension to Skill in Message Structuralization," Journal of Communication, XVI (June, 1966).

Atwood, J. , Babcock, M. , Gazdag, J. , Peterson, L., & Schill, J. Speech analysis and classification. Biological Computer Laboratory Report No. 67.2. Champaign, Ill. : University of Illinois, Biological Computer Laboratory, 1967.

Axelrod, S. Underestimation of dichotic click rates: Results using methods of absolute estimation and constant stimuli. Psychonomic Science,1968, 12, 133-134.

Black, J. W. Aural perception of sentences of different lengths, Quat. J. of Speech, 1961, 47, 51-53.

Blake, Howard E. "A Code for Teachers of Listening," Elementary English, XXXIX (January 1962).

Brewster, L. W. "Effect of a Brief Training Program in Listening Improvement," Speech Teacher, XV (January, 1966).

Brilhart, B. L. "Relationship between Some Aspects of Communicative Speaking and Communicative Listening," Journal of Communication, XV (March, 1965).

Brown, C. T. "Three Studies of the Listening of Children," Speech Monograph, XXXII (June, 1965).

Burns, Paul C. Teaching Listening in the Elementary Schools," Elementary English, XXXIX (January, 1962).

Barnard, D. P. A Study of the Effect of Differentiat d Auditory Presentation on Listening Comprehension and Rate of Reading Comprehension at the Sixth Grade Level. Boston: Boston University, 1970.

Bennett, D. H. A Study of Slow-Play Distortion and Its Influence on Speech Intelligibility under Low-Pass Filter Conditions. Seattle, Washington: University of Washington, 1963.

Babcock, M. Speech characterization, i.e., analysis, synthesis, and recognition. Biological Computer Laboratory Report No. 68.2. Champaign, Ill.: University of Illinois, Biological Computer Laboratory, 1968.

Bell, R. E. "An Analysis of Certain Elements of an Audio-Tape Approach to Instruction." Audio Visual Communication Review, 1970, 10 (2). (abstract)

Bradshaw, J. L. "Ear Assymetry and Delayed Auditory Feedback: Effects of Task Requirements and Competative Stimulation." Journal of Experimental Psychology, 1972, 94 (3), 269-275.

Brown, J. I. "Why Not Teach Listening." School and Society, February, 1949, 113-116 (a).

Brown, J. I. "The Measurement of Listening Abilities," School and Society, 71, No. 1883, February 1950, 69-71 (c).

Brent, S. B. Linguistic unity, list length, and rate of presentation in serial anticipating learning. Journal of Verbal Learning and Verbal Behavior, 1969, 8, 70-79.

Bricker, P., & Pruzansky, S. Effects of stimulus content and duration on talker identification. Journal of the Acoustical Society of America, 1966, 40, 1441-1449.

Broadbent D. Growing points in multi-channel communication. Journal of the Acoustical Society of America, 1956, 28, 533-535.

Broadbent, D. Perception and communication. New York: Pergamon Press, 1958.

Brown, J. I., & Carlsen, G. R. Brown-Carlsen listening comprehension test: Evaluation and adjustment series. New York: Harcourt, Brace & World, 1955.

Brown, S. W., Guilford, J. P., & Hoepfner, R. A factor analysis of semantic memory abilities. (Report No. 37) Psychological Laboratory, University of Southern California, Los Angeles, 1966.

C. I. D. manual for auditory tests W-1 and W-2 St. Louis: Central Institute for the Deaf, 1957.

Calway, H. F. "The Relative Effects of Instruction with Narrative and Factual Materials on Listening Skills." (Unpublished Doctoral Dissertation, University of Minnesota, 1962.)

Calaaro, C. , Teatini, G. P. , Pestalozza, G. Speech intelligibility in the presence of interrupted noise. Journal of Auditory Research, 1962, 2, 179-187.

Calhoun, S. Influence of syliabic length and rate of auditor presentation on ability to reporduce disconnected word lists. Journal of Experimental Psychology, 1935, 18, 612-620.

Carey, P. W. Delayed auditory feedback and the shadowing response. Unpublished doctoral dissertation, Harvard University, 1963.

Carhart, R. Future horizons in audiologic diagnosis. Annals of Otology, Rhinology, Rhinology, and Laryngology, 1968, 77, 706-716.

Carhart, R. Special hearing tests for otoneurologic diagnosis. Archives of Otolaryngology, 1969, 89, 64-66.

Carlson, J. Digitalized phase vocoder. AFCRL and Institute of Electrical and Electronic Engineers Audio and Electro-acoustics 1967 Conference on Speecch Communication and Processing, Bedford: , OAR, United States Air Force, 1967,

Carrell, J. , & Tiffany, W. Phonetics: Theory and application to speech improvement. New York: McGraw-Hill, 1960.

Carroll, J. B. Language and thought. Englewood Cliffs, N.J.: Prentice-Hall, 1964.

Compton, A. Effects of filtering and vocal duration upon the identification of speakers aurally. Journal of the Acoustical Society of America, 1964, 35 1748-1753.

Conant, R. , & Ashby, W. Information, transmission, and redundancy in regulatory systems. Biological Computer Laboratory Report No. 67.2. Champaign, ILL.: University of Illinois, Biological Computer Laboratory, 1963.

Chatterjea, R. Time gap in the estimation of short duration with auditory presentation. Australian Journal of Psychology, 1959, 11, 182-190.

Chomsky, N. , & Halle, M. Sound pattern of English. New York: Harper & Row, 1968.

Central institute for the deaf manual for auditory tests W-1 and W-2. St. Louis: Central Institute for the Deaf, 1957.

Condon, E. F. An analysis of the differences between good and poor listeners in grades nine, eleven, and thirteen. (Unpublished doctoral dissertation, University of Kansas, 1965) Dissertation Abstracts, 1965, 26, 3106.

Cooke, J. , & Beard, S. Speech intelligibility for space vehicles using nitrogen or helium as the inert gas. Journal of the Acoustical Society of America, 1966, 40, 1450-1453.

Cooper, F. S., Delattre, P. C. , Liberman, A. M. , Borst, J. M., & Gerstman, L. J. Some experiments on the perception of synthetic speech sounds. Journal of the Acoustical Society of America, 1952, 24 (6), 597-606.

Cooper, F. S. , Liberman, A. M. , & Borst, J. M. The interconcersion of audible and visible patterns as a basis for research in the perception of speech. Proceedings of the National Academy of Sciences, 1951, 37 (5), 318-325.

Cornett, R. Cued speech. American Annals of the Deaf, 1967, 112, 3-13.

Dale, E., & Chall, J. S. A formula for predicting readability. Educational Research Bulletin, 1948, 27, 11-20, 28.

Darley, F. L. A normative study of oral reading rate. (M. A. Thesis, State University of Iowa), 1940.

Davis, H. (Ed.) Silverman, S. R. (Co. Ed.) Hearing and deafness. (rev. ed.) New York: Holt, Rinehart, & Winston, 1964.

de Hoop, W. Listening comprehension of cerebtal palsied and other crippled children as a function of two speaking rates. Except Children, 1965, 31, 232-240.

Delattre, P. , Cooper, F. S. , Liberman, A. M. , & Gerstman, L. J. Speech synthesis as a research technique. Proceedings of the VIIth International Congress of Linguists (1952). London: Titus Wilson, 1956, 545-561.

Duker, S. "Listening and Reading," Elementary School Journal, (January, March, 1965)

Discussion of the speech code and visual speech. American Annals of the Deaf, 1967, 113, 203-204.

Duker, S. Listening bibliography. New York: Scarecrow Press, 1964.

Edgar, R. A. "Groups Organized for Listening," International Journal of Religious Education, XLII (November, 1965).

Egan, J. P. Articulation testing methods. Laryngoscope,1948, 50, 955-991.

Endres, W. On the experimental evaluation of the interior redundancy in speech. (No. B-3-10) Reports of the 6th International Congress on Acoustics,1968.

Fawcett, A. E. The effect of training in listening upon the listening skills of intermediate grade children. (Unpublished doctoral dissertation, University of Pittsburgh, 1963 Disertation Abstracts, 1965, 25, 7108,7109.

Feldman, R. , & Reger S. Relations among hearing, reaction time and age. Journal of Speech and Hearing Research, 1967, 10. 479-495.

Fergen, G. K. Listening comprehension controlled rates for children in Grades IV, V, and VI. (Unpublished doctoral dissertation, University of Missouri, 1954) Dissertation Abstracts, 1955, 15, 89.

Foder, J. A. , & Bever, T. G. The psychological reality linguistic segments. Journal of Verbal learning and Verbal Behavior. 1965, 4, 414-420.

Fry, D. Duration and intensity as physical correlates of linguistic stress. Journal of the Acoustical Society of America, 1955, 27, 765-768.

Fujimura, G. An approximation to voice aperiodicity. AFCRL and Institute of Electrical and Electronic Engineers Audio and Electro-acoustics 1967 conference on Speech Communication and Processing. Bedford: OAR, United States Air Force, 1967.

Fessenden, S. A. Designed for Listening: A Speaker-Listener Workbook. Aiowa: W. C. Brown Co. Publisher, 1951.

Fessenden, S. A. "Level of Listening -- A Theory". Education, 1955, 75, 288-291.

Fawcett, A. E. "Training in Listening," Elementary English, (May, 1966).

Flesch, R. A new readability yardstick. Journal of Applied Psychology, 1948, 32, 231-233.

Foulke, E. & Sticht, T. G. Listening rate preference of college students for literary material of moderate difficulty. J. Aud. Res., In Press.

Friedman, H. L., Orr, D. B., Freedle, R. O., & Morris, Cynthia H. Further research on speeded speech as an educational medium. Progress Report #2, Grant No. 7-48-7670-267, Office of Education, Washington, D. C.: U.S. Department of Health, Education, & Welfare, 1966 (a).

Friedman, H. L. , Orr, D. B., & Morris, Cynthia H. Further research on speeded speech as an educational medium. -- The use of listening aids. Washington: American Institutes for Research, 1966 (b).

French, N. R. , & Steinberg, J. C. Factors governing the intelligibility of speech sounds, Journal of the Acoustical Society of America, 1947, 19, 90-119.

Fletcher, H. Speech and hearing on communications. New York. D. Van Nostrand Co., 1965. (Chs. 15-19)

Flowers, A. , & Costello, M. Responses to distorted speech of children with severe articulation disorders. Journal of Auditory Research,3, 133-140.

Flanagan, J. Speech analysis synthesis and perception. New York:Academic Press, 1965, (Chs. 7-8)

Gabor, D. New possibilities in speech transmission. Journal of the Institute of Electrical Engineers, 1947, 94(3), 369-387.

Gabor, D. Improvements in and relating to transmission, recording, and reproduction of sound. London: The Patent Office, January 18, 1949. British Patent No. 616, 156.

Gabor, D. Improvements in and relating to the transmission of speech. London: The Patent Office, November 1, 1950. Brititsh Patent No. 645,542.

Gabor, D. Bandwidth compression and expansion system for transmission of speech. A description of a speech compressor. Washington, D. C.: United States Patent Office, May 11, 1965. U.S. Patent No. 3, 183, 310.

Gabrilovitch, L. Method and device for reducing and multiplying acoustic frequencies. London: The Patent Office, September 12, 1938. British Patent No. 491,937.

Gabrilovitch, L. Method and device for reducing and increasing audio frequencies. Washington, D. C.: United States Patent Office, August 22, 1939.

Gazdag, J. A method of decoding speech. Technical Report No. 9, 1966, University of Illinois, Contract Af 7-66, Electrical Engineering Research Laboratory, Engineering Experimental Station.

Gemelli, A. The minimum duration of a phoneme sufficent for its perception. In A. Gemmelli & G. Pastori (Eds.), L'analisi elettroacustical del linguaggio. Milan, Italy: Societa Editrice "Vita e Pensiero," 1934. (Pp. 149-162)

Goldman-Eisler, F. The determinants of the rate of speech out-put and their mutual relations. Journal of Psychosomatic Research, 1956, 1,137-143.

Garvey, W. D. The intelligibility of speeded speech. J. Expt. Psychol.,1953 (a), 45, 102-103.

Garvey, W. D. The intelligibility of abbreviated speech patterns. Quart. J. Speech, 1953 (b), 39, 296-306.

Garvey, W. D., & Henneman, R. H. Practical limits of speech. Dayton, Ohio: AF Technical Report No. 5917, WPAFB, USAF, 1950.

Gibbons, E. W. , Winchester, R. A. , & Krebs, D. F. The variablity of oral reading rate. J. Speech and Hearing Disorders, 1958, 23, 591-593.

Goldman-Eisler, Frieda. Speech production and the predictability of words in context. Quarterly Journal of Experimental Psychology,1958, 10, part 2, 96-106.

Goldman-Eisler, Frieda. Continuity of speech utterance, its determinants and its significance. Language and Speech, 1961, 4 , 220-231.

Goldstein, H. Reading and listening comprehension at various controlled rates. Teachers College, Columbia University Contributions to Education, No. 821. New York, Bureau of Publications, Teachers College, 1940.

Gallant, R. The Improvement of Listening Comprehension Skills at the College Level. Miami University of Ohio, 1959.

Goodman-Malamuth, L., II. An Experimental Study of the Effects of RAte of speaking upon Listenability. Los Angeles, California: University of Southern California, 1956.

Gropper, R. L. Comprehension of Narrative Passages by Fourth Grade Children As a Function of Listening Rate and Eleven Predictor Variables. Nashville, Tennessee: George Peabody College, 1969.

Garvey, W. D. Duration factors in speech intelligibility. Unpublished master's thesis, University of Virginia, 1949.

Hartlage, L. Differences in listening comprehension between blind and sighted subjects. International Journal for the Education of the Blind, 1963, 13, 1-6.

Harwood, K. A. Listenability and rate of presentation. Speech Monographs, 1955, 22, 57-59.

Hudgins, C. V. , Hawkins, J. E. , Karlin, J. E. , & Stevens, S. S. The development of recorded auditory tests for measuring hearing loss for speech. The laryngoscope, 1947, 57, 57-59.

Hutton, Charles L. , Jr. A psychophysical study of speech rate. Dissertation Abstr. 1955, 15, 168. (Unpub. Ph. D. Thesis, Univ. Iowa), 1954.

Hollingsworth, P. M. "So They Listened: The Effects of a Listening Program," Journal of Communication, (March, 1965).

Hollingsworth, P. M. "Effectiveness of a Course in Listening Improvement for Adults," Journal of Communication, 1966, Vol. 16.

Hirsch, I. Auditory perception of temporal order. Journal of the Acoustical Society of America, 1959, 31, 759-767.

Hirsch, I. Audition in relation to perception of speech. Brain Function, Vol. III: Speech, Language, and Communication. Berkley: University of California Press, 1966.

Hirsch, I. Information processing in input channels for speech and language: The significance of serial order of stimuli. In C. H. Millikan & F. L. Darley (Eds.) Brain mechanisms underlying speech and language. New York: Grune & Strattion, 1967.

Huggins, A. Distortion of the temporal pattern of speech: Interruption and alternation. Journal of the Acoustical Society of America, 1965, 36, 1055-1064.

Hunter, E. Problems of diver,communication. AFCRL and Institute of Electrical and Electronic Engineers Audio and Electro-acoustics 1967 Conference on Speech Communication and Processing. Bedford, OAR, United States Air Force, 1967.

Inderesan, P. Interrupted speech and the possibility of increasing communication effectiveness. Journal of the Acoustical Society of America, 1963, 35, 405-408.

Johnson, W. Measurements of oral reading and speaking rate and disfluency of adult male and female stutterers and nonstutterers. J. speech and hearing Disorders, Monogr. Suppl., 1961, No. 7, 1-20.

Johnson, W. , Darley, F. , & Spriestersbach, D. C. Diagnostic Methods in Speech Pathology. New York: Harper & Row, 1963, 202-203.

Jester, R. E. Comprehension of connected discourse as a function of individual differences and rate and modality of presentation. (Unpublished doctoral dissertation, University of Utah, 1966) Dissertation Abstracts, 1966, 27, 957.

Jester, R. E., & Travers, R. M. W. Comprehension as a function of rate and modality of presentation. Paper presented at the meeting of the American Psychological Association, Chicago, September 1965.

Jester, R. E., & Travers, R. M. W. Comprehension of connected meaningful discourse as a function of rate and mode of presentation. Journal of Educational Research, 1966, 59(7), 297-302.

Jester, R. E. , & Travers, R. M. W. The effect of various presentation patterns on the comprehension of speeded speech. American Educational Research Journal 1967, 4, 353-360.

Kimura, D. Cerebral dominance and the perception of verbal stimuli. Canadian Journal of Psychology, 1961, 15(3), 166-171. (a)

Kimura, D. Some effects of temporal-lobe damage on auditory perception. Canadian Journal of Psychology, 1961, 15(3), 156-165. (b)

Kimura, D. Speech lateralization in your children as determined by an auditory test. Journal of Comprative and Physiological Psychology, 1963, 56(5), 899-902.

Kimura, D. Left-right differences in the perception of melodies. Journal of Experimental Psychology, 1964, 16(4), 355-358.

Kozhevnikov, V. A., Chistovich, L. A. Speech: Articulation and perception, (Trans. No. JPRS 30, 543, 1965) Washington D. C. : United States Department of Commerce, Joint Publication Research Service, 1966.

Koen, F. m Becker, A. , & Young, The psychological reality of the paragraph. Journal of Verbal Learning and Verbal Behavior, 1969, 8, 49-53.

Kryter, K. On predicting the intelligibility of speech from acoustic measures. Journal of the Acoustical Society of America, 1956, 28.

Karlin, J. E., et al. Auditory tests of the ability to hear speech in noise. OSRD Report No. 3516. Psycho-acoustic Laboratory, Harvard University, 1944.

Kevin, Sister Mary. "Listening Comprehension at the Intermediate Grade Level" The Elementary School Journal, December, 1955, 158-161.

Ludsteen, S. W. "Critical Lis ening: An Experiment," Elementary School Journal, LXVL (January and March, 1966.

Lundsteen, S. W. "Critcal Listening: Permanency and Transfer of Gains Made during an Experiment in the Fifth and Sixth Grades," Journal of Educational Research, XVI (November, 1965).

Lafon, J. C. The phonetic test and the measurement of hearing Springfield: C. C. Thomas, 1966.

Laughery, K. , Lachman, R., & Dansereau, D. Short-term memorandum. Effects of item-pronunciation time. In, Proceedings of the 73rd annual convention of the American Psychological Association. Washington, D. C. American Psychological Association, 1965.

Laughery, K. , Pinkus, A. Recoding and presentation rate in short-term memory. Journal of Experimental Psychology, 1966, 76, 636-641.

Liberman, A. M. Some results of research on speech perception. Journal of the Acoustical Society of America. 1957, 29, 117-123.

Liberman, A. M. Some results on speech perception. In S. Sapolta (Ed.) Psycholinguistics. New York: Holt, Rinehart & Winston, 1961. (Pp. 142-153).

Lieberman, P. Intonation, perception and language, Cambridge: The MIT Press, 1967.

Lewis, R. F. "Complementing Instruction in Reading Improvement of College Students with Instruction in Auding." (Unpublished Doctoral Dissertation, Auburn University, 1963).

Menne, J. W., Hannum, T. E., Klingensmith, J.E. and Nord, D. "Use of Taped Lectures to Replace Class Attendance,: Audio Visual Communication Review, 1969, 17 (1), 42-46.

Miller, E. C. Effects on learning of variations in oral presentation. (Unpub. doctoral dissertation, Univer. of Denver), 1954

Miller, G. A., Intelligibility of speech. Effects of distortion, In C. E. Waring (Ed.), Combat Instrumentation II. Washington, D. C. Government Printing Office, 1946. (Pp. 88-109)

Miller, G. A. Language and communication. New York: McGraw-Hill, 1951. (a)

Miller, G. A. Speech and language. In S. Stevens (Ed.), Handbook of experimental psychology. New York: Wiley, 1951. (b)

Miller, G. A. What is information measurement? American Psychologist, 1953, 8, 3-11.

MacKay, D. Metamorphosis of a critical interval: Age-linked changes in the delay in auditory feedback that produces maximal disruption of speech. Journal of the Acoustical Society of America, 1968, 43, 625-627.

Maclay, H. , & Osgood, C. E. Hesitation phenomena in a spontaneous English speech. Word, 1959, 15, 19-44.

Mac Lean, D. Analysis of speech in a helium-oxygen mixture under pressure. Journal of the Acoustical Society of America, 1966, 40, 625-627.

Mahaffey, R. , & McDill, J. Some relations between perception of short silent intervals and the production of speech. Journal of the Acoustical Society of Acoustical Society of America, 1968, 44, 396.

Miller, G. A. The magical number seven, plus or minus two: Some limits on our capacity for processing information. Psychological Review. 1956, 63, 81-97.

Miller, G. A. Decision units in the perception of speech. Transactions of the Institute of Radio Engineers Professional Group on Information Theory, 1962, IT-8, 81-83.

Miller, G. A. , & Chomsky, N. Finitary models of language users. In (R. Luce, R. Bush, and E. Galanter, Eds.), Handbook of mathematical psychology, 1963, 2 , 419-492.

Miller, G. A. , Heise, G. A., & Lichten, W. The intelligibility of speech as a function of the context of the test materials. Journal of Experimental Psychology, 1951, 41, 329-335.

Miller, G. A. , & Isard, S. Some perceptual consequences of linguistic rules. Journal of Verbal Learning and Verbal Behavior, 1963, 2, 217-228.

Miller, G. A., & Licklider, J. C.R. The intelligibility of interrupted speech. Journal of the Acoustical Society of America, 1950, 22, 167-173.

Miller, G. A. , & Selfridge, J. A. Verbal context and the recall of meaningful material. American Journal of Psychology, 1950, 63,176-135.

Miller, R. L. Signaling system. Washington, D. C. : United States Patent Office, May 17, 1938. U. S. Patent No. 2, 117, 739.

Minifie, F. D. An analysis of the durational aspects of connected speech by means of an electronic speech duration analyzer. Unpublished doctoral dissertation, University of Iowa, 1963.

Miron, M. S. (ed.) Experimental phonetics: Selected articles by Grant Fairbanks. Urbana, ILL,: University of Illinois Press, 1966.

Moray, N. Attention: Selective processes in hearing and vision. London: Hutchinson, 1969.

Murdock, B. Recent developments in short-term memory. British Journal of psychology, 1967, 314 421-433.

Murray, D. Visual and auditory presentation rate and short-term memory in children. British Journal of Psychology. 1968, 59, 119-125.

Nelson, H. E. The effect of variations of rates on the recall by radio listeners of straight newscasts. Speech Monographs, 1948, 15, 173-180.

Nichols, P. G., & Stevens, L. A. Are you listening? New York: McGraw Hill, 1957.

Nober, E., & Nober, L. Speech reception thresholds and discrimination scores as a function of method of presentation and frequency response. Journal of Auditory Research, 1962, 2, 1-5.

Nolan, C. Y. Reading and listening in learning by the blind. (Progress REport, PHS Grant No. MB-04870-04) Louisville: American Printing House for the Blind, 1966.

Nolan, C. Y. Listening and reading in learning. In, Proceedings of the Louisville conference on time-compressed speech. Louisville: University of Louisville, 1967.

Nolan, C. Y. Reading and listening in learning by the blind. (Terminal Progress Report, PHS Grant No. MD-048-70) Louisville: American Printing House for the Blind, 1968.

Norman, D. Memory and attention: An introduction into human information processing. New York: Wiley & Sons, 1969.

Orr, D. B. & Friedman, H. L. Research on speeded speech as an educational medium. Progress Report, Grant No. 7-48-7670-203, Office of Education, Washington, D. C.: U. S. Department of Health, Education, & Welfare, 1964.

Orr, D. B., Friedman, H. L. , & Williams, Jane C. C., Trainability of listening comprehension of speeded discourse. J. ED. Psychol., 1965, 56, (3), 148-156.

Olsen, J. "How to Help Your Pupils Pay Attention," Grade Teacher, LXXIV (September, 1966).

Orr, D. B. "Note on Rapid Listening," Phi Delta Kappan, XLVI (May, 1965).

Ochai, Y. , & Fukumura, T. Study on fundamental qualities of vocalic timbre by rotational synchronous distortion. Mem. Fac. Eng. Nagoya, 1956, 8, 1-10.

Ochai, Y., & Imumitachi, H. Timbre study of mishearing phonemes of speech phones in rotational synchronous distortion, Report I: Mishearing of vowel timbre. Mem. Fac. Eng. Nagoya, 1955, 7, 49-60.

Ochai, Y. , Saito, S., & Watambe, Y. Allowance problem in rotational synchronous distortion as a study on timbre discrimination by infinitesimal position-shift in the so-called timbre-space. Mem. Fac. Eng. Nagoya, 1955, 7, 131-144.

Pratt, Edward. "Experimental Evaluation of a Program for the Improvement of Listening." The Elementary School Journal. March 1956. 315-320.

Pronovost, Wilbert and L. Kingman. The Teaching of Speaking and Listening in the Elementary School New York: Longmans, Green and Company. 1959.

Penfields, D. A.; Marasquilo, L. A. "Learning to Listen": A Broad Demonstration Study." Paper presented at American Educational Research Association Convention, Minnesota. March, 1970.

Peters, R. W. The effect of changes in side-tone delay and level upon rate of oral reading of normal speaker. Journal of Speech and Hearing Disorders. 1954, 19, 483-490.

Peterson, G. The significance of various portions of the wave-length in the minimum duration necessary for the recognition of vowel sounds. Unpublished doctoral dissertation, Louisiana State University, 1939.

Peterson, G. , Sivertsen, E., & Subramanyam, D. Intelligibility of diphasic speech. Journal of the Acoustical Society of America, 1956, 28, 405-411.

Peterson, H. The study of normal hearing childrens' discrimination for two types of verbal materials presented with varying degrees of distortion. Unpublished doctoral dissertation, University of Illinois, 1967.

Pickett, J. Conference on speech analyzing aids for the deaf: Historical notes and preface. American Annals of the Deaf, 1967, 113, 117-119.

Pickett, J. Recent research on speech analyzing aids for the deaf. Institute of Electrical and Electronic Engineers Transactions on Audio and Electroacoustics, 1968, AU-15, 227-234. (a)

Pickett, J. Sound patterns of speech. American Annals of the Deaf, 1968, 113, 120-126. (b)

Pickett, J. , & Martin, E. Some comparative measurements of impaired discrimination for sound spectral differences. American Annals of the Deaf, 1963, 113, 259-267.

Pickett, J. , & Pollack, I. Intelligibility of excerpts from fluent speech: Effects of rate of utterance and duration of excerpt. Language and Speech, 1963, 6, 151-164.

Pimonov, L. L'Application de la parole synthetique dans la correction auditive. Acustica, 1962, 12, 235-290. (English translation in: Journal of Auditory Research, 1963, 3, 73-82.)

Pimonov, L. La parole synthetique et son application dans la correction auditive. Cahiers d' Acoustique, 1965, 133/134, 151-187.

Pollack, I. Message probability and message reception. Journal of the Acoustical Society of America, 1964, 36, 937-945.

Pollack, I. , & Pickett, J. Intelligibility of excerpts from fluent speech: Auditory versus structural context. Journal of Verbal Learning and Verbal Behavior; 1964, 3, 79-84.

Pollack, I. , Rubenstein, H. , & Decker, L. Analysis of incorrect responses to an unknown message set. Journal of the Acoustical Society of America, 1960, 32, 454-458.

Postman, L. , Turnage, T. E. , & Silverstein, A. The running memory span for word. Quarterly Journal of Experimental Psychology, 1964, 16, 81-89.

Potter, R. , & Steinberg, J. Toward the specification of speech. Journal of the Acoustical Society of America, 1950, 22, 807-820.

Potter, S. Syllabic juncture. In A Sovijarvi & P. Aaito (Eds.), Proceedings of the fourth international congress of phonetical sciences. The Hague: Mouton & Co. , 1962.

Quillian, M. R. Semantic memory Air Force Cambridge Research Laboratories Report #2. Project No. 8668. Cambridge, Mass. : Bolt, Beranek, & Newman, 1966.

Quillian, M. R. Word concepts: A theory and simulation of some basic semantic capabilities. Behavioral Science, 1967, 12, 412-430.

Rodgers, J. R. A formula for predicting the comprehension level of material to be presented orally. J. Educ. Res., 1962, 56, 213-220.

Robinson, Helen M., Marion Monroe, and A. Stere Artley. Before We Read. The New Basic Readers-Teachers' Edition. Chicago: Scott Foresman and Company, 1962.

Russell, David H. and Elizabeth F. Russell. Listening Aids through the Grades, New York: Bureau of Publications, Teachers College, Columbia University, 1959.

Rivers, W. M. "Listening Comprehension," Modern Language Journal, L (April, 1966).

Ross, Ramon. "A Look at Listeners," Elementary School Journal, LXIV (April, 1964).

Ross, Ramon. "Teaching the Listener: Old Mistakes and a Fresh Beginning," Elementary School Journal, LVI (February, 1966).

Ramsay, R. W., & Lae, M. The measurement of duration of speech. Language and Speech 1966, 9- 96-102.

Raymond, T. , & Proud. G. Audiofrequency conversion. Archives of Otolaryngology, 1962, 76, 436-446.

Reddy, D. R. Segmentation of speech sounds. Journal of the Acoustical Society of America, 1966, 40, 307-312.

Risberg, A. The Transposer and a model of speech perception. Speech Trans. Lab. Quarterly Progress Status Report, 1965, 26-30.

Rupf, J. , Hughes, G. , & House, A. Interaural switching effects on the recognition of consonants. Paper presented at the 77th Meeting of the Acoustical Society Of America. Philadelphia, 1969.

Savin, H. B. Word-frequency effect and errors in the perception of speech. Journal of the Acoustical Society of America, 1963, 35, 200-206.

Intelligibility of reiterated speech, Journal of the Acoustical Society of America 1959, 31,423-427. Scharf D.

Schwartz, M. F. Differential effect of instructions upon the rate of oral reading. J. acoust. Soc. Amer., 1961, 33, 1801-1802.

Scott, R. J. Temporal effects in speech analysis and synthesis. (Unpub. doctoral dissertation, Univer. of Michigan), 1965.

Shearn, D. , Sprague, R., & Rosenzweig, S. A method ofr the analysis and control of speech rate. J. exp. Anal. Behav., 1961, 4, 197-201.

Spicker, H. Listening comprehension and retention of intellectually normal and retarded children as a function of speaking rate and passage difficulty. (Unpub. Doct. Diss., George Peabody College for Teachers), 1963.

Stone, S. Prior entry in the auditory-tactual complication. American Journal of Psychology, 1926, 37,234-287.

Starkweather, J. A. A speech rate meter for vocal behavior analysis. Journal of the Experimental Analysis of Behavior, 1960, 3,11-114.

Starkweather, J. A., & Hargreaver, W. A. The influence of sodium pentobarbital on vocal behavior. Journal of Abnormal Social Psychology, 1964, 69,123-126.

Sitter, T. Short term retention of sequentially presented digits as a function of interdigit interval, digit duration and series length. Journal of Experimental Psychology, 1968, 78, 174-178.

Slawson, A. Vowel quality and musical timbre as functions of spectrum envelope and fundamental frequency, Journal of the Acoustical Society of America, 1968, 43, 87-101.

Slosson, R. Slosson oral reading tests. East Aurora, N.Y.: Educational Publications, 1963.

Shriner, T., Daniloff, R., & Hemac, J. Resynthesization of meaningful and non-meanful CVC syllables. Champaign, Ill,: University of Illinois, 1969.

Tiffany, W. & Bennett, D. Intelligibility of Slow-Played Speech. J. of Speech and Hearing Research, 1961, 4, No. 3, 248-258.

Tschantz, J. I. Simultaneous Time and Frequency Distortion as a Diagnostic Test of Speech Intelligibility. Detroit, Michigan: Wayne State University, 1965.

Taylor, S. E., Frankenpohl, H., et al. (eds.) Listen and read. Huntington, N.Y.: Educational Development Laboratory, 1962.

Templin, M. C. Certain language skills in children, their development and interrelationship. Minneapolis: University of Minnesota Press, 1957.

Terengo, L. Pitch and duration charactoristics of the oral reading of males on a masculinity-feminity dimension. Journal of Speech and Hearing Research, 1966, 9, 590-595.

Thomas, I. Speech synthesis and recognition. Biological Computer Laboratory, 1967, (b)

Thomas, I. The significance of the second formant in speech intelligibility. Biological Computer Laboratory Technical Report No. 10, Eng. Res. Lab., Eng. Exp. Station. Champaign: University of Illinois, 1968. (a)

Thomas, I. Structural and dynamic aspects of speech signals. Biological Computer Laboratory Report No. 602. Champaign: University of Illinois, 1968. (b)

Thomas, I., & Flavin, R. The intelligibility of speech transposed downward in frequency by one octave. Journal of AFS, February, 1969.

Travis, L. E., & Rasmus, B. The speech sound discrimination ability of cases with functional disorders of communication. Quarterly Journal of Speech, 1931, 17,217-226.

Strickland, Ruth G. The Language Arts in the Elementary School. Boston: Heath, 1957.

Schwartz, Sheela. "What is Listening?" Elementary English, XXXVIII (April, 1961).

Sticht, Thomas G. "Learning by Listening." Monterey, California: Human Resources Research Organization, March 1971.

Sticht, Thomas G. "Some Interactions of Speech Rate, Signal Distortion and Certain Linguistic Factors in Listening Comprehension," Washington, D.C.: George Washington University Human Resources Research Office, November 1968.

Sticht, Thomas G. "Some Relationships of Mental Sptitude, Reading Ability and Listening Ability Using Normal and Time-Compressed Speech." Washington, D.C.: Human Resources Research Organization, September, 1968.

Siegel, C. M. Interexaminer reliability for mean length of response. Journal of Speech and Hearing Research, 1962, 5, 91-95.

Shriner, T. , Beasley, D., & Zemlin, W. Effects of frequency-divided speech signals on identification accuracy and reaction time measures. Journal of Speech and Hearing Research, 1970, in press.

Sequential tests of educational progress: Listening. Princeton, N.J.: Educational Testing Service, Cooperative Test Division,

Scholes, R. J. On the spoken disambiguation of superficially ambiguous sentences. Bell Telephone Laboratories Technical Memorandum, July, 1968.

Scholtz, P. N., & Bakis, P. Spoken digit recognition using vowel-consonant segmentation. Journal of the Acoustical Society of America, 1962, 34,1-5.

Snidecor, J. C. A comparative study of the pitch and duration characteristics of impromptu speaking and oral reading. Speech Monographs, 1943, 10,50-56.

Speaks, C. Intelligibility of filtered synthetic sentences. Journal of Speech and Hearing Research, 1967, 10, 289-298. (a)

Speaks, C. Performance-intensity characteristics of selected verbal materials, Journal of speech and Hearing Research, 1967, 10, 344-347. (b)

Speaks, C. Estimating the intelligibility of continuous discourse. Paper presented at the 77th Meeting of the Acoustical Society of America, Philadelphia, 1969.

Speaks, C. , & Jerger, J. Method for measurement for speech identification. Journal of Speech and Hearing Research, 1965, 8, 185-194.

Speaks, C., & Jerger, J. Synthetic sentence identification and the receiver operating characteristics. Journal of Speech and Hearing Research, 1967, 10, 110-119.

Speaks, C., & Karmen, J. The effect of noise on synthetic sentence identification. Journal of Speech and Hearing Research, 1967, 10, 859-864.

Speaks, C., Karmen, J., & Benitz, L. Effect of a competing message on synthetic speech identification. Journal of Speech and Hearing Research,1967,10,390-395.

Treisman, A. M. The effects of redundancy and familiarity on translating and repeating back a foreign and a nature language. British Journal of Psychology 1965, 56, 369-379.

Travers, R. M. W. The transmission of information to human receivers. Audio-Visual Communication Review 1964, 12, 373-385.

Voor, J. B., & Miller, J. M. The effect of practice on the comprehension of worded speech. Speck Monographs, 1965, 32, 452-455.

Voiers, W. On the problem of reliability, sensitivity, and diagnostic value in tests of speech intelligibility. AFCRL and Institute of Electrical and Electronic Engineers Audio and Electro-acoustics 1967 Conference on Speech Communication and Processing. Bedford: OAR, United States Air Force, 1967.

Van Valkenburg, John. "Learning Through Listening: Implications for Reading." (Doctoral Dissertation, The University of Rochester.) 1968.

Wagner, Guy; Morier, Max; and Blackman, Mildred, Listening Games. Darien, Connecticut: Teachers Publishing Corporation, 1960.

Winges, Sara A. The intelligibility of interrupted speech. (Unpubl thesis, Univ. of Louisville), 1963.

Wang, W. S. Y., & Fillmore, C. Intrinsic xues and consonant perception. Journal of speech and Hearing Research, 1961, 4, 130-136.

Wason, P. C. The retention of material presented through precis. Journal of Communication, 1962, 12, 36-43.

Webster, J., Davis, H., &Ward, W. Everyday speech intelligibility. Journal of the Acoustical Society of America, 1965, 38, 668.

Wechsler, D. Wechsler adult intelligence scale. New York: Psychological Corporation, 1949.

Wedenburg, E. Auditory Training of the severely hard of hearing using a coding amplifier. Proceedings of the 3rd International Congress of Acoustics. Amsterdam: Elsevier, 1961. (Pp. 657-660)

Wilkes, A., & Kennedy, R. Relationship between pausing and retrieval latency in sentences of varying grammatical form. Journal of Experimental Psychology, 1969, 79, 241-245.

Williams, C., & Hecker, M. Relation between intelligibility scores for test methods and three types of speech distortion. Journal of the Acoustical Society of America, 1968, 44 1002-1006.

Wurm. S. Pitch and intensity recording devices for the study of Australasian languages. Zeitschrift fur Phonetic, 1967, 20, 250-257.

Wilkinsion, Andrew. "Research in Listening Comprehension." Educational Research, February, 1970. 12, (2).