

COMPARISON OF REGULATED-BREATHING VERSES ABBREVIATED DESENSITIZATION ON REPORTED STUTTERING EPISODES

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This study was an investigation of the regulated-breathing method for controlling stuttering as compared to a placebo-control method consisting of abbreviated desensitization training. The regulated-breathing procedure, given to 21 stutterers, taught the speaker to breathe smoothly and deeply, to pause at natural juncturing points, to plan ahead for the content of the speech, and to relax chest and neck muscles. Several general behavioral procedures were also used including relaxation training, self-correction for errors, social support, daily home practice, and response awareness, which are components of the general habit reversal procedure for diverse habits. Training was given in one or two sessions plus regular follow-up telephone calls. Daily self-recordings were obtained of the number of stuttering episodes during everyday speech, to determine the generalized effect of the treatment. The regulated-breathing method reduced the reported stuttering episodes by 94% on the first day after training and by 97% during the fourth week and the three-month follow-up. The control procedure reduced reported stuttering only slightly (about 10%). The results indicate substantial effectiveness of the regulated-breathing method for reducing reported stuttering episodes in everyday speech as compared with an alternative treatment of equal duration.

Stuttering is known to be reduced for short durations in office or laboratory settings by several types of procedures (Ingham and Andrews, 1973; Van Riper, 1973; Yates, 1970, 1975; and Beech and Fransella, 1968). These procedures include whispering, shouting, delayed auditory feedback (Soderberg, 1969; Goldiamond, 1965), response-contingent events (Flanagan, Goldiamond, and Azrin, 1959), masking noise (Cherry and Sayers, 1956), and metronomic speech (Barber, 1940; Azrin, Jones, and Flye, 1968). Quantitative clinical trials have, however, produced few demonstrations of effectiveness extending to the clients' everyday functioning. Among the more effective recent studies are the metronome-based program of Brady (1971) that showed about 67% reduction of stuttering, and the combined DAF and articulation training program of Ryan and Van Kirk (1974), that showed a 99% reduction. Both programs required several months of repeated training sessions. A third program is the regulated-breathing method (Azrin and Nunn, 1974) that produced a 98%

Reprinted from *Journal of Speech and Hearing Disorders*
August 1979, Vol. 44, No. 3

reduction after one or two sessions and decreased telephone contacts. None of these three methods and their favorable results have been replicated in large scale, quantitative studies since their publication. This study incorporates some minor changes in the regulated-breathing method and evaluates further the effects of that method to provide: (1) a larger sample than the 14 stutterers in the earlier report, and (2) a control group of stutterers receiving an alternative treatment.

The regulated-breathing method used in this study was modified slightly from that reported in Azrin and Nunn (1974), and is described more fully in a recent manual (1977). As in the previous report, the client is taught to relax the respiratory (chest) and speaking (throat) muscles and to engage in a full respiration cycle before speaking. To synchronize speech further with the respiratory pattern, the clients were taught to exhale slightly before speaking without taking too deep a breath and to initiate phonation without interrupting the exhalation. In the earlier report, clients had been taught to initiate phonation immediately after a deep inhalation with the occasional result that some clients inhaled too deeply and initiation of phonation failed to blend smoothly into the respiratory cycle.

As in the previous report (Azrin and Nunn, 1974) the principal objective was to determine the stutterers' fluency in their everyday speech and not in the office or laboratory. Consequently, the primary data were systematic self-recordings of stuttering episodes experienced by the stutterers in their everyday functioning. To evaluate the validity of these self-recorded data in a nonsystematic way, the counselor had regular phone contacts after the first or second treatment session and also obtained reports from a person residing with the stutterer.

Subjects

~~Forty~~ 38 stutterers who responded to a newspaper advertisement were the participants in the study. None were excluded from the study. A coin flip determined which treatment would be used for each person before the person was seen by the clinician. Twenty-one participants were placed in the regulated-breathing procedure and 17 in the abbreviated desensitization procedure. The average age was 29 years for the regulated-breathing group and 30 years for the abbreviated desensitization group with a range from four to 65 years. All but six clients were male. The reported average duration of stuttering was 22 years for the regulated-breathing group and 23 years for the abbreviated desensitization. Both groups indicated an average age of onset of six years. The mean reported frequency of stuttering episodes was 337 per day for the regulated-breathing clients (with a median of 150 per day) and a mean of 443 per day for the abbreviated desensitization clients (with a median of 100 per day). All clients reported having received previous treatment for stuttering.

METHOD

Follow-Up

The study took place in a clinic located in a large urban area several hundred miles from the counselor's office. Consequently, extended follow-ups by either visits or phone were prohibitively difficult or expensive for the clients and the counselor. Follow-up contact by mail alone was not considered because it provided no opportunity to obtain supporting evidence needed to validate the reports of the current everyday speech pattern. Accordingly, a minimum follow-up period of four weeks was attempted with all clients. For several months up to 16 months, follow-up telephone calls were made insofar as they were economically and practically feasible. The data were obtained from standard recording sheets maintained by the clients and mailed to the counselor, or occasionally read over the phone if necessary.

Recording and Measurement

The measurement of stuttering is accomplished best in a structured laboratory or office assisted by tape recording equipment to obtain accurate, standardized, and reliable measures of the precise extent of stuttering. As was noted earlier, the principal aim of this study was to evaluate the degree of stuttering throughout the day. Accordingly, this study relied primarily on structured self-recording supplemented by several procedures for determining the general validity of the measures. Clients carried recording sheets with them, recorded each stuttering episode as soon as possible, and totaled them at the end of each day. The sheets were mailed to the counselor regularly and the client reported the number of stuttering episodes to the counselor during the frequent phone calls. A family member, roommate, or other person close to the stutterer was contacted regularly to obtain a general validating report regarding the client's stuttering. The regular phone conversations with the counselor provided another general estimate of validity of the stuttering records. This method of recording provides quantitative data and nonsystematic validation but suffers greatly from the lack of strict reliability and validity measures of stuttering. The clients were taught initially to define stuttering as a hesitation, repetition, or prolongation, but their self-recording during follow-up may well have departed from this definition.

Regulated-Breathing Training Program

The procedure used for the regulated-breathing condition was essentially the same as described earlier in broad outline in Azrin and Nunn (1974) and in detail with slight changes in Azrin and Nunn (1977). Therefore, only a brief description is given here. The client was seen for one or two sessions only, each session lasting two to three hours. Two sets of procedures were used,

the first being specific to the stuttering problem and the second set being general behavioral training procedures applicable to diverse habit problems as described by Azrin and Nunn (1973). During training specific to stuttering, the client was taught to breathe smoothly during speech by beginning exhalation before speaking, to blend words into the exhalation pattern, and even to continue the smooth exhalation slightly past the last speech sound. Before speaking, the client paused to formulate the content of the speech and inhaled smoothly. Smooth exhalation began slightly before speaking. During speech, the clients deliberately paused at natural juncturing points in the speech at which time they again formulated the intended speech content while inhaling. During the pause, the client was instructed to formulate the general content of the speech and not the specific wording because a word-choosing strategy might result in avoidance of stuttering-prone words, which was not desired.

This breathing-speaking pattern was taught by first having the client read a paragraph, one word at a time, juncturing after each word and progressing to two words at a time, then three, four, and so on, on succeeding lines if no speech block occurred on the previous line. If a speech block occurred, the speaker stopped immediately and repeated the entire line until it was read free of blockage. The same progressive increase was used for spontaneous speech.

The general behavioral training procedures included teaching the client to relax when nervous, to identify stuttering-prone sounds, situations, and bodily precursors of stuttering, to enlist a supportive family member, to seek out situations previously avoided, to record each stuttering episode, to practice the new breathing-speaking pattern alone each day, and to self-correct by immediately stopping speech and inhaling at the earliest indication of blocking. The last half-hour of the session was spent in casual conversation with the counselor and any other available office persons. When a speech block occurred, the client was taught to stop speaking immediately at the first sign of the block, to relax the body and especially the chest muscles, formulate thoughts, to inhale fairly deeply if insufficient air remained in the lungs, to exhale briefly before speaking, and to speak in shorter junctured phrases until further speech blocks seemed unlikely. The client's family member or friend usually participated in part of the training session. The client phoned the counselor the next day and every few days thereafter as needed until the speech blockages were almost absent.

Abbreviated Desensitization Program

The desensitization procedure of Wolpe (1958) was given in a highly condensed form so as to be comparable in session duration (two hours) and number (one to two sessions) to the duration of treatment given to the persons receiving regulated-breathing training. The client received relaxation training according to the specific instructions of Wolpe and Lazarus (1966) and was desensitized on each item of the hierarchy of stuttering-prone situations specific to that client. The clients were instructed to practice the exercises at home

daily, to record their progress, and to maintain phone contact with the counselor, just as the regulated-breathing clients were instructed.

The counselors for both training procedures were behavior therapists who had received formal training in desensitization.

RESULTS

Figure 1 shows the reduction of reported stuttering in both groups. The data are expressed in terms of the mean percentage reduction from the pre-treatment (baseline) level, which by definition is a 0% reduction. The data points are presented daily for each of the first seven days, weekly for each of the next three weeks, and monthly for each of the next two months. For the regulated-breathing condition, all 21 clients are included for the first three weeks. Data were available for 19 clients on the fourth week, 17 for the second month and 14 for the third month. For the abbreviated desensitization condi-

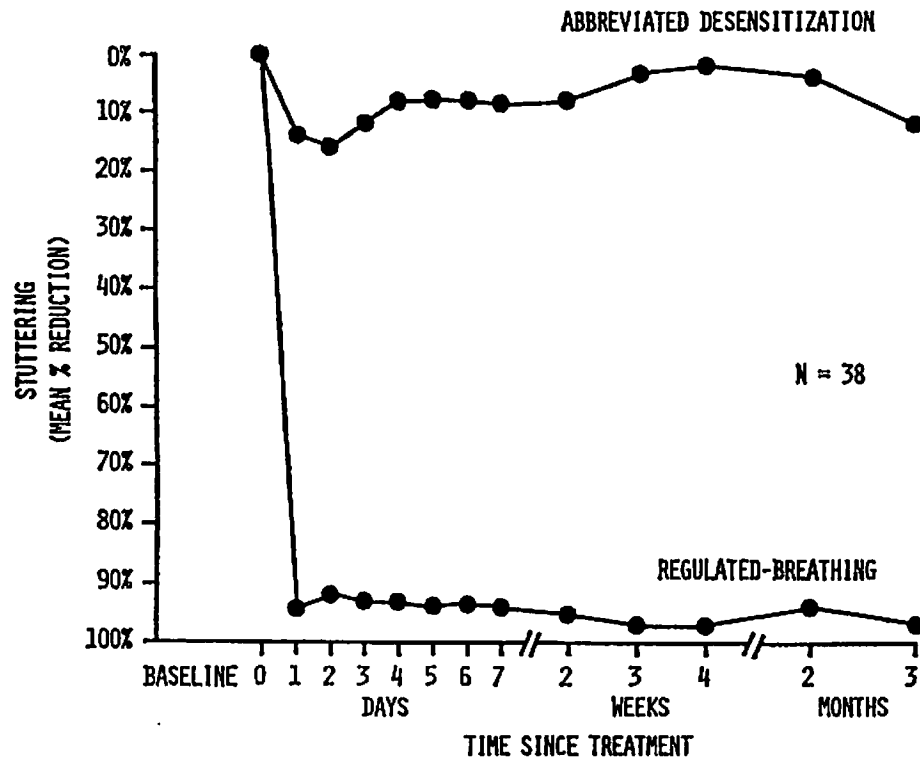


Figure 1. Stuttering pre- and posttreatment. Stuttering incidence is expressed as the mean percentage reduction of self-reported stuttering episodes relative to the baseline pretreatment level that is designated as 0% reduction. The one or two treatment sessions were given just prior to Day 1. The posttreatment data are presented daily for the first week, weekly for the first month, and monthly for the next two months. Twenty-one of the 38 subjects received regulated-breathing training (lower curve) for the one or two sessions. The other 17 subjects received abbreviated desensitization training of equal duration (upper curve).

tion, data were available for all 17 clients for the first four weeks, 13 clients on the second month, and 11 clients on the third month. The one or two treatment sessions were given just prior to Day 1.

For the regulated-breathing clients, reported stuttering decreased by 94% on the first day after the one or two days of training and remained at that general level until the third week when reported stuttering decreased further to 97% and remained at that general level at the three-month follow-up. For clients treated by the abbreviated desensitization procedure, reported stuttering decreased by about 15% on the first two days after training but gradually returned so that about a 5% reduction prevailed for the first two months of follow-up. At the third month, reported stuttering had evidenced a 12% decrease from the pretreatment level.

Sixteen months after training, an attempt was made to obtain follow-up data from the clients in the regulated-breathing condition, but only 11 of the original 21 could be reached. For these 11 clients, the mean percentage reduction at 16 months was 79%. Follow-up telephone calls, an integral part of the treatment program, were not made after the third month. The data point for the sixteenth month is not shown in Figure 1 because of the noncomparability to the other data points in terms of the number of clients and the absence of the follow-up procedure.

Examination of individual data, rather than averages, showed that seven of the 21 clients (33%) receiving regulated-breathing training reported zero stuttering at all of the follow-up periods. At the three-month follow-up, 57% (eight of 14 clients) reported no stuttering and at the 16-month follow-up, 46% (five out of 11 clients) reported zero stuttering. To ascertain how many clients relatively were unaffected by the regulated-breathing treatment, a criterion of less than 50% reduction in stuttering was selected as a cut-off level. Under this criterion all of the clients were improved (at least a 50% reduction) during the first month, all but one at the second month, and all at the third month. At the 16-month follow-up, three of the 11 clients (27%) could be classified as relatively unimproved.

Corroborative reports were obtained from a family member, roommate, or friend for each client. These reports were in general accord with those provided by the clients and the phone conversations with the counselor. In no instance did a client report zero or near-zero level of stuttering in the self-recorded data sheets and evidence stuttering on the phone with the counselor or in the report by the other person.

DISCUSSION

The regulated-breathing method produced a greater reduction in reported stuttering at all points in the follow-up than did the abbreviated desensitization method. The average reduction in reported stuttering was about 95% throughout the first three months for those clients receiving regulated-breath-

ing training whereas the reduction for the abbreviated desensitization clients averaged about 7%.

The abbreviated desensitization procedure used here cannot be considered equivalent to the full desensitization procedures used normally. This comparison treatment was included primarily as a placebo control. It provides a control for duration of treatment, subject selection bias, recording influences, general clinician influence, and the many other factors associated with any treatment program.

This finding confirms and extends previous findings regarding the effectiveness of the regulated-breathing method. The earlier study (Azrin and Nunn, 1974) with 14 clients also showed a reduction of approximately 95% on the first day after treatment, and similarly a reduction of about 98% three months after treatment. In that study, follow-up telephone calls were continued through the fourth month at which time a 97% reduction was reported. Similarly, Poppen, Nunn, and Hook (1977), in a single-subject study, found that regulated breathing produced an immediate and enduring decrease of stuttering to a normal level and with generalization to everyday situations, whereas desensitization, metronomic training, and other treatment procedures produced no substantial enduring or generalized benefit. Breathing records taken in that study showed a more regular breathing pattern after regulated-breathing training. Three other single-subject studies (Small, 1975; Hee and Holmes, 1976; and Williamson, Epstein, and Coburn, 1978) also found that regulated-breathing training eliminated stuttering. Thus, the effectiveness of the regulated-breathing method has been replicated by this study and by four other studies.

The very slight benefit (10% reduction) of desensitization training in this study should not be taken as evidence of the ineffectiveness of imaginal desensitization because this procedure used only one or two sessions in contrast with the larger number recommended (Wolpe, 1958). Also, this study did not restrict use of the abbreviated desensitization procedure to anxious subjects for whom such a procedure should be most appropriate. Using 10 sessions of desensitization over a three-month period, Boudreau and Jeffrey (1973) found a mean decrease of stuttering of about 50%. These results indicate that a full-desensitization procedure can be effective.

These data indicated the importance of follow-up telephone contacts in maintaining the near-elimination of stuttering. The Azrin and Nunn (1974) and the present findings showed that stuttering continued to decrease to a 1 to 2% level during the three- to four-month follow-up as long as occasional phone contact advice was available. But, when such contact was not scheduled or easily available in this study for 13 months, some clients began stuttering again. In each instance in which stuttering returned, the client had ceased attempting to use the regulated-breathing pattern. This finding suggests that follow-up telephone or office contacts should continue to be easily available to clients, and preferably scheduled formally, to provide the booster instruction necessary to maintain the reduction of stuttering.

This method relies heavily on the theory that the breathing pattern plays a large role in stuttering. No direct and definitive evidence for this relation has been established but several lines of indirect evidence are suggestive as has been concluded by Adams (1974; 1978) in a review of the evidence. Adams, Runyan, and Mallard (1975) found some differences in several aerodynamic measures between stutterers and nonstutterers. Meyers (1978) found a slight correlation for some stutterers between breathing pattern before speaking and stuttering. Freeman and Ushijima (1975) have reported an imbalance between the abductor and adductor laryngeal muscles with one stutterer that was associated with stuttering and this imbalance may be interpreted, as by Adams (1974; 1978), as indicative of a respiratory problem.

Stuttering is known to be reduced by several procedures that seem to alter the aerodynamic pattern, such as whispering (Perkins, Rudas, Johnson, and Bell, 1976), shouting, syllable-timed speech (Ingham and Andrews, 1973), singing, delayed auditory feedback (Goldiamond, 1965), and metronomic speaking (Jones and Azrin, 1969). Hutchinson and Navarre (1977) provide some support for this interpretation in their finding that metronomic speaking altered the aerodynamics by lowering peak pressure and increasing pressure duration for stutterers and nonstutterers. Taken together these findings suggest that respiration may be implicated in stuttering but in some as yet unspecified manner.

ACKNOWLEDGMENT

Grateful acknowledgment is given to Dr. R. DeVito, Dr. P. Levison, and Dr. C. Renzaglia for administrative support in this study. Dr. Greg Nunn is now at the Chicago Habits Clinic, 626 Grove Street, Suite 201, Evanston, IL 60201. Requests for reprints should be directed to Nathan H. Azrin, Department of Treatment Development, Anna Mental Health Center, 1000 N Main St., Anna, Illinois 62906.

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Received August 28, 1978.
Accepted December 12, 1978.