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## HABIT-REVERSAL: A METHOD OF ELIMINATING NERVOUS HABITS AND TICS\*

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**Summary**—No clinical treatment for nervous habits has been generally effective. The present rationale is that nervous habits persist because of response chaining, limited awareness, excessive practice and social tolerance. A new procedure was devised for counteracting these influences: the client practiced movements which were the reverse of the nervous habit, he learned to be aware of each instance of the habit and to differentiate it from its usual response chain and he was given social approval for his efforts to inhibit the habit. The treatment was given during a single session to 12 clients who had diverse nervous habits such as nail-biting, thumb-sucking, eyelash-picking, head-jerking, shoulder-jerking, tongue-pushing and lispings. The habits were virtually eliminated on the very first day for all 12 clients and did not return during the extended follow-up for the 11 clients who followed the instructions.

NERVOUS habits and tics are psychological disorders which are highly resistant to general types of treatment. As concluded by Eriksson and Persson (1969) "some patients become permanently disabled and resistant to every form of treatment. Judging from the literature, no single form of treatment is universally effective" (p. 351). Similarly, Yates (1970) described tics as "notoriously resistant to almost any form of treatment" (p. 201).

Different theoretical explanations of nervous habits have been proposed, each of which has served as the basis for different types of treatment. The psychoanalytic view as expressed by Mahler and Luke (1946) considers tics as "erotic and aggressive instinctual impulses . . . which are continually escaping through pathological discharge" (p. 441). The treatment derived from this view is to provide counseling that persuades the client that these impulses are the cause of his problem ('giving him insight') and to teach him to channel these impulses elsewhere. A second theoretical view is that nervous habits are caused by tension. Two types of treatment are based on this rationale; one is negative practice (Yates, 1958; Jones, 1960; Rafi, 1962) in which the client is required to perform the tic rapidly thereby preventing the tension reduction that otherwise would result. The second method of treatment that follows this tension reduction rationale is treatment by tranquilizing relaxant drugs (Connell *et al.*, 1967; Challas and Brauer, 1963). A third theoretical account is that nervous habits are learned responses that are maintained by operant reinforcement. The treatment derived from this theory has been to arrange for aversive stimuli for the response in order to counteract the effect of these reinforcers (Brierly, 1967; Bucher, 1968).

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*Present rationale*

The present rationale is that a nervous habit originally starts as a normal reaction. The reaction may be to an extreme event such as a physical injury or psychological trauma (see also Yates, 1970), or the symptom may have started as an infrequent, but normal, behavior that has increased in frequency and been altered in its form. The behavior becomes classified as a nervous habit when it persists after the original injury or trauma has passed and when it assumes an unusual form and unusually high frequency. Under normal circumstances the nervous habit would be inhibited by personal or social awareness of its peculiarity or by its inherent inconvenience. The movement may, however, have blended into normal movements so gradually as to escape personal and social awareness. Once having achieved this transformation, the movement is performed so often as to become a strongly established habit that further escapes personal awareness because of its automatic nature. For some tics, the continuing execution of the movement may even strengthen the specific muscles required for that movement and the opposing muscles become relatively unused, thereby causing difficulty for conscious inhibition of the tic and further contributing to the low level of awareness of the tic movement. Also, social reinforcement in the form of sympathy may result, especially for those movements that have had a medical origin.

This analysis of nervous habits suggests several methods of treatment. The client should learn to be aware of every occurrence of the habit. Each habit movement should be interrupted so that it no longer is part of a chain of normal movements. A physically competing response should be established to interfere with the habit. When atrophy has resulted from the disuse of the antagonistic muscles, those antagonistic muscles should be strengthened. Social reinforcement should be reversed or eliminated.

## METHOD

The procedure was evaluated by a within-subjects comparison. A measure was obtained of the extent of the problem prior to counseling and was considered to be the baseline level. This baseline level was compared with the measures taken after counseling.

*Clients*

Twelve clients were treated. Five clients contacted the counselor in response to a newspaper advertisement, three were children who were referred by their parents at the suggestion of their teacher, one was referred by a psychologist who had unsuccessfully treated the client for 2½ yr, and the other three by various types of word of mouth knowledge of the service. No client was excluded. Their clients ages varied from 5 to 64 yrs; eight were female and four were male. Educational level varied from a pre-school child to a client who had an M.A. degree. All clients had been previously treated for their habits by various professionals such as a psychiatrist, psychologist, physician, dentist, speech therapist, or for the children, by their parents and teachers. All of the adult clients reported that their nervous habit seriously interfered with their functioning. Some of the habits caused medical problems; in the case of gum-sucking, by causing softness of the gum and mouth surfaces. Dental problems were caused by the thumb-sucking. The student teacher who lisped was told her teaching duties were unsatisfactory because of the lisping. Interference with all normal physical activities was caused by the head and shoulder tics. Problems of social appearance were caused by the eyelash picking and by the nail-biting. For all clients, the habits had

been a long-standing problem of at least 3 yrs duration; for five clients the problem had existed continuously for at least 7 yrs.

*Types of nervous habits*

Eleven of the clients had one habit; one client had two. Figure 1 (left-hand column)














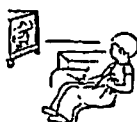
NERVOUS HABIT OR TIC	COMPETING EXERCISE
SHOULDER-JERKING 	 SHOULDERS DEPRESSED
SHOULDER-JERKING ELBOW-FLAPPING 	 SHOULDERS AND HANDS PRESSURE
HEAD-JERKING 	 TENSING NECK
HEAD-SHAKING 	 TENSING NECK
EYELASH-PLUCKING 	 GRASPING OBJECTS
FINGERNAIL-BITING 	 GRASPING OBJECTS
THUMB-SUCKING 	 CLENCHING FISTS

FIG. 1. A pictorial representation of the various types of nervous tics or habits. The left hand column illustrates the different tics or habits. The adjacent illustration in the right hand column illustrates the type of competing exercise used for that nervous tic or habit. The arrows in each of the Competing Exercise illustrations show the direction of isometric muscle contraction being exerted by the client.

illustrates the appearance of the different types of habits. Two clients experienced a shoulder-jerking tic; for one of them the right shoulder jerked upward suddenly about 5 in. and then immediately fell. For the other client the right shoulder jerked upward and forward while his elbow simultaneously jerked against his rib cage. Two or three of the shoulder jerks usually occurred in rapid succession followed by an interlude preceding the next series of spasm-like movements. For one client, his head jerked violently upward such that he was facing almost directly upward and slightly turned to one side at the end of the movement. One client's head moved rapidly up and down and side to side in short rapid movements with the neck stationary, resembling the tremor-like movements seen in Parkinson's disease. One client pressed her tongue firmly against the gum-line of her upper front teeth while she sucked against the roof of her mouth. Also, she found herself pressing her tongue firmly into the spaces between her lower back molars in the manner one uses the tongue to dislodge particles of food. Another client stroked her eyelashes repeatedly, such that the upper and lower eyelashes of both eyes were entirely plucked out. Another client lisped on all 's' and 'z' sounds. Although this problem is not ordinarily considered a nervous habit, but rather a speech problem, it was included here because of its apparent amenability to the present type of treatment. Four clients bit their fingernails resulting in the absence of all projecting portions of all 10 fingernails. Two clients (both children) sucked continually, one on her thumb, the other on her index and middle fingers.

### *Recording*

The incidence of the nervous habit was recorded by the client. Each client stated about how often the habit was occurring during the previous week either in terms of the number of incidents per minute or day or in terms of the percentage of their time each day that they experienced the habits. Each client selected the measure that was more meaningful to him in view of the nature of the habit. For the first 2 weeks after treatment, the client reported each day the incidence of the habit. After about 2 weeks, these measures were obtained at less frequent intervals of about twice per week. After several weeks elapsed, the measure was taken only about twice per month. For every client, a validating report was also obtained from individuals who were in a position to observe the client frequently, such as a spouse, parent, teacher, roommate, co-worker or boyfriend. The counselor had face-to-face contact after counseling with all but two of the clients. Since the other two clients were at a great distance, the counselor relied heavily on detailed validating reports from their family members. For the young clients below 14 yrs of age, the primary measures were obtained from the parents and secondarily from the client or his teachers. The reports of the validating observer were generally in agreement with the primary observer. When the primary observer reported a large number of incidents on a given day, then the validating observer in virtually every case reported that the habit was a problem that day. Similarly, in virtually every instance in which the client reported zero incidents on a given day, the validating observer reported having seen no instances on that day.

### *Awareness training*

The client was made very much aware of the nervous habit by means of several procedures. In one procedure, the Response Description Procedure, the client was required to describe the details of the movement to the counselor, using a mirror if necessary, while he re-enacted several instances of the typical movement. In the second procedure, the Response Detection Procedure, the counselor taught him to detect each instance of the movement by

alerting the client when an instance of the tic occurred. A third procedure was the Early Warning Procedure wherein the client was given practice in detecting the earliest sign of the habit movement, such as when the hand of the nail-biters first approached the face. The fourth procedure was the Competing Response Practice (described below) in which the client maintained heightened awareness of the nervous habit by tensing for a few minutes the muscles that were incompatible with the movement. The fifth procedure, Situation Awareness Training created awareness of the situations in which the habit occurred by having the client recall all situations, persons, and places where the habit was likely to occur and having him describe how the habit was performed in each of those situations.

### *Competing response practice*

This part of the procedure was derived in part from the over-correction rationale described elsewhere (Foxx and Azrin, 1972; Foxx and Azrin, 1973a; Foxx and Azrin 1973b; Azrin *et al.*, 1973) for treating other types of psychological disorders by having the client practice a behavioral pattern opposite to that of the problem behavior. A major departure from the overcorrection approach is the attempt to minimize any aversiveness of the required practice since the objective was to have the client maximally motivated to carry out the practice.

Each client was taught a specific response pattern that would be incompatible with the nervous habits and would, therefore, prevent the habit from being continually intertwined in normal activities. In addition, the incompatible movement was designed to have the characteristics of (1) being opposite to the nervous movement, (2) capable of being maintained for several minutes, (3) producing heightened awareness by an isometric tensing of the muscles involved in the movement, (4) being socially inconspicuous and easily compatible with normal ongoing activities but, still incompatible with the habit and (5) strengthening the muscles antagonistic to the tic movement for the muscle tics.

The clients were instructed to engage in the competing responses for about 3 min following either the temptation to perform a tic or the actual occurrence of a tic.

A different type of exercise was used for the different types of nervous habits. Figure 1 pictorially illustrates the exercise in the right-hand column; the left-hand column depicts the nervous habit. The exercises were as follows:

*Head jerking.* The competing response for the backward head-jerking tic consisted of isometric contraction of the neck flexors (sternocleidomastoid group) by pulling the chin in and down. For the first day, the client pushed his chin onto his sternum, but once having the necessary strength to control the jerking movement, isometric tension in the stationary eyes-forward position was substituted for the more conspicuous chin-on-sternum exercise.

*Shoulder jerking.* The same client also displayed an upward jerking of the right shoulder; the competing response of isometrically contracting the shoulder depressors was used to strengthen the muscles which work in opposition to this upward jerking movement.

*Head-shaking.* The client who displayed the head-shaking tic was instructed to slowly contract isometrically her neck muscles until the head was perfectly still.

*Forward shoulder-jerking.* The competing response for the client who displayed an upward and forward jerking of his right shoulder consisted of the client pushing his hands down and backward against some objects, such as the chair arms while sitting, or against his leg while standing.

*Tongue-pushing.* For the client who constantly sucked against the roof of her mouth while poking against the gum line of her upper teeth, the competing response required that she

press her tongue against the roof of her mouth (in a position different than that while performing the habit) and against the bottom of her mouth for each incident of the habit.

*Lisping.* For lisping, the client was instructed to jut her jaw slightly forward, placing her tongue against the gumline of her lower teeth and to press her tongue against the gum line for each incident of lisping. Whenever possible, she was also instructed to repeat the word she had lisped 50 times correctly (the lisper and gum-sucker are not depicted in the Figure).

*Eyelash picking, thumbsucking and fingernail biting.* For the nervous habits of eyelash picking, fingernail biting and thumb-sucking, each client was instructed to place his hands down by his sides, and to clench his fists until they could feel tension in their arms and hands. In the case of the small thumb-sucking children, the parents were asked to manually guide their child's hands through an open-close exercise 20 times, while gradually fading out their manual assistance for each uncorrected incident performed by the child. Whenever the clenching exercises for nail-biting and eyelash picking interfered with the client's ongoing activities, they were instructed merely to grasp an object or objects appropriate to that situation and squeeze until they could feel a slight amount of tension.

#### *Habit control motivation*

Preliminary efforts with other clients had indicated that little success would result if the client was only casually interested in eliminating his habit. Sufficiently strong motivation was indicated if the adult client sought out the treatment himself, rather than being urged to do so by others. Several procedures were used to increase further the client's motivation to be rid of the nervous habit. The first procedure was the Habit Inconvenience Review in which the counselor and client reviewed, in detail, the inconveniences, embarrassment and suffering that resulted from the habit. This existing motivation for controlling the habit was supplemented by Social Support Procedures introduced once the client had demonstrated he could control his habits during the counseling session. His family and close friends were instructed to strengthen his motivation by (1) commenting favorably on his efforts and improved appearance when they noted a habit-free period, (2) reminding him of the need to 'practice your exercises', when they noted an instance of the habit overlooked by the client and (3) the counselor telephoned the clients regularly after treatment praising the client for his efforts in inhibiting the habit. These calls also were used to obtain the data regarding the frequency of the habit. The frequency of the calls has been noted above under 'Recording'.

A special motivational problem existed with children since the parents and not the child desired to be rid of the habit, the parents having presented the child for treatment. For these very young, often uncooperative children, the parents and teachers increased their child's motivation to control his habit by manually guiding the child's hands through the required exercises whenever the child failed to initiate the exercises himself. Similarly, the uncooperative older children were further motivated to control their habit by requiring them to perform their exercises in the bedroom whenever they failed to initiate the exercises themselves. In all other instances, the exercises were designed to be non-aversive and non-interfering with normal activities.

Another special motivational problem existed for those tics such as the head and shoulder jerks that seemed neurologically caused and therefore not subject to voluntary control. In such instances, the family and friends believed effort at self-control futile. For these clients a Public Display Procedure was used. The family was required to observe the demonstration of self-control during the counseling sessions, and the friends and teachers or fellow



employees were notified of this ability by the client and counselor immediately after the counseling session.

### *Generalization training*

During the counseling sessions, the client was given practice and instructions as to how he should control his nervous habit in his everyday situations. First, the counselor had him practice his exercise until he was performing it correctly, this period usually requiring less than 5 min. To teach the client to be aware of the habit movement in many situations, the counselor used a Symbolic Rehearsal Procedure in which the client was to imagine common and habit-eliciting situations and to imagine that he detected a habit movement and was performing the required exercise. This symbolic rehearsal utilized the list of situations obtained previously from the client in the Situation Awareness Procedure described previously and required about 15 min. To provide actual practice in detecting the habit movement and exercising for 3 min thereafter, the counselor engaged the client in casual conversation on a variety of habit-irrelevant topics for about  $\frac{1}{2}$  hr. During that time, the client was to detect the movement himself, but if he failed to do so, the counselor reminded him using as minimal a suggestion as possible such as staring at the moving limb, or saying 'hmm' or raising his eyebrows, at which time the client would assume the competing exercise for three minutes while the conversation continued uninterrupted.

## RESULTS

Table 1 shows the pre- and post-treatment (3rd week) frequency of the nervous habit for each of the clients individually. For every client the habit was reduced by at least 90 per cent; for 10 of the 12 clients, the habit was absent during the 3rd week after treatment.

TABLE 1. DESCRIPTION AND FREQUENCY OF OCCURRENCE OF THE NERVOUS TICS AND HABITS FOR EACH OF 12 CLIENTS PRE-TREATMENT AND 3 WEEKS POST-TREATMENT BY THE HABIT-REVERSAL METHOD

Client	Nature of tic or habit	Pre-treatment occurrence of tic or habit	Post-treatment (3rd week) occurrence of tic or habit
14-yr-old male	Head and shoulder jerking	8000/day	12/day
14-yr-old male	Elbow-flopping, shoulder jerking	250/day	0
64-yr-old female	Head shaking	75% of day	0
59-yr-old female	Gum-sucking, tongue pressing	100% of day	8% of day
21-yr-old female	Lisping on 's' or 'z' sounds	100% of time	0
31-yr-old female	Eyelash picking	50% of day	0
6-yr-old female	Thumb-sucking	100% of day	0
5-yr-old female	Finger-sucking	85% of day	0
28-yr-old female	Fingernail-biting	50% of day	0
28-yr-old female	Fingernail-biting	300/day	0
21-yr-old female	Fingernail-biting	20/day	0
8-yr-old male	Fingernail-biting	50% of day	0

Figure 2 shows the day-by-day changes for all clients averaged together. Each data point of Fig. 2 is the percentage reduction in the rate of occurrence of the habit from the pre-treatment level (see Table 1 for the pre-treatment level). The data points are for each day for the 1st month and for monthly periods thereafter. All 12 clients are represented for the first 3 weeks; one client having terminated her treatment efforts after 3 weeks. At the time of this writing, sufficient time had elapsed that data for seven clients were available for 5

months. The data shows that the habit reversal training reduced the nervous habits by an average of about 95 per cent on the 1st day after training, about 97 per cent after the 1st week, and about 99 per cent after the 3rd week. This average reduction of about 99 per cent was evident for as long as data was available, which was a period of 7 months for the earliest clients (not shown in Figure). The habit reversal method was rapid, requiring only one counseling session for all the clients. Two clients were given a second session 2 months and 5 months respectively after the first one. One client, a 21-yr-old female nail-biter, decided to abandon her successful efforts after 3 weeks; no further data could be obtained thereafter.

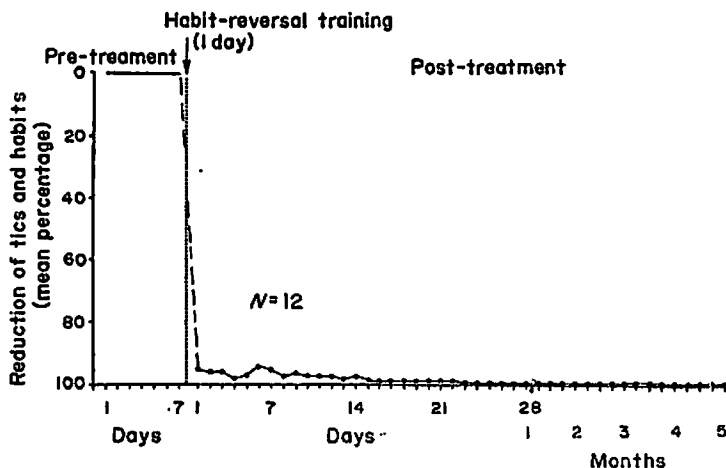


FIG. 2. The mean percentage reduction of nervous habits following treatment by the Habit-Reversal method. The pre-treatment level is designated as 0 per cent reduction and was obtained for the 7-day period immediately preceding treatment. The Habit-Reversal Training required about 2 hr on the day designated by the arrow and dotted line. The Post-Treatment data points are given daily for the first 28 days and monthly thereafter. Each data point is the average reduction relative to the pre-treatment level. The data points are for all 12 clients up to Day 21, for 11 clients for 7 weeks, for nine clients for 2 months and for seven clients for 5 months.

The 11 continuing clients were able to perform their exercises and continued to do so. When asked whether the exercises caused difficulties, all of the adult clients stated that the exercises seemed meaningful, were easy to perform and did not interfere with their ongoing activities. In response to direct questioning, the clients and their validating observers stated that no new habit appeared when the treated habit was eliminated.

## DISCUSSION

The habit reversal procedure appears to be an extremely effective method of eliminating nervous habits. The new method had a substantial effect, having eliminated, or virtually eliminated, the habits. The method was rapid, requiring only one or two counseling sessions. The treatment was durable in that the nervous habits remained absent after treatment and only one or two special telephone calls were usually needed to overcome the occasional relapses of some of the clients. (Preliminary results of a study in progress by Nunn and Azrin indicate that relapses can be eliminated almost entirely for the nail-biting habit by a modified procedure.) The method was a general treatment for many types of nervous



habits as seen by its effectiveness on such diverse habits as head-jerking, lisping, nail-biting and thumb-sucking. Given that the client was motivated, the method seemed to be effective for all types of individuals: very young children as well as adults, males as well as females, those with high frequency or severe habits as well as those with lower frequency or milder habits. A possible side-effect of the treatment was that the competing response might itself become a nervous habit. As noted, however, no such 'symptom substitution' occurred, possibly because the treated habit was eliminated so rapidly thereby requiring only infrequent practice of the competing response. The habit reversal methods appear to be a general as well as an effective treatment for nervous habits.

Evaluation of the clinical value of the present method requires comparison with the clinical results obtained with other methods of treating nervous habits. Many procedures have produced some benefit in restricted office, laboratory or hospital situations, such as self-monitoring of the tic (Thomas *et al.*, 1971); TV feedback and light aversion (Bernhardt *et al.*, 1972); and noise termination (Barrett, 1962). We are concerned here only with methods that have produced clinical benefits that have occurred in the clients' everyday life. Four such methods are psychotherapy, drugs, shock-aversion and negative practice. In the major clinical evaluation of psychotherapy (Paterson, 1945; Mahler and Luke, 1946) about one-quarter of the clients were cured with treatment lasting several months. Combining the findings of the two major studies of aversion therapy (Brierly, 1967; Bucher, 1968), about three-quarters of the clients were cured. Haloperidol, the most effective of the drug treatments have been evaluated in a number of studies (Challas and Brauer, 1963; Stevens and Blachly, 1966; Connell *et al.*, 1967; Shapiro and Shapiro, 1968). A complicating factor of this drug is its serious side effects at high doses. At safe dosages that could be used continuously, the haloperidol eliminated the tics for about one-half of the clients (Connell *et al.*, 1967; Ford and Gottlieb, 1969). Negative practice has been evaluated in a large number of case studies (Yates, 1958; Jones, 1960; Rafi, 1962; Walton, 1961, 1964; Clark, 1966 and in one large sample study, Smith, 1957). Overall, negative practice has eliminated the tics for about one-third of the clients. The present method appears to be clinically more useful than any of the alternative treatments since it was effective for virtually all clients and required only one or two sessions.

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