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AUTHORITY

SAM ltr, 18 Feb 1972

FORMAL PROGRESS REPORT V

"AUDITORY FUNCTION OF
THE HEARINC IMPAIRED"

NORTHWESTERN UNIVERSITY

Formal Progress Report V

on

AUDITORY FUNCTION OF THE HEARING IMPAIRED

A USAF Research Project
being conducted by

Northwestern University

Under Contract AF 41(609)-2643

Project-Task No. 775508

Monitoring Agency

USAF SCHOOL OF AEROSPACE MEDICINE

AEROSPACE MEDICAL DIVISION (AFSC)

BROOKS AIR FORCE BASE, TEXAS 78235

Submitted to:

SMSPP/RESEARCH SECRETARIAT

BROOKS AIR FORCE BASE, TEXAS

FORMAL PROGRESS REPORT V

15 June 1967

'AUDITORY FUNCTION OF THE HEARING IMPAIRED'

Northwestern University

INTRODUCTION

This report covers progress made at Northwestern University during the period 16 December 1966 to 15 June 1967 on the audiological research project specified by Contract AF 41 (609)-2643, Project-Task No. 775508. Project developments during the period 16 December 1966 through 15 March 1967 were detailed for the Monitoring Agency in an informal progress report submitted on this latter date. Therefore, the present report will be concerned only with activities which occurred during the last three month period. The following sections summarize matters pertaining to personnel, equipment, related activities and plans for future research.

PERSONNEL

During the current report period the research team comprised two senior members, two research assistants and a half-time secretary. Dr. Raymond Carhart continues as Principal Investigator and Dr. Tom W. Tillman as senior investigator. Mrs. Sondra K. Doyle continues to serve as full time research assistant and Mr. Kenneth Johnson as half-time assistant. Mrs. Susanne Singleton has served as project secretary on a half-time basis.

The duties of the above personnel have not changed materially during this report period. Since these duties have been described in detail in previous reports, the description is not repeated here.

EQUIPMENT

Existing physical facilities and apparatus have continued to prove adequate for the conduct of project activities and, as a result, no new items of apparatus have been ordered or received during this report period.

RELATED ACTIVITIES

In an effort to keep abreast of developments at other laboratories and facilities which related either directly or indirectly to contract activities, the two senior members of the research team have continued to participate in outside activities. Those occurring in the period from 16 March 1967 to 15 June 1967 are reported below.

On 15 March 1967 both Drs. Carhart and Tillman traveled to Washington, D.C. On 16 March Dr. Tillman participated in a meeting of CHABA Working Group 52 which was established to: "a) evaluate existing and proposed procedures for testing (evaluating) speech reception (capacity) of aviators

working in their normal duty environments (noise) and to b) recommend improved procedures, instruments and instructions whenever appropriate." From 16-18 March, Dr. Carhart participated in a meeting of the National Advisory Neurological Diseases and Blindness Council.

From 30 to 31 March Dr. Carhart attended a meeting of the Sub-committee on Human Communication and Its Disorders, held in Bethesda, Maryland. Dr. Carhart serves as Chairman of this committee which functions under the auspices of the NANDB Council.

From 10-12 April 1967 Dr. Tillman participated in a meeting of the Communicative Sciences Study Section held in Bethesda, Maryland. Then, from 31 May through 1 June, 1967 he conferred with the Contract Monitor, Captain Donald C. Gasaway at the School of Aerospace Medicine, Brooks Air Force Base, Texas. The Purpose of this latter meeting was to review the present status of research activities and to develop plans for the work to be accomplished in the final months of the contract.

On 8 June 1967 Dr. Carhart traveled to Bethesda, Maryland to attend a meeting of the Research Sub-committee of the NANDB Council. Finally, from 12-13 June 1967, Dr. Carhart participated in a meeting of the Consultants on Hearing Aids of the

Veterans Administration. This meeting was held in Washington, D.C.

During the current report period, Dr. Tillman submitted a paper for consideration by the Program Committee of the American Speech and Hearing Association. The proposed paper is entitled "Effects of Vocabulary Familiarity on Speech Discrimination Test Performance". The paper reports a portion of the work completed under the subject contract, and if accepted, it will be presented at the November, 1967 meeting of ASHA.

RESEARCH ACTIVITIES

Results of research activities during the current report period were discussed in detail with the Contract Monitor on 31 May and 1 June, 1967. Therefore, the following paragraphs will include only a very brief summary of major items of work accomplished during this period.

We now have in our possession a relatively large inventory of tape recordings supplied us by the Contract Monitor. These tapes contain samples of in-flight communications recorded under a variety of operational conditions in a variety of aircraft. We expect to receive the final tape recordings to complete our sample within the next few weeks. During the current period we have continued our analysis of the tapes in hand both for purposes of determining the range

and frequency of occurrance of vocabulary items which characterize transmission over a wide range of operational conditions and of determining the quality spectrum of the transmission typical of flight operations.

A second major area of work during this period has been the development of a test tape and accompanying questionnaire to be used in defining the spectrum of transmission quality which characterizes Air Force communications systems. The tentative version of this tape is now almost completed. Upon completion it will be transmitted to the Contract Monitor for administration to a small sample of rated personnel. The purpose of this pilot investigation will be to determine whether the test tape and questionnaire will need to be refined before administration to a larger sample of rated personnel. The purpose of this latter study will be to develop a sound basis for defining the range of transmission quality characterizing Air Force systems and the relative frequency of occurrence of the various transmission qualities. This latter information is requisite to the selection of items to be included in the validational tool which will later be used to determine the pass-fail criteria of our "simulated in-flight hearing test," N.U. Auditory Test No. 6 - Gasbag.

The final item of work to which significant effort has been devoted during this period has been the completion of data collection using N.U. Test No. 6 - Gasbag with a sample of 16 subjects with moderate hearing impairments. The data from this experiment have now been analyzed and will be reported in future communications.

PLANS FOR FUTURE RESEARCH

In the weeks immediately ahead we will complete the items of work summarized in the previous section. Once this is accomplished we can begin the task of selecting items for our validational tool and the production of the test tape carrying this and other materials to be used in the validational study of the Gasbag test. Recall that this latter item remains a task to be accomplished subsequent to the completion of the subject contract.

We now have test data from four groups of 16 subjects each covering a relatively wide range of hearing sensitivity. We have demonstrated that the Gasbag test can reliably differentiate among the four sub-groups studied to date. We now plan to combine the four groups, re-cast the data and conduct statistical analyses designed to determine the precision with which the test rank orders individuals along the continuum of communicative efficiency in duty environments