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ABSTRACT

The postdoctoral fellowship research described in this document was based on three main areas: 1) single subject research, including experiments in learning with a rat and with three stutterers; 2) linguistic research, including basic research methodology and the analysis of morphological and syntactical structures in a language; and 3) neurophysiological research, including a review of current research and the analogous processes underlying both motor and perceptual systems. It is hoped that over the next few years this continuing research may lead to a significant breakthrough in the area of pathological stuttering. (MBM)

Final REPORT

Period: September 1, 1968 to August 31, 1969

Date of Submission: October 7, 1970

Name of Institution: University of Southern California

Title of Project: Postdoctoral Fellowship Program in Educational Research

Name of Project Director(s):

Dr. Irwing R. Melbo, Dean of the School of Education, USC
Dr. William Perkins, Professor of Speech Pathology Department of Communicative Disorders, USC
Dr. Richard Curlee, Assistant Professor of Speech Pathology, Department of Communicative Disorders, USC

Major Activities and Accomplishments during this Period:

My research training and/or activities were centered around three major areas of interest.

(1) Single Subject Research. Since I had little background in conducting research with single Ss, I first enrolled in a seminar entitled "Operant Behavior, Areas of Research and Application" in the Department of Psychology at USC. Here I learned the terminology and major procedures used in conducting research in operant conditioning, I contributed several oral reports to the seminar, and I had the opportunity of running experiments in learning with a rat (single S research) in the animal laboratory.

My research with human Ss in the speech clinic at USC consisted of having three stutterers read different types of

linguistic material at both normal and maximum rates over six one-hour experimental sessions. The single S approach provided me with an opportunity to collect a greater number of measures on one subject than is possible in large sample research. In addition to replicating experimental conditions with one S, I also explored the use of statistics in single S research. As a result of this work, Dr. Curlee and I presented a paper at the American Speech and Hearing Association Convention in the fall of 1969, and we are now in the process of completing a paper entitled "Use of Statistics in Single Subject Research" for possible publication.

Also, my knowledge of operant research procedures was instrumental in assisting a doctoral student complete his research project. This paper entitled "Effect of Rehearsal on the Frequency of Stuttering" and coauthored by Brenner, Perkins, and Soderberg will be presented at the ASHA Convention this fall in New York and submitted for publication.

(2) Linguistic Research. During the year I took two graduate courses in linguistics, one entitled "Structural Linguistics" and the other, "Syntactic Structures". In the first course I became acquainted with the basic research methodologies used by linguists. I found that these descriptive techniques provide a systematic way for discovering the important units of sound in any language and organizing them for an alphabet writing. The second course was a continuation of the first, but stressed the analysis of morphological and syntactical structures in a language. Since this was my first

exposure to transformational grammar (Chomsky), I became aware of the theoretical issues (e.g., language learning and transformations between deep and surface structures) associated with this method of language analysis.

The linguistic courses were helpful in conducting my single S research; I found them particularly useful in completing the writing of two research projects I had undertaken previous to my postdoctoral study. Both of these articles, "Reduced Passage Information and Stuttering Adaptation" and "Relations of Word Information and Word Length to Stuttering Disfluencies" have been accepted for publication.

Neurophysiological Research. In a physiological psychology seminar that I attended at USC, I not only reviewed the current research in learning and perception, but I became particularly interested in the analogous processes underlying both motor and perceptual systems (Lashley). For example, backward and forward masking occur both in audition and speech production. Fortunately, I came into contact with a psycholinguist at UCLA who was working from the Lashley frame of reference and who had formulated some rather exciting theories regarding neurophysiological mechanisms underlying errors in speech (stutters, omissions, spoonerisms, and additions). I read extensively from his publications and decided that I wanted to be associated with his research programs the following year. Because of the nature of my newly acquired research interests, I submitted a proposal for postdoctoral study to the National

Institute of Neurological Diseases and Stroke. My proposal was accepted and for the past year I have been working with Dr. MacKay, the Psycholinguist at UCLA, on various research projects. The main goal of our research has been to determine the mechanisms underlying errors in speech (and especially stuttering) and other motor systems (e.g., for rapidly executed patterns of finger movement). Recently I found out that my grant from NINDS will be extended another year (1970-71).

I am thankful to the U.S. Office of Education for granting me a year of postdoctoral study at USC. Because of that fortunate beginning, I feel that my research over the next few years could well lead to a significant breakthrough in the area of pathological stuttering, a speech disorder so resistent to solution by speech pathologists over the years.

Signature of Postdoctoral Fellow George A. Soderberg

Date 10-7-70