EFFECTS OF REPETITION OF VERBAL SIGNALS UPON THE BEHAVIOUR OF CHRONIC PSYCHONEUROTIC PATIENTS*

By

D. EWEN CAMERON, M.D.

LEONARD LEVY, M.D.

and

LEONARD RUBENSTEIN

Allan Memorial Institute of Psychiatry, Montreal

STUDIES of the effects of the repetition of statements, i.e., verbal signals, upon the behaviour of chronic psychoneurotic patients have been carried out in the Allan Memorial Institute continuously since 1953 (1).

The verbal signals used in our earlier studies were taken directly from communications made by patients in psychotherapy. Repetition was limited to 10–20 minutes. The patient was not specifically prepared. We found that this procedure evoked considerable activation of the topic from which the statement was taken. The patient would return repeatedly over the next several weeks to ruminate over the topic and this, in turn, brought back into his awareness a considerable number of related memories which he had long forgotten. As a consequence, there was a general activation of the topic and, usually, the emergence of a new pattern of behaviour relative to the matter concerned.

These early studies established the central fact upon which our subsequent investigations have been based, namely, that the exposure of the individual to the repetition of verbal signals will produce a change in behaviour and that the nature of the change will bear a relation to the content of the signals.

For instance, signals drawn from a psychotherapeutic passage concerning the patient's difficulties with his father might produce an activation of the whole topic of his relationship to authoritative figures, with a subsequent increase in confidence and decrease in hostility in such situations.

Our work since then has been directed to the discovery of means (*a*) whereby we could gain precision in predetermining the nature of changes brought about by repetition and (*b*) whereby the duration of these changes could be prolonged.

Two years ago we reported that it was possible regularly to produce predetermined changes in the behaviour of chronic psychoneurotic patients by exposing them to repetition, and that in a proportion of such cases these changes had become lastingly incorporated in their behavioural patterns (2).

We are now reporting the most recent advances which we have been able to make:

Relatively early, we found that progress could be facilitated by breaking up our problem into component parts for separate study. These are:

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I. The Preparation of the Verbal Signals

In order to produce the specific changes which we planned, we found that we could not depend on the chance that satisfactory passages would appear during psychotherapeutic exchanges. Hence, we explored the possibility of constructing verbal signals directly. We found that this was successful, and we now prepare our signals from material derived from psychiatric and from psychopharmacological interviews, from social service reports and from psychological tests.

In a word, when we attempt to replace an undesirable personality characteristic, we construct our verbal signals from those facts concerning its origin and maintenance, as well as from data about the desires and attempts of the patient, and those of the meaningful figures around him, to change that characteristic.

The signals are set up in two forms—a procedure termed "reversed driving". The first—or negative—form consists in those criticisms of the characteristic which have been made over extended periods of time by or to the patient. The second—or positive—form consists in those aspirations which the patient has expressed with regard to changing the undesired characteristic.

The structure of our signals falls into four parts:

(*a*) Problem identification—this is essentially what we have described as the negative phase. This serves to bring sharply before the patient the problem as it exists in terms of his own criticisms and in terms of the criticisms of those with whom he lives and works.

(*b*) The second component is the setting up of a goal. This goal may be either the changing of an undesirable attitude (e.g. a feeling of inadequacy), an undesirable relationship (e.g. excessive dependency), or an undesirable mechanism (e.g. habitual repression of hostility).

(*c*) The third component is the inclusion of a mechanism whereby this goal may be achieved; such mechanisms being selected on the basis of those commonly observed in the course of psychotherapy, such as expanded use of "talking out" with others, or the progressive expression of resentment—first in minor situations and then in critical situations.

(*d*) Lastly, we include statements aimed at giving motivation in the form of social acceptance, anticipation of greater freedom and anxiety reduction.

The following are examples of the signals used:

Negative signal—"Madeleine, you let your mother and father treat you as a child all through your single life. You let your mother check you up sexually after every date you had with a boy. You hadn't enough determination to tell her to stop it. You never stood up for yourself against your mother or father but would run away from trouble rather than make a stand. They used to call you 'crying Madeleine'. Now that you have two children, you don't seem to be able to manage them and keep a good relationship with your husband. You are drifting apart. You don't go out together. You have not been able to keep him interested in you sexually."

Positive statement—"You mean to get well. To do this you must let your feelings come out. It is all right to express your anger, we all do, and people will understand and go on liking you just the same. Let your feelings out and you will feel more confident. You want to stop your mother bossing you

around. Begin to assert yourself first in little things and soon you will be able to meet her on an equal basis. You will then be free to be a wife and mother just like other women."

II. Preparation of the Patient

The second component into which we have broken down these investigations is the preparation of the patient. When we first began to explore the field of prolonged exposure to repetition, it was found that the individual, after undergoing repetition for quite brief periods, experiences increasing discomfort and seeks to move out of the area of exposure. In order to keep the patient under the particularly long periods (20–30 days, 16 hours a day) found requisite to achieve maximal incorporation of our signals, it was necessary to develop specific means. These means had to ensure that he stayed in the area of repetition whilst he remained maximally receptive.

The most effective procedure thus far developed is to keep the patient under a combination of sernyl and largactil. The first—1-(1-Phenylcyclohexyl) piperidine monohydrochloride—blocks extraneous sensory input in degrees varying with the dose and produces underactivity because of its effects on the motor system. Largactil potentiates the effect and controls whatever anxiety may be attendant upon the use of sernyl. In successful cases, a passive receptive state with a heightened awareness of the verbal signals is obtained. In certain chronic psychoneurotics where neurotic mechanisms appear particularly structured, these are broken up by means of intensive electroshock before starting repetition.

III. Delivery of Verbal Signals

The third component of our problem is the delivery of the verbal signals (see illustration). This is carried out by means of a continuously run magnetic tape. The negative phase is carried on until the patient shows growing rejection of the statements. This usually takes about 10 days; the tape running from 6 a.m. to 9 p.m. A pillow speaker is used. The positive phase is ordinarily carried on for another period of 10 days. In order to evoke maximal attention by the patient, the signals are varied in intensity; the period between the signals is also varied from a few seconds to as long as $\frac{1}{2}$ hour. Moreover, signals are interrupted at crucial points in their presentation to increase the anticipation of the patient.

Finally, we have attempted to intensify the effect of the negative phase by applying galvanic stimulation to the leg; this being synchronized with the end of each negative repetition.

IV. Reinforcement

The fourth component is reinforcement. Experience early showed that better results were obtained where the newly-established pattern of behaviour was reinforced by acceptance of it and encouragement from the staff and, particularly, by acceptance and encouragement from relatives, who are especially briefed on this point.

V. Assessment

The fifth component is assessment. This is difficult. It should be recognized at the outset that there is a difference between removal of the psychoneurotic

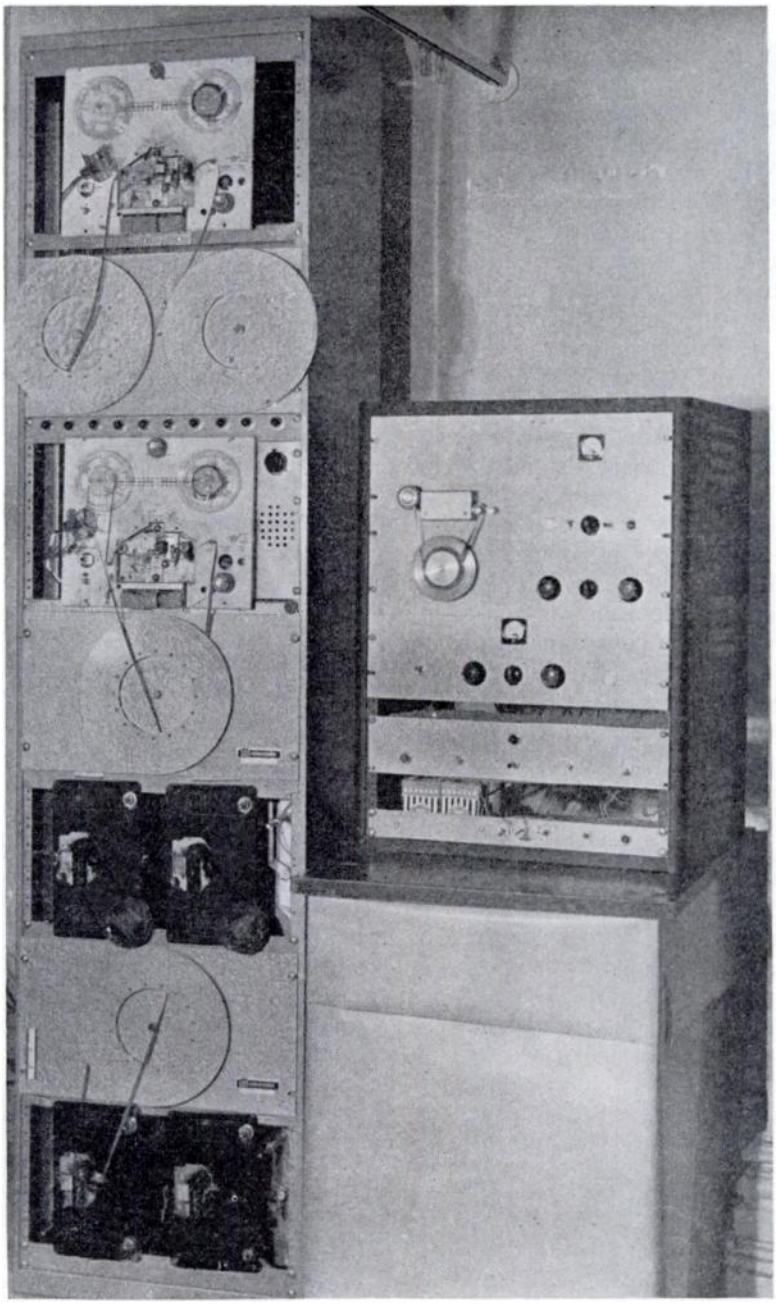

FIG. 1
A special mechanism has been built at the Allan Memorial Institute which enables us to co-ordinate delivery of eight separate sets of signals simultaneously.

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symptoms and our objective, namely, change in personality traits, and yet the two undoubtedly are related. It would, for instance, be hard to imagine that a personality trait of passivity could be changed without at the same time modifying the psychoneurotic symptoms which were based on this characteristic. Indeed, in many respects, it is reasonable to say that the achievement of changes in the personality characteristics of a psychoneurotic patient constitutes an extension of the elimination of symptoms.

With regard to the actual methods of assessment, we have found that psychological tests (which include the Rorschach, T.A.T., figure drawings and Carl Rogers' Q-sort tests) are less successful than clinical assessment. Some of the tests are too susceptible to day-to-day changes. Others continue to reveal traits which, while presumably still present, are no longer active. Integration of reports from the relatives and staff has provided a considerably more reliable guide to progress.

During the period of exposure to repetition, the patients were questioned every two hours by nurses as to their ability to repeat the verbal signals and their reaction to them. This serves both to keep in touch with the change produced by the signals and to reinforce the attention given by the patient to such signals.

We have attempted to differentiate between the effects of the agents which we have used to immobilize the patient, i.e. sernyl and largactil and electroshock, which we use on rare occasions to break up particularly structured neurotic mechanisms, on the one hand, and exposure to repetition on the other. This we have done in two ways: first, we have explored the effects of this procedure in changing physiological functions. Together with Dr. R. B. Malmo, we carried out a study on the possibility of shifting the degree of emotional tension from the group of muscles in the forearm which were predominantly tense to those which were less tense (3). We did this by putting the patient through the above-described procedure; the signals used being "Your right arm is straightening out. Your right arm feels as if you are reaching out for something. Your right arm feels stiff at the elbow as it does when you are stretching." The results of all four cases on which we experimented were positive, and an illustration (Fig. 2) is provided under the title "Change from Flexor Dominance to Extensor Dominance Associated with Driving".

A second line of attack on this problem has been the inclusion of tracer statements in the verbal signals. These are statements which have nothing to do with the nature of the psychoneurotic illness or the personality of the patient. For instance, we have included a statement in the positive signals that the patient will want to touch others while talking to them. In the two cases in which we have done this, this tendency appeared for a week or two in one case and, in the other, it appears to have become lastingly incorporated in the behaviour of that individual. It is clear that these two findings could not be brought about by any agent other than repetition of verbal signals.

PROCEDURE

In our most recent series, we have employed a procedure which incorporated all the advances to which reference is made above. We carried out this procedure in a series of ten psychoneurotic patients (see Table I).

In brief, they were exposed to 10 days of repetition of negative phase signals and 10 days of positive phase signals and kept in a semi-sleep state by

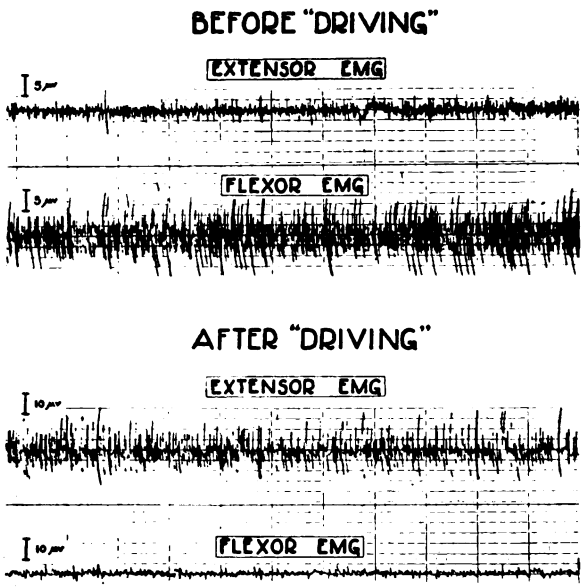

FIG. 2—Change from Flexor Dominance to Extensor Dominance Associated with "Driving".

TABLE I

Case Material

Case No.	Age	Sex	Duration of Illness	Diagnosis	Prior Treatment
1 ..	36	F	14 years	Anxiety neurosis	Tranquillizers, psychotherapy
2 ..	24	F	3 years	Anxiety hysteria	Tranquillizers, psychotherapy
3 ..	32	F	13 years	Mixed psychoneurosis	Insulin, tranquillizers, psychotherapy
4 ..	27	M	2 years	Character disorder	Tranquillizers, psychotherapy
5 ..	52	F	5 years	Character neurosis	E.C.T., tranquillizers, psychotherapy
6 ..	37	F	31 years	Character neurosis	Tranquillizers, psychotherapy
7 ..	38	F	29 years	Chronic anxiety state	Tranquillizers
8 ..	26	M	12 years	Inadequate personality	Tranquillizers
9 ..	28	F	3 years	Character neurosis	Insulin, tranquillizers, psychotherapy
10 ..	21	F	4 years	Anxiety hysteria	E.C.T., tranquillizers, psychotherapy

a combination of sernyl and largactil with occasional barbiturates. In four patients, electroshock therapy was used in addition to break up particularly resistant psychoneurotic mechanisms. Reinforcement was carried out throughout and the patients were assessed, as described, before and after exposure to repetition.

RESULTS

As indicated earlier, assessment has been a matter of singular difficulty. Hence we have attempted to provide several different forms of assessment. All clinical assessments represent the average of repeated evaluations by three psychiatrists and two research nurses.

Table II shows the changes in symptoms and personality traits subsequent to exposure. The degree of such change in symptoms and traits is based upon reports received from the staff, including the three psychiatrists mentioned above and a group of especially trained nurses. The degree of change was also based upon the reports of relatives and, finally, upon the report of the patient.

TABLE IIa

Changes Produced in Symptoms and Personality Traits by Exposure to Repetition.

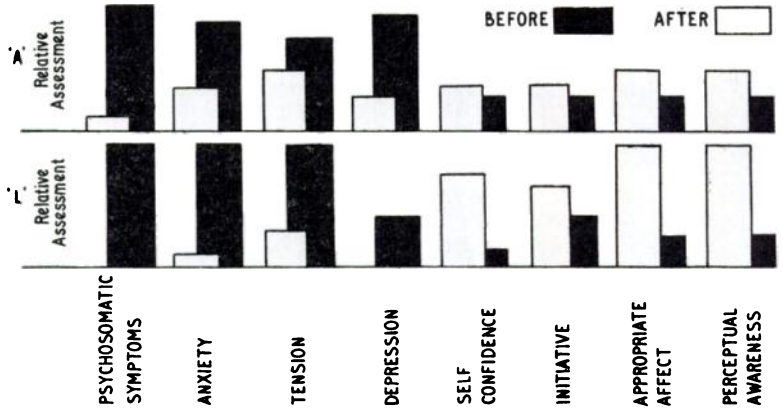

TABLE IIb

Changes Produced in Symptoms and Personality Traits by Exposure to Repetition.

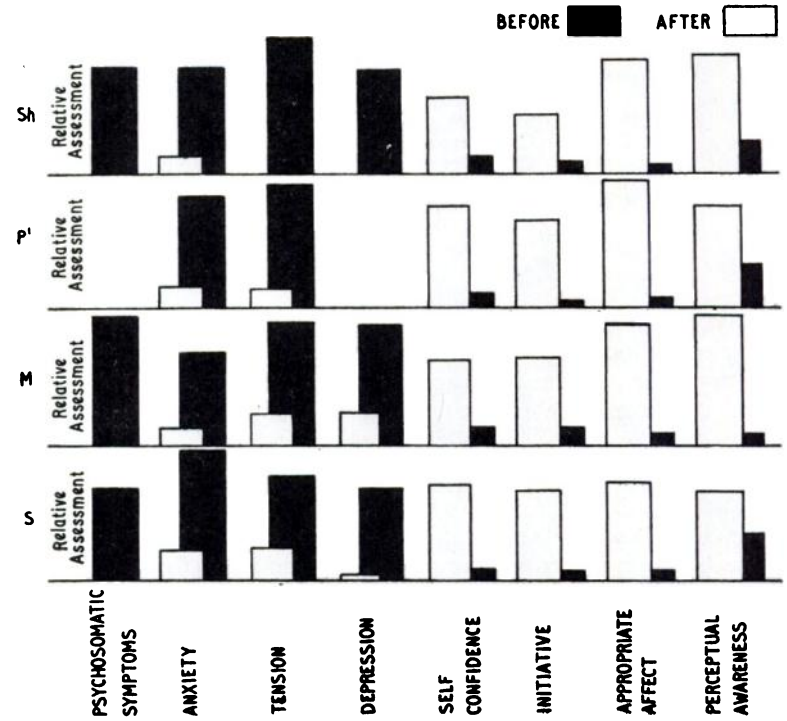

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TABLE IIc

Changes Produced in Symptoms and Personality Traits by Exposure to Repetition.

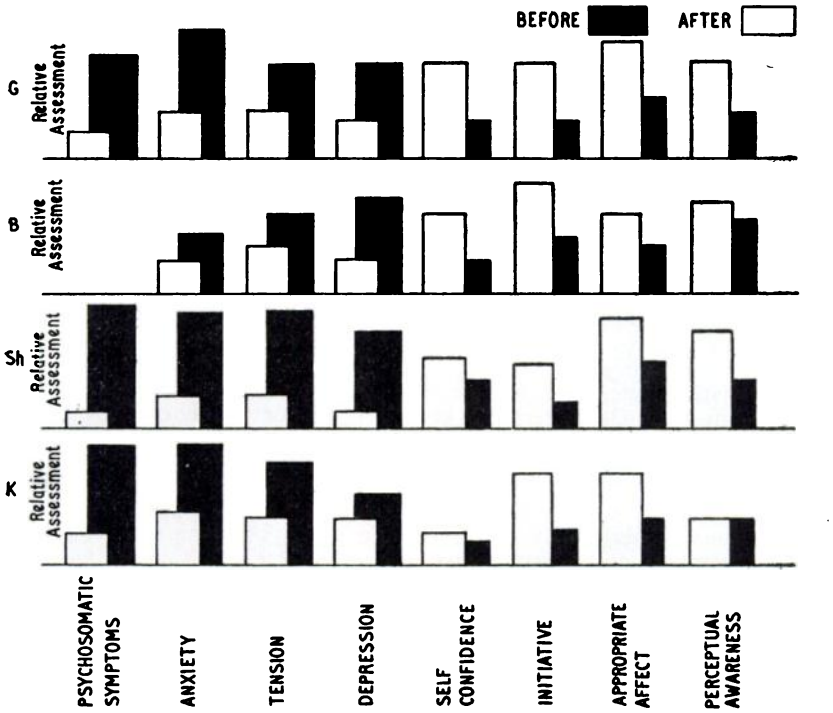

Table III presents in similar graphic form the changes produced in personality functioning as estimated by the psychologist.

TABLE III

Favourable Changes Due to the Direct Pick-up of Verbal Signals.

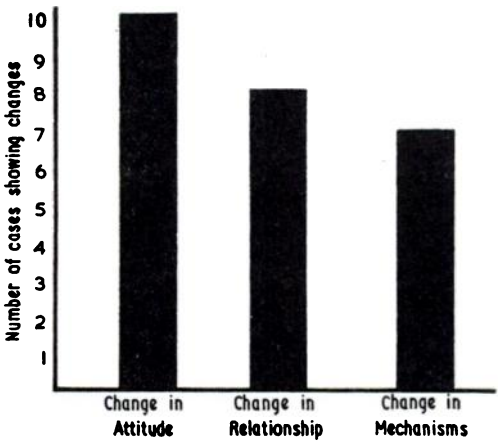

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Table IV presents a report of changes in verbal form from the staff, relatives and patients.

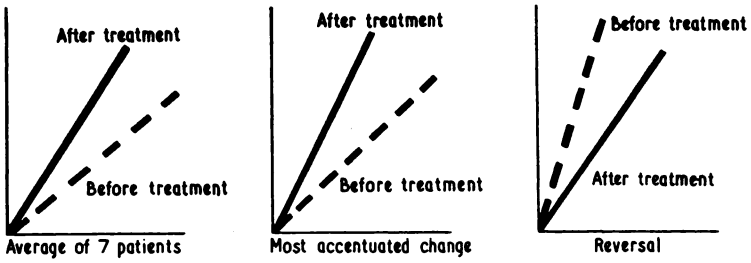
TABLE IV

Case No.	Characteristic Descriptive Statements Assembled from Patients, Relatives and Staff
1	Patient states he feels "changed and rejuvenated", "a different person".
2	Patient states that she is more relaxed, she feels much more comfortable and she does not worry about things like she used to.
3	Relatives report a marked change—patient being more responsible and capable.
4	Patient feels completely changed; says, "Things look different" . . . "I can enjoy things more" . . . "I see things more clearly" . . . "I get along with people better. I feel more confident."
5	Patient feels much more independent, sees herself separate from her mother, less concerned about other people's opinions.
6	Patient feels different, less concerned about mother's dominance, clearer in her role as wife and mother.
7	Relatives state, "She is a changed person, more interested in things and people, much more confident. She gets along with people better."
8	Patient says she no longer feels tense and anxious. She sees her relationship with people differently, feels more confident and is able to express herself more readily.
9	Patient feels more confident, less anxious, happier and more independent.
10	Patient states he feels that he is able to see his problems more clearly, is more confident and assertive—less fearful of people.

Furthermore, we have attempted to assess the degree of change by examining movies taken before and after exposure to verbal signals. The analysis of these movies is as yet too elementary to allow us to detect with any penetration the degree to which specific parts of signals are taken up. It does permit us to demonstrate change. These changes are with respect to psychomotor behaviour—greater freedom of movement, return of associated and accessory movements, and an interesting change in the degree of flexion employed in getting up from a chair. This latter change is shown on *Table V*.

TABLE V

Trunk Axis Angle of Patients Sitting Down.



It should be stressed that the process of incorporation of the signals is not a passive and mechanical one of printing in the new pattern. The patient participates actively as is shown both by the continuous ruminations recorded in the 2-hourly checks made by the nurses during the period of exposure and also by the form in which the signals become ultimately incorporated into the on-going behaviour of the patient. This active participation is in accordance with the learning theory.

The process of active participation is exemplified by a patient examined three months after exposure. At that time she said that during the time of her exposure, the negative signals seemed to her to be criticisms made in the voice of her domineering mother. Of crucial interest is the fact that she had translated part of the positive signals into a form particularly well suited to the needs and attitudes of a girl brought up in an authoritative Catholic home. The positive driving statement was "You are looking forward to going out and being happy as a wife and mother. You have gained a lot of confidence and the old problems of the past are disappearing." This she had rearranged in her own mind so that now, three months later, she says she recalls the voice as being that of one of the investigators, saying that she must remember that her family is just her husband and her two children, and her house, that is all. This served to delimit her area of responsibility and, hence to reduce her anxiety.

Discussion

The value of the procedures which have been presented is twofold: First, they provide a tool whereby direct, controlled changes in personality may be made. Obviously, what has been achieved with respect to psychoneurotic patients can be extended to any field in which there is malfunction of the personality whether within the area of psychiatry or not. Secondly, important theoretic vistas are opened up. It is clearly demonstrated that reorganization of the personality may be brought about without the necessity of solving of conflicts or abreaction, or the reliving of past experiences. While these long-held therapeutic concepts have been useful, and continue to be, there is evidence that they have begun to reach their limits and, indeed, in recent years have shown only too plainly that they are beginning to act as a straitjacket to creative thinking.

We consider that reorganization of the personality can be achieved in several ways and that what our procedure brings about is a direct building of new personality traits; the older, undesired characteristics remain but are put out of circuit.

Another matter of theoretical importance is the demonstration of repetition as a powerful force. The human organism universally seeks to escape from repetition save where its effects are desired.

Our working premise is that for organisms—particularly human organisms which are so intensely adaptive—the constantly recurring impact of an imperative to change, such as is contained within the verbal signals, constitutes a mounting pressure which the existing organization of the personality resists, but to which it continually yields in greater or lesser measure.

The validity of this premise is supported by the very considerable number of mechanisms which the human subject possesses and which serve to protect him against the impact of repetition. In an earlier publication (4), we have described those which can be seen at the behavioural level: the patient may listen without paying attention; he may react to block the effects of the signal by denying their truth or he may protect himself by misinterpreting the content of the signals.

At the neurophysiological level, a number of mechanisms are also actively engaged in blocking the effects of repetition. Sharpless and Jasper (5), who have studied habituation of the arousal reaction, have listed as additional mechanisms which bring about decrement of response to repetition of stimuli,

the following: sensory adaptation, nerve accommodation, effector fatigue, Pieron's association fatigue (6), and Pavlov's internal inhibition (7).

R. Hernández-Peón *et al.* (8) have described how afferent impulses may be blocked by a shift in attention. There is growing evidence that inhibition may actually take place at the peripheral sensory organs.

It is because of this intricate series of mechanisms which act to protect the organism against the impact of repetition and, hence, to preserve the existing personality organization, that we have found it necessary to use extremely long periods of exposure to repetition, continually to re-direct the attention of the patient to the signals and to use electroshock where the undesired personality structure is particularly fixed.

Turning from theoretical considerations to practical results, we may say that, while the effectiveness of our techniques has gradually increased to the point where exposure to repetition will produce predetermined change in all cases, we wish clearly to state that these changes remain limited in the following respects: (*a*) kind, (*b*) durability.

With regard to the kind of change, we have found that the best results can be obtained if we attempt to change a characteristic which has already been recognized by the patient as deviant and undesirable. Our working premise is that where such a characteristic has already been identified by the patient, where he has wished to change it, he has already made many attempts both in reality and in fantasy to do so and to substitute a desirable trait.

In a word, what might be termed a "contra-trait" is already in existence, but is prevented from coming into operation because of the well-recognized tendency of on-going traits to persist. When considering the total personality, this persistence of the on-going personality structure has been designated by various authors as psychobiological homeostasis. When considering neurotic traits, it has been designated by other writers as the repetitiveness of neurotic mechanisms and their imperviousness to modification even where they are entirely unrewarding.

We have been able to identify certain of the mechanisms which operate at the symbolic level to maintain the on-going pattern of behaviour despite the pressure to change exercised by the continuous repetition of verbal signals, and these have been listed earlier as denial, misinterpretation, and simply not listening. We have subsumed these and other mechanisms which we suspect to be present, but cannot yet designate, under the general term of "the switcher". The term expresses the fact that the mechanisms operate so as to switch the incoming verbal signal away so that they do not reach a point where they can produce the desired changes.

In our view, repetition results not in the destruction of the undesired trait but in its loss of dominance—the formerly dominant undesired trait being replaced by the hitherto inactivated contra-trait. We should like to emphasize that the undesired trait can, and in unsuccessful cases does, regain its dominance.

Theoretically, we consider it probable that contra-traits underlie all dominant traits. However, where the patient does not recognize his deviant trait as such, then, clearly, contra-traits—if they exist at all—have not been acted out by the patient in reality or in fantasy. Thus, they are more feebly organized and less capable of being substituted for the dominant deviant traits through our procedures.

The validity of the concept of the contra-trait is strengthened by the fact

reported earlier in the section of Delivery of Verbal Signals, that continued exposure to the negative phase results in a growing rejection of the negative phase, this suggesting that beneath the individual's self criticism lies a set of positive aspirations which are activated by the continuous repetition of his own self-criticisms.

We wish to stress that in every patient in whom we have produced change in one or in a group of undesirable characteristics, there remains a far greater number of neurotic constellations which we have not attempted to change either because of their sheer number and complexity or because we have not yet developed our procedures to the point where we might deal with such complex matters. (For instance, delayed maturation, or the extensive breakdown in self-stabilizing mechanisms such as found in drug addicts, or the intensely rewarded patterns of the sexual deviant.)

Turning to the durability of results, we recognize that this is affected by multiple factors. For several years we have known that social reinforcement is a major force as described earlier and, that, where it is in full operation, the new trait we have constructed may become permanently incorporated. At the same time, we have become increasingly aware that social acceptance is complex. The phase of re-establishment in extra-mural activity is particularly difficult. The traits which have been built up by exposure to repetition are more commonly inactivated during this phase than at any other time.

In considering the matter, it must be borne in mind that we are constantly responding in terms of long-established patterns to regularly recurring demands from the home, neighbourhood and work situations. We must also recall that in the neurotic patient, not only are certain of his patterns neurotic, but the demands made by some of the figures in his environment are particularly likely to elicit these neurotic patterns. For instance, an excessive dependency in the case of a wife is not infrequently reinforced and perpetuated by over-protectiveness on the part of the husband.

Hence we have found that the patient returning home after new traits have been built up, will respond in a variety of ways depending upon the reactions of his family and his work group to his new characteristics. For example, the impact of the confidence we had built up in one woman was such that her husband was willing to accept in large part the reorganization of their life which she proposed. He gave up a particularly time-consuming job; thus providing more joint social life which was mutually satisfactory, and which in turn reinforced her growing confidence.

In another instance, the wife was able to free herself from the dominance of her mother, friction between herself and her husband on this score was reduced, and a richly satisfactory sexual relationship was established in place of the progressive straying of the husband outside marriage.

In less successful instances, the marital partner accepts the new trait at first (e.g. a normal expression of hostility or an increased sense of adequacy), but later attempts to undermine the new pattern which then becomes less effective and which, because it is being undermined, is the cause of growing anxiety on the part of the patient. At the far end of the scale are those instances where new traits are rejected by the home figures at once. There ensues immediate turmoil on the part of the patient and, ordinarily, the new traits rapidly disappear.

We can say that where there are strong demands in the home and work situations for the old neurotic traits to continue, the results of exposure to repetition of verbal signals are likely to be poor. This is also true where the home

situation is highly complex; where the individual goes back to a home where there is not one generation but two or three living under the same roof. Contrariwise, where the home situation is simple, where the spouse is tolerant and capable of constructive adaptation, and where in particular the change produced is one long-sought by both partners, results are good.

Another factor, quite apart from social reinforcement, is the intensity of the impact of the repetition, and here it is most important that the switcher, namely those mechanisms which operate at the symbolic level to prevent conformity to repetition, should have been inactivated as far as possible over the period of exposure. The means of inactivation which we have found most useful are those already recorded, that is, prolonged sleep and electroshock treatment.

Finally, we have recently begun to test the hypothesis first raised by Pavlov and more recently by Eysenck, that individuals vary considerably in the ease with which they take up and maintain new learning. We have as yet reached no final decisions.

Summary

1. Procedures which have been developed to bring about a personality change through exposure to repetition of verbal signals are presented.

2. The results in ten psychoneurotic patients are reported.

3. Repetition is shown to be a powerful force in producing change by mechanisms other than those hitherto recognized.

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Bibliography

1. Cameron, D. E., "Psychic driving; dynamic implant" (published in the *Psychiatric Quarterly*, 1957, Fall No. 31, pages 703–712).
2. *Idem*, Levy, L., Rubenstein, R., and Malmo, R. B., "Repetition of verbal signals: behavioural and physiological changes" (published in the *Americal Journal of Psychiatry*, May, 1959, **115**, pages 985–991).
3. *Idem* and Malmo, R. B., "Effect of repeated verbal stimulation upon a flexor-extensor relationship" (published in *Candn. Psychiatric Assn. Journal*, April, 1958, **3**, No. 2.)
4. *Ibid.*, 2.
5. Sharpless, S., and Jasper, H., "Habituation of the arousal reaction" (reprinted from *Brain*, 1956, **79**, Part IV, pages 665–680).
6. Pieron, H., *Année Psychol.*, 1913, **19**, 91.
7. Pavlov, I. P., *Conditioned Reflexes*, 1927. London.
8. Hernández-Peón, R., Scherrer, H., and Jouvet, M., "Modification of electric activity in cochlear nucleus during 'attention' in unanesthetized cats" (published in *Science*, 24 February, 1956, **123**, No. 3191, pages 331–332.)