PERSONALITY CHANGE ASSOCIATED WITH PSYCHEDELIC (LSD) THERAPY[1,2] A PRELIMINARY REPORT

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Since lysergic acid diethylamide (LSD-25) was made available as an experimental drug approximately 15 years ago, well over 200 papers have been published concerning its clinical and behavioral effects. Early work focussed on similarities between LSD-induced experience and psychosis. Most recent studies involve LSD as a facilitating agent in traditional psychotherapies (Chandler & Hartman, 1960; Robinson, *et al.*, 1963) or as the primary vehicle for rapid personality change (MacLean, *et al.*, 1961; Sherwood, *et al.*, 1962).[3] The latter technique includes a brief series of exploratory interviews in preparation for a single, large dose LSD session conducted in a supportive, non-directive setting.

Although studies of the therapeutic efficacy of LSD differ widely along a number of dimensions known to influence drug and treatment outcome, impressive improvement rates have been almost uniformly reported. Such relevant variables include dose level, frequency of administration, patient set and expectations, and physical and psychological setting (Zubin & Katz, 1964). Furthermore therapists of widely divergent theoretical persuasions, e.g., Freudian (Ditman, *et al.*, 1962), Jungian (Cutner, 1959), behavioristic (Costello, 1963), existentialist (Van Dusen, 1961), and eclectic (Lewis & Sloane, 1958; Schoen, 1964) have reported positive results. In addition, group therapy sessions with LSD have also been found to greatly facilitate improvement (Tenenbaum, 1961). With regard to severity of illness and diagnostic type, the patient samples treated represent the complete spectrum of psychological disorders as well as both adults and children (Bender, *et al.*, 1963). It is also noteworthy that the effectiveness of LSD as a therapeutic agent has been reported by investigators in India, Canada, Germany, England, the Netherlands, Australia, Argentina, France, as well as in the United States (Abramson, 1960; Trouton & Eysenck, 1961).

In spite of the breadth and consistency of positive results reported with LSD, a number of limitations and shortcomings characterize this body of research. The major criticisms include small samples, subjective and vague criteria of improvement, inadequate follow-up, and lack of control groups. While some of these shortcomings are shared by the bulk of research on psychotherapy (Sargeant, 1961; Strupp, 1963), others seem less insurmountable. Most reports on the therapeutic effectiveness of LSD have been of a clinical nature, representing personal impressions of questionable reliability. The lack of independent judgements of improvement and the failure to use semi-objective rating scales (Lorr, 1960) are particularly noteworthy in view of recent work on the influence of the therapist's value orientation on treatment evaluation and outcome (Ehrlich & Weiner, 1961; Heine & Trosman, 1960; Wallach & Strupp, 1960).

Another readily soluble research problem is the absence of comprehensive and objective personality assessment pre- and post-treatment. While relationships between clinical syndromes and therapy outcome have been suggested (Savage, *et al.*, 1962), little attempt

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[3] Representative and recent studies have been listed. Unger (1963) and Schmiege (1964) have reported more extensive bibliographies on the psychotherapeutic use of LSD.

has been made to systematically relate the nature and extent of change to well-defined personality patterns. In the light of the promising claims made for LSD therapy, it would seem important to supplement and further evaluate these clinical findings with more rigorously designed research. The study reported here represents an initial step in an ongoing research program to determine the relationship between LSD experience and consequent changes in personality, value-belief systems, and actual behavior in major life areas.

The Minnesota Multiphasic Personality Inventory (MMPI) was considered valuable for LSD research. It is well-constructed, empirically-derived, and extensively validated (Dahlstrom & Welsh, 1960). In addition, objective methods of profile analysis have been devised for grouping individuals according to complex patterns of personality (Marks & Seeman, 1963; Nunnally, 1962). Another advantage is the availability of innumerable special scales permitting a more comprehensive personality description and additional assessments relevant to particular research areas. As a multivariate measure of therapeutic change, the MMPI is sensitive to transient alterations in mood as well as to pervasive characterological changes. Of particular relevance to the present study is the body of research using the MMPI to assess personality change as a function of short-term psychotherapy (Barron & Leary, 1955; Cartwright, *et al.*, 1963; Goldstein, 1960; Kaufmann, 1956; Schofield, 1956). Thus, direct comparisons can be made with other methods of treatment.

While the MMPI has been employed in a number of LSD studies concerning the "psychotomimetic" aspects of the experience, none of the work on the therapeutic value of the drug has used objective or projective tests as measures of change. The MMPI has been given prior to LSD, but not repeated, as a basis for defining groups with respect to a single personality dimension (*e.g.*, extraversion-introversion). The major interest of these studies was in the relationship between dichotomous personality types and nature of reaction to LSD (DiMascio, *et al.*, 1961; Kornetsky, 1957; Rinkel, *et al.*, 1961). Other investigators with a psychotomimetic orientation have administered the MMPI to subjects while under the influence of the drug in order to determine the similarity of the experience to a psychotic state (Belleville, 1956; Cohen, *et al.*, 1958; Lebovits, *et al.*, 1960; Linton & Langs, 1962). While these studies demonstrate the importance of personality variables as determinants of response to LSD, the results have little relevance to the potential efficacy of this chemical agent as part of a psychotherapeutic process.

The present study attempted to correct many of the deficiencies noted in previous research on LSD. Specifically, (1) both pre- and post-LSD assessments of personality were obtained, (2) both the kinds and magnitude of change associated with various personality patterns were estimated, (3) a sample large enough to permit fairly reliable conclusions was studied, and (4) extensive follow-up evaluations were made at more than one point in time.

METHOD

Clinical Procedure

All subjects were patients receiving psychedelic therapy in a private clinic cooperating with the International Foundation for Advanced Study. The therapy consists of preparation for approximately one month preceding the LSD session, consisting of weekly inhalations of a mixture of 30% CO_2 and 70% O_2 (Meduna, 1950) together with exploratory interviews. This preparation accustoms the patient to an altered state of consciousness, builds up necessary rapport between patient and therapist, and helps the patient to clarify specific problem areas he wishes to examine. On the session day the patient is given 200 to 300 μgr. of LSD plus 200 to 400 mg. of mescaline initially, with 100 to 300 μgr. of LSD added a few hours later if indicated. The experience is followed by several weeks of interviews, reviewing the notes and the recording made during the session. Throughout the procedure emotional support is provided, but not interpretative psychotherapy. A more detailed account of this procedure has been described by Sherwood, *et al.*, 1962.

Clinical Procedure

Initially, each patient was given a psychiatric interview and a physical examination as a basis for diagnosis and screening according to criteria described elsewhere (Savage, *et al.*, 1963). Upon acceptance into the program (approximately one month pre-LSD session) each subject completed the Minnesota Multiphasic Personality Inventory (MMPI), the Interpersonal Check List (ICL), and the Value-Belief Q-Sort. Three days following the LSD session, the subject was retested on the Value-Belief Q-Sort to partially test the hypothesis that the LSD experience tends to be followed by a major reconstruction

of one's value-belief system, which in turn is followed by less rapid changes in personality and overt behavior in major life areas. At two months post-LSD, the subject was again retested on the Value-Belief Q-Sort in addition to the ICL and MMPI. At six months, a semi-structured Behavior Change Interview lasting several hours was given. Also the ICL and the MMPI were completed a third time in order to estimate the stability of short-term changes. In addition to the regular clinical scales, scores were computed on ten special MMPI scales including Social Introversion (Si), Anxiety (A), Repression (R), Ego Strength (Es), Prejudice (Pr), Ego Overcontrol (EO), Neurotic Overcontrol (NO), Neurotic Undercontrol (NU), Evaluation of Improvement (Ev), and Rigidity (Rg).

Selection of Sample

The sample includes all patients who completed the LSD program during the period July, 1962-April, 1963. It consists of 70 persons; 43 males and 27 females with a mean age of 35.5 years ($SD = 7.5$) and a median educational level of two years of college. With respect to diagnosis, severity of illness and MMPI profile patterns, approximately two-thirds of the sample resembled a typical psychiatric outpatient clinic population. The remainder tested "normal" and were diagnosed as personality trait disturbances. All subjects were self-selected paying patients. As a consequence, the generality of the results of the present study are somewhat limited.

Of the 70 patients a *complete* evaluation at one month before, two months after, and six months after were obtained on 60 subjects of the original sample. Sufficient data was available on all 70 so that we may say with confidence that the 10 who did not complete their testing were not significantly different from the 60 who did, only more elusive.

RESULTS

With regard to overall changes in the total sample on the MMPI, some decrease on all clinical scales was found with the exception of the Manic scale. The most notable changes at two months post-LSD include significant decreases on *F, Depression, Psychesthenia, Schizophrenia, Social Introversion, Anxiety, Neurotic Overcontrol,* and *Evaluation of Improvement.* Significant increases were obtained on *K, Mania,* and *Ego Strength.* At six months post-LSD, there is a discernible trend toward pre-LSD levels. However, all of the changes significant at two months remain significant at six months except for the increase on *Ma.* At both two- and six-months, there is some change on all 20 clinical scales in the healthy direction. It should be noted that these consistencies in overall improvement were manifest in an extremely heterogeneous sample.

The shifts observed in the total group suggest that following the LSD experience, patients tended to display more adequate ego resources, less depression and psychic discomfort, greater sense of well-being and out-goingness, less compulsivity and anxiety, and less distance in interpersonal relations. Importantly, the finding that the elevation on the Manic scale vanished at six months suggests that decreases in pathology are not the result of a transient drug-induced euphoria.

When males and females are considered separately, essentially the same kinds and magnitude of changes occur as in the total sample. Males manifested more pathology and emotional disturbance pre-LSD than the women, but post-LSD both male and female profiles are well within normal limits. Women showed more dramatic shifts in mood (decreases on *F, D,* and *A*) than the men, although elevations in mood and self-satisfaction characterize the men also. In addition to changes in emotional tone, males showed significant decreases on the more stable and reliable character scales (*Pt* and *Sc*). Consistent with the less dramatic but more pervasive changes demonstrated by the men, there was less regression at six months post-LSD by the males. At six months, some change in the healthy direction on all 20 clinical scales was displayed by both males and females. The most consistent and unambiguous shifts in both sexes include greater spontaneity of emotional expression and increased self-confidence, particularly in relations with others.

Figures *1, 2,* and *3* indicate the relationship between severity of illness and personality changes following the LSD experience. For these analyses, the total group was divided into three subgroups based on the magnitude of profile elevation, pre-LSD. Since scores of 70 or above on any of the clinical scales (excluding *Mf* and *Si*) are considered of diagnostic significance, the following objective criteria were employed: Severe Group—3 or more scores greater than 70; Moderate Group —1 or 2 scores greater than 70; Normal Group —all scores below 70.

Comparisons between groups indicate a definite relationship between severity of illness and degree of improvement as measured by the magnitude of differences between pre-

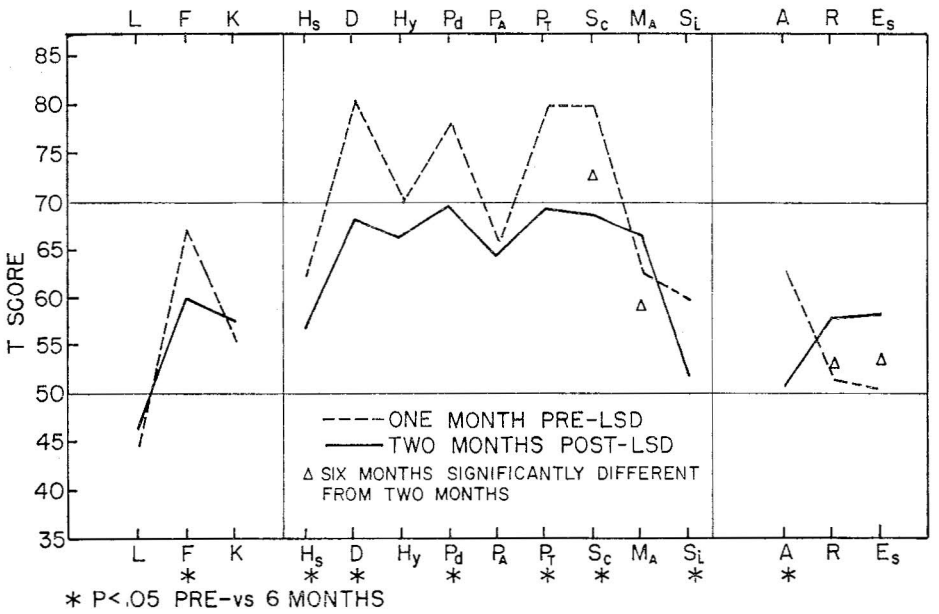

FIGURE 1. Pre-LSD and post-LSD MMPI profiles of Severe Group ($N = 17$).

and post-LSD profiles. The Severe Group showed the most marked changes post-LSD while the Normal Group changed least. The pre-LSD profile for the Severe Group included five of the eight clinical scales at 70 or above. At the two month follow-up, there was a significant decrease on all five scales with no scores above 70. In addition, significant increases were obtained on *R* and *Es*. MMPI scores at six months post-LSD which differed significantly from two month levels are also indicated in the figures. It can be seen that some regression has taken place in the Severe Group. Specifically, an increase in *Sc* and de-

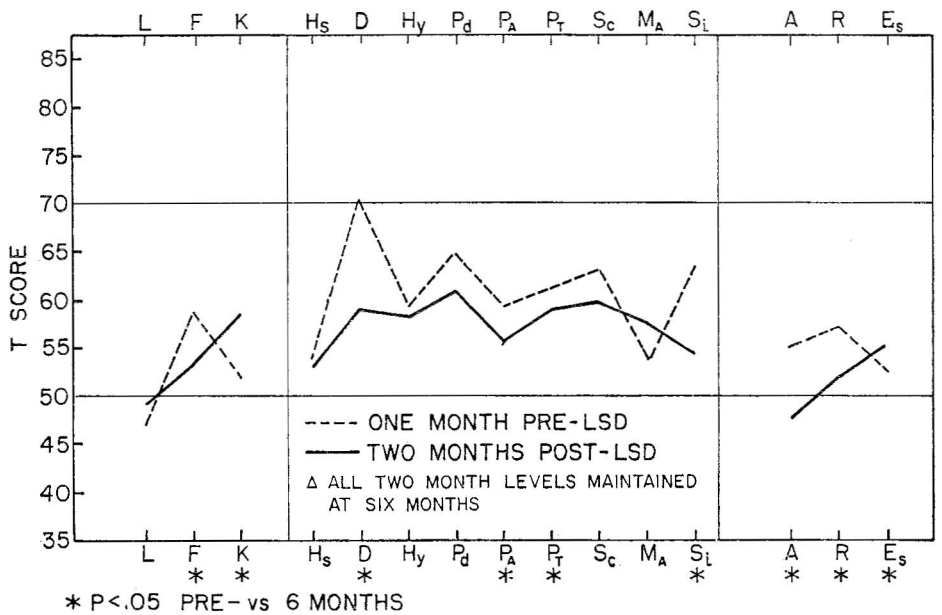

FIGURE 2. Pre-LSD and post-LSD MMPI profiles of Moderate Group ($N = 18$).

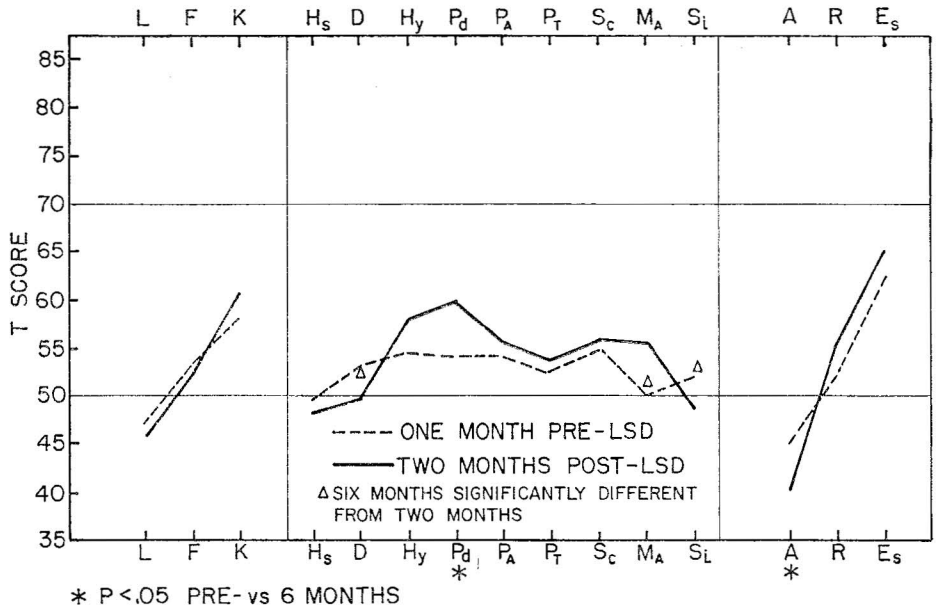

FIGURE 3. Pre-LSD and post-LSD MMPI profiles of Normal Group ($N = 25$).

creases in *Ma*, *R*, and *Es* suggest a tendency for pre-LSD ego defense patterns to reappear. However, most of the positive changes noted at two months are maintained or increased at six months.

The changes manifested by the Moderate Group are less extensive than the Severe Group but greater than the Normal Group. Essentially the same pattern of changes noted for the total group characterize the moderately severe group. Significantly, all of the changes noted at two months are maintained at six months, suggesting that this group possesses adequate ego resources to assimilate the experience and consolidate the initial gains which typically occur following LSD therapy.

The modest but significant shifts demonstrated by the Normal Group probably reflect in part the insensitivity of the MMPI to positive changes other than decreases in pathology (Schulman & London, 1963). This hypothesis is currently being tested by analyzing other indices of personality and behavior change which are more appropriate for normal populations (*e.g.*, measures of positive mental health and self-actualization).

A further attempt was made to group subjects according to more specific pre-LSD personality patterns or diagnostic types. A number of objective criteria for grouping were established which resulted in five mutually exclusive and exhaustive groups. These groupings successfully delineated the four pre-LSD profile patterns which occurred most frequently. The fifth group includes the remainder of the cases. The basis for grouping was the relative elevation of individual scale scores. The five groups and criteria for inclusion were as follows: Anxiety Neurotics—primary elevation on scales *D* and *Pt;* Borderline Psychotics—primary peak on scale *Sc;* Nonconforming Normals—primary peak on scale *Pd;* Manic-Impulsives—primary peak on scale *Ma;* Normal Depressives—remaining cases (mean profile showed all scores less than 60 with the exception of *D*).

Because of the relatively small number of cases in some of the subgroups, the differential changes associated with these modal personality patterns were viewed primarily as a basis for specific hypotheses and predictions which are currently being tested with larger samples. As can be seen in Table *1*, changes at two months were almost uniformly positive and consistent with the symptomology and defense patterns characterizing these diagnostic types. Thus, anxiety neurotics are less anxious, dysphoric, compulsive, and withdrawn while ego strength is greater and defenses more adequate. Furthermore, most of these improvements are still increasing at six months.

Nonconforming Normals and Normal Depressives also demonstrated substantial favorable shifts consistent with their respective disturbances. Although scores on the *Ma* scale drop to pre-therapy levels in these groups, positive changes are maintained at six months. In addition to other improvements, it is noteworthy that the Manic-Impulsive group was unique in manifesting a decrease on *Ma* and an increase on *R*. This group also showed a decrease in *Neurotic Undercontrol* and an increase in *Ego Overcontrol*. Interestingly, most of the significant

TABLE 1

SUMMARY OF POST-LSD CHANGES ON THE CLINICAL SCALES OF THE MMPI FOR VARIOUS PERSONALITY TYPES

Personality Type	*N*	Significant Changes Post-LSD[1]			
		At Two Months		At Six Months[2]	
		Lower	Higher	Lower	Higher
Anxiety Neurotics	9	F, D, Pt, Si, A, R	K, Es	D, Pt, Si, A	K, Es
Borderline Psychotics	12	F, Hs, D, Hy, Sc, Si, A	Ma, Es	Ma, Es	D, Hy, Pt, Sc, A
Nonconforming Normals	13	F, D, Pd, Pt, A	K, Ma	Ma, Si	None
Manic-Impulsives	8	Pt, Sc, Ma, A	R	None	None
Normal Depressives	18	D, A	Ma	Ma	None

[1] Minimum of five standard score points.
[2] Scores at six months post-LSD which differed substantially from two month levels.

changes of Borderline Psychotics noted at two months are not sustained. The six-month profile more closely resembles the pre-LSD pattern than the two-month profile. This result suggests that this group requires follow-up treatment to help consolidate the gains occurring shortly after the LSD experience. As might be expected, Borderline Psychotics do not seem to possess adequate ego resources to assimilate this profound experience without subsequent professional assistance.

A final attempt was made to isolate two diagnostic types which were observed clinically to respond particularly well to LSD. These were "female hysterics" ($N = 10$) and "obsessive-compulsive" males ($N = 17$). The female group was defined by the single criterion, $Pd - Mf$ greater than 19 standard score points. The male group included cases with *D* and *Pt* greater than 70. As anticipated, both groups showed dramatic improvement at two months. However, while the obsessive-compulsive group maintained improvement at six months, the hysteric group tended to regress to pre-LSD levels. At six months, the males maintain significant decreases on *F, Hs, D, Hy, Pd, Pt, Sc, Si* and *A* as well as increases on *Es*. Together with the anxiety neurotic pattern with which it overlaps, the obsessive-compulsive syndrome seems particularly amenable to LSD therapy. In contrast, women with hysterical trends sustain impressive elevations in mood and decreases in anxiety but passive-dependent, masochistic, and conversion tendencies which were temporarily in abeyance are again prominent at the six-month follow-up. This finding suggests that suggestibility or possibly magical expectations play a significant role in the initial improvement of the hysteric with little genuine insight or assimilation of the experience taking place. It also suggests that the greatly increased expansiveness and sense of well-being noted at two months is superficial and perhaps unrealistic. As a result, the spectacular changes occurring immediately after LSD tend to dissipate prior to the six-month follow-up since they are unsupported by reality.

DISCUSSION

It should be emphasized that the findings obtained in this study are the result of a complex set of determinants, only one of which is the ingestion of a particular chemical agent. The significance of contradictory results obtained with LSD therapy have often been obscured by the persistent search for "drug specific" reactions. Inconsistent findings become more understandable if response to LSD is viewed as the resultant of complex transactions between the patient, the therapist, set or expectation, and the setting. In short, the administration of LSD is inevitably imbedded in a larger psycho-therapeutic process.

In this connection, it is worth noting that the crucial importance of non-drug variables is not confined to the psychedelics (DiMascio & Klerman, 1960). Furthermore, recent experimental work in human psychopharmacology, particularly the placebo studies, indicates that the view of non-drug factors as extraneous or spurious is in need of revision (Frank, 1961 Mielke, 1957). Instead, variables associated with the context of drug administration are more accurately viewed as essential and integral aspects of drug therapy which should be optimized rather than eliminated.

Since the present study focussed on the relationship between personality factors and treatment outcome, an attempt was made to keep other relevant variables as constant as possible, *i.e.,* the therapeutic procedure was essentially the same for each patient. On the other hand, in order to determine the role of specific process variables in various outcomes, the inclusion of appropriate control groups becomes a necessity. In this connection, Cholden, Kurkland, and Savage (1955) early showed the relative uselessness of inert placebos as a control measure, since within an hour it was obvious to both staff and patients which one had LSD and which had the placebo. More recently, the ineffectiveness of both double- and single-blind procedures has been demonstrated in well-controlled studies by DeMaar, *et al.* (1960), and Linton and Langs (1962). Nevertheless, there are two feasible and useful methods of control which to date have not been adequately employed. One is the use of a waiting list of patients who have applied for LSD therapy. The other is the use of an active placebo such as psilocybin or a low dose of LSD which would produce many of the subjective and side-effects without the profound psychic experience. Research plans currently in progress include the use of both types of control group.

Since the LSD experience is an integral part of a technique of short-term psychotherapy, it is instructive to compare the kinds of personality change noted in the MMPI and the relative magnitude of these changes with other MMPI studies of change as a function of psychotherapy. While a number of studies have been reported, few are directly comparable to the present research because of differences in patient characteristics. However, a number of general conclusions can be made against which the results of the present study can be evaluated.

A number of studies report no change or slight and unreliable changes following various periods of psychotherapy with outpatients (Goldstein, 1960; Schofield, 1956). Kaufmann (1956) studies MMPI changes in a group of psychoneurotic patients most closely resembling the Moderate Group of the present study. He reported slight but significant changes on five of the clinical scales but only for cases who were judged clinically to have improved. Despite this important selective factor, the number of significant scale changes and the magnitude of these changes were considerably greater in the present study. On the basis of extensive assessment of MMPI changes following psychotherapy, Ford (1959) concluded that the MMPI must be insensitive to improvement since the findings were consistently negative.

A study which is perhaps more directly comparable to the present research was conducted by Barron and Leary (1955). Their sample, treatment regime, and follow-up closely resembled the present study. With regard to diagnosis and severity of illness, the group profile is highly similar to the Moderate Group. Their results are consistent with Gallagher's (1956) finding that changes reflect primarily shifts in feeling or mood, while the least changes occur on the character and behavior disorder scales. Contrary to this general finding, most of the subgroups of the present study showed significant decreases on both mood and character scales. These comparisons suggest that LSD therapy is an effective method of treatment both in an absolute sense and relative to other therapies.

The preliminary results reported here indicate that given under optimal conditions and with adequate preparation, a single psychedelic experience tends to be followed by significant decreases in pathology associated with emotional conflict, neurotic symptoms, damaged self-esteem, and the like. In addition, it was found that given this particular psychotherapeutic technique, the nature and extent of improvement were clearly a function of severity of illness, personality factors, and type of defense pattern. The various relationships demonstrated suggest a number of directions for future research which deserve mention.

The present findings indicate that the distinction between mood and characterological changes provides a useful basis for interpretation. Specifically, the extent and stability of improvement over time seems directly related to differential changes along this dimension. Thus, patients who tested low on ego strength as well as patients with hysterical trends showed dramatic elevations in mood at both the two- and six-month follow-up but

were unable to maintain the more pervasive personality alterations. In contrast, patients characterized by cyclothymic trends, free-floating anxiety, tension states, obsessive-compulsive symptoms, neurotic depressions, and passive-aggressive tendencies displayed less spectacular shifts in mood shortly after the psychedelic experience but continue to show positive changes in character structure at the six-month follow-up.

These relationships have a number of implications which are currently being investigated further. First, it appears as though the intensity and profundity of the psychedelic experience leads to a major change in an individual's self- and world-view which is reflected to some extent in MMPI changes at two months. The finding that at six months some patients have consolidated these positive changes, while others show a tendency either toward regression or further improvement, suggests that (1) the ability to integrate rapidly acquired insights into one's life style and reality situation is related to differences in pre-treatment personality; (2) the nature and extent of change occurring shortly after the experience provides a basis for predicting need for follow-up treatment in anticipation of subsequent regression; (3) since some patient types continue to demonstrate movement at six months, longer follow-up evaluations are necessary (an additional follow-up at 12 months including assessments of specific changes in behavior are currently being conducted).

While the present investigation demonstrated that personality variables are an important class of determinants of response to LSD, other possible correlates warrant systematic study. These include personal history variables, type of presenting complaints (*e.g.*, neurotic symptoms *vs.* existential-type problems), and variations in the psychedelic experience itself. With regard to the latter, many writers view LSD as a means of triggering a transcendental or "peak" experience (Maslow, 1962) which is followed by major changes in life style. It should be possible to obtain reliable ratings during the experience in order to test this hypothesis. An alternative or supplementary hypothesis, also testable, concerns the pleasantness or unpleasantness of the LSD experience. Wallace's stress theory (1956), for example, would lead one to predict that the extent of personality and behavior change is positively related to the amount of stress experience. Independent ratings on these and other dimensions of the experience have recently been initiated in order to test these suggestive hypotheses.

SUMMARY

MMPI data are presented which were obtained from 60 patients prior to, two months after, and six months after a brief psychotherapeutic program culminating in a single, large dose LSD session. While all sub-groups show significant positive changes at two months, some patients manifest a tendency towards regression while others either consolidate initial gains or display further improvement at six months. The results indicated that the nature, magnitude, and stability of changes following a psychedelic experience were related to personality variables, severity of illness and modal defense patterns.

REFERENCES

ABRAMSON, H. A. (Ed.). *The Use of LSD in Psychotherapy*. New York: Josiah Macy Foundation, 1960.

BARRON, F., & LEARY, T. Changes in psychoneurotic patients with and without psychotherapy. *J. consult. Psychol.*, 1955, **19**, 239-45.

BELLEVILLE, R. E. MMPI score changes induced by LSD-25. *J. clin. Psychol.*, 1956, **12**, 279-82.

BENDER, LORETTA, FARETRA, G., & COBRINK, L. LSD and UML treatment of hospitalized disturbed children, *Rec. Adv. in Biol. Psychiat.*, 1963, **5**, 84-97.

CARTWRIGHT, D., KIRTNER, W., & FISKE, D. Method factors in changes associated with psychotherapy. *J. abnorm. soc. Psychol.* 1963, **66**, 164-75.

CHANDLER, A. L., & HARTMAN, M. A. LSD as a facilitating agent in psychotherapy. *Arch. gen. Psychiat.*, 1960, **2**, 286-300.

CHOLDEN, L., KURLAND, A., & SAVAGE, C. Clinical reactions and tolerance to LSD in chronic schizophrenia. *J. nerv. ment. Dis.*, 1955, **122**, 211-16.

COHEN, S., FICHMAN, S., EISNER, B. Subjective reports of LSD experiences in a context of psychological test performance. *Amer. J. Psychiat.*, 1958, **115**, 30-37.

COSTELLO, C. G. LSD as an adjunct to behavior therapy. Unpublished paper, 1963, Ottawa, Canada.

CUTNER, MARGOT. Analytic work with LSD-25. *Psychiat. Quart.*, 1959, **33**, 715-34.

DAHLSTROM, W. G., & WELSH, G. S. *An MMPI Handbook*. Minneapolis: Univ. of Minnesota Press, 1960.

DEMAAR, E. W., WILLIAMS, H., MILLER, A., PFEIFFER, C. Effects in man of single and combined

oral doses of reserpine, iproniazid, and LSD. *Clin. Pharmacol. Therap.*, 1960, **1**, 23-31.

DITMAN, K. S., HYMAN, M., & WHITTLESEY, J. Nature and frequency of change following LSD. *J. nerv. ment. Dis.*, 1962, **134**, 346-52.

DIMASCIO, A., & KLERMAN, G. Experimental human psychopharmacology: The role of non-drug factors. In G. J. Sarwer-Foner, (Ed.), *The Dynamics of Psychiatric Drug Therapy*. Springfield, Ill.: C. C. Thomas, 1960.

DIMASCIO, A., RINKEL, M., & LEIBERMAN, J. Personality and psychotomimetic drugs. In *Proceedings of the third world congress of psychiatry*. Ontario, Canada, 1961.

EHRLICH, D., & WEINER, D. N. The measurement of values in psychotherapeutic settings. *J. gen. Psychol.*, 1961, **64**, 359-72.

FORD, R. Research approaches to psychotherapy. *J. counsel. Psychol.*, 1959, **6**, 55-60.

FRANK, J. D. *Persuasion and Healing*. Baltimore: Johns Hopkins Press, 1961.

GALLAGHER, J. MMPI changes concomitant with client-centered therapy. In G. S. Welsh & W. G. Dahlstrom, *Basic Readings on the MMPI*. Minneapolis: Univ. of Minnesota Press, 1956.

GOLDSTEIN, A. P. Patient expectancies and nonspecific therapy as a basis for (un)spontaneous remission. *J. clin. Psychol.*, 1960, **16**, 399-403.

HEINE, R. W., & TROSMAN, H. Initial expectations of the doctor-patient interaction as a factor in continuance of psychotherapy. *Psychiatry*, 1960, **23**, 275-78.

KAUFMANN, P. Changes in the MMPI as a function of psychiatric therapy. In G. S. Welsh & W. G. Dahlstrom, *Basic Readings on the MMPI*. Minneapolis: Univ. of Minnesota Press, 1956.

KORNETSKY, C., & HUMPHRIES, O. Relationship between effects of a number of centrally acting drugs and personality. *Arch. Neurol. Psychiat.*, 1957, **77**, 325-27.

LEBOVITS, B., VISOTSKY, H., & OSFIELD, A. LSD and JB 318: A comparison of two hallucinogens. *Arch. gen. Psychiat.*, 1960, **2**, 390-407.

LEWIS, D. J., & SLOANE, R. B. Therapy with LSD. *J. Clin. Exp. Psychopath.*, 1958, **19**, 19-31.

LINTON, H., & LANGS, R. Placebo reactions in a study of LSD-25. *Arch. gen. Psychiat.*, 1962, **6**, 369-383.

LORR, M. Rating scales, behavior inventories, and drugs. In L. Uhr & J. Miller (Eds.), *Drugs and Behavior*. New York: J. Wiley & Sons, 1960.

MACLEAN, J. R., MACDONALD, D. C., BYRNE, U. P., & HUBBARD, A. M. The use of LSD-25 in the treatment of alcoholism and other psychiatric problems. *Quart. J. Stud. Alcohol.*, 1961, **22**, 34-45.

MARKS, P. A., & SEEMAN, W. *The Actuarial Description of Abnormal Personality*. Baltimore: Williams & Wilkins, 1963.

MASLOW, A. *The Psychology of Being*. New York: Van Nostrand, 1962.

MEDUNA, L. J. *Carbon Dioxide Therapy*. Springfield, Ill.: C. C. Thomas, 1950.

MIELKE, F. Methods employed and results obtained in psychiatric studies with new drugs acting on the brain stem. *Amer. J. Psychiat.*, 1957, **114**, 134-46.

NUNNALLY, J. The analysis of profile data. *Psychol. Bull.*, 1962, **59**, 311-19.

RINKEL, M., DIMASCIO, A., ROBEY, A., & ATWELL, C. Personality patterns and reactions to psilocybine. In E. Rothlin (Ed.), *Neuro-psychopharmacology*, vol. 2. Basle, 1961.

ROBINSON, J., DAVIES, L., SACK, E., & MORRISSEY, J. A controlled trial of abreaction with LSD-25. *Brit. J. Psychiat.*, 1963, **109**, 46-53.

SARGEANT, HELEN D. Intrapsychic change: methodological problems in psychotherapy research. *Psychiatry*, 1961, **24**, 93-107.

SAVAGE, C., TERRILL, J., & JACKSON, D. D. LSD, transcendence, and the new beginning. *J. nerv. ment. Dis.*, 1962, **135**, 425-36.

SAVAGE, C., STOLAROFF, M. J., HARMAN, W. W., & FADIMAN, J. Caveat: The psychedelic experience. *J. Neuropsychiat.*, 1963, **5**, 4-6.

SCHMIEGE, G. R. The current status of LSD as a therapeutic tool. *New Jersey Med. Soc. J.*, 1963, **60**, 203-207.

SCHOEN, S. LSD in psychotherapy. *Amer. J. Psychother.*, 1964, **12**, 35-51.

SCHOFIELD, W. Changes following certain therapies as reflected on the MMPI. In G. S. Welsh & W. G. Dahlstrom (Eds.), *Basic Readings on the MMPI*. Minneapolis: Univ. of Minnesota Press, 1956.

SCHULMAN, R. & LONDON, P. Hypnotic susceptibility and MMPI profiles. *J. consult. Psychol.*, 1963, **27**, 157-160.

SHERWOOD, J. N., STOLAROFF, M. J., & HARMAN, W. W. The psychedelic experience—a new concept in psychotherapy. *J. Neuropsychiat.*, 1962, **4**, 69-75.

STRUPP, H. H. The outcome problem in psychotherapy revisited. *Psychotherapy*, 1963, **1**, 1-13.

TENENBAUM, B. Group therapy with LSD-25. *Dis. nerv. Syst.*, 1961, **22**, 459-62.

TROUTON, D., & EYSENCK, H. J. The effect of drugs on behavior. In H. J. Eysenck (Ed.), *Handbook of Abnormal Psychology*. New York: Basic Books, 1961.

UNGER, S. M. Mescaline, LSD, psilocybin, and personality change. *Psychiatry*, 1963, **26**, 111-125.

VAN DUSEN, W. LSD and the enlightment of Zen. *Psychologia*, 1961, **4**, 11-16.

WALLACE, A. F. C. Stress and rapid personality change. *Internat. Rec. Med.*, 1956, **169**, 761-774.

WALLACH, M. S., & STRUPP, H. H. Psychotherapists' clinical judgements and attitudes towards patients. *J. consult. Psychol.*, 1960, **24**, 316-323.

ZUBIN, J., & KATZ, M. M. Psychopharmacology and personality. In P. Worschel & D. Byrne (Eds.), *Personality Change*. New York: John Wiley & Sons, 1964.