

Behavioral  
Patterns in  
Convulsive  
Therapy

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MAX FINK, M.D.

AND

ROBERT L. KAHN, Ph.D.

GLEN OAKS, L. I., N. Y.

Individual differences in the behavioral response to convulsive therapy are marked. In psychiatric practice, patients with similar psychopathologic syndromes and of similar sex and age show a variety of clinical responses: some improve, some only slightly, some fail to improve. These differences have been related to the degree and duration of induced neurophysiological change,<sup>1,2</sup> personality patterns of personality,<sup>3,4</sup> and sociopsychological characteristics.<sup>5,6</sup>

While these studies have emphasized ratings of improvement, the derivative nature of the evaluation and its dependence on staff attitudes have been noted. The present study has been designed to provide a more objective method for the evaluation of clinical response to convulsive therapy and to relate this to the problem of the evaluation of the therapy process.

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Electroconvulsive was administered 3 times weekly under thiopental sedation (Pentothal) premedication using either a Miller unidirectional or a Melfort alternating current instrument. Grand mal or subconvulsive treatments were administered by altering the strength of current. Neither

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From the Department of Experimental Psychiatry, Hillside Hospital.

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Individual differences in the behavioral response to convulsive therapy are marked. In psychiatric practice, patients with similar psychopathologic syndromes, and of similar sex and age, show a variety of clinical responses: Some improve and sustain such change; some improve, only to relapse quickly; and some fail to improve. These differences have been related to the degree and duration of induced neurophysiological change,<sup>3,6</sup> premorbid patterns of personality,<sup>5,11,15</sup> sociopsychological characteristics,<sup>13,15</sup> and psychotherapeutic approaches.<sup>1</sup> While these studies have emphasized ratings of improvement, the derivative nature of this evaluation and its dependence on staff attitudes, expectations, and family tolerance have been stressed.<sup>2,4,5,8</sup>

The manifest behavioral patterns provide the basis for the evaluations of clinical response. It is the purpose of this report to describe behavioral patterns in patients undergoing convulsive therapy and to relate these to problems of the evaluation of improvement and to an understanding of the convulsive therapy process.

Of consecutive patients referred for electroshock therapy during 1956-1957, seventy-three patients were subjects of the analyses described here. The patients were selected for treatment by the resident therapist and the supervising psychiatrist—the investigators playing no role in their selection. These observations were made during a convulsive-subconvulsive electroshock study in which subjects referred for therapy were randomly assigned to courses of subconvulsive or convulsive treatments.

Electroshock was administered 3 times weekly under thiopental sodium (Pentothal) premedication, using either a Reiter unidirectional or a Medcraft alternating current instrument. Grand mal or subconvulsive treatments were administered by altering the strength of current. Neither

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patient, therapist, nor evaluating physicians was aware which course of therapy each patient received until after the evaluation period.

Changes in brain function were measured at weekly intervals by tests of language patterns both clinically and after amobarbital and by the degree of slow-wave activity in electroencephalograms. The intercorrelation of these indices and their relation to behavioral changes have been reported previously.<sup>3,12</sup>

The manifest symptom patterns of the referred patients were variable and included suicidal preoccupation, retardation, disturbances of mood and affect, excitement, agitation, panic and tension, delusions, ideas of reference, negativism, withdrawal, and somatic complaints. The clinical diagnoses were depressive psychoses of manic-depressive, involuntional and reactive varieties, and schizophrenic psychoses of paranoid, mixed, catatonic, and pseudoneurotic types.

Clinical behavior was assessed in weekly psychiatric interviews, structured perceptual task situations,<sup>14,15</sup> and by conferences with the patient's therapist. In these observations, the evaluation of improvement along the continuum of "recovered-unimproved" appeared inadequate and was supplemented by a rating of the degree of behavioral change.

The degree of change in clinical and ward behavior was rated on a 4-point scale of "marked," "moderate," "minimal," or "no change." These evaluations were not value judgments as to the quality of the change, but rather quantitative estimates of differences in behavioral patterns under similar conditions of observation. The assigned rating was based on changes observed during the treatment period and for 2 weeks post treatment.

Evaluations of improvement response were made on the 4-point scale of "recovered," "much improved," "improved," and "unimproved or worse." These evaluations were value judgments, based upon the behavior of the patient, the therapist's expectations, the tolerance by therapist and patient of those aspects of behavior often called "side-effects of the treatment," and the therapist's judgment as to the family's attitudes to the patient's behavior. These evaluations were short-term, re-

flecting the patient's adaptation 2 to 4 weeks following the last treatment.

### Observations

#### A. Behavioral Change and Improvement.

A comparison of the behavioral ratings and the improvement evaluations is presented in Table 1. That ratings of recovered and much improved were associated with high or moderate degrees of behavioral change is an expected observation. Similarly, that patients with minimal or no change in behavior were evaluated as unimproved or improved, is also expected. The significant relationship, however, lies in the patients showing high and moderate degrees of behavioral change and still rated as showing a poor clinical response. Of the 30 patients observed with high degrees of behavioral change, 17 were evaluated as recovered and much improved, and 13 as improved or unimproved.

B. Modes of Adaptation.—Analyses of the behavioral patterns of the subjects during and following treatment permitted the description of various modes of adaptation. For illustrative purposes we have described 4 behavioral patterns under the titles of *euphoric-hypomanic*, *somatization*, *paranoid-withdrawal*, and *panic* modes.

Euphoric-Hypomanic Mode: These subjects appeared pleasant, affable, and friendly. They dressed neatly, spoke quietly, and participated in ward activities with increased interest. Occasionally they dressed gaudily and smiled and giggled excessively. Pre-treatment symptoms were not manifest, and premorbid attitudes and behavior were again prominent.

TABLE 1.—Comparison of Evaluations of Behavioral Change and Clinical Improvement (Convulsive and Subconvulsive Therapies)

Behavioral Change	Recovered	Improvement Rating		
		Much Improved	Improved	Unimproved and Worse
High degree change (30)	8	9	8	5
Moderate degree change (17)	3	6	6	2
Minimal degree change (10)	0	0	5	5
No change (16)	0	0	1	15

In their psychotherapeutic interviews they described their illness in a detached manner, emphasizing "it" (illness) as having "disappeared." They denied having been ill and facetiously suggested they were at the hospital for a rest, or that the institution was not a hospital, but a resort or a school. Symptoms were described in the past tense, and the quality of having been a different person during the illness was reiterated. Speech was marked by denial, displacement, evasion, qualification, and clichés.<sup>11</sup> The third person mode was frequently used, as in such statements "the doctor says I am ill" or "my wife should have come here."

Gross changes in memory were either not apparent, or were described for the treatment period only. The patients expected and accepted these deficits, and neither connection with treatment nor apprehension was expressed.

They looked forward to home visits and made realistic discharge plans. While conflicts with family members were described, these were minimized and expressed mainly in the past tense. Referential questions were answered in a referential manner and without an arousal of affect. For the more hypomanic subjects, questions about home planning were responded to nonreferentially, with marked use of inappropriate clichés. When pressed with referential inquiries, they quickly exhibited anxiety and discomfort, minimized their feelings, and changed the focus of the session.

Such adaptations were sustained throughout the discharge planning period. The more hypomanic features were rarely sustained and within a few weeks were replaced by a more stable euphoric or somatization type of adaptation.

**Somatization Mode:** In these subjects, incessant complaints about bodily symptoms and loss of memory, demands for reassurance and relief, and preoccupation with feelings of unreality and confusion dominated behavior. They remained unkempt and their rooms were untidy. When such an adaptation appeared early in therapy, further treatment was refused.

Speech was principally in the present tense and in the first person, with few third person references and a minimal use of clichés, denial, or qualifications. In psychotherapy sessions, they were demanding and hostile, reporting their problems in terms similar to those used prior to therapy. They complained that the treatment caused additional and more incapacitating difficulties. To referential questions, answers were generally correct, but associated with complaints of memory impairment.

They described their family relations in pretreatment terms, with an occasional "I don't remember" in response to experiential inquiries. Discharge planning was difficult, since they insisted that their new symptoms prevented any home adaptation.

On the ward, their hostile demands for attention and relief of symptoms increased with treatment. Participation in group activities increased, however, for those subjects who had previously been withdrawn and seclusive.

Memory complaints were preeminent. Patients demanded reassurance that their memory would return and repeatedly asked if treatment would be harmful. They described feelings of derealization and confusion. Events, bodily feelings, and relations to friends and relatives seemed strange, fuzzy, unclear, and out of focus. While they complained chiefly of memory impairment, they also complained of back pain, headache, tingling of fingers and toes, nausea and weakness, and ascribed these to the treatment.

At the end of treatment, the symptoms for which hospitalization had occurred were no longer present, and although complaints were many, their relation to the treatment and their transience was so universally accepted by both the staff and the patients, that the results were evaluated as beneficial. This adaptive mode was sustained into the postdischarge period.

**Paranoid and Withdrawal Mode:** Another pattern was the appearance of paranoid ideation, suspiciousness, hostility, ideas of reference, and delusions. These patients

failed to care for themselves and remained unkempt in their dress. Their rooms, in which they remained much of the day, were untidy. Speech was sparse and not spontaneous. When questioned about their illness, they were hostile and demanded to know why they were questioned. They refused to answer inquiries or categorically denied or agreed to all specific questions. Experiential questions were answered referentially. When inquiry was insistent, they denied illness and minimized the symptoms which had resulted in their admission.

They refused or avoided sessions with their therapist and insisted convulsive therapy be ended because it was harming them. When treatments were continued, they demanded release from the hospital, or precipitated discharge by elopement, suicide attempts, or aggressive and destructive outbursts. They were unable to discuss their relations with family or friends and focused on demands for either release or relief from somatic symptoms. Hostility was overt and engendered a fearfulness in the staff. On the ward, when coaxed out of seclusion, they were loud, aggressive, and demanding. They were suspicious of attempts at friendliness and expressed thoughts that others wished to harm them or talked about them.

While insisting on discharge, no realistic discharge planning was achieved. Their view of the environment was grossly distorted and self-centered, preventing adequate care.

In testing, they were uncooperative, and voiced angry suggestions of being experimented upon or abused. Complaints of memory impairment were infrequent and occasionally denied even when clinically manifest. On such occasions, they were enraged at the implied deficit.

**Panic Mode:** These patients became increasingly anxious, agitated, restless, sleepless, and anorexic. In their dress, they were neat and cared for themselves. Speech patterns were unchanged and continued with emphasis on first person and present tense modes. Symptoms were distressing and prominently voiced. When asked about pre-treatment symptoms, these were expressed

in the same terms as those used earlier, with the complaint that treatment had made everything worse.

Patients feared treatment and hid on treatment days, or pleaded with the staff to forego further applications. They threatened elopement and if this failed, submitted administrative requests for discharge.

On the ward, they continued their pre-treatment patterns of minimal participation. On treatment days, they were withdrawn, sullen, and negativistic, and cooperation was poor. They demanded to see their therapists and on such occasions insisted that treatment be discontinued. They were unable to discuss family situations or their attitudes to others, being preoccupied with their feelings of fear. In discussing their home, they insisted on immediate discharge, while stating they were severely frightened, anxious, depressed, and unwell.

Ideation was unchanged with fearfulness as the principal affect. Fears of damage to the brain or mind was expressed, accompanied by the awareness that memory impairment may be a sign of such damage. Complaints of memory impairment were infrequent and when present, were expressed as a specific reason for discontinuation of treatment.

Patients were uncooperative and fearful of testing and participated only if encouraged that such tests may be helpful in the therapist's decision about further treatment. Occasionally, when treatment was discontinued, a more stable adaptation of relief, acquiescence, and denial appeared.

*C. Adaptive Mode and Improvement Ratings.*—Thus, for the various adaptive behavioral patterns, a range of short-term evaluations was observed. Those subjects who developed and sustained the euphoric-hypomanic modes were generally rated as recovered or much improved. Patients with somatization and panic modes were occasionally rated as improved, although unimproved ratings were frequent. The paranoid-withdrawal mode was evaluated as unimproved or worse, as were patients exhibiting the panic modes. The relation be-

TABLE 2.—Adaptive Mode and Improvement

Modes		Improvement Rating			
		Recovered	Much Improved	Improved	Unimproved, Worse
Euphoric-Hypomanic	(36)	11	14	10	1
Somatization	(10)	0	1	5	4
Paranoid-Withdrawal	(7)	0	0	2	5
Panic	(7)	0	0	2	5
No adaptive change*	(13)	0	0	1	12

\* Includes subconvulsive treated subjects without second course of ECT.

tween adaptive modes and ratings of improvement is summarized in Table 2.

### Comment

These observations emphasize the variety of behavioral adaptations that occur during convulsive therapy and relate short-term evaluations of improvement to the type of behavioral change. Earlier observers of convulsive therapy have described a range of behavioral patterns, ascribing the changes to ego adaptive responses, to the trauma of the treatment, organic brain changes, or psychologic significance of the treatment.<sup>7-9,21</sup> These observations that subjects with similar psychopathologic syndromes receiving similar treatment may exhibit discordant behavioral adaptations and be variously rated as recovered or unimproved, are of significance for an understanding of the convulsive therapy process.

In earlier studies, the conclusion was reached that persistent alterations in brain function were a necessary condition for behavioral change in convulsive therapy.<sup>2,4,6</sup> With changes in brain function, all aspects of behavior undergo modification. Perception, mood, affect, judgment, attitude, memory and recall are altered, and with these, the subject's adaptation in the environment. Not all behavioral changes are viewed as improvement, however. Improvement appears to be a special type of behavioral response, being the subjective estimate by an observer that the patient is "better." It is based, not only on the patient's behavior, but also on such nonspecific aspects as the observer's expectations, and tolerances, and those of the family and environment.

Studies relating physiological or psychological aspects of convulsive therapy to clinical outcome have reported inconsistent results.<sup>16</sup> Thus, it has been reported that depressed patients respond favorably to convulsive therapy while schizophrenic or neurotic subjects do not; while other observers indicate that neurotic depressive patients respond badly, and that some schizophrenic subjects do have favorable outcomes. Various measures have been suggested as predictors of improvement, only to fail on more extensive testing. In such instances, the differences in results and discrepancies in convulsion can be related to the utilization of a variety of global estimates of improvement as the criterion of behavioral change, without adequate specification of the standards used in the evaluation.

Such standards differ widely, depending on institutional populations and staff attitudinal factors. Varying attitudes toward "side-effects," the use of global rating scales, and varying psychosocial attitudes affecting goals of treatment have each served to make results from different laboratories incompatible. Thus, in our evaluations of convulsive therapy, the development of changes in memory, recall, and orientation have been considered as temporary manifestations of therapy and disregarded in the clinical evaluations.<sup>3,19</sup> Patients developing the euphoric or hypomanic modes, despite concomitant memory loss, have been rated as much improved.

In a comparable study by Johnson et al.,<sup>10</sup> the Lorr global ratings of behavioral change were utilized. In this type of evaluation the changes in memory and orientation are in-

cluded as negative scores in the improvement scoring, so that a high number of subjects were reported as "unimproved or worse." Besides population differences, this single factor is sufficiently potent to alter the relationships between the 2 studies and justifies the discrepant observations.

The use of global estimates of behavioral change in evaluating therapy has other significant deficiencies. Psychiatric therapies are rarely focused, or effective in modifying a single symptom. The induced changes affect a spectrum of behaviors, with varying rates of change for different aspects. Global estimates tend to lose differences in individual elements within the medial designations necessary to define the whole response. In such situations changes in behavior which may be prominent, though not pervasive nor enduring, may dominate the evaluation as to overshadow other, potentially more significant changes. Thus, alterations in memory and recall, or increased somatization or increasing withdrawal may dominate unimproved evaluations; while explicit verbal denial, clichés, and euphoria may lead to recovered or much improved designations. The use of improvement ratings may be empirically justified as an early approximation in studies of a new therapeutic measure, but further analyses of the behavioral observations are required for understanding and adequately applying the treatment. The typologies described in this report are one approach—one that has been helpful in our understanding of the convulsive therapy process and one that is now being tested in studies of psychopharmacologic agents.

In addition to the differences in improvement evaluations occasioned by attitudes to "side-effects" and the use of global ratings, there are differences due to the attitudes of therapists toward various sociocultural populations. The adaptation of explicit verbal denial in a lower class patient in a community institution is welcomed by therapists and family, but the same adaptation in an upper class professional in a psychotherapeutic hospital is considered poor or psychotic. The display of rationalization,

minimization and displacement, even when accompanied by a return to premorbid work levels, is considered marked improvement in one setting, but is viewed as a lack of improvement in another if goals of insight had been set by the therapist. Interference with memory and recall may be disregarded by therapists for one sociocultural group, but arouse empathic solicitude for patients of another social class. Such factors affect not only institutional attitudes, but within an institution, therapists of different therapeutic orientations may have differing attitudes towards evaluations and therapies. The many recent sociocultural studies of therapists, and their attitudes towards selection of therapies, are indicative of these attitudinal differences.<sup>13,17,18,20,22</sup>

It is our impression, therefore, that improvement ratings are no longer useful devices in evaluating psychiatric therapies. For the symptomatic therapies extant today, which are seemingly not directed toward the alteration of an etiologic factor, typologic descriptions have a greater applicability and empiric justification. Typologies based on concepts of diagnosis, target symptoms, or on dynamic-structural formulations have attempted to structure the pretreatment clusters in which therapies may be effective. Treatment and post-treatment symptom improvement scales have been used with utility. These are limited approximations, however, and there is a need for a broader approach to both the pretreatment and the treatment behavior, and a phenotypic, adaptive behavioral typology, using multivariate techniques of data analysis, seems worthy of assessment.

### Summary

An analysis of the variety of behavioral adaptations of 73 voluntary psychiatric patients undergoing convulsive therapy resulted in the description of 4 major patterns. These are described as euphoric-hypomanic, somatization, paranoid-withdrawal, and panic modes.

The relation of these modes to clinical ratings of improvement is described. The

derivative and generally nonoperational nature of improvement ratings is emphasized. The difficulties in a communicative definition of this variable is seen as a major factor in the discrepant studies of indices predictive of improvement in convulsive therapy and in understanding the processes of somatic therapies in psychiatry.

Max Fink, M.D., Department of Experimental Psychiatry, Hillside Hospital, 75—59 263rd St., Glen Oaks, L.I., N.Y.

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Patterns of Behavioral Change and Improvement  
in Convulsive Therapy

Max Fink, M.D. and Robert L. Kahn, Ph.D.\*

From the Department of Experimental Psychiatry, Hillside Hospital,  
Glen Oaks, L.I., N.Y.

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\*Present Address: Division of Psychiatry, Montefiore Hospital,  
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The manifest behavioral patterns provide the basis for the evaluations of clinical response. It is the purpose of this report to describe behavioral patterns in patients undergoing convulsive therapy, and to relate these to problems of the evaluation of improvement and to an understanding of the convulsive therapy process.

Method:

Of consecutive patients referred for electroshock therapy during 1956-57, seventy-three patients were subjects of the analyses described here. The patients were selected for treatment by the resident therapist and the supervising psychiatrist - the investigators playing no role in their selection. These observations were made during a convulsive-subconvulsive electroshock study in which subjects referred for therapy were randomly assigned to courses of subconvulsive or convulsive treatments.

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Observations:

(a) Behavioral Change and Improvement

A comparison of the behavioral ratings and the improvement evaluations is presented in Table I. That ratings of recovered and much improved were associated with high or moderate degrees of behavioral change is an expected observation. Similarly, that patients with minimal or no change in behavior were evaluated as unimproved or improved, is also expected. The significant relationship, however, lies in the patients showing high and moderate degrees of behavioral change and still rated as showing a poor clinical response. Of the thirty patients observed with high degrees of behavioral change, seventeen were evaluated as recovered and much improved, and thirteen as improved or unimproved.

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TABLE I

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(b) Modes of Adaptation

Analyses of the behavioral patterns of the subjects during and following treatment permitted the description of various modes of adaptation. For illustrative purposes we have described four behavioral patterns under the titles of euphoric-hypomanic, somatization, paranoid-withdrawal and panic modes.

Euphoric-Hypomanic Mode: These subjects appeared pleasant, affable and friendly. They dressed neatly, spoke quietly, and participated in ward activities with increased

TABLE I

Comparison of Evaluations of Behavioral Change  
and Clinical Improvement  
(Convulsive and Subconvulsive Therapies)

<u>Behavioral Change</u>	<u>Improvement Rating</u>			
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Speech was principally in the present tense and in the first person, with few third person references and a minimal use of cliches, denial or qualifications. In psychotherapy sessions, they were demanding and hostile, reporting their problems in terms similar to those used prior to therapy. They complained that the treatment caused additional and more incapacitating difficulties. To referential questions, answers were generally correct, but associated with complaints of memory impairment.

They described their family relations in pre-treatment terms, with an occasional "I don't remember" in response to experiential inquiries. Discharge planning was difficult, as they insisted that their new symptoms prevented any home adaptation.

On the ward, their hostile demands for attention and relief of symptoms increased with treatment. Participation in group activities increased, however, for those subjects who had

previously been withdrawn and seclusive.

Memory complaints were pre-eminent. Patients demanded reassurance that their memory would return, and repeatedly asked if treatment would be harmful. They described feelings of derealization and confusion. Events, bodily feelings and relations to friends and relatives seemed strange, fuzzy, unclear, and out of focus. While they complained chiefly of memory impairment, they also complained of back pain, headache, tingling of fingers and toes, nausea and weakness, and ascribed these to the treatment.

At the end of treatment, the symptoms for which hospitalization had occurred were no longer present, and although complaints were many, their relation to the treatment and their transience was so universally accepted by both the staff and the patients, that the results were evaluated as beneficial. This adaptive mode was sustained into the post-discharge period.

Paranoid and Withdrawal Mode: Another pattern was the appearance of paranoid ideation, suspiciousness, hostility, ideas of reference and delusions. These patients failed to care for themselves, and remained unkempt in their dress. Their rooms, in which they remained much of the day, were untidy. Speech was sparse and not spontaneous. When questioned about their illness, they were hostile and demanded to know why they were questioned. They refused to answer inquiries or categorically denied or agreed to all specific questions. Experiential questions were answered referentially. When inquiry was insistent, they denied illness and minimized the symptoms which

had resulted in their admission.

They refused or avoided sessions with their therapist, and insisted convulsive therapy be ended because it was harming them. When treatments were continued, they demanded release from the hospital, or precipitated discharge by elopement, suicide attempts or aggressive and destructive outbursts. They were unable to discuss their relations with family or friends, and focused either on demands for release or relief from somatic symptoms. Hostility was overt, and engendered a fearfulness in the staff. On the ward, when coaxed out of seclusion, they were loud, aggressive and demanding. They were suspicious of attempts at friendliness, and expressed thoughts that others wished to harm them or talked about them.

While insisting on discharge, no realistic discharge planning was achieved. Their view of the environment was grossly distorted and self-centered, preventing adequate care.

In testing, they were uncooperative, and voiced angry suggestions of being experimented upon or abused. Complaints of memory impairment were infrequent, and occasionally denied even when clinically manifest. On such occasions, they were enraged at the implied deficit.

Panic Mode: These patients became increasingly anxious, agitated, restless, sleepless and anorexic. In their dress, they were neat and cared for themselves. Speech patterns were unchanged and continued with emphasis on first person and present tense modes. Symptoms were distressing and prominently voiced. When asked about pre-treatment symptoms,

these were expressed in the same terms as those used earlier, with the complaint that treatment had made everything worse.

Patients feared treatment and hid on treatment days, or pleaded with the staff to forego further applications. They threatened elopement and if this failed, submitted administrative requests for discharge.

On the ward, they continued their pre-treatment patterns of minimal participation. On treatment days, they were withdrawn, sullen and negativistic, and cooperation was poor. They demanded to see their therapists and on such occasions insisted that treatment be discontinued. They were unable to discuss family situations or their attitudes to others, being pre-occupied with their feelings of fear. In discussing their home, they insisted on immediate discharge, while stating they were severely frightened, anxious, depressed and unwell.

Ideation was unchanged with fearfulness as the principal affect. Fears of damage to the brain or mind was expressed, accompanied by the awareness that memory impairment may be a sign of such damage. Complaints of memory impairment were infrequent and when present, were expressed as a specific reason for discontinuation of treatment.

Patients were uncooperative and fearful of testing, and participated only if encouraged that such tests may be helpful in the therapist's decision about further treatment. Occasionally, when treatment was discontinued, a more stable adaptation of relief, acquiescence and denial appeared.

(c) Adaptive Mode and Improvement Ratings

Thus, for the various adaptive behavioral patterns, a range of short term evaluations were observed. Those subjects who developed and sustained the euphoric-hypomanic modes were generally rated as recovered or much improved. Patients with somatization and panic modes were occasionally rated as improved, although unimproved ratings were frequent. The paranoid-withdrawal mode was evaluated as unimproved or worse, as were patients exhibiting the panic modes. The relation between adaptive mode and ratings of improvement are summarized in Table II.

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TABLE II

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TABLE II

Adaptive Mode and Improvement

<u>Modes</u>	<u>Improvement Rating</u>			
	<u>Recovered</u>	<u>Much Improved</u>	<u>Improved</u>	<u>Unimproved, Worse</u>
Euphoric-Hypomanic (36)	11	14	10	1
Somatization (10)	0	1	5	4
Paranoid-Withdrawal ( 7)	0	0	2	5
Panic ( 7)	0	0	2	5
No adaptive change* (13)	0	0	1	12

\*Includes subconvulsive  
treated subjects without  
second course of ECT.

Discussion:

These observations emphasize the variety of behavioral adaptations that occur during convulsive therapy, and relate short term evaluations of improvement to the type of behavioral change. Earlier observers of convulsive therapy have described a range of behavioral patterns, ascribing the changes to ego adaptive responses, to the trauma of the treatment, organic brain changes, or psychologic significance of the treatment (7,8,9,21). These observations that subjects with similar psychopathologic syndromes receiving similar treatment may exhibit discordant behavioral adaptations, and be variously rated as recovered or unimproved, is of significance for an understanding of the convulsive therapy process.

In earlier studies, the conclusion was reached that persistent alterations in brain function were a necessary condition for behavioral change in convulsive therapy (2,4,6). With changes in brain function, all aspects of behavior undergo modification. Perception, mood, affect, judgment, attitude, memory and recall are altered, and with these, the subject's adaptation in the environment. Not all behavioral changes are viewed as improvement, however. Improvement appears to be a special type of behavioral response, being the subjective estimate by an observer that the patient is "better". It is based, not only on the patient's behavior, but also on such non-specific aspects as the observer's expectations, and tolerances, and those of the family and environment.

Studies relating physiological or psychological aspects

of convulsive therapy to clinical outcome have reported inconsistent results (16). Thus, it has been reported that depressed patients respond favorably to convulsive therapy while schizophrenic or neurotic subjects do not; while other observers indicate that neurotic depressive patients respond badly, and that some schizophrenic subjects do have favorable outcomes. Various measures have been suggested as predictors of improvement, only to fail on more extensive testing. In such instances, the differences in results and discrepancies in conclusion can be related to the utilization of a variety of global estimates of improvement as the criterion of behavioral change, without adequate specification of the standards used in the evaluation.

Such standards differ widely, depending on institutional populations and staff attitudinal factors. Varying attitudes toward "side-effects", the use of global rating scales and varying psychosocial attitudes affecting goals of treatment have each served to make results from different laboratories incompatible. Thus, in our evaluations of convulsive therapy, the development of changes in memory, recall and orientation have been considered as temporary manifestations of therapy and disregarded in the clinical evaluations (3,19). Patients developing the euphoric or hypomanic moods, despite concomitant memory loss, have been rated as much improved.

In a comparable study by Johnson et al, (10), the Lorr global ratings of behavioral change were utilized. In this type of evaluation the changes in memory and orientation are included

as negative scores in the improvement scoring, so that a high number of subjects were reported as "unimproved or worse."

Besides population differences, this single factor is sufficiently potent to alter the relationships between the two studies, and justifies the discrepant observations.

The use of global estimates of behavioral change in evaluating therapy has other significant deficiencies. Psychiatric therapies are rarely focused, or effective in modifying a single symptom. The induced changes affect a spectrum of behaviors, with varying rates of change for different aspects. Global estimates tend to lose differences in individual elements within the medial designations necessary to define the whole response. In such situations changes in behavior which may be prominent, though not pervasive nor enduring may dominate the evaluation as to overshadow other, potentially more significant changes. Thus, alterations in memory and recall, or increased somatization or increasing withdrawal may dominate unimproved evaluations; while explicit verbal denial, cliches and euphoria may lead to recovered or much improved designations. The use of improvement ratings may be empirically justified as an early approximation in studies of a new therapeutic measure, but further analyses of the behavioral observations are required for understanding and adequately applying the treatment. The typologies described in this report are one approach - one that has been helpful in our understanding of the convulsive therapy process, and one that is now being tested in studies of psychopharmacologic agents.

In addition to the differences in improvement evaluations occasioned by attitudes to "side-effects" and the use of global ratings, there are differences due to the attitudes of therapists toward various sociocultural populations. The adaptation of explicit verbal denial in a lower class patient in a community institution is welcomed by therapists and family, but the same adaptation in an upper class professional in a psychotherapeutic hospital is considered peer or psychotic. The display of rationalization, minimization and displacement, even when accompanied by a return to pre-morbid work levels, is considered marked improvement in one setting, but is viewed as a lack of improvement in another if goals of insight had been set by the therapist. Interference with memory and recall may be disregarded by therapists for one sociocultural group, but arouse empathic solicitude for patients of another social class. Such factors affect not only institutional attitudes, but within an institution, therapists of different therapeutic orientations may have differing attitudes towards evaluations and therapies. The many recent sociocultural studies of therapists, and their attitudes towards selection of therapies, are indicative of these attitudinal differences (13,17,18,20,22).

It is our impression, therefore, that improvement ratings are no longer useful devices in evaluating psychiatric therapies. For the symptomatic therapies extant today, which are seemingly not directed toward the alteration of an etiologic factor, typologic descriptions have a greater applicability and empiric

justification. Typologies based on concepts of diagnosis, target symptoms or on dynamic-structural formulations have attempted to structure the pre-treatment clusters in which therapies may be effective. Treatment and post-treatment symptom improvement scales have been used with utility. These are limited approximations, however, and there is a need for a broader approach to both the pre-treatment and treatment behaviors, and a phenotypic, adaptive behavioral typology, using multivariate techniques of data analysis, seems worthy of assessment.

Summary:

An analysis of the variety of behavioral adaptations of 73 voluntary psychiatric patients undergoing convulsive therapy resulted in the description of four major patterns. These are described as euphoric-hypomanic, somatization, paranoid-withdrawal and panic modes.

The relation of these modes to clinical ratings of improvement is described. The derivative and generally non-operational nature of improvement ratings is emphasized. The difficulties in a communicative definition of this variable is seen as a major factor in the discrepant studies of indices predictive of improvement in convulsive therapy, and in understanding the processes of somatic therapies in psychiatry.

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Method:

Of consecutive patients referred for electroshock therapy during 1956-57, seventy-three patients were subjects of the analyses described here. The patients were selected for treatment by the resident therapist and the supervising psychiatrist - the investigators playing no role in their selection. These observations were made during a convulsive-subconvulsive electroshock study in which subjects referred for therapy were randomly assigned to courses of subconvulsive or convulsive treatments.

Electroshock was administered three times weekly under pentothal pre-medication, using either a Reiter unidirectional or a Medcraft alternating current instrument. Grand mal or subconvulsive treatments were administered by altering the strength of current. Neither patient, therapist nor evaluating physicians was aware which course of therapy each patient received until after the evaluation period.

Changes in brain function were measured at weekly intervals by tests of language patterns both clinically and after amobarbital, and by the degree of slow wave activity in electroencephalograms. The intercorrelation of these indices and their relation to behavioral changes have been reported previously (3,12).

The manifest symptom patterns of the referred patients were variable, and included suicidal preoccupation, retardation, disturbances of mood and affect, excitement, agitation, panic and tension, delusions, ideas of reference, negativism, withdrawal