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A Study to Test the Effectiveness of Time-out in the Decrease of Moderate Stuttering

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A STUDY TO TEST THE EFFECTIVENESS OF TIME-OUT IN THE DECREASE OF MODERATE STUTTERING

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This thesis submitted by Judy E. Clausen in partial fulfillment of the requirements for the degree of Master of Science from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

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ABSTRACT

The purpose of this study was to examine the effect of time-out from speaking on the frequency of moderate stuttering.

Two parallel single subject studies were carried out concurrently. Two adult moderate stutterers were selected as subjects.

Two sessions of baserate measurement were followed by nine sessions in which 10 seconds of time-out from speaking was made contingent upon the stuttering of Subject A. Subject B was the control subject for the first nine sessions and he received no consequences for stuttering. With session twelve, Subject A became the control and Subject B was required to stop speaking for 10 seconds following each stuttering behavior.

Time-out from speaking, signalled by a red light, was instituted contingent upon subject stuttering. Results of the study showed the rate of stuttering decreased during the use of time-out procedures. Stuttering was shown to increase when time-out from speaking was withdrawn as a consequence for stuttering.

It was concluded that the time-out from speaking used in this study was effective in reducing stuttering behavior.

CHAPTER I

INTRODUCTION AND REVIEW OF LITERATURE

The purpose of this study was to examine the effect of time-out from speaking on the frequency of moderate stuttering. According to McReynolds (1970), time-out is basically a period of time during which there is no opportunity for positive reinforcement. Time-out has generally been used as a punisher to modify disruptive and non-attending behavior but it has been employed in the experimental manipulation of stuttering behavior.

Introduction to Stuttering

About 1% of the total population or one person in one hundred stutters (Emerick, 1963, p. 1). According to Johnson et al. (1952), the word stuttering is used in three main ways: It can describe what a speaker does, it names how the listener judges one's speech and it names what the speaker does in his reaction to the listener's evaluation.

Stuttering is a complex behavior and it has been defined by many authors. According to Van Riper (1963), stuttering occurs when there is an abnormal interruption of the speech flow.

Emerick (1963, p. 1) defines stuttering as a "conditioned avoidance of speech breaks." Sloane and MacAulay (1968) further

defined stuttering by stating that it consisted of certain speech forms. These forms could include repetitions, breaks, pauses and other blockages.

Many different attempts to modify stuttering behavior have been employed by speech clinicians. Among these attempts the principles of operant conditioning have been applied to stuttering. These have included reinforcement for fluency as well as punishment for stuttering.

There has been a great deal of discussion about using some form of punishment as a conditioner for stuttering. Fraser (1962, pp. 12-13) defines punishment as the application of an undesirable or painful consequence to behavior in order to suppress or eliminate that behavior.

Punishment must actively oppose the influences of positive reinforcement. Since punishment is produced by painful or noxious stimuli, it should suppress the behavior that is directly preceding it.

In order to be effective, punishment must be consistent. Continuous, consistent punishment reduces the effect of punishing any other behavior that may have been randomly present during the stuttering moment.

To discuss the effect of punishment meaningfully, it is necessary to specify the behavior that is contingently followed by the negative stimulus. Although he is not an advocate of punishment for modifying human behavior, Skinner (1953) says that the most common technique of control in modern life is punishment. Punishment is designed to reduce tendencies to behave in a certain way.

In the defining of the term punishment, Azrin and Holz (1966, p. 381) state that punishment is a reduction of the future probability of a specific response as a result of the immediate delivery of a stimulus for what response. Sloane and MacAulay (1968) add to this definition by stating that behavior can be weakened by its consequences. After an individual performs some act, a positive reinforcer may be removed. This is usually found to decrease the future probability of the behavior.

Not every reduction in behavior is caused by punishment. There can be punishment only when there is a decrease in performance due to some stimulus presentation. In a personal communication, Prins (1972) stated that punishment could be a very effective clinical tool but it had to be carefully controlled by the experimenter. Controlling punishment suggests that the experimenter must use it only at the appropriate time.

In summarizing punishment, Seigel (1970) declared that punishment is given a prominent place in most contemporary theories in attempting to explain both the origin and persistance of stuttering behavior. Avoidance theorists have suggested that avoidance and hence stuttering would increase as the punishment increases. However, the operant theorist would expect that behaviors that are punished would decrease in frequency.

One of the most widely cited examples of the effects of punishment on stuttering was an early study by Van Riper (1937). He used the threat of shock for future occurrence of stuttering during

reading. The frequency of stuttering increased. It should be noted that Van Riper used the threat of shock rather than the actual response-contingent presentation of the electric shock.

The first reported attempt to modify stuttering with operant procedures appears to have been in a study by Flanagan, Goldiamond and Azrin (1958). They presented a loud noise contingent upon stuttering. The noise was considered a punisher in that it reduced the frequency of the stuttering.

Another punisher is the use of delayed auditory feedback. Goldiamond (1965) found that delayed auditory feedback reduced stuttering frequency when it was made contingent upon stuttering.

Electric shock, too, has been widely used as a punisher. Curlee and Perkins (1968) studied the effect of punishment on stuttering expectancy and frequency. They assigned twelve stutterers to two groups to test the effect of punishment of signaled expectancies of stuttered moments. One group signaled their expectancy to stutter and electric shock was delivered contingent upon their signal. The findings of the study indicated that the expectancy and frequency of stuttering decreased following punishment of signaled expectancies to stutter.

Daly and Frick (1970) also punished stuttering expectancies and stuttering utterances. They used thirty-six adult male stutterers. These subjects were subjected to three punishment conditions. Electric shock was delivered contingent upon signaled expectancies to stutter in one condition; in a second condition, shock was administered for emitting stuttering utterances; and in the third condition, the effect

of punishment for both signaled expectancies and stuttered utterances was studied. The combined punishment procedures did not affect a more immediate or more significantly reduced stuttering behavior than the stuttering utterance contingent punishment procedure in which punishment was directly contingent upon stuttering.

The studies by Van Riper (1963), Flanagan, Goldiamond and Azrin (1958), Curlee and Perkins (1968) and Daly and Frick (1970), used electric shock to attempt to modify stuttering. But electric shock is not easily controlled and quantified with human subjects because people vary widely in their tolerance for this stimuli. Also some researchers are reluctant to employ electric shock so it is often replaced by other stimuli.

A program of research with stutterers at the University of Minnesota had its origin in the attempt to reconcile Goldiamond's (1965) early findings with traditional views of punishment and stuttering. Seigel and Martin (1965) obtained a more substantial decrease in disfluency by presenting the verbal stimulus 'wrong' contingent upon stuttering than the decrease obtained by electric shock. Seigel and Martin (1966) replicated the effects of response-contingent 'wrong' on disfluencies and they discovered that contingent presentation of an ordinary buzzer had a comparable suppression effect.

Quist and Martin (1967) did a follow-up study on the effects of response-contingent 'wrong' on the stuttering of three adult male stutterers. After baseline was established, the word 'wrong' occasioned a 30% to 40% reduction in stuttering frequency. For one subject, 'wrong' produced almost total suppression of stuttering. Removal of

the contingency was followed by a return to baserate frequency and reintroduction of the verbal punisher produced almost total reduction in stuttering.

Brookshire and Martin (1967) studied the effects of three verbal stimuli on disfluencies. They used verbal consequences 'wrong,' 'no,' and 'huh-uh' contingent upon stuttering. The study findings showed decreased disfluency with all three punishers although they were not equally effective.

Time-Out From Speaking

A form of punishment is the procedure of time-out from speaking. Time-out is defined by Ferster and Skinner (1957, p. 34) as "any period of time during which the organism is prevented from emitting the behavior under observation."

In a typical time-out punishment experiment, the subject is placed in a given situation until a stable response frequency is established under a positive reinforcement schedule. After a response frequency has stabilized, an experimental procedure is introduced in which the same or different response is followed by a period during which no reinforcement is forthcoming.

Time-out procedures were originally used in the field of experimental psychology. Ferster (1957) demonstrated that an organism's behavior can be maintained by the use of positive reinforcement or reward. Withdrawl of a situation in which reinforcement occurs was described as an aversive event and has been called time-out from positive reinforcement.

Leitenberg (1964) stated that time-out belonged to a class of stimuli called punishing or aversive. He found that time-out was an effective punishing stimuli because it suppressed the behavior that preceded it.

Ferster and Skinner (1957, p. 35) found time-out to be aversive only when it was time-out from positive reinforcement. It was their contention that time-out was punishing only when something reinforcing was removed.

To be successful, time-out punishment must be immediate and consistent, Azrin and Holz (1966, p. 394) found "better carryover or lasting effectiveness using immediate punishment." Sloane and MacAulay (1968, pp. 8-9) found that "immediate consequences were more effective than delayed consequences."

More rapid learning takes place and behavior is controlled when reinforcement is instantaneous. McReynolds (1970) suggested that if there is a delay between response and reinforcer, other behavior will be reinforced. Thus, time-out punishment should be consistent and immediate to be effective.

The literature notes that the specific techniques employed are not as important as the procedures for administering the time-out. According to Sloane and MacAulay (1968), the major emphasis is to maintain contingencies that are precise and consistent. They suggested that no time-out should be administered the first few sessions as this leaves time to establish baseline rate.

The duration of the time-out is dependent upon the behavior which is to be modified. A time-out of 15-20 seconds is often used to

terminate emotional behavior whereas 10 seconds is very often used to modify stuttering behavior.

Time-out has also been used in articulation therapy. Engel and Peterson (1969) employed time-out from talking as part of a project which used a reinforcement panel with articulation therapy sequence administered by a teacher aide. When the subject was able to use his improved articulation in running speech, time-out was made contingent upon misarticulation. The results of the study showed time-out to be an effective means of decreasing misarticulations.

Time-out from speaking is a procedure often used in stuttering modification. Time-out from speaking is a specified period of time during which the subject is required to stop speaking and remain silent. In the University of Minnesota studies, Haroldson et al. (1968) and Martin et al. (1972) speculate that the act of speaking is self-reinforcing, therefore, time-out from speaking serves as an aversive or punishing event.

In recent years considerable research has been done on the effects of time-out from speaking on stuttering disfluency. Haroldson et al. (1968) used time-out contingent upon stuttering. In this study they used four adult stutterers. The study investigated what effect time-out from speaking contingent upon a certain response would have on the frequency of that response. A marked decrease in stuttering behavior was observed during the time-out sessions. But the frequency of stuttering increased again when the contingency was removed.

Adams and Popelka (1971) tested the hypothesis that stuttering could be manipulated by using time-out. They had eight young adult stutterers read in two different conditions. In one condition, 10 seconds of time-out was contingent upon the occurrence of stuttering. No contingency was administered in the other "control" condition. Statistical analysis revealed a decrease in stuttering in both conditions, however, disfluency diminished more in the time-out condition.

Martin et al. (1972) used time-out with two stuttering children. The experimenter used a "talking" puppet to talk with the children. Treatment consisted of a time-out procedure in which the puppet was not visible and did not talk with the child for 10 seconds contingent on each stuttering. Stuttering frequencies were reduced below one stuttering moment during the 20 minute treatment sessions, and remained at that low frequency through-out generalization, carry-over and follow-up sessions.

The punishment of expectancies of stuttering responses were investigated in a study by Harris et al. (1971). Three adult stutterers spoke spontaneously for a number of sessions. They were instructued to depress a handswitch each time they expected to stutter. During conditioning each handswitch depression produced a 10-second time-out from speaking. It was found that for one subject, punishing expectancy responses markedly decreased the frequency of expectancy responses but the percentage of words stuttered decreased very little. For the second subject, simply depressing a handswitch contingent upon

each expectancy response (with no subsequent time-out from speaking) resulted in a reduction in both expectancy and stuttering. For the third subject, punishing expectancy responses resulted in a marked reduction in stuttering, but a much smaller decrease in expectancy response.

In the above studies, the authors speculate that perhaps the suppression effect of the time-out does not extinguish as rapidly as the effect of electric shock or noise. It has been found that when punishment is discontinued, stuttering rate tends to return to the preconditioning level. In an effort to increase the resistance to extinction so that the stuttering rate will be suppressed even after the punishment is removed, Boberg and Martin (1969) compared experimenter and self-administered time-out. The experimenter first administered time-out and later the subject administered his own time-out. Comparison showed there was less extinction or longer lasting suppression following the self-administered time-out. At present there have been no follow-up studies to supplement the research done by Boberg and Martin (1969).

The reported literature has demonstrated that time-out from speaking functions as an aversive event. Speculations are that the act of speaking is pleasurable enough so that being required to stop talking is punishing.

The present investigation consisting of two parallel single subject studies carried out concurrently. The study was designed to investigate the persisting effect of time-out after the contingency

was removed. It also investigated the possibility of significant difference existing between the effect of time-out and a control condition in which no such consequence was attached to stuttering.

The present study was designed to investigate the effects of time-out from speaking on stuttering behavior. Answers to the following questions were sought:

1. Does the use of time-out from speaking significantly decrease the frequency of moderate stuttering?
2. Does the effect of time-out on stuttering persist after the contingency is removed?
3. Is there a significant difference between the effect of time-out and a control condition in which no such consequence is attached to stuttering?

CHAPTER II

PROCEDURE

Subjects

Two parallel single subject studies were carried out concurrently. The subjects were two adult males from Grand Forks, North Dakota. They were both judged to be moderate stutterers. According to the Iowa Scale For Rating Severity of Stuttering, moderate stuttering is defined as: Stuttering frequency of about 5-8 percent of words, tension occasionally distracting; disfluencies averaging about one second in duration and disfluency patterns characterized by an occasional distraction sound. A moderate stutterer would exhibit no severe struggle behavior or silent blocks (Johnson et al., 1952).

The subjects were young adult males and their ages were 26 and 30 years old. They had both had previous speech therapy. The criteria necessary to qualify as subjects for this study were an exhibition of stuttering of moderate severity and a lack of control of stuttering behavior.

Baseline measurements were a tally of stuttering behaviors in two thirty-minute samples each consisting of six five-minute segments. The stuttering frequency per minute was computed by counting stuttering behaviors in a five-minute segment and dividing the stuttering behaviors

by the five minutes. In the tally each single repetition or block was counted as one stuttering behavior.

The equipment used for the project included a handcounter to tally stuttering disfluencies, 3½ x 2½ Word Making picture cards to help stimulate continuous discourse when necessary and a timing device. The time-out device consisted of a Hunter Model 116 electronic timer, a handswitch, and a one-inch red jewel light set in a gold colored 4" x 2¼" x 2½" aluminum chassis box. The experimenter and the timing device were located outside a sound treated audiometric booth and the subject and the box containing the jewel light were inside the booth. The timer was wired so the depression of the handswitch activated the timer and illuminated the light. After ten seconds, the timer automatically extinguished the light and reset so the next depression of the handswitch repeated the cycle.

The sound-proof audiometric booth, a single-walled IAC room remoted the experimenter from the subject. It was used to reduce extraneous stimuli such as the handcounter movements and the clicks from the timer. A Viking tape deck, which was part of the audiometric equipment installed in the sound-treated room, was used to record samples of conversational speech. A talk-back microphone was suspended from the ceiling of the sound-proof booth.

Description of the Project

The subjects were seated in the sound-proof booth. The experimenter and the equipment were in the adjoining room. Speech stimulation cues were provided by the Word Making picture cards which

were placed on a small table inside the booth in front of the subject. During all sessions, a subject's task was to speak continuously. It was explained to him that the picture cards were available to help him think of things to talk about.

There were twenty sessions lasting 30 minutes each. For the first two sessions, each subject was instructed to speak spontaneously using the provided stimulus to establish a baseline. A Viking tape deck was employed to record two segments of their baseline. This recording was done as a means of checking intra-rater reliability. A handcounter was used to tally live each stuttering behavior. A handcounter was also used to tally the stuttering behaviors of the two recorded segments of baseline conversation.

In the baseline measurement, the experimenter noted no obvious upward or downward trend existing during the last four measurements of the second baserate session.

Before baseline measures had been taken, Subject A was given the following explanation:

> You will be part of an experimental therapy project. As an experimental subject you will be instructed to speak using the provided stimulus cards as cues. For the first two sessions you will simply speak after which you will be exposed to time-out punishment. Each time I hear a stuttering block or a syllabic or word repetition you will be punished. I will depress a red light which will remain on for ten seconds. You must stop speaking until this light goes off and then you may begin speaking again. After a series of time-out sessions you will become the control subject in which you will simply converse using the provided stimulus cards.

Subject A was run for two sessions of baserate measurement and nine sessions during which ten seconds of time-out from speaking was

made contingent upon stuttering. For the final nine sessions, Subject A became the control subject without any contingencies attached to his stuttering.

Before baseline measurements were taken, Subject B was given the following explanation:

> You will be part of an experimental therapy project. As a control subject you will be instructed to speak using the provided stimulus cards. For a number of sessions you will converse after which you will be exposed to the time-out punishment. Each time I hear a stuttering block or a syllabic or word repetition you will be punished. I will depress a red light which will remain on for ten seconds. You must stop speaking until this light goes off then you may begin speaking again.

Measurement

Tallies were made of stuttering behaviors of each 30 minute session in five-minute segments. These tallies were counted by the researcher using a handcounter and recorded on graph paper. Baseline measures were tallied live plus tape recordings were used to establish reliability.

Reliability

During baseline and treatment, stutters were tallied live. In an effort to establish that the measurements were reliable, two baseline segments were tape recorded and, following completion of the study, these tallies were counted from the tape recordings by the experimenter and another clinician. The results of this tally were then compared with the original data by the use of the Pearson product moment correlation coefficient. The correlation between these segments

was 1.00 for interrater reliability and 1.00 for intra-rater reliability suggesting that the tallying of stuttering behaviors was reliable.

For Subject A, the time-out procedure was instituted during the nine sessions following baseline measurements (Sessions 3 through 11). Stuttering behaviors were tallied live in five-minute segments and these tallies were graphed for each session.

For Subject B, the time-out procedure was instituted during the last nine sessions of the procedure (Sessions 12 through 20). The same procedure of tallying and graphing was followed when the subjects changed roles as the experimental and control subjects.

Analysis of Data

The data was analyzed by comparing the frequencies of stuttering in each condition. The *t*-test was used to make statistical comparisons between Subject A and Subject B as well as within the data for each subject.

CHAPTER III

RESULTS AND DISCUSSION

Data on each subject is graphically presented in Figure 1. The mean number of stutters per minute was calculated for each session for both subjects (see Table 1).

The mean number of stutters per session during baserate for Subject A was 19.6 and, 17.6 respectively, while the mean of stutters per session during baserate for Subject B was 20.5 and 19.16. A t-test was used to make statistical comparisons of stuttering frequency between Subject A and Subject B as well as within the data for each subject (see Table 2).

For Subject A, the two baserate means were compared to the means of the last five time-out sessions. A t-test was applied to the means and it yielded a t value of 17.849 which was significant at the .05 level.

For Subject A, a comparison was also made between the last of five time-out sessions and the last of five sessions where no consequences were administered. A t-test yielded a t value of 14.805, which was significant at the .05 level.

In comparing the means of the baserate sessions to the no consequence session means, a t-test yielded a t value of 1.313 which was not significant at the .05 level of confidence. Thus, Subject A

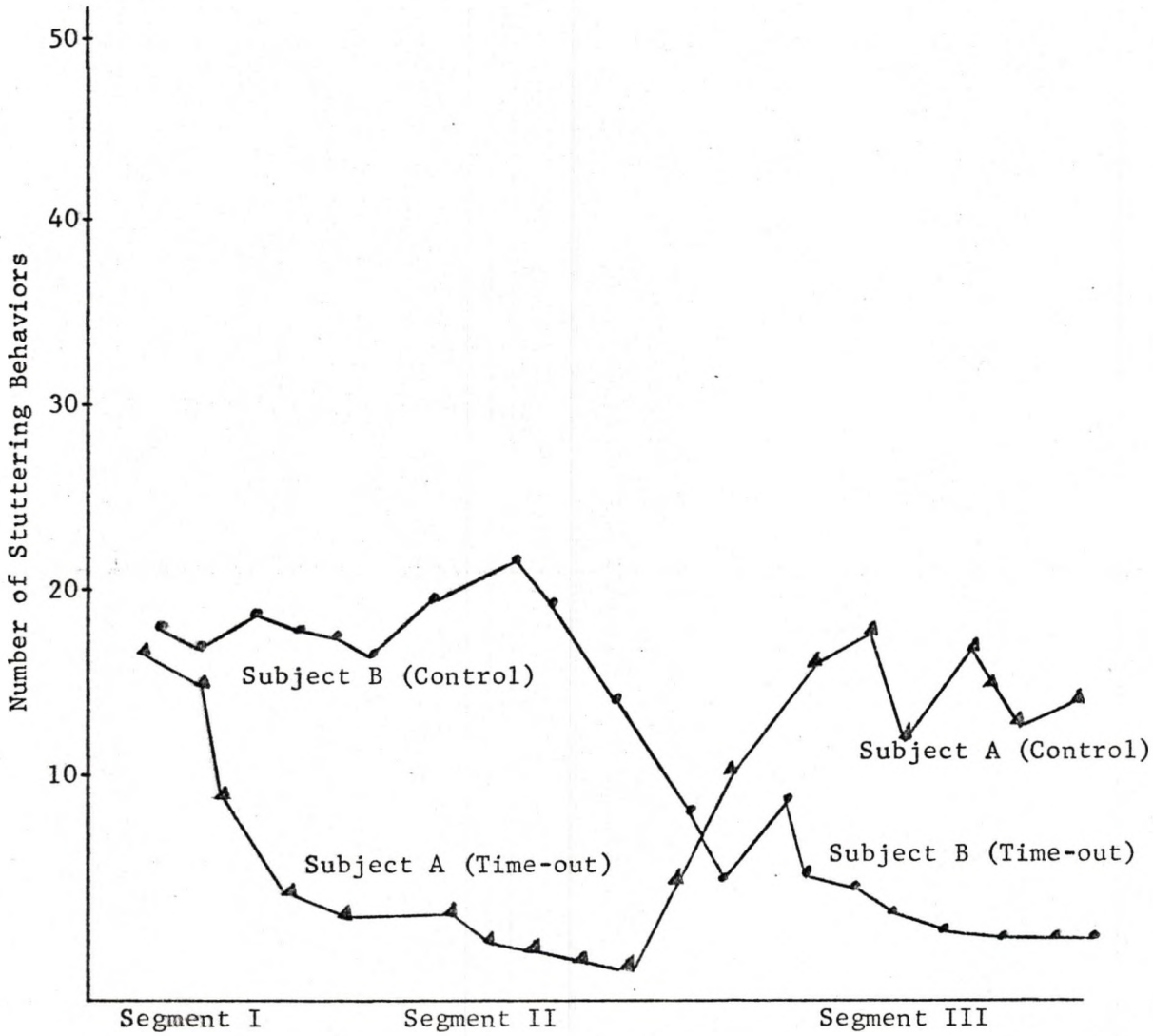

Fig. 1--Comparison Measurements For Subjects A and B.

TABLE 1

THE MEAN NUMBER OF STUTTERS PER FIVE MINUTES FOR SUBJECT A AND SUBJECT B

Session	Subject A	Subject B
	Baseline	Baseline
1	19.6[a]	20.5[a]
2	17.6[a]	19.1[a]
	Time-out	Control
3	10.8	21.5
4	6.0	20.6
5	5.0	20.3
6	3.1	18.6
7	4.8[a]	22.0[a]
8	3.6[a]	23.0[a]
9	3.3[a]	23.3[a]
10	2.8[a]	20.8[a]
11	2.5[a]	14.1[a]
	Control	Time-out
12	7.1	9.1
13	13.3	7.5
14	17.8	10.0
15	20.1	7.6
16	14.0[a]	7.3[a]
17	18.8[a]	6.6[a]
18	17.6[a]	6.1[a]
19	16.1[a]	6.1[a]
20	17.0[a]	6.1[a]

[a]Denotes those sessions used to make comparisons within the subject's data and between data of Subject A and B.

TABLE 2

SUMMARY OF t-TESTS

Comparisons	t Values
Subject A Baserate to Subject B Baserate	.983[a]
Subject A Baserate to Subject A Control-Condition	1.313[a]
Subject A Baserate to Subject A Time-Out Condition	17.849[b]
Subject A Control Condition to Subject A Time-Out	14.805[b]
Subject B Baserate to Subject B Control Condition	0.294[a]
Subject B Baserate to Subject B Time-Out Condition	24.682[b]
Subject A Control to Subject B Time-Out Condition	12.231[b]
Subject B Control to Subject A time-Out Condition	9.914[b]

[a]No Significant Difference
[b]Significant difference at the .05 level of confidence

1. With 5 degrees of freedom a t value of 2.571 or greater was required for significance.
2. With 8 degrees of freedom a t value of 2.306 or greater was required for significance.
3. With 1 degree of freedom a t value of 12.706 or greater was required for significance.

showed a significant decrease in stuttering from baserate when time-out from speaking was instituted. His rate of stuttering increased significantly when the time-out contingency was removed.

For Subject B in comparing the two sessions of baserate to five sessions of no consequence, a t-test yielded a t value of 0.294 which was not significant at the .05 level.

For Subject B, the five sessions of no consequence were compared to five sessions of time-out. A t-test yielded a t value of

8.301 which was significant at the .05 level. A comparison of the baserate session means to the five time-out means yielded a t value of 24.684 which was significant at the .05 level.

Thus, Subject B showed no decrease in stuttering frequency when no consequences for stuttering was extended for nine sessions beyond the baseline sessions, but his stuttering decreased significantly when time-out contingency was introduced.

In comparing the stuttering frequencies of the two subjects during baseline, no significant difference was found. When a t-test was used to compare five sessions of Subject A during the first condition (time-out) with five sessions of Subject B during the first condition (control) a t value of 9.914 was found which was significant at the .05 level. A t value of 12.231 was found in the comparison of the last five session means for Subject A (control) with the last five session means for Subject B (time-out). This t was significant at the .05 level.

Discussion

The application of time-out from speaking contingent upon stuttering resulted in reduced stuttering behavior. A significant difference was shown between the sampling of the time-out sessions and those of the no consequence sessions.

Reduced stuttering was shown to be specific to the time-out contingency and not to continued speaking in the same general situation

over time. Thus, time-out from speaking was shown to function as a punisher for these subjects.

The stuttering of Subject A was reduced in the nine sessions following his baserate measurement. When time-out was discontinued his stuttering increased. Subject B received no consequences following baseline measurements and his stuttering did not decrease during these sessions. When, at session twelve, he began receiving time-out his stuttering behavior decreased.

In general, the application of time-out did reduce stuttering. However, no obvious carry-over to outside situation was noted nor any persistence of the effect of the procedure when the contingency was removed.

It should be noted that these results may have been influenced by the instructions. Subjects were told when they were experimental subjects and when they were functioning as control subjects. The extent to which their expectations influenced their behavior, if any, is unknown.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Two parallel single subject studies were carried out concurrently. They consisted of twenty 30 minute sessions. Two adult moderate stutterers were selected as subjects. Before treatment began, baserate measures were taken.

Subject A was assigned to the time-out phase and Subject B, assigned the role of control subject, received no consequences for his stuttering behavior. With session twelve, the subjects switched roles. Subject A became the control subject and Subject B received the time-out punishment for the remaining sessions.

The following conclusions were drawn from examination of the data:

1. Stuttering behavior decreased with administration of the time-out from speaking in both subjects.
2. Time-out from speaking served as an aversive event in that it significantly decreased the frequency of the stuttering behavior that preceded it.
3. For Subject A stuttering behavior gradually increased and returned to pre-conditioning level after time-out was discontinued.

Suggestions for Further Research

1. Further research should be extended to a larger population.
2. Increase the number of baseline measurements when observing stuttering behavioral changes.
3. Further research extended to stutterers who exhibit more severe stuttering blocks.

REFERENCES CITED

Adams, M. and Popelka, G. The influence of time-out on stutterers and their dysfluency. Behavior Therapy, II, July, 1971.

Azrin, N. and Holz, W. Punishment. Edited by W. Honig, Operant Behavior: Areas of Research and Application. New York: Appleton, 1966.

Boberg, E. and Martin, R. The effects of self-administered and experimenter-administered time-out on stuttering. Paper presented at the American Speech and Hearing Association National Convention, November 14, 1969.

Brookshire, R. H. and Martin, R. R. The differential effects of three verbal punishers on the disfluencies of normal speakers. Journal of Speech and Hearing Research, X, September, 1967.

Curlee, R. and Perkins, W. The effect of punishment of expectancy to stutter on the frequencies of subsequent expectancies and stutterings. Journal of Speech and Hearing Research, XI, June, 1968.

Daly, D. and Frick, J. The effects of punishing stuttering expectations and stuttering utterances: A comparative study. Behavior Therapy, I, May, 1970.

Emerick, L. An outline of stuttering therapy. An Unpublished Paper presented at Moorhead State College, 1963.

Engel, D. and Peterson, D. The use of operant procedures by a teacher aide in a public school setting. Paper presented at the American Speech and Hearing Association National Convention, November 14, 1969.

Ferster, C. Withdrawl of positive reinforcement as punishment. Science, CXXVI, 1957.

Ferster, C. and Skinner, B. F. Schedules of Reinforcement. New York: Appleton, 1957.

Flanagan, B.; Goldiamond, I.; and Azrin, N. Operant stuttering: The control of stuttering behavior through response-contingent consequences. Journal of the Experimental Analysis of Behavior, I, 1958.

Fraser, M. (ed.) Stuttering: Its Prevention. Memphis, Tennessee: Speech Foundation of American, 12-13, 1962.

Goldiamond, I. Stuttering and fluency as manipulable operant response classes, in Research in Behavior Modification: New Developments and Their Clinical Implications. Edited by L. Kasner and L. Ullman. New York: Holt, Rinehart and Winston, 1965.

Haroldson, S.; Martin, R.; and Starr, C. Time-out as a punishment for stuttering. Journal of Speech and Hearing Research, XI, September, 1968.

Harris, C.; Martin, R.; and Haroldson, S. Punishment of expectancy responses by stutterers. Journal of Speech and Hearing Research, XIV, December, 1971.

Johnson, W.; Darley, F.; and Spriestersbach, D. C. Diagnostic Methods in Speech Pathology. New York: Harper-Row, 1952.

Leitenberg, H. Is time-out from positive reinforcement an aversive event? A review of experimental evidence. Psychological Bulletin, IXIV, 1964.

Martin, R.; Kuhl, P.; and Haroldson, S. An experimental treatment program with two stuttering children. Paper presented at the American Speech and Hearing Association National Convention, November 18, 1972.

McReynolds, L. V. Contingencies and consequences in speech therapy. Journal of Speech and Hearing Disorders, XXXV, February, 1970.

Prins, D. Personal Communication at the American Speech and Hearing Association National Convention, November 21, 1972.

Quist, R. and Martin, R. The effects of response contingent verbal punishment on stuttering. Journal of Speech and Hearing Research, X, December, 1967.

Seigel, G. and Martin, R. Verbal punishment of disfluencies in normal speakers. Journal of Speech and Hearing Research, VIII, 1965.

Seigel, G. and Martin R. Punishment of disfluencies in normal speakers. Journal of Speech and Hearing Research, IX, June, 1966.

Seigel, G. Punishment, stuttering and disfluency. Journal of Speech and Hearing Research, XIII, December, 1970.

Skinner, B. F. Operant behavior. Science and Human Behavior. New York: Macmillan, 1953.

Sloane, H. N. and MacAulay, B. D. Operant Procedures in Remedial Speech and Language Training. Boston: Houghton Mifflin Co., 1968.

Van Riper, C. The effect of penalty upon the frequency of stuttering spasms. Journal of Speech Disorders, II, 1937.

Van Riper, C. Speech Correction: Principles and Techniques. Engelwood Cliffs: Prentice-Hall, 1963.