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CHANGES IN LANGUAGE DURING ELECTROSHOCK THERAPY

By ROBERT L. KAHN, PH.D., AND MAX FINK, M.D.*

IN RECENT YEARS Weinstein and his associates have described patterns of symbolic adaptation in patients with cerebral dysfunction.¹ The main emphasis in their work has been placed on altered language patterns. Their observations have shown the similarity and relationship between various kinds of behavior which were previously regarded as disparate phenomena. Instead of being isolated defects due to focal brain lesions, these phenomena can be understood as unified aspects of an altered pattern of adaptation under the conditions of a diffuse disturbance in brain function. Some of the factors which determine the particular type of adaptation shown include the premorbid personality and the nature of the environmental stresses.

This emphasis on language has been shown to be a useful method of study. For example, the presence of certain characteristic changes in language under the influence of amobarbital sodium, such as disorientation for time and place, denial of illness, and reduplication, has been standardized as a diagnostic test of brain disease in neurological patients.^{2, 3}

This technique has application in the study of other conditions of altered brain function, as in the somatic therapies. The electroshock population is of interest for two reasons. It is possible in these patients, as it is not in those with neurological diseases, to manipulate experimentally the stimulus causing changes in brain function. Secondly, the mode of action and the psychological changes associated with electroshock treatment remain poorly understood. In a previous study we have shown that a favorable clinical response to electroshock treatment is related to early and persistent manifestations of language changes with amobarbi-

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tal sodium characteristic of altered brain function.⁴ This finding was considered to support the hypothesis advanced by Weinstein and Kahn^{1, 5} that the mechanism of therapeutic action of electrically induced convulsions lay in the creation of a condition of altered brain function in which the patient might express his problems in a new symbolic fashion, particularly in the form of denial.

The present investigation is a further attempt to test this hypothesis by studying changes in language that occur with treatment. The following questions specifically were studied:

1. Are there characteristic identifiable changes in language which develop in the course of electroshock treatment?
2. Are these changes related to the clinical response?
3. Are these changes related to the degree of alteration of brain function?
4. Does the administration of amobarbital sodium prior to treatment produce any changes in language which have prognostic value for the eventual clinical response to treatment, the development of altered brain function, and the development of language changes during treatment?

METHOD

Population: Sixty-five consecutive referrals for electroshock treatment at the Hillside Hospital were studied. The Reiter electrostimulator was used on 49 patients, while 16 were treated with the Medcraft. There were 20 men in the series and 45 women and ages ranged from 21 to 68.

Each patient was tested prior to treatment and retested during the second week of treatment after having received 4-6 convulsions, and during the third week after having received 7-9 convulsions. On each of these occasions the patient was first tested clinically and then after amobarbital sodium had been administered at the rate of .05 grams per minute until nystagmus, slurred speech, drowsiness, and errors in counting backward were noted.²

The test consisted of a standardized series of questions concerning orientation and awareness of illness. This study is based, however, on the response to only three of the questions used: (1) What is your main trouble? (2) Why did you come to this place? (3) If you could have one wish, what would you wish for? All responses were recorded verbatim. Observations were also made on such nonverbal aspects as smiling, laughing, gestures, and other bodily movements.

RESULTS

Patterns of Language Change Noted Clinically During Treatment

In evaluating the changes in language, the original responses to the three questions given clinically prior to treatment were used as the baseline. The evaluation of what constituted a change was based on explicit objective changes in grammar rather than on subjective or interpretative changes as to affect, mood, feeling, pitch, voice quality, *etc.* In this manner the following types of language change were noted clinically during the course of treatment: (1) alteration in the syntactical use of person, (2) evasion, (3) verbal denial, (4) qualification, (5) change in tense, (6) displacement, (7) stereotyped expressions and cliches, and (8) smiling and laughing.

Alteration in the syntactical use of person. Instead of using the first person singular as in the pretreatment period, 28 patients used the second or third person and, occasionally, the first person plural. To the question concerning main trouble such responses were given as, "It's what they call a depression," "They told me I was emotionally and mentally sick," "We're having a lot of trouble with my mother-in-law," "My cousin brought me; she said I was nervous," "What's *your* main trouble, or don't *you* know?" and "My Mrs. is sick and I would appreciate it if they would let her in here as soon as possible." The reason for coming to the hospital was variously given as, "My wife brought me," "My father told me to come here," or "My doctor said this was a good hospital." The wish was given as "Perfect health for my family," "My children, my husband, and all my good friends should be healthy and happy," and "There should be peace in the world."

Evasion. Evasion in answering the question about their illness was shown by 27 patients. This commonly took the form of answering this question with another, as, "What do you mean by my main trouble?," "What do you expect me to say?," "Well, what it it?," and "What did I say last time?" Other language patterns considered evasive included such responses as, "I don't know how to tell you," "I don't get what you mean," "Let me think," "It's hard to say," and "I just don't know how to express it." One patient asked the examiner to give her a hint.

Verbal denial. Explicit verbal denial of illness was shown by 23 patients. They either said they had no main trouble, were well or else, after giving evasive "I don't know" responses, denied their illness and symptoms when specifically questioned about them.

Qualification. Qualification of a response in the direction of less commitment was shown by 19 patients. This language pattern was characterized by the use of such words as "guess," "kind of," "sort of," "think," "apparently," "probably," "possibly," "might be," "seem," "assumed," and "perhaps." Thus such responses were given as, "I guess I have been jittery," "I seem to be very much depressed," "Probably that I'm nervous," "I suffer from anxieties, apparently," "Possibly worry about the future," "I have sort of gotten frightened," "Mentally upset, I assume," and "I think I'm a little insecure."

Change in tense. In 18 patients there was a change in tense in describing their illness. In most cases the patient used the past tense: "I was depressed when I came here" or "I had been nervous." In other cases the patient answered the question about his main trouble by putting it in the future tense as a wish.

Displacement. In 20 cases there was a displacement of the complaint to something other than originally given prior to treatment. This was invariably less serious than the original complaint. Sometimes the displacement was in the form of a somatic complaint, as saying the main trouble was "diarrhea," "headaches," "pain in the feet," "I slammed the finger in the door," and "I've got an itch." In other cases the displacement was to some concrete aspect of the hospital situation, as "My main trouble is getting these treatments," or "I'm upset because I was transferred to another ward."

Stereotyped expressions and cliches. The use of stereotyped expressions and cliches was shown by 11 patients. They gave such responses as "It seems to me under the proper circumstances I'd be all right," "[My trouble is] monetary problems with people that are honorary and sincere," "That's the root of the whole thing," "The only thing certain is death and taxes," "Learn my lesson and be a good boy," "To be a person of pep and reliability," and "I just want to stop being a lazy lout." One woman responded to a question of her one wish with, "I think I should consult my husband before I make a wish because he's a lawyer and the father of my children."

Smiling and laughing. In 20 cases the patient was noted to smile or laugh either immediately preceding or following his response to the question concerning his illness.

Language Changes Shown with Amobarbital Sodium During Treatment

The language patterns after amobarbital sodium during the second

and third weeks of treatment were similar to those noted clinically. With the drug, however, the changes appeared earlier in the course of treatment. A given language pattern might be noted in the second week of treatment with the drug, but would not occur clinically until the third week. In addition, the reactions to the drug took more extreme forms, which are described as (1) cryptic responses, and (2) withdrawal reactions.

Cryptic responses. These were shown by 23 patients. Responses were classed as cryptic when they had no obvious relevance to the test question or when their meaning was obscure, representing a very personalized expression. Thus one patient, when asked his main trouble, said, "Nightmare of the afternoon of the evening of the nightmare." Others gave such responses as "I didn't know the problems—couldn't do the problems," "Getting my husband to write down what he does," or "What could I say—you don't get the crossword."

Withdrawal reactions. Some pattern of withdrawal was noted in 33 patients. This behavior was characterized by incomplete sentences, incoherent mumbling, neologisms, perseveration, the use of a foreign language by bilingual patients, and delay or failure to respond to the questions. These patients would characteristically lie with their eyes open, would smile or turn their heads when the examiner spoke, and would speak clearly and promptly and in English when asked questions not pertaining to their illness.

Other Changes in Language

Other changes in language were noted both clinically and with amobarbital sodium in response to the other questions of the test battery but not as a part of this study. There was frequent misnaming of the examiner or reference to him as "Mister." With the drug those patients who had a "positive reaction," *i.e.*, one characteristic of altered brain function, showed the characteristic patterns of disorientation for place and time and confabulation described in previous communications.⁽²⁾

Relation of Language Changes to Clinical Response

The evaluation of clinical response to treatment was made independently of this study. The patients were rated by the supervising psychiatrist in charge of the treatments, by the patient's own therapist and supervising psychiatrist, and by the medical director. On the basis of these ratings the patients were classified into three groups: 28 patients were

considered much improved, no longer showing the symptoms which had brought them into the hospital; 22 patients were rated as moderately improved, showing some symptomatic relief but still showing disturbing features; and 15 were regarded as unimproved, having shown only equivocal or transient changes at best. The ratings were short term evaluations, being made within two months after completion of treatment.

For quantitative purposes the language changes shown during both the second and third weeks of treatment have been grouped together as though the patients had been tested only once. If a particular pattern was shown during both periods, the item was scored only once. Altogether, 89 per cent of the patients showed at least one of these patterns of language change clinically during treatment. Such changes were found in all of the much improved patients but in only 73 per cent of the unimproved group. It was apparent that there was a relation between the degree of clinical improvement and the number of changes in language patterns. When the data are analyzed for the patients who showed three or more language pattern changes, there is a significant difference between the groups (table 1). While 68 per cent of the much improved patients showed three or more language changes, only 20 per cent of the unimproved patients showed this degree of language change. Using Chi-square, the over-all difference is significant at better than the 1 per cent level of confidence.

TABLE 1.—*Relation of Language Changes Shown Clinically to Response to Treatment*

Change	No.	Three or more patterns *		Fewer than three patterns *	
Much improved	28	19	68 per cent	9	32 per cent
Moderately improved	22	7	32	15	68
Unimproved	15	3	20	12	80
Total	65	29	45 per cent	36	55 per cent

* $X^2 = 11.26; P < .01$

When each language pattern is analyzed individually (as shown in fig. 1) it becomes apparent that not all patterns discriminated equally

between the groups. In all but one case, a greater percentage of the much improved group was most likely to show denial, use of the second or third person, evasion, and displacement of complaint. The only language pattern on which little difference was found between the much improved and unimproved patients was the incidence of smiling and laughing.

Analysis of the changes shown by the different groups under amytal is shown for the cryptic and withdrawal reactions only in figure 1. While the cryptic responses did not vary much with the different groups, the showing of a withdrawal reaction differentiated the three groups significantly,* occurring in 71 per cent of the much improved, 45 per cent of the moderately improved, and only 20 per cent of the unimproved patients.

Relation of Language Changes to Electroencephalographic Response

In a previous communication a method of quantitatively evaluating electroencephalographic records was described.⁶ Criteria were established for rating records as showing relatively high, middle or low degree of slowing according to five criteria: average per cent time delta waves (waves of six or fewer cycles per second), the highest per cent time delta waves at any one lead, the lowest frequency in the record, the highest amplitude of delta waves, and the longest duration of a burst of delta waves. In the present study, an electroencephalogram was obtained prior to treatment and in the second and third weeks of treatment. Each record was evaluated according to the dichotomy of showing a relatively high degree of delta activity or not, using these criteria.

In table 2 the relationship is shown between electroencephalographic slowing and changes in language. Those patients with the highest degree of cerebral dysfunction, having high degree delta in both the second and third weeks of treatment, show a greater number of language changes both clinically and with amobarbital sodium. Using the withdrawal reaction as an index of the drug effect, however, the difference just fails to be statistically significant.

Pretreatment Language Patterns

The language patterns described in this study were considered as changes only when they occurred after the original pretreatment clinical test which was used as a baseline. Seven patients, however, showed some

* $X^2 = 10.72$, significant at better than the 1 per cent level of confidence.

TABLE 2.—*Relation of Language Change to High Degree Delta on the Electroencephalogram During the Second and Third Weeks of Treatment*

Change	No.	Three or more changes clinically *		Withdrawal reactions with amobarbital sodium †	
Both weeks high Delta Activity	25	16	64 per cent	15	60 per cent
One week high Delta Activity	16	8	50	9	56
No high Delta Activity	24	6	25	8	33

* $X^2 = 7.62$; $P < .05$

† $X^2 = 4.87$; $P < .10$

form of these language patterns in the initial clinical test. The manifestation of these same patterns by these patients at any other time was accordingly not scored as a change.

When given amobarbital sodium prior to treatment, however, 30 patients (or 46 per cent of the total) showed some language change comparable to that noted during treatment. Table 3 shows the relation between such changes at this time and the eventual clinical response. These changes were found in 68 per cent of the much improved patients, in 36 per cent of the moderately improved, and in 20 per cent of the unimproved groups.

TABLE 3.—*Relation of Pretreatment Language Changes with Amobarbital Sodium to Eventual Clinical Response*

Change	No.	Change with amobarbital sodium *	
Much improved	28	19	68 per cent
Moderately improved	22	8	36
Unimproved	15	3	20

* $X^2 = 10.30$; $P < .01$

In table 4 it is demonstrated that the pretreatment change with the drug was also prognostic of the eventual physiological response to treatment as measured by the degree of electroencephalographic slowing. The over-all distribution just falls short of statistical significance, although when those who showed high delta activity in both periods are compared with all the other cases as a group, the difference is significant at the 5 per cent level of confidence.

TABLE 4.—*Relation of Pretreatment Changes with Amobarbital Sodium to High Degree EEG Delta Activity During the Second and Third Weeks of Treatment*

Change	No.	Change with amobarbital sodium *	
Both weeks high Delta Activity	25	16	64 per cent
One week high Delta Activity	16	6	38
No high Delta Activity	24	8	33

* $X^2 = 5.27$; $P < .10$

Finally, the initial response to amobarbital sodium was also prognostic of the degree of language change shown clinically and to the manifestation of withdrawal reactions with the drug during treatment (table 5).

TABLE 5.—*Relation Between Pretreatment Language Response to Amobarbital Sodium and Clinical Changes and Withdrawal During Treatment*

	No.	Three or more clinical lan- guage patterns *		Withdrawal reac- tions to amobar- bital sodium †	
Pretreatment response to amo- barbital sodium	30	18	60 per cent	21	70 per cent
No pretreatment response to amo- barbital sodium	35	11	31	12	34

* $X^2 = 4.26$; $P < .05$

† $X^2 = 6.88$; $P < .01$

DISCUSSION

The relationship of the language changes to the development of altered brain function and to the clinical response is consistent with our original hypothesis concerning the mode of action of electroshock treatment. In previous studies^{4, 6} we have shown that the clinical outcome is related to the presence and degree of alteration in cerebral function. Using the "amytal test"² and the EEG as indices, it has been found that those patients with the earliest and most persistent manifestations of cerebral dysfunction were most likely to have a favorable response. Such physiological changes create the milieu which facilitates behavioral change.

The present study, analyzing language patterns, clarifies the nature of the behavioral changes that occur with treatment.

The language shown originally (prior to treatment) may be summarized in the statement, "I have this particular illness." The subject of this sentence answers the question "who," the predicate refers to "what," and the verb describes the relationship, including the temporal and intensity aspects. During treatment the subject of the sentence may be modified by changes in the use of person, so that the sentence might read, "You [or he, she, or they] have this particular illness." Changes in the predicate are shown by such patterns as displacement or evasion. In displacement the sentence might read, "I have some other kind of illness," while, with evasion, it would be, "I have something, but I don't know what." Changes in the verb are shown by denial, qualification, or alteration of tense. In denial the statement would be, "I don't have this particular illness;" a qualified sentence would read, "I might have this particular illness;" while with alteration of tense the sentence would be, "I *had* this particular illness."

Some language patterns modify the sentence as a whole. If the patient smiles, or if he introduces his statement by saying, "The doctors tell me that . . . ," any part or all of the sentence may be modified. In other reactions, particularly those noted under amytal, the patient avoids giving any meaningful statement at all. In the withdrawal reaction he says nothing or omits part of the sentence. In the use of cliches or cryptic expressions no specific referential meaning can be drawn from the language.

It is evident from this analysis that the language changes are not random or bizarre, but form a patterned reorganization of communica-

tion characterized by an alteration in the patient's attitudes to his problems and his illness. The patient either says he is not now and never has been ill, displaces his illness temporally, spatially, or personally, is less committed to his awareness of his illness by the use of qualifications, or avoids the whole problem by evasion and noncommunication.

These patterns are comparable to those noted previously by Weinstein and Kahn¹ in patients with cerebral disorders, and referred to by these authors as the "language of denial." Similar language changes have also been described following other somatic therapies. Frank^{7, 8} reports that lobotomized patients avoid talking about the operation, and he states that "the facility and glibness with which they say 'well I had an operation for my nerves, I guess' contain the quality of unconscious denial." Legault,⁹ working intensively with post-lobotomy patients, found persistent attitudes of denial. One patient, when asked why she came to see the doctor, said it was her relatives' idea. Many gave qualified responses, saying they "supposed" they had had an operation. Others doubted that the operation was on the brain, or used an evasive, stereotyped expression as "some nerve in there," or displaced the procedure as in, "Oh, yes, I went to the hospital and got two black eyes." When asked about the symptoms that led up to the operation, patients gave such response as, "It seems to have gone." In studying patients who showed clinical improvement following prolonged coma reactions in insulin coma therapy, we have noted similar changes in language. In a case report¹⁰ we noted the appearance of reduplicative phenomena, evasion, verbal denial, displacement, increased use of stereotyped expressions and cliches, cryptic responses, and much smiling and laughing, at a time when clinical improvement was most marked.

Since these language changes occur most frequently in patients who are clinically evaluated as improved, may not the language patterns themselves be the critical cues that give a favorable clinical impression? There is traditionally much difficulty in rating patients after treatment. Such evaluations are highly variable because of the lack of suitable objective criteria. While there are other objective cues which can be used, such as the amount of sedation required or the quantity of food eaten, the appearance of these language patterns may constitute an operational basis for clinical evaluation in the psychiatric interview.

Not all patients, however, who showed at least three of the language changes were regarded as much improved, and not all of the much im-

proved patients showed this degree of change. There may be other aspects of language and communication not covered by this study which are significant. Another explanation is that the use of these language patterns may vary in time or in different situations. On the basis of our previous observations of the "Amytal test" and the electroencephalogram in electroshock patients, we should predict that unimproved patients would show these language changes only transiently, while improved patients would show them persistently. Future work should also be directed toward comparison of language patterns shown when the patient is speaking to a physician with those used when he is with his family or friends. The degree to which members of the patient's family are made more comfortable by the changed language, and even their inclination to use similar language, may explain the variability in the duration of improvement following treatment. Both Weinstein and Kahn^{1, 11} and Legault⁹ have indicated a relationship between the patterns of communication of the patient and those of his family.

Finally, our results demonstrate the prognostic usefulness of amobarbital sodium administered prior to treatment. The prognostic value of the drug in the somatic therapies has been noted previously by Hoch¹² and others,^{13, 14} who felt that patients who became more normal in speech, ideation, and behavior under the influence of barbiturates were most likely to improve with treatment. In the present study the manifestation of a change in language with the drug was related not only to the development of altered brain function and to the clinical outcome, but to the eventual manifestation of these language patterns clinically. On this basis, an operational definition of the goal of electroshock therapy might be described as enduring clinical manifestation of those language patterns which occur initially only with amobarbital sodium.

SUMMARY AND CONCLUSIONS

1. Sixty-five consecutive patients referred for electroshock treatment were studied prior to and during the second and third weeks of treatment. Each patient was tested at these times both clinically and with amobarbital sodium with a standard series of questions concerning attitude toward illness.

2. The results showed that characteristic changes in language occurred both clinically and with amobarbital sodium during treatment. These changes were significantly related to the clinical response to treatment

and to the degree of alteration of brain function as measured by the electroencephalogram.

3. The presence of these language patterns with amobarbital sodium prior to treatment was related to the eventual clinical response, the development of altered brain function, and the development of language changes clinically during treatment.

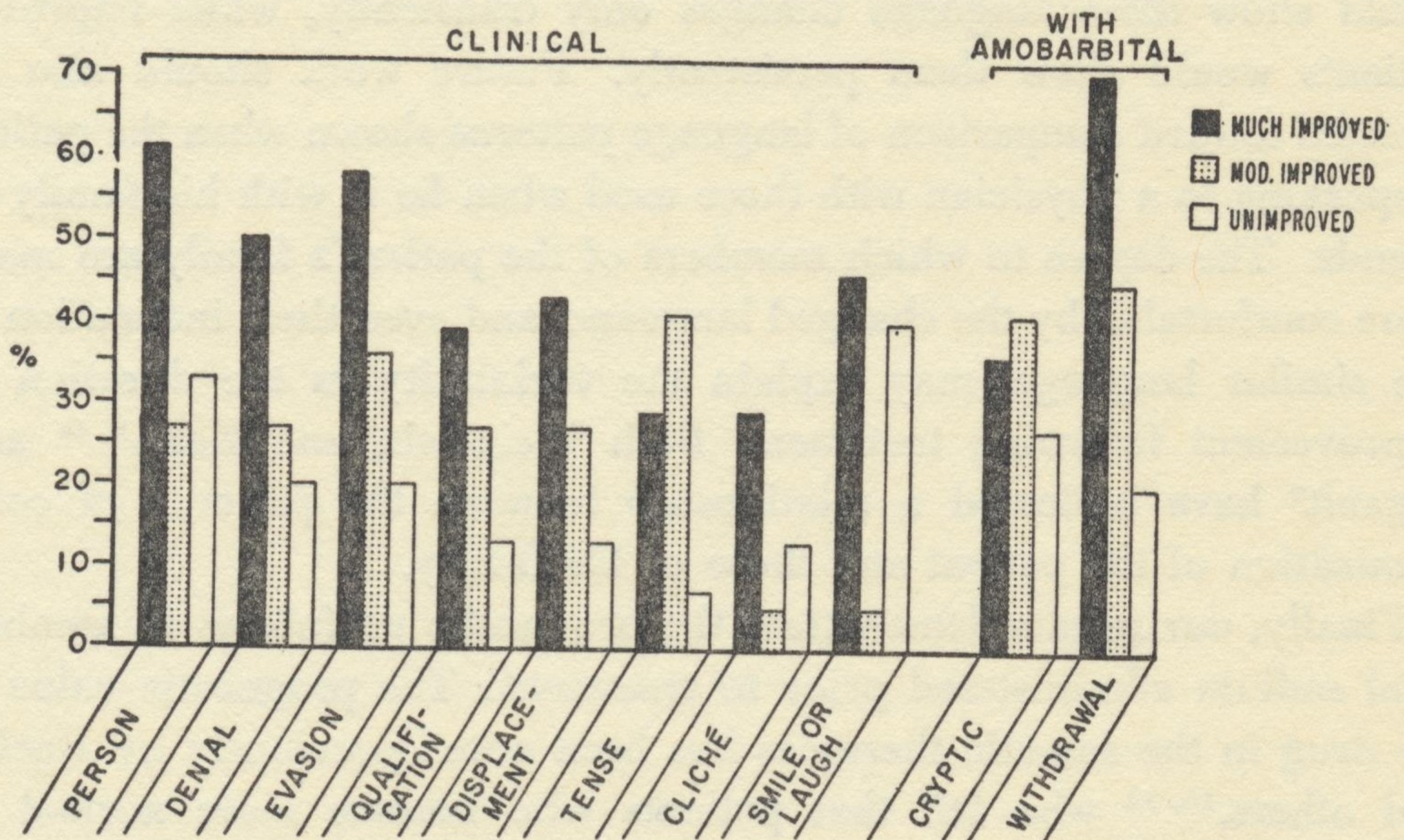


FIG. 1. Relation of each language pattern to response to treatment.

4. It is felt that these language changes constitute an operational basis for the evaluation of the clinical response.

5. The results support the hypothesis that the therapeutic mechanism of electroshock treatment is the development of different patterns of symbolic adaptation to the patient's problems and illness under the conditions of altered brain function.

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symbolic fashion, particularly in the form of denial.

The present investigation is a further attempt to test this hypothesis by studying changes in language that occur with treatment. Specifically, the following questions were studied:

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Population: Sixty-five consecutive referrals for electroshock treatment at the Hillside Hospital were studied. The Reiter Electrostimulator was used on 49 patients, while 16 were treated with the Medcraft. There were 20 men in the series and 45 women, and the ages ranged from 21 to 68.

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The test consisted of a standardized series of questions concerning orientation and awareness of illness. This study is based, however, on the response to only three of the questions used: 1) What is your main trouble? 2) Why did you come to this place? 3) If you could have one wish, what would you wish for? All responses were recorded verbatim. Observations were also made on such non-verbal aspects as smiling, laughing, gestures and other bodily movements.

RESULTS

A. Patterns of Language Change Noted Clinically During Treatment

In evaluating the changes in language the original responses to the three questions given clinically prior to treatment were used as the baseline. The evaluation of what constituted a change was based on explicit objective changes in grammar rather than on subjective or interpretative changes, as to affect, mood, feeling, pitch, voice quality, etc. In this manner the following types of language change were noted clinically during the course of treatment:

1) alteration in the syntactical use of person, 2) evasion, 3) verbal denial, 4) qualification, 5) change in tense, 6) displacement, 7) stereotyped expressions and cliches, and 8) smiling and laughing.

1. Alteration in the syntactical use of person. Instead of using the first person singular as in the pretreatment period, 28 patients used the second or third person and occasionally the first person plural. To the question concerning main trouble such responses were given as "It's what they call a depression," "They told me I was emotionally and mentally sick," "We're having a lot of trouble with my mother-in-law," "My cousin brought me; she said I was nervous," "What's your main trouble, or don't you know," and "My Mrs. is sick and I would appreciate it if they would let her in here as soon as possible." The reason for coming to the hospital was variously given as "My wife brought me," "My father told me to come here" or "My doctor said this was a good hospital." The wish was given as "Perfect health for my family," "My children, my husband and all my good friends should be healthy and happy" and "There should be peace in the world."

2. Evasion. Evasion in answering the question about their illness was shown by 27 patients. This commonly took the form of answering this question with a question, as "What do you mean by my main trouble?," "What do you expect me to say?," "Well, what is it?," and "What did I say last time?" Other language patterns considered evasive included such responses as "I don't know how to tell you," "I don't get what you mean," "Let me think," "It's hard to say," and "I just don't know how to express it." One patient asked the examiner to give her a hint.

3. Verbal denial. Explicit verbal denial of illness was shown by 23 patients. They either said they had no main trouble or were well, or else, after giving evasive "I don't know" responses, denied their illness and symptoms when specifically questioned about them.

4. Qualification. Qualification of a response in the direction of less commitment was shown by 19 patients. This language pattern was characterized by the use of words as "guess," "kind of," "sort of," "think," "apparently," "probably," "possibly," "might be," "seem," "assumed," and "perhaps." Thus such responses were given as "I guess I have been jittery," "I seem to be very much depressed," "probably that I'm nervous," "I suffer from anxieties, apparently," "Possibly worry about the future," "I have sort of gotten frightened," "Mentally upset, I assume," and "I think I'm a little insecure."

5. Change in tense. In 18 patients there was a change in tense in describing their illness. In most cases the patient used the past tense, as "I was depressed when I came here" or "I had been nervous." In other cases the patient answered the question about his main trouble by putting it in the future tense as a wish.

6. Displacement. In 20 cases there was a displacement of the complaint to something other than originally given prior to treatment. This was invariably less serious than the original complaint. Sometimes the displacement was in the form of a somatic complaint, as saying the main trouble was "diarrhea," "headaches,"

"pain in the feet," "I slammed the finger in the door," and "I've got an itch." In other cases the displacement was to some concrete aspect of the hospital situation, as "My main trouble is getting these treatments," or "I'm upset because I was transferred to another ward."

7. Stereotyped expressions and Cliches. The use of stereotyped expressions and cliches was shown by 11 patients. They gave such responses as "It seems to me under the proper circumstances I'd be alright," "(My trouble is) monetary problems with people that are honorary and sincere," "That's the root of the whole thing," "The only thing certain is death and taxes," "Learn my lesson and be a good boy," "To be a person of pep and reliability," and "I just want to stop being a lazy lout." One woman responded to a question of her one wish with, "I think I should consult my husband before I make a wish because he's a lawyer and the father of my children."

8. Smiling and laughing. In 20 cases the patient was noted to smile or laugh either immediately preceding or following his response to the question concerning his illness.

B. Language Changes Shown with Amobarbital Sodium During Treatment

The language patterns after amobarbital sodium during the second and third weeks of treatment were similar to those noted clinically. With the drug, however, the changes appeared earlier in the course of treatment. A given language pattern might be noted in the second week of treatment with the drug, but would not occur clinically until the third week. In addition, the reactions to the drug took more extreme forms, which are described as cryptic responses and withdrawal reactions.

1. Cryptic responses. This was shown by 23 patients. Responses were classified as cryptic when they had no obvious relevance to the test question or when their meaning was obscure, representing a very personalized expression. Thus one patient, when asked his main trouble, said "Nightmare of the afternoon of the evening of the nightmare." Others gave such responses as "I didn't know the problems - couldn't do the problems," "getting my husband to write down what he does," or "What could I say - you don't get the crossword."

2. Withdrawal reactions. Some pattern of withdrawal was noted in 33 patients. This behavior was characterized by incomplete sentences, incoherent mumbling, neologisms, perseveration, the use of a foreign language by bilingual patients, and delay or failure to respond to the questions. These patients would characteristically lie with their eyes open, would smile or turn their head when the examiner spoke, and would speak clearly and promptly and in English when asked questions not pertaining to their illness.

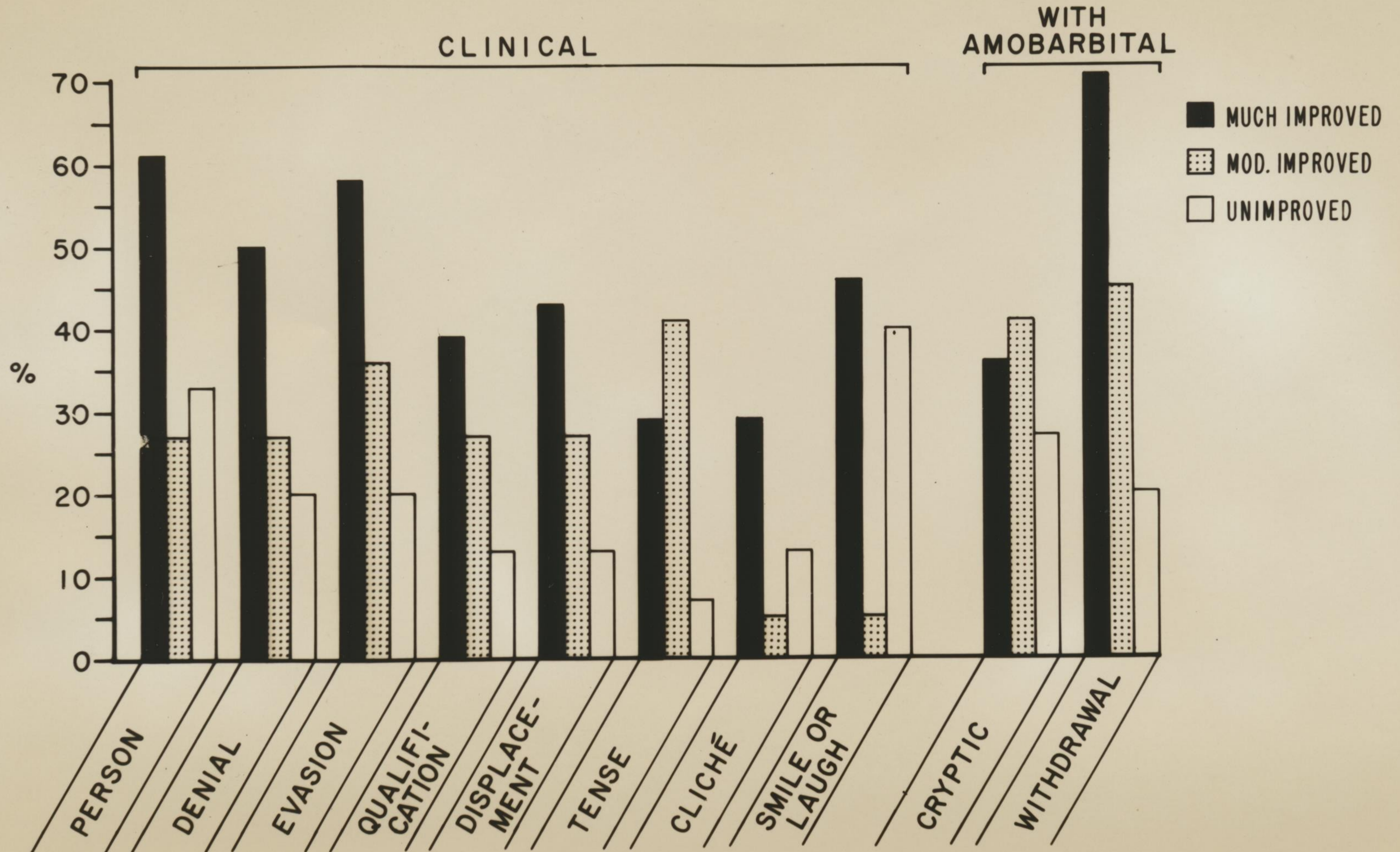
C. Other Changes in Language

Other changes in language were noted both clinically and with amobarbital sodium in response to the other questions of the test battery but not part of this study. There was frequent misnaming of the examiner, or referring to him as "Mister." With the drug those patients who had a "positive reaction," i.e., one characteristic of altered brain function, showed the characteristic patterns of disorientation for place and time and confabulation described in previous communications (2).

D. Relation of Language Changes to Clinical Response

The evaluation of clinical response to treatment was made independently of this study. The patients were rated by the supervising psychiatrist in charge of the treatments, the patient's own therapist and supervising psychiatrist, and by the medical director. On the basis of these ratings the patients were classified into three groups: 28 patients were considered much improved, no longer showing the symptoms which brought them into the hospital; 22 patients were rated as moderately improved, showing some symptomatic relief, but still showing disturbing features; and 15 were regarded as unimproved, having shown only equivocal or transient changes at best. The ratings were short term evaluations, being made within two months after completion of treatment.

PERCENTAGE SHOWING EACH LANGUAGE PATTERN ACCORDING TO RESPONSE TO TREATMENT



For quantitative purposes the language changes shown during both the second and third weeks of treatment have been grouped together as though the patients had been tested only once. If a particular pattern was shown during both periods, the item was scored only once. Altogether, 89% of the patients showed at least one of these patterns of language change clinically during treatment. Such changes were found in all the much improved patients but in only 73% of the unimproved group. It was apparent that there was a relation between the degree of clinical improvement and the number of changes in language patterns. When the data is analyzed for the patients who showed three or more language pattern changes, there is a significant difference between the groups (Table I). While 68% of the much improved patients showed three or more language changes, only 20% of the unimproved patients showed this degree of language change. Using χ^2 the overall distribution is significant at better than the 1% level of confidence.

TABLE I

Relation of Language Changes Shown Clinically to Response to Treatment

	3 or More Patterns		Less than 3 Patterns	
	No.	%	No.	%
Much Improved (28)	19	68%	9	32%
Moderately Improved (22)	7	32%	15	68%
Unimproved (15)	3	20%	12	80%
<hr/> Total (65)	29	45%	36	55%

$$\chi^2 = 11.26$$

$$P < .01$$

When each language pattern is analyzed individually, as shown in Figure 1, it becomes apparent that not all patterns discriminated equally between the groups. In all but one case, a greater percentage of the much improved patients were most

likely to show denial, use of the second or third person, evasion and displacement of complaint. The only language pattern on which little difference was found between the much improved and unimproved groups was on the use of smiling and laughing.

Analysis of the changes shown by the different groups under amytal is shown for the cryptic and withdrawal reactions only in Figure 1. While the cryptic responses did not vary much with the different groups, the showing of a withdrawal reaction differentiated the three groups significantly,* occurring in 71% of the much improved, 45% of the moderately improved and in only 20% of the unimproved patients.

E. Relation of Language Changes to Electroencephalographic Response

In a previous communication a method of quantitatively evaluating electroencephalographic records was described (6). Criteria were established for rating records as showing relatively high, middle or low degree of abnormality according to five criteria: average percent time delta waves (waves of six cycles per second or less), the highest percent time delta waves at any one lead, the lowest frequency in the record, the highest amplitude of delta waves, and the longest duration of a burst of delta waves. In the present study, an electroencephalogram was obtained prior to treatment and in the second and third week of treatment. Each record was evaluated according to the dichotomy of showing a relatively high degree of abnormality or not, using these criteria.

In Table 2 the relationship is shown between electroencephalographic abnormality and changes in language. Those patients with the greatest degree of cerebral dysfunction, having high abnormality in both the second and third weeks of treatment, show a greater number of language changes both clinically and with amobarbital sodium. Using the withdrawal reaction as an index of the drug effect, however, the difference just fails to be statistically significant.

* $X^2 = 10.72$, significant at better than the 1% level of confidence.

TABLE 2.

Relation of Language Change to High Abnormality on the Electroencephalogram During the Second and Third Weeks of Treatment

	3 or More Changes Clinically		Withdrawal Reactions with Amobarbital Sodium	
	No.	%	No.	%
Both Weeks High Abnormality (25)	16	64%	15	60%
One Week High Abnormality (16)	8	50%	9	56%
No High Abnormality (24)	6	25%	8	33%
	$\chi^2 = 7.62$ $P < .05$		$\chi^2 = 4.87$ $P < .10$	

F. Pre-treatment Language Patterns

The language patterns described in this study were considered as changes only when they occurred after the original pre-treatment clinical test which was used as a baseline. Seven patients, however, showed some form of these language patterns in the initial clinical test. The manifestation of these same patterns by these patients at any other time was accordingly not scored as a change.

When given amobarbital sodium prior to treatment, however, 30 patients, or 46% of the total, showed some language change comparable to that noted during treatment. In Table 3 the relation between showing such changes at this time is related to the eventual clinical response. Such changes were found in 68% of the much improved patients, but in only 36% of the moderately improved and 20% of the unimproved groups.

TABLE 3

Relation of Pre-treatment Language Changes with Amobarbital Sodium and Eventual Clinical Response

	Change with Amobarbital Sodium	
	No.	%
Much Improved (28)	19	68%
Moderately Improved (22)	8	36%
Unimproved (15)	3	20%
<hr/>		
Total (65)	30	46%

$X^2 = 10.30$

$P < .01$

In Table 4 it is demonstrated that the pre-treatment change with the drug was also prognostic of the eventual physiological response to treatment as measured by the degree of electroencephalographic abnormality. The overall distribution just falls short of statistical significance, although when those who showed high abnormality in both periods are compared with all the other cases as a group, the difference is significant at the 5% level of confidence.

TABLE 4

Relation of Pre-treatment Language Changes with Amobarbital Sodium and High Degree EEG Abnormality Drug the Second and Third Weeks of Treatment

	Change with Amobarbital Sodium	
	No.	%
Both Weeks High Abnormality (25)	16	64%
One Week High Abnormality (16)	6	38%
No High Abnormality (24)	8	33%

$X^2 = 5.27$

$P < .10$

Finally, the initial response to amobarbital sodium was also prognostic of the degree of language change shown clinically and to the manifestation of withdrawal reactions with the drug during treatment (Table 5).

TABLE 5

Relation of Pre-treatment Language Response to Amobarbital Sodium To Clinical Changes and Withdrawal Reactions During Treatment

	3 or More Clinical Language Patterns		Withdrawal Reactions to Amobarbital Sodium	
	No.	%	No.	%
Pre-treatment Response to Amobarbital Sodium (30)	18	60%	21	70%
No Pre-treatment Response to Amobarbital Sodium (35)	11	31%	12	34%
	$\chi^2 = 4.26$		$\chi^2 = 6.88$	
	$P < .05$		$P < .01$	

Discussion

The relationship of the language changes to the development of altered brain function and to the clinical response is consistent with our original hypothesis concerning the mode of action of electroshock treatment. In previous studies (4,6) we have shown that the clinical outcome is related to the presence and degree of alteration in cerebral function. Using the "amytal test" (2) and the EEG as indices, it has been found that those patients with the earliest and most persistent manifestations of cerebral dysfunction were most likely to have a favorable response. Such physiological changes create the milieu which facilitates behavioral change.

The present study, analyzing language patterns, clarifies the nature of the behavioral changes that occur with treatment.

The language shown originally, prior to treatment, may be summarized in the statement, "I have this particular illness." The subject of this sentence answers the question 'Who,' the predicate refers to 'What,' and the verb describes the relationship, including the temporal and intensity aspects. During treatment the subject of the sentence may be modified by changes in the use of person, so that the sentence might read "You (or he, she or they) have this particular illness." Changes in the predicate are shown by such patterns as displacement or evasion. In displacement the sentence might read "I have some other kind of illness," while, with evasion, it would be, "I have something, but I don't know what." Changes in the verb are shown by denial, qualification or alteration of tense. In denial the statement would be, "I don't have this particular illness;" a qualified sentence would read, "I might have this particular illness;" while with alteration of tense the sentence would be, "I had this particular illness."

Some language patterns modify the sentence as a whole. If the patient smiles, or if he introduces his statement by saying, "The doctors tell me that....," any part or all of the sentence may be modified. Other reactions, particularly those noted under amytal avoid giving any meaningful statement at all. In the withdrawal reaction

the person says nothing or omits part of the sentence. In the use of cliches or cryptic expressions no specific referential meaning can be drawn from the language.

It is evident from this analysis that the language changes are not random or bizarre, but form a patterned reorganization of communication characterized by an alteration in the patient's attitudes to his problems and his illness. The patient either says he is not now and never has been ill, displaces his illness temporally, spatially or personally, is less committed to his awareness of his illness by the use of qualifications, or avoids the whole problem by evasion and non-communication.

These patterns are comparable to those noted previously by Weinstein and Kahn (1) in patients with cerebral disorders, and who referred to them as the "language of denial." Similar language changes have also been described following other somatic therapies. Frank (7,8) reported that lobotomized patients avoid talking about the operation, and he states that "the facility and glibness with which they say 'well I had an operation for my nerves, I guess' contain the quality of unconscious denial." Legault (9), working intensively with post-lobotomy patients, found persistent attitudes of denial. One patient, when asked why she came to see the doctor, said it was her relatives' idea. Many gave qualified responses, saying they "suppose" they had an operation. Others doubted the operation was on the brain, or used an evasive, stereotyped expression as "some nerve in there," or displaced the procedure as in "oh, yes, I went to the hospital and got two black eyes." When asked about the symptoms that led up to the operation such responses were given as "it seems to have gone." In studying patients who showed clinical improvement following prolonged coma reactions in insulin coma therapy, we have noted similar changes in language. In a case report (10) we noted the appearance of reduplicative phenomena, evasion, verbal denial, displacement, increased use of stereotyped expressions and cliches, cryptic responses and much smiling and laughing at a time when clinical improvement was most marked.

Since these language changes occur most frequently in patients who are clinically evaluated as improved, may not the language patterns themselves be the critical cues that give a favorable clinical impression? There is traditionally much difficulty in rating patients after treatment. Such evaluations are highly variable because of the lack of suitable objective criteria. While there are other objective cues which can be used, such as the amount of sedation required or the quantity of food eaten, the appearance of these language patterns may constitute an operational basis for clinical evaluation in the psychiatric interview.

Not all patients, however, who showed at least three of the language changes were regarded as much improved, and not all of the much improved patients showed this degree of change. There may be other aspects of language and communication not covered by this study which are significant. Another explanation is that the use of these language patterns may vary in time or in different situations. On the basis of our previous observations of the "amytal test" and the electroencephalogram in electroshock patients, we would predict that unimproved patients would show these language changes only transiently, while improved patients would show them persistently. Future work should also be directed to comparing language patterns shown when the patient is with a physician and when he is with his family or friends. The degree to which the patient's family is made more comfortable by the changed language, and even their inclination to use similar language, may explain the variability of the duration of improvement following treatment. Both Weinstein and Kahn (1, 11) and Legault (9) have indicated a relationship between the patterns of communication of the patient and his family.

Finally, our results demonstrate the prognostic usefulness of amobarbital sodium administered prior to treatment. The prognostic value of the drug in the somatic therapies has been noted previously by Hoch (12) and others (13, 14) who felt that patients who became more normal in speech, ideation and behavior under the

influence of barbiturates were most likely to improve with treatment. In the present study the manifestation of a change in language with the drug was related not only to the development of altered brain function and to the clinical outcome, but to the eventual manifestation of these language patterns clinically. On this basis, an operational definition of the goal of electroshock therapy might be described as enduring clinical manifestation of those language patterns which only occur initially with amobarbital sodium.

SUMMARY AND CONCLUSIONS

1. Sixty-five consecutive patients referred for electroshock treatment were studied prior to and during the second and third weeks of treatment. Each patient was tested at these times both clinically and with amobarbital sodium with a standard series of questions concerning attitude toward illness.

2. The results showed that characteristic changes in language occurred both clinically and after amobarbital sodium during treatment. These changes were significantly related to the clinical response to treatment and to the degree of altered brain function as measured by the electroencephalogram.

3. The presence of these language patterns with amobarbital sodium prior to treatment was directly related to the eventual clinical response, the development of altered brain function, and the development of language changes clinically during treatment.

4. It is felt that these language changes constitute an operational basis for the evaluation of the clinical response.

5. The results support the hypothesis that the therapeutic mechanism of electroshock treatment is the development of different patterns of symbolic adaptation to the patient's problems and illness under the conditions of altered brain function.

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