



8-1-1970

A Study of the Effects of an Operant Program Applied to the Correction of Frontal Lisps in Young Adults

Beverly Jackson

[How does access to this work benefit you? Let us know!](#)

Follow this and additional works at: <https://commons.und.edu/theses>

Recommended Citation

Jackson, Beverly, "A Study of the Effects of an Operant Program Applied to the Correction of Frontal Lisps in Young Adults" (1970). *Theses and Dissertations*. 3552.
<https://commons.und.edu/theses/3552>

This Thesis is brought to you for free and open access by the Theses, Dissertations, and Senior Projects at UND Scholarly Commons. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of UND Scholarly Commons. For more information, please contact und.commons@library.und.edu.

A STUDY OF THE EFFECTS OF AN OPERANT PROGRAM
APPLIED TO THE CORRECTION OF FRONTAL LISPS
IN YOUNG ADULTS

by
Beverly Jackson

Bachelor of Arts, University of North Dakota 1969

A Thesis
Submitted to the Faculty
of the
University of North Dakota
in partial fulfillment of the requirements
for the degree of
Master of Arts

Grand Forks, North Dakota

August
1970

This Thesis submitted by Beverly Jackson in partial fulfillment of the requirements for the Degree of Master of Arts from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

Dean C. Egel
(Chairman)

James W. Peebles
John C. Campbell

William Johnson
Dean of the Graduate School

Permission

Title A Study of the Effects of an Operant Program Applied to the
Correction of Frontal Lisps in Young Adults

Department Speech Pathology and Audiology

Degree Master of Arts

In presenting this thesis in partial fulfillment of the requirements for a graduate degree from the University of North Dakota, I agree that the Library of this University shall make it freely available for inspection. I further agree that permission for extensive copying for scholarly purposes may be granted by the professor who supervised my thesis work or, in his absence, by the Chairman of the Department or the Dean of the Graduate School. It is understood that any copying or publication or other use of this thesis or part thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of North Dakota in any scholarly use which may be made of any material in my thesis.

Signature

Beverly Jackson

Date

July 20, 1970

ACKNOWLEDGEMENTS

I wish to acknowledge with appreciation the contributions to this thesis made especially by my graduate committee chairman, Dr. Dean C. Engel. I am also grateful for the assistance given me by my committee members, Dr. John C. Crawford and Dr. James D. Peebles. I also wish to thank the students of the University of North Dakota who cooperated as subjects for this study.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iv
LIST OF TABLES	vi
LIST OF ILLUSTRATIONS	vii
ABSTRACT	viii
Chapter	
I. INTRODUCTION AND REVIEW OF THE LITERATURE	1
II. PROCEDURE	10
III. RESULTS AND DISCUSSION	14
IV. SUMMARY AND CONCLUSIONS	25
APPENDIX	
I. CRITERION TEST SCORES OF SUBJECTS	27
II. CORRECT AND INCORRECT RESPONSES OF SUBJECTS ON UNAWARE SAMPLES	28
SELECTED BIBLIOGRAPHY	29

LIST OF TABLES

Table	Page
1. Criterion Test Scores of Subjects	27
2. Correct and Incorrect Responses of Subjects on Unaware Samples	28

LIST OF ILLUSTRATIONS

Figure	Page
1. Percent of correct responses obtained during carryover and followup for subject one	17
2. Percent of correct responses obtained during carryover and followup for subject two	18
3. Percent of correct responses obtained during carryover and followup for subject three	20
4. Percent of correct responses obtained during carryover and followup for subject four	22

ABSTRACT

The purpose of this study was to determine if the S-Programmed Articulation Control Kit could be effectively used with young adults with trading stamps administered for reinforcement. The study also investigated the possibility of selecting peers to aid in the carryover of the desired /s/ response to nonclinical situations.

Four college students displaying frontal lisps were selected as subjects for this study. The therapeutic sequence of the S-Programmed Articulation Control Kit was administered to all subjects. Trading stamps were administered for reinforcement following correct responses. Following the administration of the therapeutic sequence of the S-Programmed Articulation Control Kit, each subject then selected a close friend who was trained by the writer to discriminate between a correct and incorrect /s/ response. The peer then worked with the subject each day for two weeks tallying correct responses emitted by the subject. Both the peer and the subject were reinforced with trading stamps for correct responses produced by the subject. During this two week period the peer also obtained six samples of the subject's speech while the subject was unaware he was doing so. Correct and incorrect responses in these samples were calculated to determine if carryover was actually taking place.

Results of this study indicated that the S-Programmed Articulation Control Kit was effective in correcting frontal lisps of young adults. It was also determined that trading stamps were a positive

reinforcer for young adults. Finally, it was determined peers could effectively be selected to aid in carryover procedures.

CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

There has been recent emphasis on behavioral principles in the treatment of speech disorders. It was the purpose of this study to determine if a programmed instruction kit which has been reported successful in correcting frontal lisps in children (Mowrer, Baker, Schutz, 1968) could be effectively used with young adults using trading stamps as reinforcement. This investigation then proceeded to determine if assimilation of the corrected /s/ articulation into situations other than the clinical situation would be accomplished if peers were utilized in a carryover strategy.

Because this study is based on the application of operant procedures in the treatment of articulation disorders, a brief review of operant theory is in order. McReynolds (1970) lists five basic procedures which are employed in operant conditioning: 1. If the frequency of a response increases when a stimulus is presented contingent upon the emission of that response, the stimulus is a positive reinforcer. 2. Negative reinforcement is used to increase the frequency of a specified response by removing an aversive stimulus contingent upon that response. 3. The first type of punishment results in a decrease in the frequency of a specified response by presenting an aversive stimulus contingent upon that response. 4. The second type of punishment involves a decrease in

the frequency of a response by removing a positive reinforcement contingent upon the emission of the response. This type of punishment has also been called time out from positive reinforcement. 5. The third type of punishment decreases the frequency of the incorrect response by requiring that reinforcers administered for correct responses be given up for every incorrect response. This type of punishment has been termed response cost punishment.

Brookshire (1967) lists three steps which he feels must be closely adhered to in order to obtain effective behavior modification in clinical situations. First, he states a baseline must be established. This is necessary in order to attribute changes in behavior following treatment to the treatment itself. Secondly, the behavior must be modified. This step includes the actual therapeutic treatment. Finally, the correct response acquired in the clinic must be carried over to nonclinical situations.

Much research has been done applying behavioral principles to clinical speech problems such as stuttering (Flanagan, Goldiamond and Azrin, 1958; Martin and Siegel, 1969; Shames and Sherrick, 1963; etc.). aphasia (Holland, 1967; McReynolds, 1966; Lane and Moore, 1962; etc.) and disorders of psychotic origins (Wolf, Risley and Mess, 1964; Isaacs, Thomas and Goldiamond, 1960; etc.). Until very recently little has been done in the area of applying operant procedures to the treatment of articulation disorders. The research recently undertaken has revealed that the use of operant conditioning in the clinical treatment of articulation disorders is effective. Not only have such procedures been found effective but they have proven to be extremely efficient in that maximum use

of time can be made freeing the clinician to deal with the more involved problems and to handle more cases. Research has also supported the use of an aide in administering operant programs.

Mowrer (1965) discovered that when an experimental group of children with frontal lisps received tokens contingent upon a correct response, they obtained significantly higher scores on a thirty item criterion test both immediately after and two weeks following a programmed sequence than a control group receiving no tokens during treatment. The standardized programmed learning instrument used in the study had resulted from previous pilot studies and is the same one used in the present study. He reported that the program was 100 percent effective in correcting the frontal lisp. The same study further indicated that there were no significant differences among scores of subjects who could see the therapist's face as she produced the /s/ or who received the auditory stimuli from a tape recorder. One group observed the other subjects in the program, but did not actively participate. The study concluded that listening to others learn correct articulation in a group therapy situation produced no improvement in articulation.

Mowrer (1966) also dealt with extending control of the /s/ to school and home environments. An instructional program to follow up the first program was written for use by a classroom teacher or parent over a three week period. Two experiments were conducted with this "home training" program. For Experiment I, experimental groups were established to determine: (1) the effect of reinforcing each correct response and (2) the effect of combined teacher-parent administration of the program versus parent only administration. Results of a criterion test administered

upon completion of the "home training program" showed that: (1) the four children who received tokens following each correct response achieved eleven to fifteen correct responses on a fifteen item criterion test whereas three of the four receiving no tokens received zero or one correct response on the criterion test and (2) there was little difference between results obtained by parent plus teacher administration of the "home training program" and parent administration. The purpose of Experiment II was to "field test" this program which had been developed in previous pilot studies and had been revised from the information received in the previous study (Mowrer, 1965). The program consisted of prerecorded visual material which was administered during the first week and the "home training program" which was administered the following three weeks. Twelve children identified as lispsers in a remote school district in a rural area were selected as subjects. A substitute teacher was given about two hours of instruction concerning equipment and administration of the home training program. At the end of the four week period, a speech therapist administered a criterion test. Eight of the twelve subjects received perfect or near perfect scores on the criterion test. Mowrer stated "the results were highly gratifying to the investigators and demonstrated the feasibility of utilizing 'packaged' programs to correct speech defects."

Mowrer's next study (1967) tested the hypothesis from previous studies: (1) that a home training program was extremely effective in establishing the correct /s/ outside of the laboratory situation and (2) that a lay individual could administer the first program sequence consisting of prerecorded visual material. The sequential program could be administered by a lay individual in three twenty minute sessions. A

previous study showed that 90 percent of the children who completed this program no longer lisped in the laboratory controlled environment. A field test was conducted in a public school setting. Eight children identified as lispers in a remote public school district served as subjects. A substitute teacher receiving three hours of training was again selected to administer the program. Following administration of the laboratory program, the teacher conferred with each parent concerning administration of the "home training program." Five weeks following the beginning of the program, each child was tested. Then one and one half years later a second criterion test was administered. The results of this study again suggested that correction of the frontal lisp no longer requires the direct attention of a speech therapist. Mowrer felt that by using non-professionals a clinician could help more children.

Mowrer, Baker and Schutz (1968) compile their findings to date and list five basic conclusions from their studies:

1. The development of an effective standardized set of instructions and the establishment of well controlled school-laboratory conditions provided a set of powerful procedures for empirically studying the effects of manipulations of specified instructional variables on the correction of articulation.
2. The use of reinforcers external to the instructional program were dramatically effective in facilitating the learning of correct articulation responses.
3. The inference that group procedures in speech therapy are inefficient, at least in the acquisition stage, seem warranted.
4. Apparently the speech therapist himself is not a source of cues that facilitates program success.
5. The validation of a tightly sequenced instructional program and the brief training of a non-speech therapist to monitor the program and evaluate subject responses precluded the necessity of having to use a trained therapist for such instruction.

Mowrer, Baker and Schutz have marketed the programmed therapeutic sequence and the subsequent "home training program" which was developed for these studies. Entitled the S-Programmed Articulation Control Kit, this therapy sequence was published in 1968 by Educational Psychological Research Associates.

Holland and Matthews (1963) evaluate the effectiveness of using a teaching machine to present programmed instruction for teaching speech sound discrimination to children with articulation disorders. They concluded, first, that techniques for improvement of /s/ discrimination in children who misarticulate /s/ are amenable to teaching machine programming. The machine devised for such use included a tape recorder. The subject's response to each problem was to press one of three buttons. An incorrect response resulted in the tape recorder's immediate rewinding and replaying the problem. On correct responses the tape recorder continued to play. The machine met the qualifications of a teaching machine presenting such material in that it:

1. Presented short problems.
2. Required the student to respond.
3. Gave immediate reinforcement.

One of the chief characteristics of such automation cited was the definite time advantage. The study also discovered that the program for teaching discrimination of the /s/ sound by a teaching machine was one which included the following steps:

1. Discrimination of /s/ in isolation from other speech sounds.
2. Subject's discrimination of the sound in words.
3. Child's identification of the position of the /s/ in the word.

4. Discrimination of correctly articulated from misarticulated /s/ sounds within words.

Engel and Peterson (1969) further studied the use of operant procedures by a teacher aide in a public school setting. The major device used in this study was a reinforcement panel which incorporated a token dispenser. The tokens used were trading stamps. The front panel of the machine also contained a light. The subject thus received immediate feedback via the light as to whether his response was correct or not. Approximately 20 percent of the time when the response was correct, a trading stamp was dispensed. When the subject reached a stage in therapy where they were incorporating their new responses into running speech, a second device--the "time-out mask" was used. Each time the child misarticulated the sound, the mask was placed in front of the aide's face, and the subject had to stop talking until the mask was lowered. The speculated belief is that speaking in itself is reinforcing so that "time out" is an aversive event. A sequence of therapy based on Eugene MacDonald's Sensory-Motor Approach was administered by the aide. The aide had received very little training and supervision although a speech clinician was constantly available to help her as needed. Results of this study showed that this operant group (administered by the teacher aide) when compared to a matched "traditional" group and an untreated control group made significantly more improvement. Comparing the results of the nine subjects in the operant group to the nine of the "traditional" group and the untreated control group on the pre- and post- Arizona Articulation Proficiency Scale scores, the operant group attained a total of 298.0 percent of improvement, the "traditional" group achieved 114.5 percent of improvement and the untreated

control group improved 82.2 percent. It was concluded that a teacher's aid could be effective in administering operant therapy in a public school setting.

The research to date has revealed very positive possible uses of operant procedures in the treatment of articulation disorders. The major findings include:

1. Reinforcement is very effective in correcting articulation errors.
2. A lay individual can be employed to administer programmed material for the correction of articulation errors.
3. Cues of a therapist are not always necessary in correcting articulation errors. Machines may be employed to administer some parts of programmed instruction.
4. Home programs may be developed and administered effectively by parents in carrying the desired response to other situations after the laboratory or clinical programmed sequence has been completed.

The purpose of this investigation was to determine if Mowrer, Baker and Schutz's S-Programmed Articulation Control Kit (1968) written for the correction of frontal lisps of children, could be used successfully with young adults employing trading stamps as reinforcement. It was also undertaken to establish whether or not peers could be incorporated into a carryover program designed to stabilize the correct /s/ outside the clinical setting. The study was designed to answer the following questions:

1. Can Mowrer, Baker and Schutz's S-Programmed Articulation Control Kit be used effectively with young adults?

2. Are trading stamps positive reinforcers for young adults?

3. Can peers be effectively used in a carryover program designed to stabilize the correct /s/ in young adults outside the clinical setting?

CHAPTER II

PROCEDURE

Four college students, ages eighteen to twenty-one, at the University of North Dakota were selected as subjects for this study. All subjects displayed a frontal lisp. A frontal lisp was defined as the protrusion of the tongue between the teeth in the production of the /s/ sound (Mowrer, Baker and Schutz, 1968). Two of the subjects were males and two were females. No subject had a record of a hearing loss. It was required that each subject achieve a score of 50 percent or less on the thirty item criterion test of the S-Programmed Articulation Control Kit (1968) to qualify for the study. This indicated that 50 percent or more of the /s/ responses in the criterion test were incorrect and that the subject would benefit from the therapeutic sequence of the S-Programmed Articulation Control Kit.

Each subject was then administered all three parts of the S-Programmed Articulation Control Kit (S PACK). The S PACK was developed by Mowrer, Baker, and Schutz and is commercially available. The original purpose of the S PACK was to correct frontal lisps in elementary school-aged children. It consists of a criterion test, three parts of actual programmed instruction and a parent's book for use in carryover procedures at home. This program employs redeemable tokens for reinforcement. According to Mowrer, Baker and Schutz the actual program should take approximately three twenty-minute sessions.

This program was administered to the subjects in the three parts on three different days within the course of a week. The program was administered by the writer of this paper. The setting for the instruction was the University of North Dakota Speech and Hearing Clinic.

Trading stamps were administered as reinforcement for correct responses. Two stamps were dispensed for every correct response in order that the subject might accumulate enough stamps within the course of the program to give them value. Incorrect responses were punished by the sounding of a loud buzzer. The device used for reinforcement in this study was a reinforcement panel which incorporated a trading stamp dispenser (PDQ model SD - 400). The front panel of the machine contained a light and two push buttons which were not used in this study. For this study, only the buzzer and the stamp dispenser were used.

Throughout the administration of the program, correct and incorrect responses were recorded by the administrator. A percentage of correct and incorrect responses were then calculated to determine progress throughout the program. At the completion of the three parts of the programmed sequence, a second criterion test was administered to determine overall progress during the therapeutic sequence.

At the completion of the second criterion test, each subject was asked to bring to the therapy session a person with whom he spent much time each day. This peer was then trained to discriminate and signal a correct and incorrect /s/ sound. The subject and peer then worked together each day for a two week period. The peer was given a plastic grocery counter on which he counted correct and incorrect /s/ sounds produced by the subject in normal conversation. Each word containing an /s/

sound which was correctly produced was counted as one point. Words in which the /s/ was misarticulated received no points. A maximum of one hundred points could be attained each day. Both the subject and peer received two trading stamps for each point earned outside the Speech Clinic.

The peer was also asked to secretly tally the /s/ sounds of the subject's speech on six occasions during the two week period. These samples were obtained by the peer while the subject was talking on the telephone, talking with someone else, etc. Each sample consisted of thirty words which contained /s/ sounds. The peer wrote these words on a sheet of paper circling the words in which the subject produced an incorrect /s/ sound. A percentage of correct and incorrect /s/ words was attained for each sample throughout the two weeks to produce a measurement of actual carryover. The peer also received two stamps for every word recorded in the unaware samples.

At the end of the first week the subject and peer returned to the clinic where they were given two trading stamps for each point on the counter. The peer was also given stamps for the words recorded in the unaware samples. At the end of the second week, the peer and subject returned again and were given stamps for that week. The third criterion test was also administered to the subject at this time. This completed the program for the subject.

As a followup measure the peer was asked to obtain one unaware sample a week for the following two weeks. These samples were obtained in the same manner as those obtained during the carryover procedure.

The followup was carried out to produce a measure of the subject's articulation behavior when the treatment was no longer being administered.

CHAPTER III

RESULTS AND DISCUSSION

The criterion test of the S-Programmed Articulation Control Kit (S PACK) was administered before and after the therapeutic sequence. In all four cases the criterion test score prior to treatment was under 50 percent indicating all subjects would profit from the therapy sequence of the S PACK (Mowrer, Baker, Schutz, 1968). At the end of administration of the S PACK all but one subject attained a criterion test score of 100 percent. This subject attained a score of 97 percent. These criterion test scores indicated that the administration of the S-Programmed Articulation Control Kit is successful in correcting frontal lisps of young adults.

To determine if frequency of the desired response increased as a result of the trading stamps used as reinforcement, a percent of correct to incorrect responses for each of the three parts of the S PACK was determined. In all four cases, frequency of the desired response progressed from below 50 percent as indicated on the first criterion test to 97 percent or above as indicated on the second criterion test. This would indicate that trading stamps are a positive reinforcer for young adults since frequency of the desired response did increase when trading stamps were presented contingent upon the emission of the desired response (Brookshire, 1967).

Upon completion of the S PACK sequence, a colleague of the subject was trained to discriminate between a correct and incorrect /s/ sound. The colleague then worked with the subject each day for two weeks to facilitate carryover into nonclinical situations. During this two week period the peer also recorded six samples of the subject's speech while the subject was unaware he was doing so. A percent of correct to incorrect /s/ responses was calculated and graphed for each sample to determine if carryover into nonclinical situations was actually taking place and to determine if there was actually an increase in correct /s/ responses as the two weeks progressed. As the graphs indicate, the percentages for each subject did progressively increase throughout the two week carryover period. In all four cases, 90 percent or more of the /s/ responses in the unaware samples were correct at the end of the two week period. Thus, percentages which increasingly progressed to a point of 90 percent or more in all cases throughout the two week carryover period indicate that a peer can successfully be employed to aid in carryover procedures.

Following the carryover period, a third criterion test was administered to provide a comparison with the first and second criterion tests. All four subjects obtained a score of 100 percent.

Upon completion of the third criterion test, the peer was asked to record one unaware sample for the next two weeks to determine if correct /s/ responses in nonclinical situations increased, decreased or plateaued when no treatment was being administered. In all but one of the four cases, the percentage of correct responses seemed to plateau or increase in the followup period. This further indicated that the carryover procedures administered with the aid of a peer was effective in

carrying over and stabilizing the correct /s/ response in nonclinical situations. In the one case where percent of corrected errors decreased significantly, it was felt a longer carryover period might have been more successful in stabilizing the correct response.

SUBJECT ONE

Subject One, a nineteen-year-old female, attained a criterion test score of 33 percent prior to treatment. She progressed to a score of 100 percent correct responses on Part I, Part II and Part III of the S PACK. On the second criterion test following administration of the therapy sequence, she obtained a score of 100 percent.

Carryover procedures were carried out by a good friend of the subject. On the first of the six unaware samples obtained in the carry-over stage, Subject One received a score of 85 percent correct responses. The second unaware sample decreased to 80 percent, and following samples increased to a score of 100 percent on sample four. There was a slight decrease to 97 percent on sample five which increased back to 100 percent on sample six.

On the third criterion test, Subject One obtained a score of 100 percent.

On the two followup samples, percent of correct responses had slightly decreased to 93 percent on both samples. This slight decrease was not felt to be significant.

SUBJECT TWO

Subject Two, an eighteen-year-old male, obtained a score of 0 percent on the first criterion test. On Part I of the S PACK, he responded correctly 100 percent of the time. On Part II he obtained a score of 97

P
E
R
C
E
N
T

C
O
R
R
E
C
T

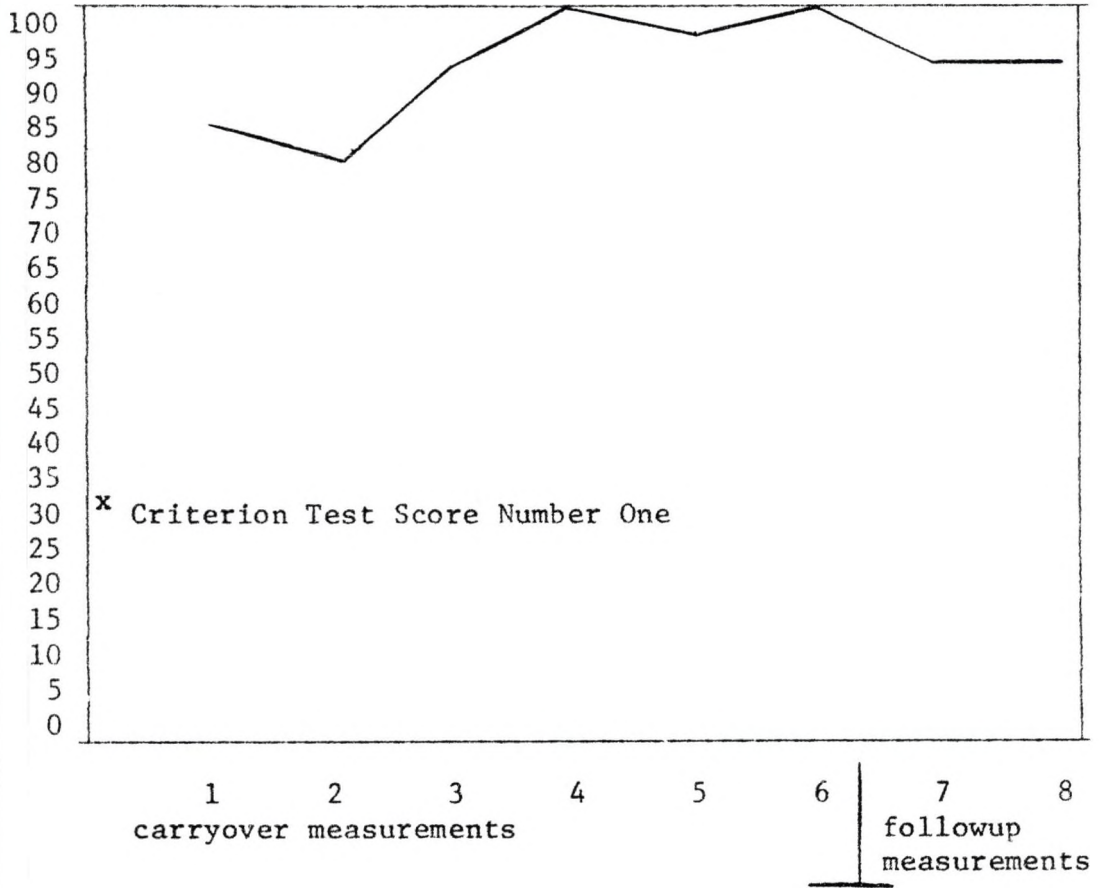


Fig. 1. -- Percent of correct responses obtained during carryover and followup for subject one.

P
E
R
C
E
N
T

C
O
R
R
E
C
T

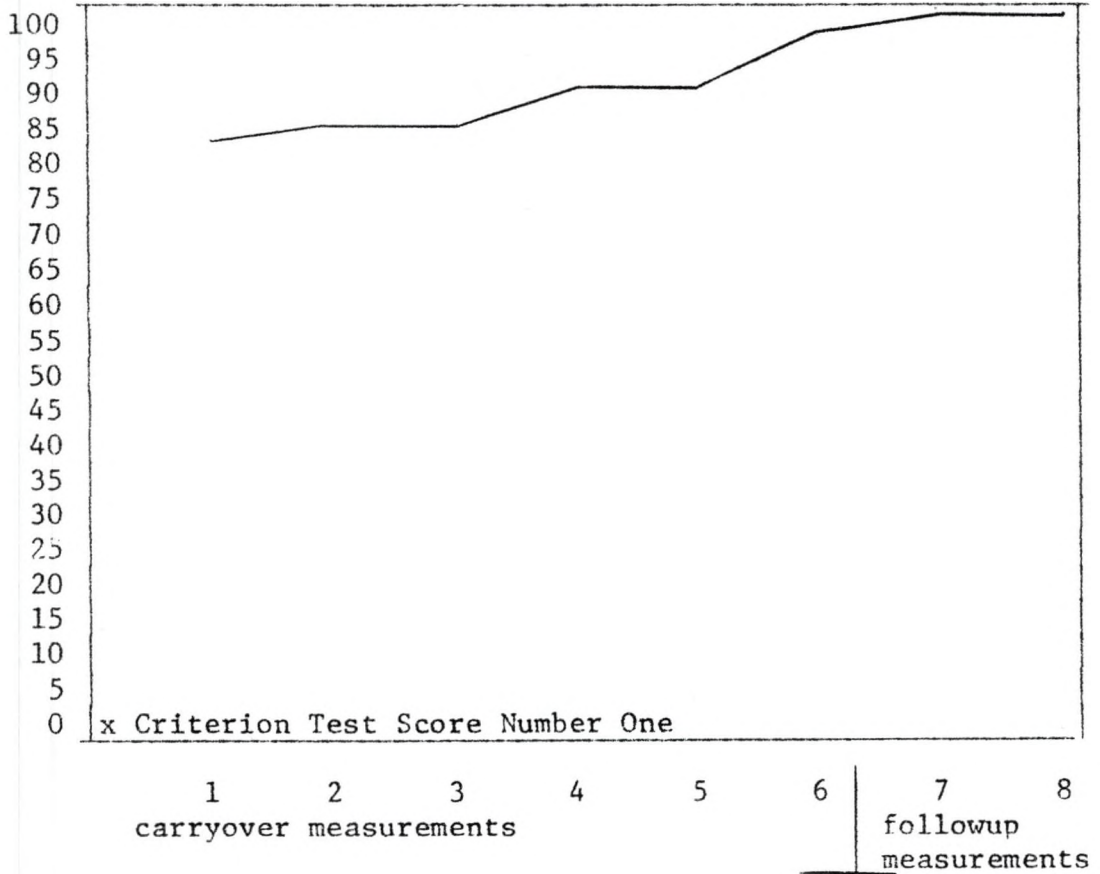


Fig. 2. -- Percent of correct responses obtained during carryover and followup for subject two.

percent correct responses, and on Part III he scored 100 percent again. On the second criterion test following administration of the S PACK, Subject Two received a score of 97 percent correct responses.

Paternity brother of Subject Two carried out the carryover procedures and obtained the unaware samples. There was an even progression of increasingly correct responses throughout the two week carryover period as indicated by the percentages obtained on the six unaware samples. On the first unaware sample, Subject Two obtained a score of 83 percent correct /s/ responses. On samples four and five he achieved a score of 90 percent correct responses, and in the final sample, Subject Two received a score of 97 percent. On the second criterion test, he achieved 100 percent.

On both of the followup samples obtained after treatment, Subject Two attained scores of 100 percent correct responses.

SUBJECT THREE

Subject Three, a nineteen-year-old female, attained a criterion test score of 43 percent prior to treatment. She progressed to a score of 96 percent correct responses on Part I of the S PACK. On Part II she received a score of 100 percent correct responses, and on Part III she attained a score of 99 percent. On the second criterion test following administration of the S PACK, Subject Three obtained a score of 100 percent.

A close friend was chosen by Subject Three to aid with carryover procedures. She also obtained the unaware samples. Subject Three obtained a score of 65 percent correct responses on the first unaware sample, and the percent of correct responses on the following samples gradually

P
E
R
C
E
N
T

C
O
R
R
E
C
T

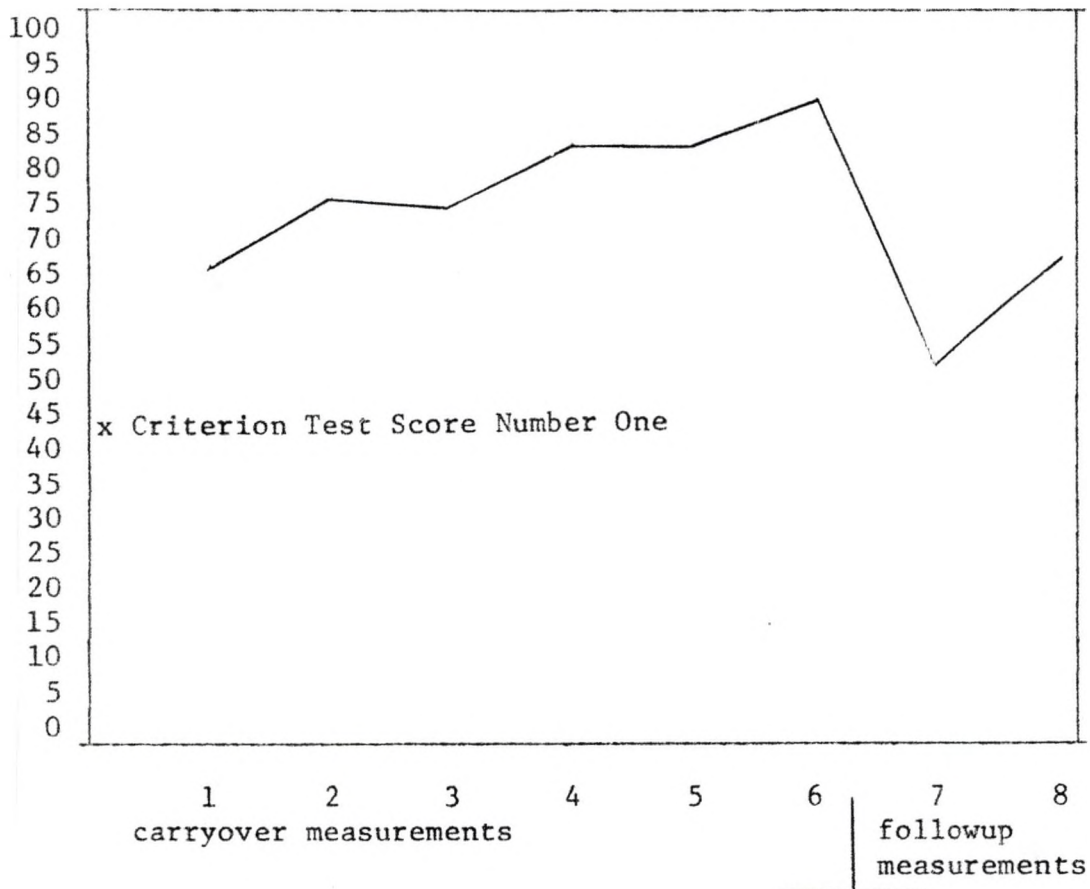


Fig. 3. -- Percent of correct responses obtained during carryover and followup for subject three.

progressed to 90 percent on sample six. On the third criterion test, Subject Three achieved a score of 100 percent.

On the first of the two followup samples, percent of correct responses decreased to 52 percent. On the second followup sample a score of 67 percent correct responses was obtained. It was felt that the significant decrease in percent of correct responses in the followup sample indicated that the two week carryover period was not long enough to establish the correct response sufficiently in nonclinical situations for this particular subject.

SUBJECT FOUR

Subject four, a twenty-one-year old male, obtained an initial criterion test score of 17 percent correct responses prior to treatment. He progressed to a score of 100 percent correct responses on Part I and Part II of the S PACK. On Part III he obtained a score of 99 percent. On the second criterion test following administration of the S PACK, Subject Four obtained a score of 100 percent.

Subject Four chose his fiancé to work with him in the carryover period. She also obtained the unaware samples. On the first unaware sample, Subject Four received a score of 81 percent. He made a gradual progression throughout the two week period to a score of 97 percent correct responses on the sixth unaware sample. On the third criterion test he received a score of 100 percent.

On the two followup samples following treatment, Subject Four slightly decreased to a score of 93 percent correct responses on the first of the two followup samples and 90 percent on the second followup sample. This decrease was not felt significant.

P
E
R
C
E
N
T

C
O
R
R
E
C
T

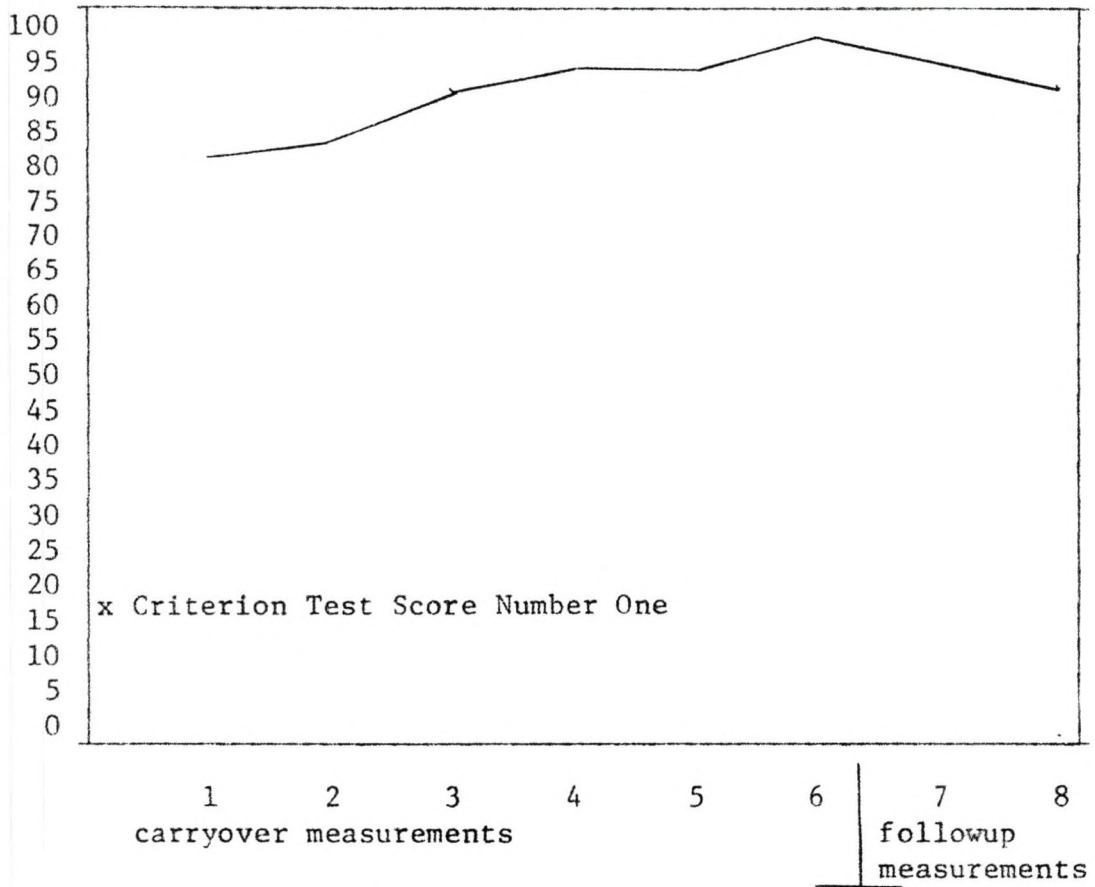


Fig. 4. -- Percent of correct responses obtained during carryover and followup for subject four.

It is felt that the results of this study can significantly be applied to the treatment of frontal lisps in young adults. The high percentage scores of all subjects on the three parts of the S PACK indicate it can be successfully used to correct frontal lisps of young adults. The high scores of the subjects, all of which were over 50 percent, on the first of the unaware carryover samples further indicated that the correct /s/ response had been firmly established in the clinical situation by the administration of the S PACK. The S PACK can be efficiently used by speech therapists in that approximately fifteen minutes was needed to administer each part of the program. Minimum materials are required. It is felt that the results of this study, which indicate the S PACK is efficient as well as effective in correcting frontal lisps of adults, suggest an adaption of the S PACK for adults would be worthwhile.

Since the frequency of the desired response increased significantly in all four cases with trading stamps dispensed as reinforcement, it was felt trading stamps were a positive reinforcer for young adults. The dispensing of trading stamps also allowed for immediacy of reinforcement contingent upon the response which Holland (1967) states is an important consideration in selecting a reinforcer. The stamps could also be efficiently administered making maximum use of therapy time.

Observation, however, led the experimenter to believe that the stamps were considerably more reinforcing to the females than the males. The cost of the trading stamps, about \$18.00 for each subject and peer, indicated that trading stamps are also economically feasible as a reinforcement in most clinical situations.

It seemed that the scores obtained in the unaware samples during the carryover period were surprisingly high in most cases. It was felt this could be due to the fact that the same person was working with the subject in the carryover period and was also obtaining the unaware samples. Thus the subject was naturally more conscious of his /s/ production in the presence of that person. A suggestion for further research might be to have a different person obtain the unaware samples. The high scores could also be due to the fact that this study dealt with adults who are more conscious of their speech and more motivated than if the study had dealt with children.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The purpose of this study was to determine if the S-Programmed Articulation Control Kit developed by D. E. Mowrer, R. L. Baker and R. E. Schutz (1968) could be successfully used in correcting frontal lisps of young adults with trading stamps being administered as reinforcement. This study further investigated the possibility of enlisting peers of young adults to aid in carrying the corrected response over into nonclinical situations.

Four subjects, ages eighteen to twenty-one, were administered the therapy sequence of the S-Programmed Articulation Control Kit. Following the administration of this therapeutic sequence, peers were selected by the subject to aid in the carryover of the /s/ response to nonclinical situations. During this carryover period, the peer also obtained samples of the subject's speech while the subject was unaware he was doing so. The peer was also reinforced with trading stamps. Percent of correct and incorrect /s/ responses was calculated to determine if carryover was actually taking place.

On the basis of the findings of this study, the following conclusions were made:

1. The S-Programmed Articulation Control Kit is effective in correcting frontal lisps of young adults. An adaption of this therapy

sequence for adults would thus seem worthwhile.

2. Trading stamps functioned as a positive reinforcer.

3. Peers can effectively be utilized to aid in carrying over a desired response to nonclinical situations.

It is felt that the results of this study can be generalized to other articulation disorders as well as other speech disorders. Further research might substantiate the use of trading stamps as reinforcers in the treatment of other speech disorders. Research might also attempt selecting peers to aid in carryover procedures for disorders such as stuttering.

APPENDIX I

TABLE I
CRITERION TEST SCORES OF SUBJECTS

Subject	Criterion Test Score Number One	Criterion Test Score Number Two	Criterion Test Score Number Three
One	33 percent	100 percent	100 percent
Two	0 percent	97 percent	100 percent
Three	43 percent	100 percent	100 percent
Four	17 percent	100 percent	100 percent

APPENDIX II

TABLE 2

CORRECT AND INCORRECT RESPONSES OF SUBJECTS
ON UNAWARE SAMPLES

Unaware Sample	Subject One	Subject Two	Subject Three	Subject Four
1 Correct	26	25	13	17
Incorrect	4	5	7	4
2 Correct	25	26	20	25
Incorrect	5	4	7	5
3 Correct	28	26	17	27
Incorrect	2	4	6	3
4 Correct	30	27	19	28
Incorrect	0	3	4	2
5 Correct	29	27	20	28
Incorrect	1	3	4	2
6 Correct	30	29	18	29
Incorrect	0	1	2	1
7 Correct	28	30	12	28
Incorrect	2	0	11	2
8 Correct	28	30	12	26
Incorrect	2	0	6	4

SELECTED BIBLIOGRAPHY

Books

- SKINNER, B. F. Science and Human Behavior. New York: Macmillan, 1953.
- SLOANE, HOWARD N., JR., and MACAULAY, BARBARA D. Operant Procedures in Remedial Speech and Language Training. Boston: Houghton Mifflin Company, 1968.

Articles

- BROOKSHIRE, R. H. "Speech Pathology and the Experimental Analysis of Behavior." Journal of Speech and Hearing Disorders, XXXII (1967), 215-227.
- FLANAGAN, BRUCE; GOLDDIAMOND, ISRAEL; and AZRIN, NATHAN. "Operant Stuttering: The Control of Stuttering Behavior through Response Contingent Consequences." Journal of Experimental Analysis of Behavior, I (1958), 173-177.
- HOLLAND, AUDREY L. "Some Applications of Behavioral Principles to Clinical Speech Problems." Journal of Speech and Hearing Disorders, XXXII (1967), 11-18.
- HOLLAND, AUDREY L., and MATTHEWS, JACK. "Application of Teaching Machine Concepts to Speech Pathology and Audiology." Journal of Speech and Hearing Disorders, V (1963), 474-482.
- ISAACS, W.; THOMAS, J.; and GOLDDIAMOND, I. "Application of Operant Conditioning to Reinstate Verbal Behavior in Psychotics." Journal of Speech and Hearing Disorders, XXV (1960), 8-12.
- LANE, H. L., and MOORE, D. J. "Recondition a Consonant Discrimination in Aphasics: An Experimental Case History." Journal of Speech and Hearing Disorders, XXVII (1962), 232-243.
- McREYNOLDS, LEIJA V. "Operant Condition for Investigating Speech Sound Discrimination in Aphasic Children." Journal of Speech and Hearing Research, IX (1966), 518-528.
- McREYNOLDS, LEIJA V. "Contingencies and Consequences in Speech Therapy." Journal of Speech and Hearing Disorders, XXXV (1970), 12-24.

- MARTIN, RICHARD R., and SIEGEL, GERALD M. "The Effects of Neutral Stimulus (Buzzer) on Motor Responses and Disfluencies in Normal Speakers." Journal of Speech and Hearing Research, XII (1969), 179-184.
- SHAMES, G. H., and SHERRICK, C. E. "A Discussion of Nonfluency and Stuttering as Operant Behavior." Journal of Speech and Hearing Disorders, XXVIII (1963), 3-18.
- WOLF, M. M.; RISLEY, T.; and MESS, H. "Application of Operant Procedures to the Behavior Problems of an Autistic Child." Behavioral Research Therapy, I (1964), 305-312.

Other

- ENGEL, DEAN C., and PETERSON, DARRELL A. "The Use of Operant Procedures by a Teacher Aide in a Public School Setting." Paper presented to the American Speech and Hearing Association National Convention, 1969.
- MOWRER, DONALD E. "An Experimental Analysis of Variables Controlling Lipping Responses of Children." Paper presented at the American Speech and Hearing Association National Convention, 1965.
- MOWRER, DONALD E. "Extending Control of Lipping Behavior to Non-Laboratory Situations." Paper presented at the American Speech and Hearing Association National Convention, 1966.
- MOWRER, DONALD E. "Programmed Speech Therapy--A Field Test." Paper presented at the American Speech and Hearing Association National Convention, 1967.
- MOWRER, DONALD E.; BAKER, R. L.; and SCHUTZ, R. E. S-Programmed Articulation Control Kit, Educational Psychological Research Associates, Tempe, Arizona, 1968.