FIELD DEPENDENCY AND REHABILITATION THERAPY

IN

PHYSICALLY DISABLED PATIENTS

by

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CHAPTER I

INTRODUCTION

Problem

Will a brief period of intensive physical training which brings about the development of increased self reliance in a group of chronically disabled patients also produce changes in Field-Dependency-Independency?[1] The study is oriented towards possible change in F-D-I as measured by the Rod and Frame Test and a constellation of other variables that have been previously associated with F-D-I.

F-D-I is a concept derived from the Rod and Frame Test and from other tests which have been shown by Witkin et al. (1954, 1962) to be significantly correlated with each other. It is a construct to account for the communality among measures of the accuracy of perceiving the vertical in a series of experimental conditions where internal cues are in conflict with external visual cues. The construct is also intended to account for variations in ease

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[1]For convenience Field-Dependency-Independency will be referred to hereafter as F-D-I, Field-Dependency or Field-Dependent as F-D, and Field-Independency or Field-Independent as F-I.

and accuracy of separating elements from their context. F-D or F-I is not a dichotomous trait. Scores vary along a continuum. Everybody is to some degree F-D. The least F-D are called F-I.

Processes involved in the perception of the vertical are highly relevant to F-D-I. Given a conflict between internal cues and visual cues, the F-I persons are able to utilize the internal cues more appropriately than the F-D. Analytic vs. global attitude is another relevant variable. F-I persons can separate elements from their context more readily than F-D persons who tend to merge elements.

In earlier research a constellation of relationships between F-D-I measures and performances on tests indicative of intelligence and other features of personality has been found. Behavior associated with F-D-I was expressed in measures of intellect and of personality. Intellectually F-D-I is expressed by tasks lending themselves to analytic vs. global reactions. In the area of Personality, F-D-I is expressed by tests and situations which involve different degrees of self acceptance, self awareness and the capacity to struggle against the environment to achieve an objective correlated with F-D-I behavior.

So far consistent patterns of these relationships have been found in normal populations. Few studies have dealt with the effect of intensive training on a physically handicapped population. It is possible that physically impaired patients also regressed in areas of personality functioning. Retraining in coping with the environment could result in a changed self image. Therefore it is worth investigating the stability of the pattern of relationships between F-D-I and selected intellectual and personality measures in chronically disabled patients.

Consider a population of chronically disabled patients undergoing rehabilitation training. Does this brief intensive training in self sufficiency accomplish its purpose? If there is behavioral change, are there concomitant changes in F-D-I as measured by the Rod and Frame Test and as expressed in intellectual functioning and personality measures?

Literature

Originally single motivational forces, relatively isolated, represented the points of interest for experimentation in the area of perception. Witkin et al. (1954, 1962) contributed to the study of perceptual style by coining the concept of F-D-I and by investigating its implications in the personality and perceptual spheres.

Witkin (1965) saw F-D-I as central in a constellation of relationships which includes intellectual and personality functions. The common factors that integrate these functions are the articulation of body concept and a sense of separate identity. He called the style "global-articulated" which differentiates between people who experience the world in a diffuse manner and those who react to it analytically.

Tasks used to investigate F-D-I directly

To investigate F-D-I behavior Witkin and his coworkers used four perceptual tests: The Rod and Frame, the Tilting-Room-Tilting-Chair, the Rotating-Room and Gottschaldt's Embedded Figures.

In the present study the sole measure to estimate F-D-I was the Rod and Frame Test (RFT).[2] The RFT requires that a subject adjust a luminous rod to the vertical. The rod is within a luminous frame that can be upright or can be tilted to the left or right.

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[2]The nature of the population made it unfeasible to use other measures. A pilot study in which a sample of B. S. Coler patients was tested showed that they had great difficulty with the Embedded Figures, taking much longer than non-hospitalized subjects.

Test performances associated with F-D-I

Intellectual tasks

In the past, when testing neurotic, schizophrenic and brain damaged patients, it was shown by Cohen (1952) by way of a factor analysis that the three performance subtests of the Wechsler-Bellevue, Block Design, Picture Completion and Object Assembly, load on a Perceptual Organization factor. In these three subtests the subject is faced with the task of analyzing and structuring experience. He has to see the relationship between parts and the whole configuration. A further factor analysis by Cohen (1957) with normal subjects showed that only Block Design and Object Assembly consistently loaded on the Perceptual Organization factor. Later Goodenough and Karp (1961) identified a parallel to intellectual behavior in perceptual functioning. The authors did a factor analysis on the WISC results of a group of boys and girls aged 12, and a group of boys aged 10. The subtests of the WISC, Block Design, Picture Completion and Object Assembly showed the highest correlations with F-D-I in the direction that the more F-I subjects performed better than the more F-D subjects. These three subtests comprise the Analytic Index which became the measure for change in intellectual functioning in the present study

with an impaired population.

Personality investigations

Two devices for investigating personality used originally by Witkin et al. were employed in the present study. They are the Figure Drawing Test and the TAT.

Figure Drawing Test.--Since concern about the body is of particular importance in a physically impaired population one of the techniques selected from the original battery was Figure-Drawings. According to Machover (1949) Figure-Drawings "indicate an intimate tie-up between the figure drawn and the personality of the individual who is doing the drawing."

Machover had devised a variety of measures for the Figure-Drawings which show degree of body confidence, struggle for sexual identification, drive and drive modification present within an individual. She found composite scores based on these dimensions to be highly differentiating between F-I and F-D subjects in a number of populations such as children, college students and mental hospital patients. These drawings would appear thus to reflect some significant self attitudes of people. F-I subjects evaluated their bodies more favorably, while F-D subjects revealed a relatively primitive body image.

Primitive in the sense that an underdeveloped self concept was projected onto the representation of the body. It included disproportionate body formations, a minimum of sexual characteristics as well as other features to be described later when quantitative measures for Figure-Drawings will be discussed.

The meaning of the body concept is an expression of the manner in which a person experiences the self. It is based on factual knowledge about the body, as well as on the unique and personal feelings and values attributed by the individual to the body. In the physically disabled it would be of particular interest to deal with these drawings as representative of the patient's body concept. These drawings must be used with caution when referring to body image though, clinically, there are many cases in which they are related to a patient's body concept. In the past ten years there have been a number of conflicting articles concerning the validity of using figure drawings. Among the more positive evidence are the following studies:

When the Figure-Drawings of 50 crippled and 50 non-crippled children, ages 6-11, were rated by Wysocki and Whitney (1965) in accordance with Machover's criteria some of the assumptions were confirmed. The crippled children

expressed more aggression and feelings of inadequacy. Furthermore, 36 percent of the crippled indicated an area of insult in their drawings which corresponded to their own crippling condition. Polio patients frequently omitted parts of the body in which function was lost.

Schmidt and McGowan (1959) had judges place the figure-drawings of 30 physically disabled and 30 normal persons into disabled and normal categories. The Chi Square of 14.34, significant at .01, showed that the figure-drawings by the two groups were distinguishable.

Many studies of Figure-Drawings were done with psychiatric populations. An investigation that supports the notion that the perception of oneself is projected onto the figure drawn was done by Kamano (1960). He asked 45 hospitalized schizophrenic women, aged 18-38, to rate fifteen concepts on Osgood's Semantic Differential with regard to their "Actual Self," "Ideal Self" and "Least Liked Self." The same fifteen concepts were employed by each patient for rating her drawing of a woman. The highest correlation obtained, $r = .59$, significant at .01, was between the figure drawn and the "Actual Self."

Holzberg and Wechsler (1950) studied the discriminatory value of Figure-Drawings in differentiating

between normal and schizophrenic subjects. A check list of 174 items for drawings of the human figure was completed, and the productions of schizophrenics and student nurses, both of at least normal intelligence, were rated. The schizophrenic women exhibited less interest in feminine attributes, such as hair and sophisticated clothing. They also drew transparencies more often and omitted both legs and feet. Nevertheless many of the items on the check list were not usable in order to differentiate between the schizophrenic and normal groups, so that results only partially support its discriminatory value.

Surveys of the literature by Roback (1968) and Swensen (1968) present contradictory evidence with regard to the body image hypothesis. Apparently there is more than one influence on Figure-Drawings. It does not seem wholly the result of an identity projection, and its significance could vary from person to person. However, findings with respect to the physically disabled suggest that for them there is a relationship between body concept and the drawing of the human figure.

TAT.--Another personality assessment technique employed by Witkin et al. was the TAT. This test differs from the Figure-Drawing Test in that it is a verbal task which provides conscious and unconscious information about the fantasy life of a person. The extent of self

assertiveness of the most important figure in each story was established. The criterion for rating was whether or not the central character could cope with the environment and with his problems. It was found by Witkin et al. that highly F-I persons produced more stories with self assertive content than did highly F-D subjects. The TAT seemed particularly appropriate to test a hospital population, since active coping with the environment is essential to a patient's improvement.

Effect of experience on F-D-I and on intellectual and personality factors associated with F-D-I behavior

Developmental changes

There seems to be a developmental progression as far as F-D-I is concerned. Investigations indicate that there is a relationship between the ages of experimental groups studied and degree of F-D-I.

Witkin, Goodenough and Karp (1967) followed the changes in perceptual functioning in a group of eight-year olds, retesting them after five years at age thirteen. Another group of ten-year-olds was retested at ages fourteen, seventeen and twenty-four. In addition to these longitudinal studies comparable cross sectional data was obtained which supported the following results: Up to age seventeen the subjects increased in

F-I, and they did not change any further between ages seventeen and twenty-four. Even over fourteen years marked relative stability within this general developmental trend was noticeable.

In general it has been established that once maturity is attained F-D-I hardly shows any alteration. When adult subjects were retested on RFT after one-year and three-year intervals significantly high correlations were obtained by Witkin et al., indicating marked stability in people's manner of perception of the vertical.

There is probably a retrogressive change in RFT performance with advanced aging. Some support for the hypothesis of change in later years comes from Schwartz and Karp (1967). They compared three different age groups, one of 17-year-olds, the second 30 to 39-year-olds and the third ranging from 58 to 80 years, on perceptual F-D-I tasks. On the RFT the 17-year-old-group obtained a mean error score of 8.5° for males and 11.8° for females, the 30 to 39-year-olds of 12.3° and 16.8° respectively, and the geriatric group scored an average of 27.7° and 23.7°. The older sample readily accepted the frame as the standard for verticality, and movement of the rod was always in the direction of the tilt of the frame. These results are in agreement with

Goldfarb's (Arieti 1959) view that insecurity, loss of self-esteem and dependency in old age are critical issues pertaining to problems of decline in old age, but they have to be interpreted with some caution. The comparability of the aged sample with the younger groups left much to be desired. The older subjects were primarily foreign born, were mostly supported through Social Security and had only attended Grammar School. The middle group consisted of native born subjects, the men gainfully employed and the women functioning as housewives, who had received a High School education. The youngest group consisted of students recruited from High School who belonged to the middle class.

In addition when Karp (1967) divided retired subjects into three groups ranging in age from 60-67, 68-74 and 75-92 he found the greatest change in F-D until age 74. Beyond that there was little increase. It suggests that a plateau in F-D is reached in the seventh decade.

Effect of diseases of the Nervous System

The situation where a person deviates from the normal as a result of disease is of importance for a study dealing with physically impaired individuals. It is well known that visual space perception is disturbed in many brain injured persons, so that possibly their performance

on RFT would have been different prior to their illness. Bruell and Peszesynski (1958) attempted to assess the prognostic value of the disturbance for rehabilitation training for hemiplegic patients. They tested a group of normal college students, average age 20 years, an elderly group with a mean age of 73.2 years, groups of Spinal Cord, Multiple Sclerosis and Parkinson's Disease patients, as well as Hemiplegics. Average errors on RFT ranged from 14.1° for Hemiplegics through 5.6° for the elderly, 4.3° for Parkinsonians, 4.2° for Multiple Sclerotics, 2.8° for Spinal Cord patients to 1.9° for the college sample. The relatively low average error in all groups can be attributed to the procedure used by Bruell and Peszcsynski. Testing was interrupted when the examiner doubted that the subject understood the instructions, and the subject then was asked to perform with lights on. The error score was significantly larger for the Hemiplegics than it was even for the elderly. As for the prognostic value of their investigation Hemiplegics with error scores of less than 10° were more likely to benefit from rehabilitation than those with larger errors.

Alcoholism affects the Nervous System. Karp, Witkin and Goodenough (1965) found chronically alcoholic

patients to be markedly F-D individuals. In their study which focused on the problem of stability they dealt with the effect of alcohol on F-D-I. They wanted to find out whether F-D is a consequence of alcoholism, or whether F-D antedates the onset of drinking behavior. If the psychological dimension were a consequence of alcoholism it was thought that F-D would be greater when a person was intoxicated than when sober, greater among chronic alcoholics, and would be less among people who stopped drinking than among those who were inveterate drinkers. The subjects, 24 male alcoholics, were tested twice, the first time when they were sober, and once when they were given a certain dosage of alcohol. The test retest interval was one to seven days. No evidence was found as far as performance on RFT was concerned that the extent of F-D was affected by the ingestion of alcohol. There was no significant difference between pre- and post-tests.

At the Topeka Veterans Administration Hospital results were obtained which differed from Karp, Witkin and Goodenough's findings. There chronic alcoholic patients were exposed to a three months' psychiatric treatment program. The patients in this program were evaluated at the beginning and at the end of the treatment period.

RFT was one of the tests given at pre- and post-treatment time. Sixty-two male alcoholics were tested by Goldstein and Chotlos (1966) to test the hypothesis that treatment would affect the RFT performance of chronic alcoholic patients. After approximately 8 to 10 weeks the patients showed a mean decrease of 3.3^{o} on RFT which was highly significant. It is likely that performance on the test improved after a period of abstinence from alcohol ingestion, but there is no mention of a control group which did not receive treatment for three months. It is difficult to judge, therefore, whether it was abstaining from alcohol or the psychiatric treatment which caused lower RFT scores. Whatever the cause, a change in F-D-I took place, a result which casts some doubt on the stability hypothesis as it applies to RFT.

Conditions of living that produce different degrees of F-D-I

Apparently extensive training in space orientation such as one receives in ballet does not greatly influence F-D-I. Gruen (1955) compared the performance of dancers and Brooklyn College students on perception and personality measures. He administered the usual F-D-I tests. No significant differences were found between the performance level of dancers and students. Furthermore, the

relationship between perception and personality test scores of the dance group were similar to those of the control group for Rorschach and Interview techniques, but on Figure-Drawings correlations were consistently lower for the dancers. Since personality tests intercorrelations were much lower than perception and personality correlations Gruen concluded that perceptual performance on various tasks is related to personality, but that there are more factors involved than the single dimension of F-D-I.

If not training in balance and muscular control then activity could be a living condition affecting F-D-I performance. Comalli (1965) compared a group of Spanish American War Veterans, aged 80-90, to a group of men, aged 65-80, who were members of a Working Center. There was no difference between the perceptual performance of the Spanish War Veterans and the actively employed members of the Center. Karp (1967) thought the Spanish War Veterans to be a particularly active group, so he tested 20 employed and 20 retired males between the ages of 60 and 75 on RFT. He found the actively employed group to be more F-I.

Experiments attempting change of F-D-I

There are conflicting reports on whether experimental manipulation can induce change in F-D-I. Threat to the self

esteem increased F-D in 17 female volunteer college students. Hill and Feigenbaum (1966) established a F-D-I base rating on RFT for each subject. A week later a stress situation was set up in which each subject was told that she did worse on a social desirability questionnaire which rated the students than any of the other women. Immediately following the artificial stress situation the RFT was readministered, and scores increased significantly. A control group of women did not show any change. Although all experimental subjects increased their mean error scores their relative standing on the dimension of F-D-I remained stable.

The effect of brief sensory deprivation on F-D-I was studied by Jacobson (1966). He assumed that attention to internal stimuli would increase under a sensory deprivation condition and that, consequently, a person would become more aware of his own body. Jacobson believed that greater attention to proprioceptive cues would lead to a reduction in attention to visual cues. In turn, the reduction of visual cues would result in a significant decrease in the level of F-D-I. Subsequent to the RFT pretest experimental subjects underwent one hour of sensory deprivation. They were retested on the RFT immediately following the sensory deprivation

period. Control subjects were instructed to remain awake and were watched that they would do so during the interim one hour between pre- and posttesting. The data indicated that the experimental group had a significantly greater reduction of the mean sum of errors, while the control group did not score any significant change. This particular study suggests that F-D persons may become less so when reliance on internal body sensations is strengthened by modifying the sensory environment, or possibly also by encouraging self reliance by physical retraining.

A study which supported the notion of stablity of F-D-I showed that training can only have a temporary effect. The results cannot be called conclusive since the experimental and control groups were very small. Elliott and McMichael (1963) selected two groups consisting of 4 females and 3 males each who, at the original testing had made at least an average error of 2.5° on RFT. Nine days later the one group was tested again after pointing out the distorting influence of the frame and urging the subject to disregard it and to use bodily clues instead. The other group was retested by being given the same instructions as the first group. In addition, subjects in the second group were continually informed how they were doing, so that they were aware of their errors. There was no

improvement associated with the training of the first group, but in the second group all members decreased their error score. To see whether people can achieve a permanent change on F-D-I the second group was re-tested 4 to 7 weeks later under normal RFT conditions. Now the improvement was completely lost, the error scores resembling those at pretesting. The authors concluded that the basis for the reduced scores at the second testing was not caused by more accurate perception. Rather by having learned one's own relative constant error tendency a subject developed judgment clues for the specific situation.

Summary

From the studies cited the following can be concluded:

There are minimal changes during the course of development except for early and late ages. Even with changes a person's position in relation to the group tends to remain stable.

There is some evidence that individuals who are brain damaged and alcoholics are more F-D than unimpaired subjects.

Reports are conflicting whether special conditions of living, such as amount of activity, produce varied

degress of F-D-I.

Experimental manipulations, i.e. stress situations or sensory isolation had their effect on RFT performance. On the other hand, training and instruction in order to decrease F-D did not have any permanent influence.

Problems Relevant to this Study

This is a study in which chronically disabled patients were exposed to a physical retraining program. It attempted to determine whether the nature of changes as a result of rehabilitation was in physical as well as in psychic areas.

The training consists of physical exercises devised to strengthen and activate those part of the body which have not been in use. Changes in physical behavior can be ascertained through repeated ratings on an Activities of Daily Living Scale (ADL). The ADL designed by Dinnerstein, Lowenthal and Dexter (1965) was used in this study.

In the disabled a relationship exists between the state of physical well being and degree of adjustment to the environment. Fisher (1966) focused on the relationship between body attitudes and personality processes. He found that the mode of experiencing one's body boundaries is linked to traits relating to

self-assertion and coping behavior. Dissatisfaction with one's body was associated with a low self-concept. Fisher's specific interest centers around personality characteristics and the manner in which an individual distributes attention to his body.

Neff and Weiss (1965) enlarged the psychological field involved in the adjustment of the disabled. According to them a great deal of the problems of the impaired center around "psychosocial barriers to life adjustment." How a disabled individual reacts to his new life situation which can include loss of family, friends, job, largely depends on his general way of adaptation. The authors maintain that, just like healthy individuals, the disabled display a wide range of cognitive and behavioral response patterns. They view rehabilitation procedures as an attempt at restoration of earlier more meaningful functioning. The traumatic experience of physical impairment can, to some patients, represent a blow to narcissism and to others an awareness of the bodily resources which are remaining. Similarly the thwarting of goals can lead to lowered self-esteem and passivity, or to coping behavior and renewed attempts at overcoming obstacles. Thus environmental, physical and psychological factors have a role in the adjustment

of the handicapped. After a period of retraining it is to be expected, according to the authors, that not only physical improvement occurs, but also emotional reactions become stabilized.

If physical impairment has its effect on personality there also exist patterns of psychological organization which may help or hinder in the rehabilitation progress. For instance, in discussing handicapped patients, Hughes (1960) cautions that greater awareness does not necessarily mean self-acceptance. Excessive self-acceptance can prevent a disabled person from attempting to do things he could handle. Greater awareness should mean the ability to recognize and accept one's physical and mental limitations, but should not result in dependency and total inactivity. Dependency is one of the outstanding attributes of the F-D individual, and it could be a fatal characteristic for a chronically disabled patient.

A rehabilitation program is geared towards strenghening the coping behavior of the disabled. Patients are trained to adjust more efficiently to institutional functioning. The specific manner of retraining stresses differentiation between parts of the body and their proper utilization. Environmental clues have to be

distinguished from proprioceptive inner stimuli in order to achieve a sense of balance. These training procedures, designed to strengthen independent behavior, utilize factors related to F-D-I. Patients who thus attain increased self-confidence are given a greater chance for change than patients whose only treatment consists of medical care.

Hypotheses

1. Disabled patients who are retrained to master activities of daily living will become perceptually less field-dependent on tests measuring F-D-I and on personality and intellectual tasks associated with F-D-I after a period of three months. They will show changes in self sufficiency, self awareness and intellectual-analytic behavior.

In terms of the tests and measures used in this study the following is expected of patients receiving physical rehabilitation training as compared to patients not receiving such treatment.

Perceptually

They will show a reduction on RFT scores.

Intellectually

They will show better intellectual-analytic ability by an increase on the Analytic Index score of the WAIS.

Personality Characteristics

They will show a reduction, indicative of a higher degree of self-acceptance, on Machover's Graphic Items Scale score for Figure-Drawings. The scale includes items specifically related to levels of activity, body esteem and self assurance.

They will show a reduction on the Lack-of-Self-Assertiveness score of the TAT.

2. All patients, regardless of whether they are in rehabilitation or control, whose change scores on ADL show physical improvement or deterioration will concomitantly show changes on RFT, the Analytic Index of the WAIS, Figure-Drawings and the TAT, commensurate with the degree and direction of change on ADL.

CHAPTER II

METHOD

In an investigation of the relation between an individual's characteristic way of perceiving and his general personality organization a number of tests originally used by Witkin et al. (1954) were administered to physically disabled patients. The population of a hospital for chronic diseases was chosen because, as the design of the study required retesting after a period of three months, it was reasonable to assume that the majority of subjects in a center for long term care would still be available at this time.

Some of the patients in this hospital are retrained to cope with the physical environment, while others are given only medication without any special training. This situation made possible the obtaining of two populations who differed with regard to having or not having physical rehabilitation training.

Selection and Description of Subjects

Subjects

According to past experience in Bird S. Coler Hospital expectations were that out of approximately 90 subjects at least 50 patients in a rehabilitation group (R), and 20 patients in a non-rehabilitation group (NR) would remain after a period of three months. Thus initially, during the first two weeks of their admission, 90 patients who had entered the hospital within a twelve-months period were approached with the request to cooperate. The total admission figure during this period was approximately six hundred patients.

Alternating between male and female admission wards the examiner asked the head nurse whether the newest patient admitted was well enough oriented to answer questions, could use his dominant hand, and could be moved from the floor by sitting in a wheelchair. If these requirements were met the examiner asked the patient's permission to use him in a psychological study in the area of physical rehabilitation. It was explained that he personally would not profit by this experiment, but that he would contribute toward furthering scientific knowledge. Eighty-seven of the 90 patients thus approached agreed to be tested.

An additional three patients had to be excluded from the study as they scored below a pre-selected cut off point of intelligence on the Verbal Index of the WAIS. The Verbal Index and the cut off point are described later.

Of the remaining 84 subjects, 41 males and 43 females, 8 went home before it was time for retesting, 2 were transferred to other hospitals, and one woman was too ill to be disturbed. The last three patients were not given the second battery of tests because the required number of subjects for the experimental and the control groups had been obtained. Since hospital procedure did not allow for randomly assigning of the disabled into a rehabilitation (R) group and a non-rehabilitation (NR) group the experimental group consisted of the first 50 patients in a physical retraining program, and the control comprised the first 20 patients who had not been exposed to physical rehabilitation. Each patient was given a number and subjects were retested sequentially if still present after three months. Assignment of the patients to a rehabilitation program was done by a team of doctors, nurses and physical therapists.

B. S. Coler patients represent a largely underprivileged population, belonging to a low income group.

A detailed account of their educational and socioeconomic background can be found in Appendix A.

The 50 subjects for the R group, 25 males and 25 females, ranged in age from 19 to 81. The patients were heterogenous with regard to physical disability. A variety of impairments were represented including the following cases: 16 hemiplegics, 4 diabetics, 5 with multiple sclerosis, 8 with peripheral neuropathy and 17 with other ailments such as diseases of the spinal cord, arthritis, heart, amputation, etc.

The 20 subjects for the NR group, 11 males and 9 females, ranged in age from 19 to 84 years. Again patients were heterogenous with regard to physical disability. The cases included 5 hemiplegics, 1 diabetic, 2 with multiple sclerosis, 3 with peripheral neuropathy and 9 patients with other ailments such as diseases of the spinal cord, arthritis, heart, amputation, etc.

Procedure and Tests

The first half of the testing usually took place in the morning and the second part in the afternoon. Each subject was tested individually.

Tasks performed by the subjects could be divided into functioning in four areas: 1) physical, 2) intellectual, 3) perceptual, and 4) personality. The last

three were all selected from the battery given by Witkin et al.

Rating of physical functioning

Activities of Daily Living (ADL)

The design of the study necessitated a quantitative evaluation of the physical behavior exhibited by a patient at the time of initial testing, as well as after a three-months-interval. Hence during the first two weeks after admission an Activities of Daily Living (ADL) rating was computed for each patient by the nurse supervisor. The rating scale was designed by Dinnerstein, Lowenthal and Dexter (1965) to obtain a numerical rating of a patient's ability in 66 different behaviors in 11 areas of functioning.

Activities covered were: 1) Transfer from bed, 2) Grooming, 3) Dressing, 4) Wheelchair, 5) Ambulation, 6) Bathroom, 7) Feeding, 8) Care of possessions, 9) Undressing, 10) Transfer to bed, and 11) Interpersonal relations. The last item "Interpersonal relations" does not refer to purely physical behavior, but also to voluntary participation in activities outside the limits of the ward. It was decided, therefore, to consider Part 11 as an unconnected measure called Social ADL, and to treat it as a separate variable of secondary importance.

Each activity was rated on a five-point scale as follows: 0 = Independent, 1 = Difficult, but still independent, 2 = Supervision, 3 = Physical help, 4 = Dependent.

The range for the full ADL scale is 0 to 264. For ADL without "Interpersonal Relations" the range is 0 to 240, for Social ADL alone 0 to 24. A copy of the ADL form is attached in Appendix B.

Dinnerstein et al. (1965) had done a reliability study by correlating the ADL ratings of twenty patients who were evaluated by a researcher, a physical therapist and an occupational therapist, and nurses' aides. Correlations ranged from .93 to .99 for initial ratings of the patients, as well as for ratings done two months later. The high level of interrater reliability showed that trained raters, working independently of each other, could strongly agree concerning a patient's ADL status.

To examine the reliability of rating of this study, ADL forms for the first twenty patients were filled out in their entirety twice for each subject by a nurse supervisor, a physical therapist and a nurses' aide. The hospital requires every nurse supervisor to attend an ADL course given by the chief nurse clinician. The nurses' aide had taken part in the original study on ADL by Dinnerstein et al. and the physical therapist was trained in ADL ratings.

Intellectual functioning

Verbal Index

First three subtests of the WAIS, namely Information, Comprehension and Vocabulary, were administered to the subject and a Verbal Index score was computed. The Verbal Index consisted of the sum of the scaled scores of these three tests and served as control for level of intelligence. Any patient who did not at least attain a total score of 24 was not tested any further. When Witkin et al. (1962) considered the relation of perceptual tasks to Verbal Index of the WISC in a group of ten-year-olds they obtained a nonsignificant Pearson's r of .26. These results suggest that verbal intelligence and mode of perception are not necessarily related.

Analytic Index

An additional three subtests of the WAIS made up the Analytic Index, consisting of the sum of the scaled scores of Picture Completion, Block Design and Object Assembly. Good performance on these subtests revealed a subject's capacity of overcoming an embedded context which makes an analytic way of experiencing possible. Hence, a high score is viewed as representing the analytic field approach in intellectual activities as opposed to global functioning.

In contrast to the non significant correlation coefficient for Perceptual and Verbal Indices Witkin et al. (1962), in the study with ten-year-olds obtained an r of .66, significant at the .01 level, for Perceptual Index and Analytic Index. At least in ten-year-old boys performance skills on the WISC were more closely related to mode of field approach than those of a verbal nature.

Perceptual ability

Rod-and-Frame Test (RFT)

Following the administration of the six subtests of the WAIS the patient was brought into a dark room with a mask over his face, and with instructions to keep his eyes closed. The wheelchair of the subject was placed six feet in front of the Rod-and-Frame apparatus. Since the experiment takes place in a completely darkened room the normal visual field was eliminated. The test evaluates the person's perception of the upright as influenced by a luminous frame. The instrument used consisted of a square frame, its sides one inch wide and forty-two inches long within which was a mounted rod one inch wide and thirty-nine inches long. Frame and rod could be tilted from side to side independently of each other. Frame and rod were coated with luminous paint and during the test were the only objects visible in a completely dark

room. Mounted on the back of the frame shaft was a protractor which was fixed and against which a movable pointer marked off the degrees of the displacement from the true vertical.

First the subject was asked to show his right hand. If he was unable to distinguish between right and left he was given a penny to hold in one hand. Then the following instructions were given to the subject: "In this test we want to find out how well you can determine the upright, i.e. the vertical. When you open your eyes, you will see a square frame and within this frame you will see a rod. Except for the frame and the rod the room will be in complete darkness. It is possible for me to tilt the frame to the left or the right. I can also tilt the rod to the left or right. I can tilt the frame alone or the rod alone, or I can tilt them both at the same time, either to the same side or to the opposite side. When you open your eyes at the beginning of each trial I want you to tell me whether the rod and frame are straight up and down--i.e. vertical--or whether the rod and frame are straight with the walls of this room or whether they are tilted." "Are there any questions?" "It is of the utmost importance that you keep your eyes closed at all times except when I specifically ask you to open them. Also when I ask you to close your eyes, please do so promptly."

The subject was given eight trials with two trials at each of four different pairs of setting of the rod and the frame. The conditions were the following: Trial 1: The frame was adjusted to -28^{o}, a deviation from 0 to the right, and the rod to -28^{o}. Instructions were: "Raise your mask and open your eyes. Can you see the frame and the rod? What is the position of the rod and the frame?"

If the subject said that the rod was not vertical, it was said to him: "I will now turn the rod slowly until you think it is straight with the walls of this room. As I said, I will turn it slowly, and after each turn, tell me whether it has been turned enough or whether you want it turned some more. Just say "more" or "enough" after each turn. Please make your decisions quickly and don't be too finicky."

"Which way shall I move the rod to make it vertical to the right or to the left, (or towards the hand in which you have the penny, or the other)?"

Now the rod was moved about three degrees at a time opposite to the direction in which the subject said it was tilted until he reported "enough." On this first trial only the subject after he reported the rod as vertical was asked: "Is the rod now vertical, that is is it straight with the walls of this room? In other words, is

it straight up the way the flagpole outside is."

If the subject now said that he wanted the rod moved some more in either direction, it was done. Then the subject was asked to close his eyes, and the position of the rod was recorded.

Trial 2: The frame was left at -28^{o} (to the right from 0) and the rod adjusted to $+28^{o}$ (to the left from 0). Instructions were: "Would you tell me now and at the beginning of all subsequent trials whether the rod and the frame are straight with the walls of this room, or tilted, and if the rod is tilted, whether this rod should be moved to the right or to the left to be made straight."

Trial 3:	Frame at $+28^{o}$	rod at $+28^{o}$
Trial 4:	Frame at $+28^{o}$	rod at -28^{o}
Trial 5:	Frame at -28^{o}	rod at -28^{o}
Trial 6:	Frame at -28^{o}	rod at $+28^{o}$
Trial 7:	Frame at $+28^{o}$	rod at $+28^{o}$
Trial 8:	Frame at $+28^{o}$	rod at -28^{o}

A large deviation from the upright, from 0, when the rod was reported to be straight indicated adherence to the visual field, whereas a small deviation indicated reliance on one's body.

The amount by which the subject's setting of the rod was off the true vertical was determined for each of

the trials. The direction of the deviation was not taken into account, and the scores of all eight trials were averaged, the result representing the mean error for the subject.

Personality characteristics

If the manner in which a person orients himself in space is related to his general psychological functioning, performance on RFT would be associated with certain trends in his personality organization as revealed by some projective techniques.

Figure-Drawing Test (FDT)

The second half of the testing started with the request to the patient to draw a person, and then to draw a person of the other sex. Machover (Witkin et al. 1954) developed a short graphic scale of 45 items for women and 40 items for men which discriminated among subjects with varying ranges of accomplishment on perceptual tasks, such as RFT. The scale, described below, served as a scorable counterpart of personality characteristics which were found to be related to F-D-I. With few exceptions the same items could be used for men and women. The drawings of highly F-D individuals contained more graphic items than those produced by highly F-I people. Correlations between

RFT scores and FDT scores obtained by Witkin et al. were .70 for men and .54 for women respectively, both significant below the .01 level.

The list of items on the scale can be divided into the following three categories according to different dimensions of personality:

LACK OF BODY CONFIDENCE. Items in this category include weak body posture in the self-sex figure, meager sex characteristics, primitive expressions of anxiety, i.e. shading or transparencies, foot peculiarities, and hostility towards the opposite sex.

LACK OF STRUGGLE FOR SEXUAL IDENTIFICATION. These items show confusion about how to manage one's adult role with self-confidence and, therefore, include absence of masculine or feminine traits, as well as a lack of sensuous features, such as full lips.

LACK OF DRIVE AND DRIVE MODIFICATIONS. This category deals with activity-passivity. Weakness of drive as shown in "arms out away from the body," for instance, suggests need for contact or support. Poor control of drive is represented by such items as lack of margin at neckline or at cuffs, or too much emphasis on accessories instead of on essential features.

In Appendix C the list of graphic items is presented,

together with a brief description of each item as copied from Witkin et al.

Each subject received a single score by adding the total number of graphic items found in his drawings, dividing the result by the total number of items, 45 for women and 40 for men, and finally by converting the ratio into a percentage. Thus the percentage represents lack of adequacy in Figure-Drawings. A high score on the graphic item scale suggested lack of self-assurance, ineffective controls, poor male-female differentiation and, frequently, immature dependency needs.

Since Witkin et al. obtained high correlations, ranging from .90 to .76 between "Body Confidence," "Sexual Identification" and "Drive" scores division into these categories was not maintained in the statistical handling of the data.

In addition to the examiner two advanced graduate students in psychology who were especially trained by means of the pilot study, independently scored the 70 pretest and 70 posttest sets of the drawings. This was done to establish the reliability of the examiner's judgments. Except for the description of the sex of the patient all means of identification were removed. Furthermore, the independent judges were not familiar with the design or purpose of the study, and only knew that

they were to evaluate one male and one female drawing of chronically disabled patients. As will be shown in the Result section there was high agreement among the judges which warranted the use of the examiner's judgments.

Thematic Apperception Test (TAT)

For the final test in the battery the subjects were asked to tell some stories to pictures. The purpose of administering the TAT to the patients was to obtain a sample of their fantasy life by giving additional, less direct, indications of coping behavior.

The subjects were assured that there was no right or wrong way of responding to this task, but that the examiner was interested in the extent of their imagination and creativity. Instructions were to describe what was going on in each picture, what led to the situation perceived and what would happen in the future, so that the story had a beginning, a middle, and an end. In addition, the patients were urged to say something about the people in the picture, what they were doing, thinking, feeling.

Each subject was presented with the following eleven TAT cards:

1 A boy with a violin

2 Three people on a farm

3BM A person huddled on the floor

6BM An elderly woman and a younger man

7BM An older man and a young man

8BM An operation performed on a man by two others, and a young boy in the foreground

12M A young person on a couch with an older man leaning over him

12F A young woman and a weird old woman

14 Silhouette of a man near an open window

17BM A man climbing a rope

18GF A woman with hands around another's throat.

Cards 1, 2, 3BM, 7BM, 12M, 12F and 14 were selected because Witkin et al. found them to be discriminating between high and low performers on perceptual tasks, such as the RFT, in either men or women. Moreover, cards 8BM and 17BM were added because they deal with physical aspects of the personality. Thus card 8BM produced responses like reaction to pain, operations, doctors, outside help, frequently revealing dependent behavior. Card 17BM, on the other hand, often brought out self-reliance and pride in bodily activity. Card 18GF was included because the patient population contained many angry, frustrated people, as well as individuals engaged in power struggle. The choice of this card was fortunate as it showed how a subject dealt with his anger, either aggressively or unassertively.

While the subject told a story to a picture the examiner wrote it down using the patient's exact words. Most of the subjects were rather unimaginative so that, on the average, this procedure only took about a half hour.

Each story was judged for lack-of-self-assertiveness of the central character, if it was possible to make such a judgment. Since the previous findings of a pilot study of a sample of nine patients of the hospital population showed that frequently these people did not identify with a particular principal character the general atmosphere of the story also was taken into account. For instance, if the three people in card 2 were proud of their hard work and successful crops, the story was thought to show self-assertiveness. Scoring was based on Witkin et al.'s (1954) pattern and findings, namely that highly F-D individuals often produced fantasies in which the hero was crushed by circumstances, where he was unable to deal with problems by himself and initiate solutions. Recovering from danger, utilizing one's productive resources and making up one's own mind even if taking somebody else's advice were contents of stories associated with F-I.

To check on the reliability of the examiner's judgments seventy TAT pretest protocols and seventy posttest

protocols were independently evaluated by two advanced graduate students in psychology who had been trained by judging the TAT stories of the pilot study. Again they had no more than a vague idea of the nature of the study, nor did they know that they received two sets of tests of the same individual. It was, therefore, possible to assume that their judgments were relatively unbiased.

Instructions for scoring the level of lack-of-self-assertiveness of the TAT stories were as follows:

Read each story carefully and decide in which category it belongs. Then write the symbol which is appropriate on the answer sheet corresponding to the number of each subject and the TAT card you judged.

Symbol

A Self-assertive. Principal character shows active coping with the situation and an ability to act on his own needs.

I Lack of self-assertiveness. Rejection of own needs or failure to cope.

½ Neutral. Balance between the two tendencies.

\- None of the above.

Further explanations of the categories:

A 1. Difficulties created by the physical environment not so often seen as insurmountable. (Like trying to change a situation, finding a solution.)

2. Opposition by others not requiring appeasement (cherish one's own needs).
3. Rebellion (often in thought).
4. Activity (doing meaningful work like farm work, operating, athletics, pride in body.)
5. Identification with older person who gives advice. Receptive to help, but capable of acting on his own. Accepting conflict as something to be dealt with, but not by outside agency.
6. Need to dominate or control. (Includes aggression by principal character, hypnotizing another, leaving.)

I 1. Principal character is crushed by circumstances. There is nothing he can do about them.
2. Abrogate his own needs in order to receive protection from others. Acquiescence.
3. Depression or accident without recovery. Crying.
4. Have outside agencies solve conflicts (like magic, depending on prayer or blessing, authority, being hypnotized).
5. Death, suicide.

½ 1. Where symbols A and I are both present in one story.
2. Ambivalence (like wanting to jump out of the

window and then decide not to).

3. Trying to solve a problem but mostly, not totally dependent on other person.

- 1. When story cannot be classified into any of the above categories.

2. Story has nothing to do with either coping or non-assertive behavior.

3. It is not possible to discern the principal character or the feeling tone of the story.

As there was high agreement among the three judges, the examiner's ratings of the protocols were used. For each story which showed "Lack-of-Self-Assertiveness" the subject was given 1 point, and ½ point if it was classified under "Neutral." Points were summed up, and the total number of stories thus obtained was divided by the total number of stories told by the subject which could be categorized into either "Self-Assertive" (A), "Lack-of-Self-Assertiveness" (I) or "Neutral" (½). The end result was then converted into a percentage. Thus a high percentage score meant that a patient was lacking in self-assertiveness.

Retesting procedure

Three months after they had been initially tested

the subjects in the experimental and control groups were reminded that they had originally participated in a rehabilitation study and were asked whether they would agree to once more being tested, much like the first time. All 70 subjects consented.

Again ADL ratings were filled out by the trained nurse supervisor who knew the patient. The testing was an exact repetition of the first administration, except that the verbal subtests of the WAIS were not included.

Difference scores were computed by subtracting the prescores obtained by each subject from his postscores.

Treatment of Data

Initial t tests.--Patients in this study either belonged to those who were exposed to rehabilitation training, the experimental group, or consisted of subjects who only received medical care, the control group. It was important to examine how well matched the groups were at the time of admission on variables pertaining to the study.

The initial level of achievement, as far as physical, perceptual, intellectual behaviors and personality characteristics were concerned was determined by eight t tests comparing the mean scores of each group for the following variables: Age, Verbal Index, Analytic Index,

RFT, Figure-Drawings, TAT, ADL and Social ADL.

t tests of change scores.--With the exception of Age and Verbal Index another set of t tests of the same tasks repeated after three months served to compare the mean relative change score obtained by a group on a particular test. The difference score between the first and second performance made it possible to determine whether the experimental or control group, as a whole, moved in the direction of improvement or deterioration, with the exception that the patients in rehabilitation training, as a group, would show greater positive change than those who were not in a retraining program. These t tests represent the within group analyses.

t tests of change score differences.--between the experimental and control groups for Analytic Index, RFT, Figure-Drawings, TAT and ADL were computed.

t tests of posttest scores.--In order to determine whether gains in the R group suggested that the R program was effective posttest scores obtained by the two groups on the relevant variables were compared by t tests.

The t tests described in the first, third and fourth paragraphs represent the between group analyses.

Correlational Analysis.--To investigate whether disabled patients who improved physically also performed more efficiently in other areas after retraining three correlational matrices: a, b, and c in Appendix D were computed. Matrix a shows correlations among pretest scores and change scores for all the variables for all 70 subjects combined, matrix b for the 50 experimental subjects, and matrix c for the 20 control subjects. The scores of the variables at pretesting time were for: Sex, Age, Verbal Index, Analytic Index, RFT, Figure-Drawings, TAT, ADL and Social ADL. Correlated change scores are for Analytic Index, RFT, Figure-Drawings, TAT, ADL and Social ADL where these variables are marked with a D (for Difference scores).

The correlational matrices also served to further investigate whether findings of previous studies were replicated. In other words, are qualities of F-D-I consistently found in an individual, so that a person who was able to withstand the influence of the visual field would exhibit highly analytic, self-assertive behavior in other areas as expressed through his test results.

The correlational matrices in Appendix D only deal with pretest scores and change scores. Since it is feasible that after a period of three months in a rehabilitation hospital patients, particularly those in the R group, are less

impaired, a matrix of selected posttest correlations was computed. These statistical findings showed which correlations retained their significance, which did not, and pointed to new relationships between the relevant variables.

Order of presentation of data.--The order of presentation will consist of:

1. Reliability of Measures Used. In order to establish reliability of the judgments, reliability coefficients obtained by different raters with regard to ADL, Figure-Drawings and TAT scores are shown.
2. t Tests for Differences between the Two Groups. Since initial differences between the R and NR patients could affect the later comparability of the two groups results of t tests are discussed showing that they were well matched. Further t tests between the change scores of the two groups, as well as between their posttest scores, show the impact of exposure to physical retraining. The investigation included significant differences between the two groups, as well as an examination whether each group, as a whole moved toward improvement or

deterioration.

3. Correlations among Physical Behavior, Perceptual, Intellectual and Personality Characteristics. Results of tasks measuring these areas were examined for consistency, and it was expected that highly F-D individuals would operate poorly in all areas associated with F-D-I.

Correlations among the F-D-I test, other measures associated with it and ADL determined whether the degree of impairment of disabled patients at the beginning of treatment was related to performance on RFT, Analytic Index, Figure-Drawings and TAT.

Correlations among change scores of F-D-I, F-D-I related tasks and ADL of the R group and the NR group showed whether a patient who improved or deteriorated physically, thus altering his coping behavior within the environment, did so concomitantly on other attributes which affected the psychological adjustment to his surroundings.

The last correlational analysis was employed to investigate whether after physical improvement there would be a distinctly different personality pattern.

CHAPTER III

RESULTS

Reliability of All Measures Dependent on Raters and a Test-Retest Reliability on RFT

ADL scale and interrater reliability

In order to establish whether the nurse supervisors, who previously had taken a course in ADL procedures were reliable raters, two additional staff members, a physical therapist and a nurses' aide also rated the first twenty patients. These two people had been specially trained in filling out ADL forms. The reliability coefficients obtained were .88 for the combined ratings of the physical therapist and the nurse supervisor, and .92 for those of the nurses' aide and the supervisor. These results are in accordance with those obtained by Dinnerstein et al. (1965), demonstrating that hospital personnel with special training in ADL make reliable judgments.

Agreement of judges on Figure-Drawings

Figure-Drawings were rated according to Machover's short list of graphic items as previously described.

Scoring of seventy pretest and seventy posttest Figure-Drawing sets was performed by the experimenter and by two psychology graduate students.

Pearson r correlation coefficients among the ratings of the judges ranged from .91 to .95 for pretest drawings, and from .93 to .95 for posttest drawings.

Agreement of judges on TAT

TAT stores were categorized for level of Lack-of-Self-Assertiveness as previously described. Scoring of seventy pretest and seventy posttest TAT stories was performed by the experimenter and by two psychology graduate students.

Pearson r correlations ranged from .89 to .93 for pretest TATs and .86 to .90 for posttest TATs.

The correlations for each test were so high that the experimenter's judgments could be accepted as reliable and, consequently, were used as data.

Test-retest correlations for RFT

Performance on RFT of the chronically disabled remained stable from pre- to posttesting. The retest reliability was .97 for the R group and .90 for the NR group. A good example is a diabetic patient in NR who

showed exceedingly high deterioration in all areas, including physical, intellectual and behavioral indices. Yet his average pretest deviation score on RFT was 22.5° and his posttest score 22.9°. Another patient in R whose performance on ADL, Analytic Index and Figure-Drawings improved drastically, obtained a mean deviation score of 15.4° at first testing and 15.6° three months later.

Equation of the Rehabilitation (R) Group and Non Rehabilitation (NR) Group on Personality and Test Factors

Composition of the two groups, R and NR

The experimental group consisted of 50 R patients, 25 males and 25 females; the control group consisted of 20 NR patients, 11 males and 9 females. Assignment of a patient into a R program by the medical team depended on whether it was anticipated that he would profit by physical retraining. The subjects in both groups were not only deprived as far as physical health was concerned, but were for the most part also lacking in economic resources and educational opportunities.[3]

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[3] In Appendix A distributions into occupational and educational categories are presented. The majority of patients in both groups had been manual workers. Many subjects had been unemployed prior to hospitalization. Over one half in each group had not attended High School.

Comparison of the two groups with respect to scores on the various measures used

The averages for the two groups in every measure presented in Table 1 show that there were no significiant differences at p= .05 with the exception of Social ADL.

Verbal Index

The average score of the Verbal Index, 27.92 for R and 30.65 for NR patients with a range of 25 to 44 points was somewhat higher than results obtained by Wechsler (1955) with the national older age sample, 60 years and over, who had an average score of 23.84.

Analytic Index

Compared to a normal population the patients performed rather poorly on the Analytic Index, particularly on Block Design, which according to Wechsler (1958) shows Mental Deterioration. The average score achieved was 15.98 for R and 18.80 for NR subjects within a range of 7 to 32, which was considerably lower than the average 23.84 of Wechsler's sample of age 60 and over. Low analytic scores were to be expected since one half of the population sample in each group consisted of subjects who were over fifty years old. Both groups contained brain damaged individuals as well as chronic alcoholics

TABLE 1

MEANS, STANDARD DEVIATIONS AND t TESTS FOR INITIAL DIFFERENCES OF AGE, SCORES ON F-D-I TASKS AND ADL RATINGS BETWEEN THE R AND NR GROUPS

	Age		Verbal Index		Analytic Index		RFT		Figure-Drawings		TAT		ADL		Social ADL	
Group	R	NR	R	NR	R	NR	R	NR	R	NR	R	NR	R	NR	R	NR
Mean	49.78	52.35	27.92	30.65	15.98	18.80	18.07	16.05	35.80	33.40	41.83	40.55	91.30	72.55	4.98	1.25
S.D.	13.81	17.46	5.19	8.26	6.03	8.74	8.70	8.46	11.10	12.22	15.30	15.59	68.50	68.10	5.86	2.29
t	0.65		1.31		1.53		0.88		0.76		0.32		0.94		2.75	
p	n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		n.s.		$<.01$	

Note:
1. RFT scores represent degress of error per trial.
2. Figure-Drawing and TAT results are percentages.
3. For RFT, FDT, TAT, ADL and Social ADL the lower the scores the better the performance.
4. For Verbal and Analytic Indices the higher the scores the better the performance.

which probably accounted for low Object Assembly performance.

RFT

Again in accordance with the age and physical disability distributions almost one half of the sample obtained error scores of 20° and above. Deviation scores from the upright ranged from 2.0° for R and 1.8° for NR patients to 28° for both groups. None of the subjects showed the perceptual shifts described by Witkin and Asch (1948) where some subjects became so confused that they mistook the upright for the horizontal. The average scores for each group. 18° for R and 16° for NR, were considerably higher than the 7.4° for men and 11.0° for women found in Witkin et al.'s college population.

Figure-Drawings

The mean percentage of Figure-Drawing items was 35.80 for the R group and 33.40 for the NR group, with a range of 10 percent to 58 percent and 10 percent to 53 percent respectively. A high score reflected a low evaluation of the body.

TAT

The Lack-of-Self-Assertiveness percentage scores were 41.83 for the R group and 40.55 for the NR group,

ranging from 14 percent to 77 percent and from 8 percent to 75 percent respectively. Here also a high score represented inadequate handling of difficult situations.

ADL

ADL ratings ranged from 0 to 236 for R patients with a mean of 91.30 and 0 to 240 for NR patients with a mean of 72.55. Among the latter group there was one patient at the extreme who was completely incapacitated.

Social ADL

Ranges of Social ADL showed a considerable discrepancy, 0 to 21 for R with a mean of 4.98 and 0 to 8 for NR with a mean of 1.25.

As can be seen from the test results in Table 1 the two groups of patients were relatively well matched, although the R group proved to be consistently, if not significantly, poorer in all areas. Comparing the R and NR patients for Age, Verbal Index, Analytic Index, Rod-and-Frame Test, Figure-Drawing Test, TAT and ADL performances resulted in a non-significant t in each instance for the difference between the means of the two groups. Except for RFT and ADL scores standard deviations were slightly higher in the NR group, indicating greater variability among the control patients. Where there was

heterogeneity of variance formula 8.2 by Edwards (1960) was used to determine significance.

The two groups differed at below the .01 level in their Social ADL scores. In the original Social ADL ratings R patients obtained a mean score of 4.98, while the NR patients' mean score was 1.25, resulting in a t of 2.75. Formally communicative behavior exhibited by the R group was significantly less than that shown by the controls. The assignment of the R patients into a rehabilitation program, therefore, could represent an error of biased selection. Apart from this finding, however, the two groups did not differ significantly on any of the major variables.

Patterns of Interconnections of F-D-I and Relevant Variables

The correlations which were extracted from the appended correlational matrices a, b, and c of Appendix D are presented in Table 2 on the following page.

Relation of Verbal and Analytic Indices to variables associated with F-D-I

Correlations among the initial scores of the Verbal and Analytic Indices are .518 for All Subjects Combined, .437 for R and .571 for NR, significant at less than the

TABLE 2

INTERCORRELATIONS AMONG INITIAL SCORES OF INTELLECTUAL, PERCEPTUAL, PERSONALITY CHARACTERISTICS AND ADL MEASURES FOR ALL SUBJECTS COMBINED, R GROUP AND NR GROUP

Test	Verbal Index	Analytic Index	RFT	Figure-Drawings	TAT
Analytic Ind.	.518[a]				
	.437[a]				
	.571[a]				
RFT	-.204	-.345[a]			
	-.115	-.259			
	-.326	-.487[b]			
Figure-Drawings	-.128	-.536[a]	.401[a]		
	-.036	-.476[a]	.299[b]		
	-.229	-.631[a]	.630[a]		
TAT	-.034	.095	.084	.091	
	-.166	.007	-.007	.070	
	.194	.281	.313	.128	
ADL	-.016	-.040	.159	.173	.252[b]
	-.037	-.045	.112	.258	.179
	.100	.047	.233	-.065	.424

Notes:

1. For each variable the first coefficient is for All Ss Combined, the second for the R Group and the third for the NR group.

2. a = significant at .01
   b = significant at .05

3. Positive coefficients indicate high associations for Verbal Index and Analytic Index, RFT and Figure-Drawings, RFT and TAT, RFT and ADL, Figure-Drawings and TAT, Figure-Drawings and ADL, and TAT and ADL.

   Negative coefficients indicate high associations for Verbal Index or Analytic Index and RFT, Figure-Drawings, TAT and ADL.

.01 level. The Verbal Index does not show any significant association with any other task. On the other hand, coefficients obtained for the Analytic Index and RFT, -.345 for All Subjects Combined and -.487 for NR patients were significant below the .01 and .05 levels respectively. Similarly intercorrelations among initial scores for the Analytic Index and Figure-Drawings, -.536 for All Subjects Combined, -.476 for R, and -.631 for NR are significant below the .01 level. Results are in agreement with Goodenough and Karp's (1961) findings that F-D-I is related to an analytic component of intelligence.

Relationships between F-D-I and personality measures

F-D-I and Figure-Drawings

As far as perceptual mode of orientation and its relation to Figure-Drawings is concerned, correlation coefficients were .401 for All Subjects Combined, .630 for NR, both significant below the .01 level. For the R group .299 was significant below the .05 level.

F-D-I and TAT

Correlations between the Lack-of-Self-Assertiveness measure of the TAT and scores on other F-D-I tests were not significant for any group.

Relationships between ADL and relevant variables

A Pearson r of .252 between ADL and TAT scores for All Subjects Combined was significant with a $p = .05$.

Degree of impairment was not related to RFT, Analytic Index or Figure-Drawing scores. This result suggests that, at admission time, the physically healthier subjects responded in a more self-assertive manner than the seriously disabled. They did not perform better on any of the other tests.

In this chronically disabled population initially neither TAT scores, regarded as a measure of self-assertive behavior, nor ADL ratings which were evaluations of physical coping behavior, were found to relate to the other relevant variables, though they did relate to each other. On the other hand results of the remaining tests associated with F-D-I permit the conclusion that, at admission, a certain amount of consistency was present among perceptual, intellectual and personality components of this perceptual style.

Change in Performance of the Two Groups, R and NR

Difference of change scores between R and NR groups

Results of the t tests of the change scores between the R and the NR groups as presented in Table 3 are

TABLE 3

t TESTS FOR CHANGE SCORE DIFFERENCES OF SIX MEASURES BETWEEN THE R AND NR GROUPS

	Analytic Index		RFT		Figure-Drawings		TAT		ADL		Social ADL	
Group	R	NR	R	NR	R	NR	R	NR	R	NR	R	NR
Mean	2.56	-0.05	-0.49	1.19	-7.04	-0.30	-2.88	7.35	-46.30	-8.10	-1.58	2.85
S.D.	3.27	5.74	2.70	3.56	7.59	10.54	16.59	17.42	60.62	69.00	6.56	2.85
t	2.39		2.33		2.99		2.30		2.30		2.76	
p	$<.05$		$<.05$		$<.01$		$<.05$		$<.05$		$<.01$	

consonant with the hypothesis that two groups experiencing dissimilar types of treatment will be affected in different ways. It has to be kept in mind that the R group initially started with poorer performance, so that a regression to the mean could have caused greater movement of this group.

The better average performance of R than NR for the Analytic Index with a t of 2.39, significant below the .05 level, suggests that R improved considerably. Results have to be interpreted with some caution since practice often produces improved subtest scores at re-testing.

RFT, Figure-Drawing, and TAT changes differed significantly between the two groups. Particularly Figure-Drawing showed a positive change for R as compared to NR, with scores of -7.04 for R and -0.30 for NR with a t of 2.99, significant below the .01 level.

The improved state of physical health score, (ADL), -.46.30 for R, was greater than that for NR of -8.10, with a t for the difference of 2.30, significant below the .05 level.

Direction of change in
R and NR groups

In order to further clarify which group was

responsible for a significant t a number of additional t tests were computed to inspect the significance of change for each group separately. Table 4 reveals the direction and its statistical significance in which each of the groups had been moving at the time of the second testing.

a. The positive difference score of 2.56 of the Analytic Index for the R group, indicating improved intellectual performance, with a t of 5.56 is significant below the .01 level, while the NR group did not change.

b. The mean change deviation scores for RFT are not significant for either group, supporting Witkin's findings that the perceptual mode of orientation is stable. However the R group improved slightly, while the NR group became slightly F-D. The movements in opposite directions account for a significant difference between the means of the two groups.

c. The decreased Figure-Drawing percentage score of -7.04 with t = 6.36, significant below the .01 level, suggests a change towards a healthier representation of the human body. There was no significant change in NR.

d. Although a trend was in evidence towards a decrease of self-assertive behavior in the change

TABLE 4

t TESTS FOR CHANGE SCORE DIFFERENCES OF SIX MEASURES
FOR EACH GROUP, R AND NR, SEPARATELY

	Analytic Index		RFT		Figure-Drawings		TAT		ADL		Social ADL	
Group	R	NR	R	NR	R	NR	R	NR	R	NR	R	NR
Mean	2.56	-0.05	-0.49	1.19	-7.04	-0.30	-2.88	7.35	-46.30	-8.10	-1.58	2.85
S.D.	3.27	5.74	2.70	3.56	7.59	10.54	16.59	17.42	60.62	69.00	6.56	2.85
t	5.56	0.37	1.58	1.46	6.36	0.13	1.25	1.88	5.44	0.48	1.61	2.85
p	<.01	n.s.	n.s.	n.s.	<.01	n.s.	n.s.	n.s.	<.01	n.s.	n.s.	<.01

scores of the TATs of the NR group, it did not reach the acceptable level of significance. Neither did the trend towards greater self-assertiveness in R.

e. For the R group the mean difference score on ADL of -46.30 in the direction of improved health was significant at the .01 level. Although movement of the NR group was in the same direction, it was too slight to be significant.

f. A mean change of 2.85, significant at .01, on Social ADL took place in the NR group only. Patients in this group deteriorated considerably on Social ADL.

Results of posttest score differences between the R and NR groups

At retesting after the treatment period the only significant difference between means of the two groups was for the TAT, $t = 2.48$, significant below the .05 level. The results suggest that although the R group showed significant gains, the effect of treatment was small when compared to the range of individual differences within both the treated and untreated groups.

To sum up in support of Hypothesis 1, the within group analyses of the data suggest that R patients

effected more positive changes than NR patients. They improved physically and also on the Analytic Index and on Figure-Drawings, while the NR group's performances remained constant, except for evidence of deterioration on Social ADL. It seems that for the NR group the hospital mainly served to maintain the original level of functioning.

There was no change in expression of self-assertiveness in either group.

Although both groups moved in opposite directions as far as their RFT performance was concerned it cannot be concluded that physical retraining reduced error scores. Taking each group separately the level of F-D-I did not change significantly for either experimental or control subjects from pre- to posttesting.

The between group analyses of the data indicate that although the R group improved on ADL, Analytic Index and Figure-Drawings the treatment gains were small and, after three months, did not significantly differentiate the two groups.

Changes of Patterning of Interconnected Variables after Rehabilitiation

Concept of consistency among attributes of F-D-I

Hypothesis 2 that as a result of physical change

in disabled patients F-D-I and aspects associated with it would covary was only partially supported.

The pretesting produced significant correlations which showed that initially F-D subjects did poorly on Figure-Drawings. They also were globally oriented as far as the Analytic Index was concerned. However, the pattern of correlations presented in Table 5 gives evidence that changes on RFT were not accompanied by concomitant changes on any other task.

As stated previously the test retest correlations for RFT were highly significant, thus supporting the stability hypothesis. A patient hardly showed changes on RFT but did so on other measures, not in accordance with his RFT scores, but often in relation to the ADL change scores.

Physical improvement or deterioration was related to changes in intellectual functioning and evaluation of the human body.

Further examination of Table 5 reveals that only in the NR group there existed a significant relationship, $r = -.699$ with a p of less than .01, between the change scores of the Analytic Index and ADL. It seems as if the NR group had to rely on their own analytic ability in order to substitute for the support and training provided by the hospital for rehabilitation patients.

TABLE 5

INTERCORRELATIONS AMONG CHANGE SCORES
FOR ALL SUBJECTS

Test	Analytic Index	RFT	Figure-Drawings	TAT	ADL
RFT	-.153				
	-.063				
	-.099				
Figure-Drawings	-.493[a]	.186			
	-.231	.069			
	-.699[a]	.162			
TAT	.028	.102	-.003		
	.190	-.043	-.035		
	.011	.141	-.207		
ADL	-.477[a]	.125	.598[a]	-.015	
	-.219	.060	.492[a]	-.024	
	-.758[a]	.050	.822[a]	-.250	
Social ADL	-.249[b]	.197	.393[a]	.005	.543[a]
	-.265	.142	.411[a]	-.215	.648[a]
	-.045	.105	.138	.372	.036

Notes:

1. For each variable the first coefficient is for All Ss Combined, the second for R and the third for NR.

2. a = significant at .01.
   b = significant at .05.

3. Positive coefficients indicate high associations for RFT and FDT, RFT and TAT, RFT and ADL, RFT and Social ADL, FDT and TAT, FDT and ADL, FDT and Social ADL, TAT and ADL, and TAT and Social ADL.

   Negative coefficients indicate high associations for Analytic Index and RFT, FDT, TAT, ADL, and Social ADL.

The positive correlations among Figure-Drawing and ADL change scores, .598 for All Subjects Combined, .492 for R, and .822 for NR which were all significant below the .01 level, suggest that an individual who improved or deteriorated physically changed his body concept accordingly, irrespective of treatment received.

Changes in TAT were wholly unrelated to changes in any other variable for All Subjects Combined, R and NR groups.

Correlations between the change scores of Social ADL and Figure-Drawings, $r = .411$, and Social ADL and ADL, $r = .648$ in the R group were significant below the .01 level, in contrast to $r = .138$ and .036 for the NR group. Patients in physical training who moved towards recovery became socially more attuned. They also improved their body concept.

It can be stated, therefore, that although the perceptual level of this population remained stable, there were changes in other aspects related to F-D-I. Some of the changes were related to an altered physical state, but not necessarily to rehabilitation training.

Intercorrelations among posttest scores of variables

Difference scores only permit the investigation

of concomitant changes, but intercorrelations among post-test scores of tests related to F-D-I and ADL scores as presented in Table 6 give a picture of the personality pattern of a patient after a three-months-stay at the hospital.

TABLE 6

INTERCORRELATIONS AMONG POSTTEST SCORES FOR R AND NR GROUPS

Test	Analytic Index II	RFT II	Figure-Drawings II	TAT II
RFT II	-.313[b] -.466[b]			
FDT II	-.577[a] -.690[a]	.145 .488[b]		
TAT II	.397[a] -.202	-.105 .209	-.356[b] .149	
ADL II	-.263 -.215	-.082 -.059	.524[a] .035	-.078 .008

Notes:
1. For each variable the first coefficient is for the R, the second coefficient for the NR group.
2. a = significant at .01
   b = significant at .05
3. Positive coefficients indicate high associations for RFT and FDT, RFT and TAT, RFT and ADL, FDT and TAT, FDT and ADL, and TAT and ADL. Negative coefficients indicate high associations for Analytic Index and RFT, FDT, TAT, ADL.

Pearson r's for performance on RFT and Analytic Index, -.313 for R and -.466 for NR, both were significant

below the .05 level. Thus the more F-D subjects performed in a more global manner than the highly F-I person. RFT and Figure-Drawing scores showed a correlation of .488, significant at .05 level, for the NR group only. For neither group was there any significant association of perceptual level and TAT scores.

For the experimental group Figure-Drawings and TAT produced a Pearson r of -.365, significant at the .05 level. The Analytic Index and TAT correlation was .397 with a p of less than .01. It appears thus that self-assertive behavior and analytic thinking, as well as self-assertiveness and adequate drawing of the human body were not positively related.

After retraining in R change in physical health correlated highly with Figure-Drawings, r = .524 with a p below .01.

Comparison of intercorrelations of pre- and posttests of relevant variables

Even after a period of treatment of three months in the hospital patients did not function consistently in all areas connected with F-D-I. There were some aspects in which individuals performed in accordance with their respective perceptual level.

TABLE 7

INTERCORRELATIONS FOR PRE- AND POST-TREATMENT PERIODS FOR REHABILITATION AND NON REHABILITATION GROUPS

Test	Analytic Index		RFT		Figure-Drawings		TAT	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
RFT	-.259 -.487[b]	-.313[b] -.466[b]						
FDT	-.476[a] -.631[a]	-.557[a] -.690[a]	.299[b] .630[a]	.145 .488[b]				
TAT	.007 .281	.397[a] -.202	-.007 .313	-.005 .209	.070 .128	-.356[b] .149		
ADL	-.045 .047	-.263 -.215	.112 .233	-.082 -.059	.258 -.065	.524[a] .035	.179 .425	-.078 .008

Note:

1. For each variable the first coefficient is for the R, the second coefficient for the NR group.

2. a = significant at .01
   b = significant at .05

3. Positive coefficients indicate high associations for RFT and FDT, RFT and TAT, RFT and ADL, FDT and TAT, FDT and ADL, and TAT and ADL. Negative coefficients indicate high associations for Analytic Index and RFT, FDT, TAT and ADL.

Table 7 shows that, at the intial testing, the correlation for RFT and Analytic Index was not significant for the R group, but the posttest correlation coefficient of .313 was significant at the .05 level. When r was converted to z, the difference between the z scores was not significant, so that no real change occurred.

The relationship between perceptual performance and Figure-Drawings in the R group was significant at pretesting, but became non significant after treatment. Again the change was too slight to be significant.

The change from a Pearson r of .007 to an r of .397, significant at the .01 level, for TAT and Analytic Index suggests that even after rehabilitation analytic thinking and self-assertiveness were not positively related. Testing the difference between the two r's gives a z of 2.009, just missing 2.01 which would have been significant.

The negative correlations between Figure-Drawings and TAT scores which in the R group changed from a non-significant r of .070 to -.356, significant at the .05 level, contraindicate the existence of a particular personality pattern related to level of F-D-I. The difference between the two r's is significant below the .05 level.

At posttesting ADL and Figure-Drawing scores show a positive r of .524, significant at the .01 level, suggesting that physical changes in the R group seemed to affect adequate graphic representations of the human body.

For the NR group the correlations among the different variables do not show any appreciable changes.

None of the pretest correlations between F-D-I and

tests associated with it and ADL ratings were significant for either group.

Summary of Results

1. At admission
   a. perceptual functioning related to intellectual functioning in NR only. It also related significantly to adequate drawing of the human body in R and NR.
   b. analytic intellectual functioning and adequacy of Figure-Drawing showed positive relationships in both groups.
   c. physical behavior ratings did not show any significant relationship with F-D-I and related tasks in either group.
2. Changes
   a. in perceptual performance were not significantly related to other personality aspects of the F-D-I constellation in either group.
   b. in intellectual functioning and in drawing of the human body were positively related in the NR group only.
   c. in physical behavior showed a positive relationship with changes in drawing of the human body. The changes were found in both R and NR groups.

3. After a three-months-interval

   a. perceptual functioning related to intellectual functioning in R and NR. It now related to drawing of the human body in NR only.

   b. analytic intellectual functioning and drawing of the human body still showed positive relationships in both groups.

   c. physical behavior ratings now showed a significant relationship with drawing of the human body in R only.

   d. self-assertiveness was negatively associated with intellectual analytic functioning and with body drawings for R patients only.

It can be restated, therefore, that although there was limited evidence of a consistent F-D-I personality constellation, changes did not take place concomitantly in all attributes associated with F-D-I. The constellation was not greatly altered after the treatment period.

Patients in the R group improved physically, intellectually and in body drawings, thus partially supporting Hypothesis 1. They did not differ significantly from NR group patients except in the level of self assertive fantasy expression.

There was some evidence of concomitant changes on

ADL and some aspects related to F-D-I for both R and NR groups, thus partially supporting Hypothesis 2.

Relationship of Sex and Age to RFT and ADL

The correlations in Appendix D, matrix a, show that for

Sex and RFT.--Small sex differences in style of field approach were obtained, a finding which agrees with that of Witkin and his coworkers. Initially women produced greater error scores than men. But the differences were relatively slight when compared to the range of individual differences within each sex. Females were equally divided in both groups, but those in the R group obtained greater RFT change scores than women in NR.

Sex and ADL.--Women also had somewhat higher initial ADL scores, but again the range of ratings far exceeded differences between the scores of physical functioning of men and women.

Age and RFT.--In contradistinction to prior experimental work Age did not appear to be related to RFT performance. Since we are dealing with the chronically disabled it is probable that the physical impairment had a confounding effect possibly similar to decrement in

old age, on the performance of the young and the old patients.

Age and ADL.--The degree of physical impairment in the sample showed no association with the age of the patient.

Qualitative Analysis and Clinical Impressions

During the year of testing there was ample opportunity to observe the patients and learn about their behaviors. These observations could not always be expressed in numerical scores.

For instance, there were some subjects who improved on ADL ratings although they did not belong to any active rehabilitation program. One thirty-year-old female patient, suffering from Cerebral Palsy, associated with another thirty-year-old woman and, on her own, executed all the exercises done by her friend for which she did not need equipment or manipulation by a physical therapist. This patient showed a remarkable improvement, taught herself to walk again, and was able to leave for home.

As far as Social ADL was concerned, in general patients who did not partake in social activities had a difficult time adjusting to the environment. One subject

who was always alone and whose second Social ADL showed increased withdrawal said: "I am going to rot in this place." The physically disabled who became friendly with the staff and their co-patients usually sounded more hopeful in their comments.

Figure-Drawings was a task to which the majority of the patients objected. Usually they grumbled that they had never learned how to draw, had not done so for decades, etc. A frequent change from pre- to posttest drawings was the addition of parts of the body which had not been sketched in the first time. Often initial drawings lacked facial features, suggesting a guarded suspiciousness which may well have been directed towards the experimental situation in which the patients found themselves. Another feature, added by patients who had physically improved, particularly by those who had become more ambulatory, was the inclusion of legs or feet, or sometimes a firmer stance in their later drawings.

Following are two sets of drawings, pretest and posttest, which show some of the changes that could occur.

The first set are the drawings of Patient A, a sixty-one-year-old woman in the R group, who was well enough to go home shortly after retesting.

Portrait Pic

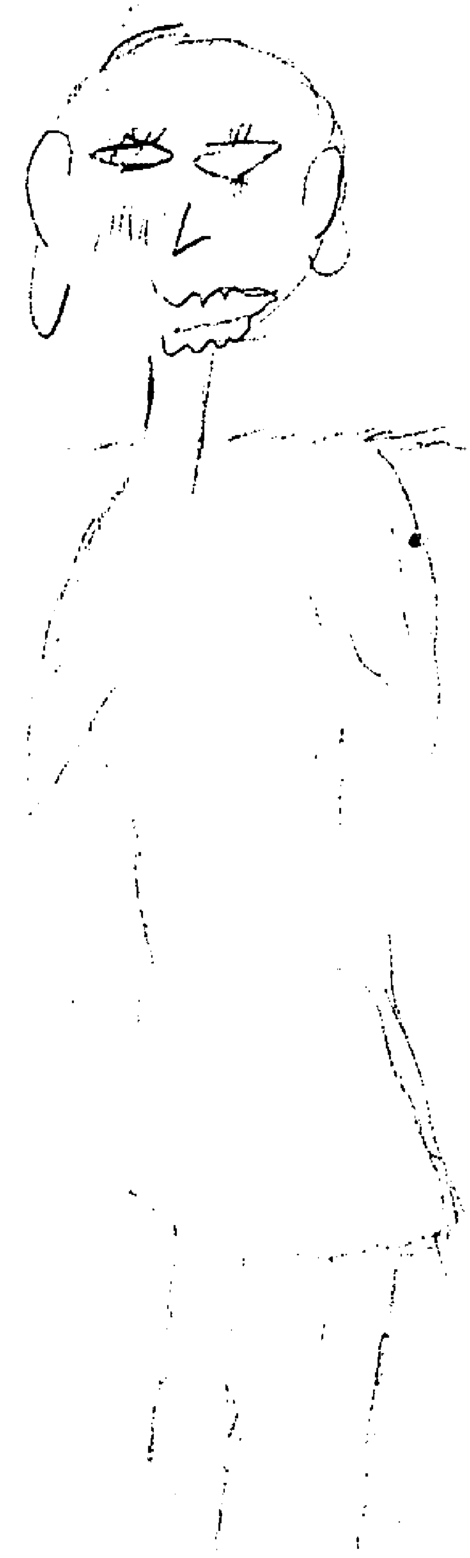
I (Man)

II

Patient A

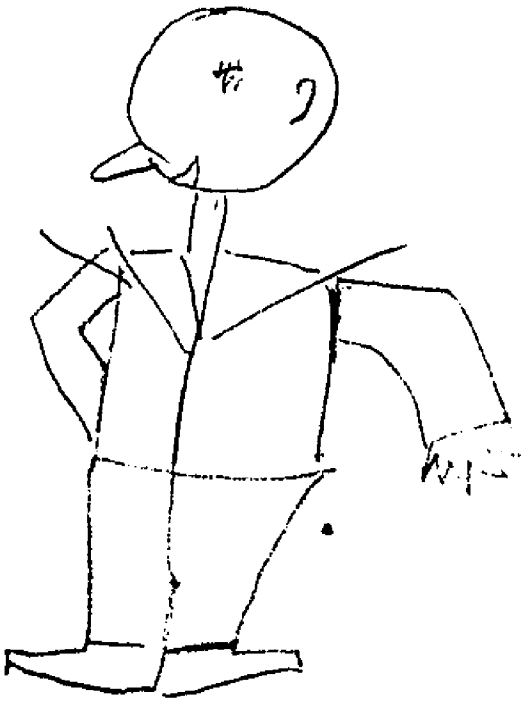
(Woman)

Pre



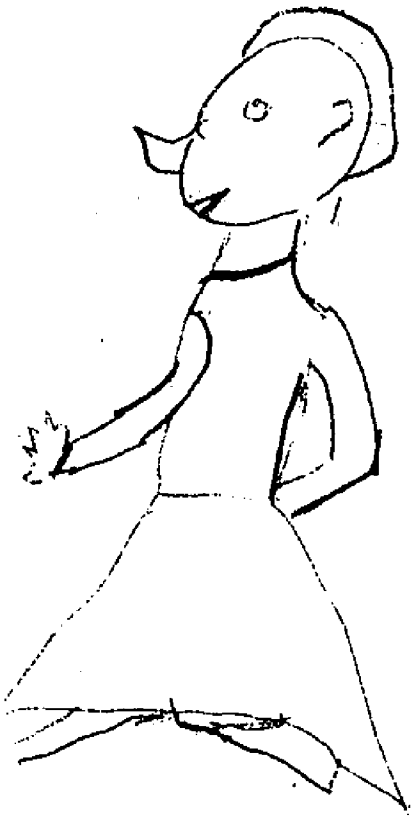
Patient A Post

(Name) T



Patient A

T (Post / Woman)



Her people in the second set of drawings appear to be stronger and more energetic. Greater confidence was expressed by the addition of arms and legs, particularly on the figure of the self sex. The female now wore a proper dress and had hair on her head, so that there was an increased interest in the body and awareness of being a woman.

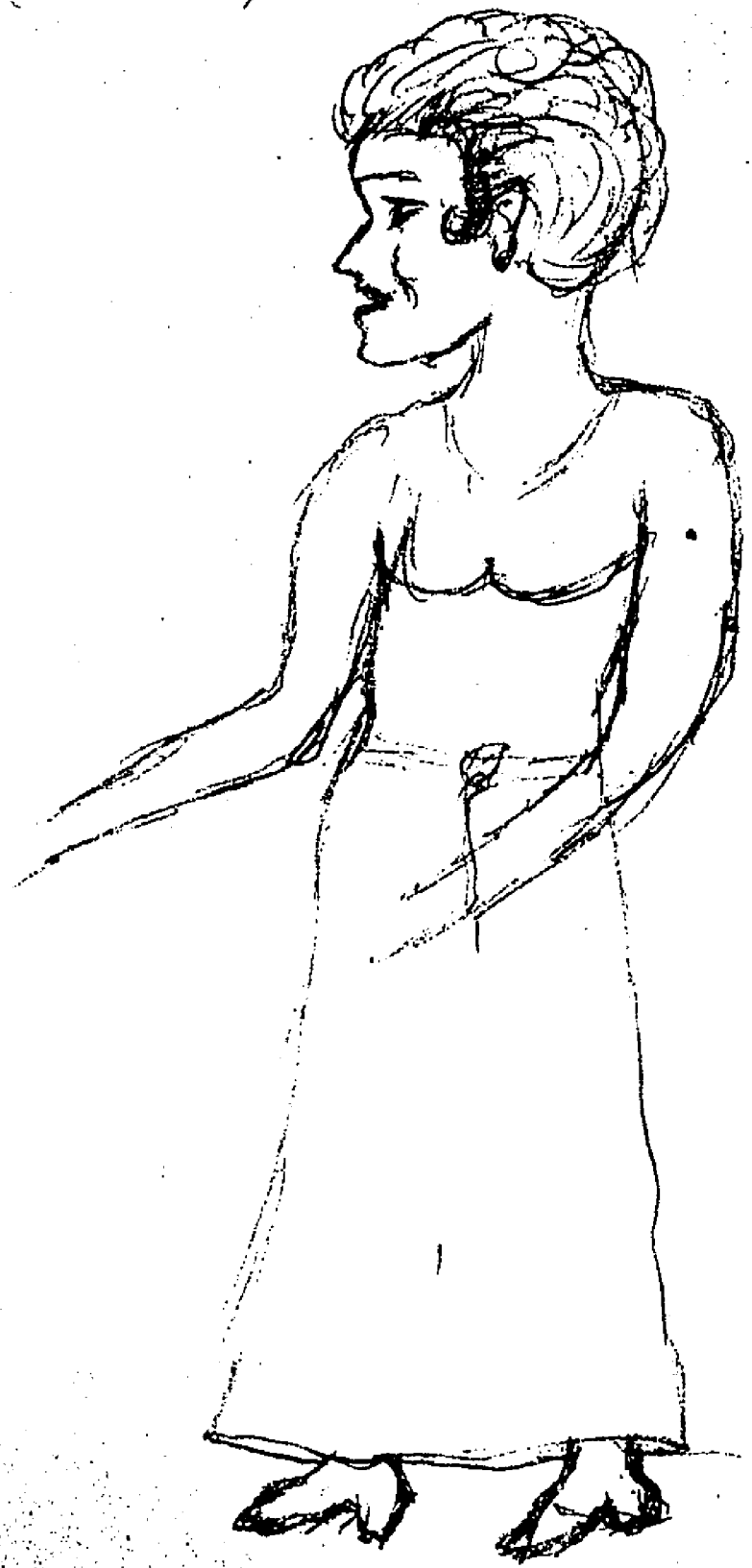
The second set of drawings was executed by Patient B in the NR group, a fifty-six-year-old man, whose physical condition remained at the same level during the three-months-period.

In contrast to Patient A this subject did not improve in his drawings. Uncontrolled hair shading, both in the male and the female, gave the impression of greater anxiety at posttesting. Foot blurring did not occur in the first drawing and suggests a lack of self-assurance. Also there was an added disturbance around the mouth indicative of greater dependency needs.

With few exceptions the TAT stories told by the patients were very short, factual, and not too creative. A typical example are the following TAT fantasies produced by Patient A, the sixty-one-year-old woman in the R group, who had considerably improved on ADL:

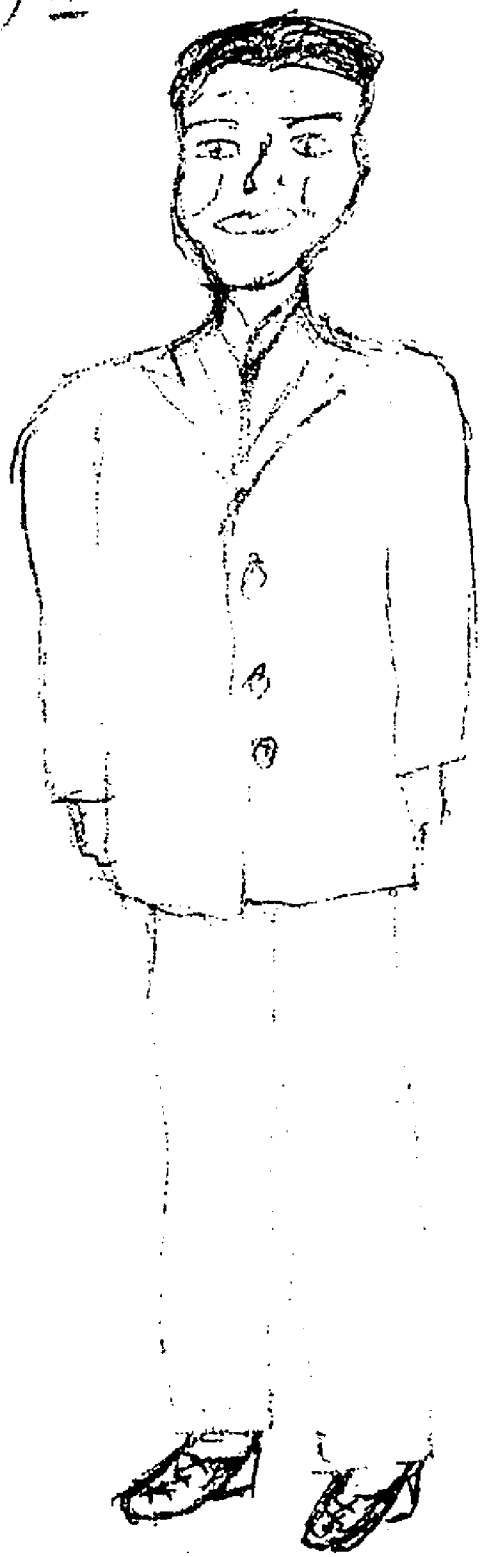
Patient B Pre

T (woman)



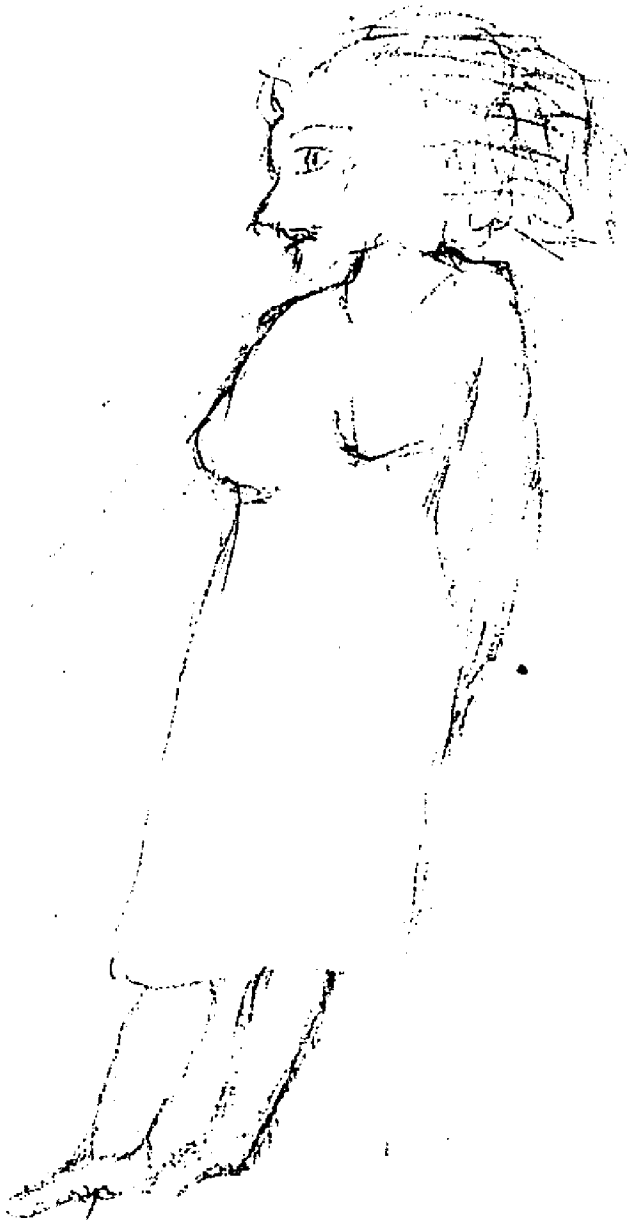
Patient B Pre

(Human) II

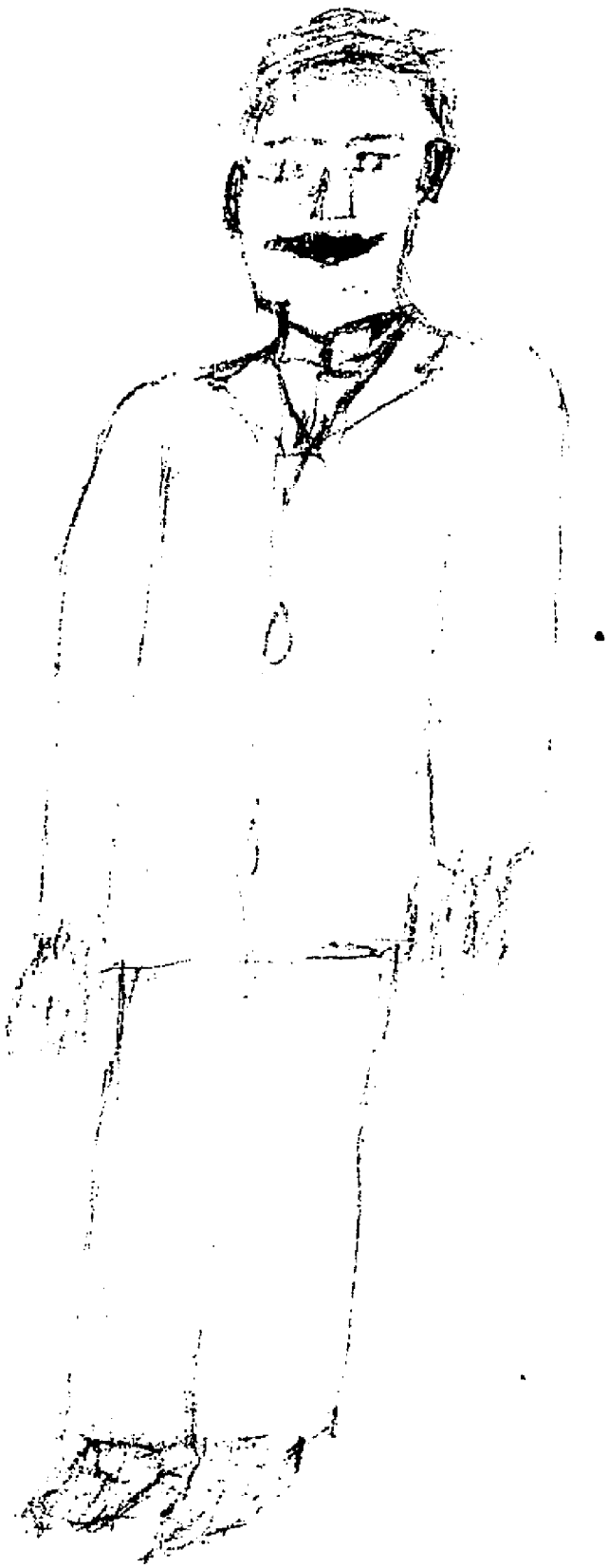


Patient B . Post

I (illegible)



Patient B II (now) Post



TATs of Patient A

	TAT I		TAT II
1	This is a violin player. He does not look like he is interested in playing the fiddle.	1	He is about to have his violin lesson, and he is wondering if he can play the violin.
2	L.l. a farmer's daughter at planting time. She doesn't show much interest in what is going on. The mother l.l. she is very stern and proud. (?) I should be afraid of her.	2	This l.l. it is on a farm and it is planting time. They are working hard, determined to get that work done that day.
3BM	L.l. he is stealing a nap. Whatever he was doing he got very tired, seems to be exhausted.	3BM	I guess he has played so hard that he just fell asleep just there.
6BM	Mother and son. They l.l they are very religious. They might be standing there having a prayer, a little meditation.	6BM	This is mother and son talking over their problems. They are helping each other solve problems.

7BM	Must be a father instructing the son to the right way of life.	7BM	I guess that is the father and the son picture. The father is instructing the son. The son is accepting the instructions. Most of them are so proud of their dads that they can't resent what they say.
8BM	I guess somebody was shot and they are trying to get the bullet out of him. (?) L.1. they will be successful.	8BM	L.1. it might be a war picture. One buddy trying to help and save another one's leg. L.1. he is working very earnestly.
12F	L.1. a princess and a witch. Long time since I have read anything like that. The witch she is trying to frighten her, and I know I would be frightened.	12F	L.1. it is a nice daughter but the mother doesn't look to be very nice. She looks more like a witch, doesn't seem to be of good character.
17BM	L.1. he might have been a sailor. Now he is climbing up a rope.	17BM	L.1. the sailor boy climbing a rope on a ship. He seems to be enjoying it.

Changes that took place in the above stories range from a disinterest in what is going on to an active tackling of difficult life situations. Moreover, in the second protocol problems are solved by first discussing them with other people, so that a person can make up his own mind instead of relying on prayer and on authoritarian instructions. A realistic apprehension of what to expect from the future remains, but people are not to be feared any more, and they are presented in a more tolerant fashion.

The next example are the fantasy productions of Patient B, a male in the NR group, fifty-six-years old, who did not improve physically during the three-months period, but who became slightly more depressed in the content of his TAT stories.

TATs of Patient B

	TAT I		TAT II
2.	A young lady on her way home from school seems to be wondering if the time will ever come when she will marry a young man, own her home and have a field of their own to till and to grow produce.	2	This is a young girl seemingly just on her way home from school, standing seemingly watching her parents work out in the field and thinking about the fact that she has to go into the house

and change her clothing and come back and assist her parents in the gathering of grain.

3BM A young lady or a young man. I say young lady, seems to be in deep remorse about something that happened in her life which might change the whole course of her livelihood. But perhaps after a good cry and a lot of thought there is a possibility that she will be on her feet again to start a new phase of life, being very careful not to make the same mistake again.

3BM It seems as though the young woman or young man, I don't know which, has had some sort of slight misfortune, and has dropped to the floor with arms on a couch and head resting on the arms, and seemingly crying spell or perhaps a fit of temper. Also in the picture, maybe not having anything to do with it, there seems to be lying on the floor a toy gun or perhaps a real gun which may or may not have anything to do with the person's seemingly depressed mood.

14	In the afternoon after having come home from a day's labor, this man is at the window of a darkened room, contemplating upon the fact that he has just gone through a successful day. And he is thinking about the fact that he is now free to relax and about a nice, restful night.	14	Here is a picture of a person in a darkened room, standing before an opened window, thinking about some of the deeds that he or she had done during the day.
18GF	The mother is holding the child in her arms. She is trying to console the child after she has just fallen down the stairway and is obviously in pain of some sort. Although after a doctor's examination they will be assured of the fact that there are no broken bones, just minor bruises, and in a couple of days the child will be as good as new.	18GF	In this particular picture there seems to be a mother and a daughter. The mother seems to have an angry look on her face, and the mother's hands are around the girl's neck, seemingly supporting her head, and it's rather difficult to tell whether the child has been crying or has been hurt, or has been scolded for some act of misdeed.

In the first protocol the patient still expressed some hope to succeed and a curiosity about life, although it contains some scepticism. The later stories contain frustrated anger as if he felt at the mercy of external forces.

These two patients are good examples that an altered state of physical health varies concomitantly with the conception of one's body. At admission Patient A was unable to walk, but left the hospital using a cane. Her Figure-Drawings and TAT stories showed considerable emotional and motivational improvement. Since the majority of patients became healthier and Patient B's physical condition remained constant his deterioration in drawings and fantasy productions was to be expected.

CHAPTER IV

DISCUSSION

Review of Findings

General

The present study was undertaken to evaluate the effect of therapeutic intervention on a physically handicapped hospital population. The RFT, as an index of F-D-I, was administered together with tests in the intellectual and personality spheres. Previous studies had indicated that these tests were connected with level of performance on RFT.

Hypotheses and Results

Hypothesis 1.

The results offer only partial support of the hypothesis that disabled patients who are retrained to master activities of daily living become less F-D.

The R group showed considerable physical improvement, while the NR group apparently was just maintained at the initial level of functioning. One possible explanation related to this improvement could be the fact

that, at admission, the R group obtained poorer ADL ratings, though the difference between the two groups was not significant. Therefore conclusions that can be drawn are limited, but are worth examining further with a more carefully matched control group.

With regard to RFT performance the R and NR groups moved in opposite directions, showing a significant difference after the treatment period. However the movement of either group was too slight to allow the conclusion that change did occur on RFT. It had been hypothesized that the R group would improve its perceptual performance, since it received training in physical activity geared towards better adjustment to the environment. This view was developed because of the following studies:

Karp (1967) tested employed and retired aged men and found the actively employed to be more F-I. Essentially the situations are not comparable. For Karp's older subjects activity was a way of life over many years, while the hospital group was still confined in a restricted environment. They were only retrained over a three-months period.

Alcoholics at the Topeka Veterans Administration showed increased F-I after noningestion of alcohol for 8-10 weeks. Goldstein and Chotlos (1966) explained their

subjects' reduction of RFT errors by an altered body state. The Topeka Veterans also received psychiatric treatment. This treatment could have had its effect on F-D-I by changing deeper attitudes and making people more self oriented. No psychiatric treatment was given to the B. S. Coler patients. Karp, Witkin and Goodenough (1965) did not find a decrease of F-D when patients were retested on RFT after 1-8 days, regardless of whether they were in an intoxicated state or not. In agreement with Karp, Witkin and Goodenough's findings the present study upholds the stability hypothesis of RFT performance.

Since the experimental and control groups did not differ from each other on most variables after three months conclusions are indeterminate and need further investigation.

Patients in R improved on analytic thinking, while the control group did not change. The contention that exposure to physical rehabilitation had its effect on intellectual functioning was supported.

So was the program's effect on Figure-Drawings. Drastic changes were shown by R patients in depicting the human body far more adequately, suggesting a better self image.

The expected increase of self-assertive behavior

in fantasy productions was minimal. A tendency towards a decrease of self-assertive content of TAT stories was noticed in NR, but it did not reach an acceptable level of significance.

Since only the R group changed with respect to Analytic Index and Figure-Drawings, while NR did not show any significant improvements the results were consonant with Hypothesis 1. A patient's physical and psychological functioning seemed to be affected by exposure to the rehabilitation program. These changes took place, yet RFT performance remained unaltered.

In such a program a patient received special attention and extra care. It is difficult to ascertain, therefore, whether the improvement was caused by the actual retraining, or simply by the motivational factor of being selected for the rehabilitation program.

Hypothesis 2

It was hypothesized that patients who improved or deteriorated physically would show concomitant changes on F-D-I and variables connected with it.

In normal populations consistent personality patterns had been found. A patient who comes to the hospital is handicapped, but impairment does not affect every area of functioning to the same degree. When he improves

physically there is reorganization, and new personality patterns emerge. At times of admission people exhibited contrasting modes of field approach which were also reflected in intellectual and body concept aspects, although not in self-assertive TAT fantasies.

Dependency was an important dimension of the Lack-of-Self-Assertiveness score of the TAT. Goldstein et al. (1968) questioned the hypothesis that perceptual dependency could be generalized to other areas of dependency. The authors employed a series of dependency measures of various tests on alcoholics, but found little association between them and RFT performance. Results of the present study suggest that in the disabled population level of F-D-I also was not related to degree of dependency as a personality characteristic.

While Lack-of-Self-Assertiveness was not associated with F-D-I it initially, for All Subjects Combined, related to physical impairment. The more disabled were less assertive. Cath et al. (1957) feel that mild regressive behavior could be ego syntonic at the stage of disability when the patient is in a physically dependent state.

Neither level of F-D-I nor of physical health was associated with changes in fantasy stories, but physical functioning seemed to have its effect on the drawing of

the human figure. Patients who became healthier produced more adequate drawings. They probably developed a better self image. Discussing paralyzed patients Cath et al. mention the need of the "Development of a new and different body image that takes into account the changed physical stucture of the body." Other possible interpretations are increased awareness of the parts of the body, or even improved motor coordination which results in heightened drawing ability.

In part the second hypothesis was upheld by the findings, particularly by those of the NR group. RFT performance remained stable, and it was not associated with changes in other variables. Physical improvement and positive changes in analytic thinking and Figure-Drawings took place concomitantly. As far as relative changes are concerned one cannot conclude that Witkin et al.'s cluster of interconnected attributes consisting of perceptual, intellectual and personality characteristics related to F-D-I develop as a unit, unperturbed by environmental influences.

Relative degree of change is not solely indicative of the patterning of variables associated with F-D-I which emerged after a three-months stay at the hospital. By comparing pre- and posttest correlational results of the R

and NR patients the extent of the effect of rehabilitation became evident. It has to be kept in mind that a personality reorganization after a relatively brief period of retraining could only be minimal. Most of the patients had not yet been fully restored and were still in a state of transition. Some of the correlational scores on tests obtained by the R group differed slightly from their initial composition, while those of the NR patients virtually remained unaltered. A trend towards change found in the relationship between Figure-Drawings and ADL ratings almost reached acceptable statistical significance. At posttesting physical improvement contributed to a patient's increased awareness of the human body or his ability to draw.

Apparently neither improved health nor a better representation of the body increased the self-assertive content of TAT stories. The finding is consonant with Murstein's (1968) statement that the self-concept and not external behavior determines the nature of response to TAT cards. The strength of the TAT, more than any of the other tests used, lies in revealing inner fantasies and fears. Kubie (1945), when describing the role of the unconscious in the process of recovery of disabled persons, talks about the reality level and

the level of unconscious fantasy and feeling. It is possible that, at the reality level, an R patient had shown physical improvement, which decreased his ADL rating. He had also regained the use of a leg and he included it in Figure-Drawings. Yet he now became afraid that he would never function as efficiently as before. The fear then could have been expressed as Lack-of-Self-Assertiveness in the TAT stories at the fantasy level.

There were other patients who may have had the need to deny physical defects by producing highly self-assertive stories. Fisher (1958) calls denial "the basic defense of the individual in the face of threat. He distorts unacceptable reality and makes it possible to exist and function within this reality." It remains a subject for discussion and further research whether for this type of population denial actually represents an obstacle to recovery. When arriving at the hospital many of the patients believed in a full return to their prior state of health. Only slowly did they come to recognize the permanent damage. Denial could have served to submerge depression and, consequently, was of help to keep a patient responsive to retraining procedures.

Other Findings

Prognostic value of results

The original level of perceptual F-D-I was not associated with improvement in physical health. Thus the prognostic value of the study was not significant. However, closer inspection of the available data reveals an interesting fact. Eight patients could not be included in the study because they were sufficiently restored to leave for home before the end of three months. Six of these patients obtained error scores on RFT below 10^{o}, two patients below 18^{o}. If these patients had been available at time of retesting results might have been closer to those of Bruell and Peszczynski (1958). They had found that patients with lower error scores on RFT appeared to benefit more from rehabilitation training than those with larger error scores.

Social functioning

One section of Dinnerstein et al.'s (1965) original ADL rating form was Social ADL. It was handled as a separate variable because it loaded on an additional factor which did not exclusively pertain to physical functioning. Social ADL proved to be the one variable in which the R group and the NR group differed initially. At the time of admission R patients, as a group, according to their scores on Social ADL, were more reluctant to formally

communicate and to participate in social activity. They also took less interest in their personal appearance than the NR patients.

After three months the R group did not show any significant changes on Social ADL, while the NR group decidedly became worse. On the whole patients who received medication only seemed to maintain the levels of their physical and psychological abilities, but interpersonal behavior deteriorated during the stay at the hospital. Patients in the R group, on the other hand, became more outgoing in accordance with their physical improvement, but as a group remained at the same level of interpersonal communication.

A hospital for the chronically diseased necessitates a continual readjustment to the environment. Patients respond to the requirements in a variety of ways in accordance with their unique personalities. At the same time they exhibit levels of a personality constellation which at least partially is stable.

Significance of the qualitative data

Holt (1968) in the foreword to Rapaport, Gill and Schafer's Diagnostic Psychological Testing remarks that "nature is particulate yet typical" and that at closer

inspection "all contours lose their sharpness . . . and turn into gradients." The present data corroborates the idea that it is erroneous to neatly classify people into categories. People are individuals, and all one can do is to describe them in terms of types which most nearly match their personalities. In this way test batteries are helpful.

Furthermore people react to external happenings, and particularly hospital life is full of major and minor events. People die, leave, relationships cease to exist and new ones are formed. In an institutional setting any experience can become therapeutic or prove to be harmful to some of its members.

Patient A, a woman whose Figure-Drawings and selected TAT stories were presented in the Result section is a good illustration of the successful R patient. This woman had a family which awaited her return home. In other words, there were people who cared and who were interested in her. The family's concern could have augmented her regard for the person as can be seen in the second set of Figure-Drawings. Furthermore, in the later TAT stories this patient expressed a great deal of determination to get work done and be useful. Overtly she had

tackled the difficulties of overcoming her physical handicap with similar energy.

There were other patients whose families showed concern with their physical state of well being, yet some of them became disgusted because progress was slow and painful.

The testing material of Patient B, a man of the NR group, showed coping behavior which became much impaired with time. His wife also came to visit him regularly. Without retraining there was no physical improvement, and the patient voiced great disappointment in not having been selected for rehabilitation therapy. His drawings evidenced an increasing sense of weakness, and greater anxiety about his body image.

The content of his TAT stories changed from denial of unpleasantness to a sense of hopelessness, frustration and depression. At first he apparently could function by finding happy endings and distorting unacceptable reality. The defense mechanism did not work at a later stage.

The two patients well illustrate the differential changes that could take place in R and NR patients respectively. The sixty-one-year-old woman improved physically, while the fifty-six-year-old man remained relatively unchanged in physical functioning. As for intel-

lectual performance the female patient started to think in more analytical terms and the male patient deteriorated. Figure-Drawings revealed the development of a much more articulated and very different body concept for the woman, while the man drew replicas of the first figures, only in a much weakened condition. Enjoyment in coping behavior superseded the originally much less self-assertive content of the TAT stories produced by the female patient. If depression can be submerged by denial, the NR patient's later stories show that this defense mechanism broke down and gave way to feelings of the futility of life.

Formal communication also differentiated the two patients. At retesting time the woman had come to greatly enjoy social activities, while the man refused to participate in them and only reluctantly left the ward. Mode of orientation was not affected in either of the patients.

Some Implications of the Results

Implications for personality theory

To a certain extent, perceptual, intellectual and some other features of personality were found to be correlated with each other. It also has been established

that the mode of orientation remained stable in this population, irrespective of external circumstances.

In accordance with the predictions made correlates of F-D-I did change, though the changes did not all take place concomitantly with each other. Furthermore, the results strongly suggest that the changes which did occur were a reaction to an altered physical state. Findings cannot be called conclusive since treatment effect was small. Furthermore after such a brief period of retraining we are still faced with an impaired personality pattern in most cases.

The results support the environmental hypothesis, namely that appropriate experiences affect the personality even in a relatively short time, though apparently do not influence perceptual-motor behavior. They show that later events in life must be considered in evaluating the psychological makeup. The demands and opportunities of a rehabilitation hospital test a patient's ability to cope with changes. At the same time, the altered circumstances leave their mark on the individual's personality structure.

Many experts in the field of rehabilitation for the disabled contend that the problems of the handicapped involve psychological adjustment to life. The

adjustment frequently is the outcome of an accurate perception of one's bodily resources and their usefulness. Results of this study do not warrant the conclusion that there is a static F-D-I personality constellation whose cognitive, affective and behavioral response patterns predispose towards recovery. Patterns are liable to change, and the changes are related to environmental and cultural factors, not merely to a patient's state of physical and mental health.

In treating the physically disabled it would be advantageous to keep in mind that certain ongoing life experiences are critical. The role of the family, rewarding or rejecting relationships with members of a hospital and the staff, and other psychosocial variables are relevant factors in determining a patient's potential for restoration.

From the above findings it seems plausible that people who are not physically impaired also can change in different areas which have been associated with F-D-I even if their perceptual behavior remains unchanged.

Implications for further research, and limitations of the study

Since the control group failed to show any marked improvement on the test measures, some evidence is present

that the experimental group was affected by exposure to rehabilitation training. Caution in interpretation is still necessary, since the investigator did not randomly assign patients to treatment groups. Although the experimental group and the control group were matched with regard to sex, age, level of intelligence, kind of disability and distributions of scores on all other major variables, the physical improvement of the R group could have been the result of a wise choice made by the staff. Ideally patients should be randomly assigned to R or NR, but such a procedure was not practical and would have raised questions of ethics.

It is not clear what the factors were in the exposure to a rehabilitation program which caused a patient to profit by it. Interpersonal attention could be a significant factor. Again if it were feasible and not detrimental to the patient's health, a research design should include three groups, namely an experimental R group and a NR group, as was the case in this study, plus a third group of patients who were told that they are in a different kind of rehabilitation program. During the hours the R patients received physical retraining instructions, the second control group would have enforced rest periods, closely supervised by physical therapists who would give

these patients all the attention spent on R patients. Individuals in such a program would not feel rejected or abandoned, since they would receive the same treatment as rehabilitation patients, minus the physical exercises. It would then be possible to evaluate factors of personal attention and physical rehabilitation.

A three-months' stay in a hospital for the chronically disabled is a short time for rehabilitation. Although many of the R patients improved rapidly and changed from moving about in a wheelchair to ambulation, others improved at a much slower pace. If better physical health influences various correlates of F-D-I it probably does so at different rates, so that changes are not discernible all at once. It seems that a longer period than three months would be needed in order to evaluate gains made in the psychological aspects of personality.

In addition it would be worthwhile to do a follow-up on the patients tested at admission and then three months later at the time of their discharge, irrespective of how much time elapsed between the second testing and the release from the hospital. At that moment possible gains should have become stabilized and integrated, and maybe one could then find a truly self-consistent personality pattern.

The ADL rating scale which was used served to keep the nursing staff and physical therapists informed of a patient's physical functioning. For the purpose of the study the rating system was not quite refined enough. A few patients obtained a score of 0 on all behaviors rated, which meant that they were totally independent and did not need any assistance. However, even those patients still could have improved physically. During the course of therapy gait became steadier, movements became faster, or fingers became more agile. Patients were quite proud of what was considered to be a minor amelioration, which a psychological test might have picked up, while it could not show on ADL.

Clinical implications

The major conclusion to be drawn from this study is that a relationship exists between state of physical health and some aspects of the personality structure. People are apt to change in many areas of their personality, and the change in one aspect possibly can affect another one.

Rehabilitation proceedings are the domain of the medical staff of a hospital, but it is advantageous to help making a patient more amenable and teachable.

Such a reeducation entails change in attitudes. To bring about these changes could well be the role of the psychologist working in an institutional setting with the disabled. In order to function the human being must adapt to the environment. Changes must be effected in all areas, and attention should not be given to physical retraining only.

The style of coping behavior is of great importance in the disabled. It has to be nurtured, strengthened, and wherever possible dependency has to be discouraged. By identifying cues of undesirable conduct it should become possible to eliminate behaviors which are detrimental to a patient's recovery.

Frequently the disabled becomes maladjusted because he has suffered a trauma which affected his competence in many areas. Disability can be experienced as some kind of a loss which results in extreme mourning, similar to the state which is described by Freud (1957) in connection with Melancholia. The impaired patient loses his self-respect, and conflict arises between the ego and his conscience. For example, he can become depressed and withdrawn and consequently, refuse to cooperate in any endeavor which would help in restoring his health. As was corroborated by the

content of some of the TAT stories, frequently, depending on earlier personality patterns, the patient believed to have committed some sin in the past for which he had to be punished.

A learning-theory-based psychodynamic behavioral therapy as described by Stampfl and Levis (1967) seems appropriate to treat such impaired persons. The strategy employed by implosive therapists is to discover cues of anxiety-evoking conditional stimuli. TAT stories should be helpful in revealing anxiety-arousing memories which tend to generate undesirable behavior in a patient.

In order to extinguish the objectionable responses, whether overt actions or emotional states, the implosive therapist attempts to bring the person as near to the original anxiety producing situation as possible. Areas which particularly apply to the disabled and frequently are included in such cues are punishment and guilt, rejection, death wishes, body injury and the fear of loss of control. Scenes including cues of those areas would be introduced by having the patient imagine them and ask him to act them out. In the absence of reinforcement anxiety would be reduced, particularly if one started with the least anxiety producing cue and hierarchally worked up to the greatest concern. Stampfl and Levis

comment that the striking feature of this therapy is that marked improvement was achieved with only one to fifteen sessions with patients exhibiting a wide variety of psychopathological problems. Moreover, since the disabled hospital population of this study showed impairment in analytic thinking the fact that the patient does not have to understand the significance of the cues in order to deal with them effectively enhances the possibility of success of implosive therapy.

Although perceptual functioning was not affected by physical changes, some associated characteristics of F-D-I moved in the direction of change. A procedure in which, through psychological intervention, a patient becomes more amenable to rehabilitation training would be extremely useful. It, therefore, seems worthwhile to investigate a short term technique such as implosive therapy in order to help the disabled individual to gain psychological strength which subsequently might alter overt behavioral responses.

One thing is certain, a new look is needed to help the disabled. The look must encompass the whole human being in addition to the physical component.

CHAPTER V

SUMMARY

The dimension of field-dependence-independence was introduced by Witkin and his coworkers in 1954. Operationally, the construct refers to the inability of some people to distinguish items as separate from the background, while others are less influenced by the field which surrounds an object.

The test most commonly used by Witkin to differentiate between highly field-dependent and highly field-independent individuals is the Rod-and-Frame Test (RFT), which requires the subject's judgment of the vertical in the presence of a tilted visual field. Field-dependency-independency defined by the RFT correlates with intellectual functioning and with a number of personality characteristics.

Most experimental work has supported the concept of a stable, self-consistent, field-dependent-independent style, but a few studies showed that, either by experimental intervention or some kind of treatment, errors in RFT performance could be reduced.

In order to test a) the stability, and b) the self-consistency of field-dependence-independence and its correlates, newly admitted patients at Bird S. Coler Hospital were tested. The subjects consisted of 50 disabled patients (R), 25 males and 25 females, who were assigned to physical rehabilitation training. A control group of 20 subjects (NR), 11 males and 9 females, received only medication but no physical therapy.

It was hypothesized that patients in a physical rehabilitation program would improve in their physical functioning and would concomitantly improve in mode of orientation on the RFT and in its psychological correlates.

Within two weeks of admission, a rating scale of Activities of Daily Living (ADL) was completed for each subject. At the same time some selected tests from Witkin's original battery were administered, namely three performance subtests of the WAIS, the RFT, Figure-Drawings, and 11 TAT cards. Each test relates to a different aspect of the field-dependent-independent personality structure. RFT relates to perceptual functioning, WAIS subtests to analytic thinking, Figure-Drawings to body concept and TAT stories to self-assertive behavior.

After a period of three months the patient again

was rated on ADL, and the testing procedure was repeated.

Effect of exposure to physical retraining

Results showed that at retesting: Patients in physical rehabilitation training significantly improved in physical functioning and also, as a group, improved their analytic thinking and developed a more adequate body concept. The Rod-and-Frame Test performance remained unaltered.

The control group did not show change in either physical functioning or in any of the tests related to field-dependency-independency.

After the treatment period the groups did not differ in their physical functioning.

Concomitant changes of pertinent variables

Concomitant changes in the R group occurred between physical functioning and adequate concept of the body, while control subjects also showed changes in intellectual functioning commensurate with physical improvement or deterioration.

Comparison between the personality test correlations with field-dependence-independence at pre and post-testing

In the R group, at first testing, level of field-dependence-independence related to body concept, but not

to analytic thinking. After three months level of field-dependence-independence related to analytic thinking, while it did not show a relationship with body concept. These correlational changes from pre to post-testing were too small to be statistically significant. Scores of human body drawings and level of self-assertiveness moved in opposite directions after treatment.

For the control group the relationships between the aspects related to field-dependence-independence remained the same as at time of admissions.

It was concluded that for the sample of disabled patients:

1. Exposure to physical rehabilitation program resulted in changes in physical and psychological functioning.
2. Patients in the retraining program were affected by exposure to rehabilitation in so far as some personality characteristics associated with field-dependency-independency changed, while this was not the case in the control group. However the differences between the initial and final constellation were too slight to allow the conclusion

that the personality structure related to field-dependency-independency was significantly changed.

3. The perceptual style of field-dependence-independence is a stable one which was not altered by improved physical abilities.

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APPENDIX A

TABLE 1

DISTRIBUTIONS OF SEX, RACE AND EDUCATION IN R AND NR GROUPS

Group	N	Sex		Race		Education--Years of Schooling			
		M	F	W	N	6 or less	7-8	9-12	College
R	50	25	25	20	30	13	14	19	4
NR	20	11	9	8	12	6	5	6	3
All Ss	70	36	34	28	42	19	19	25	7

TABLE 2

DISTRIBUTION OF OCCUPATIONS IN R AND NR GROUPS

Group	N	Profes-sional	Clerical	Operators	House-work	Laborers	Stu-dents
R	50	4	3	17	10	14	2
NR	20	3	0	7	2	7	1
All Ss	70	7	3	24	12	21	3

Name of Patient _____ Age _____ Admitting Number _____

Diagnosis _____ Admission Date _____

ACTIVITIES OF DAILY LIVING EVALUATION FORM

	Date				
EARLY MORNING ACTIVITIES					
I. Transfer from bed					
1) Roll to side					
2) Feet from covers over edge					
3) Come to sitting at edge					
4) Maintain sitting balance					
5) Prepare for transfer					
6) Transfer					
II. Grooming					
1) Wash hands and face					
2) Sponge bathe					
3) Brush teeth or dentures					
4) Comb or brush hair					
5) Shave or apply makeup					
6) Gather & return equipt.					
III. Dressing (include fastenings)					
1) Sleepwear off					
2) Shirt or slip on					
3) Trousers or dress on					
4) Socks on					
5) Slippers on					
6) Shoes on					
THROUGHOUT THE DAY ACTIVITIES					
IV. Wheelchair					
1) Lock brakes					
2) Unlock brakes					
3) Raise footrests					
4) Lower footrests					
5) Propel forward					
6) Propel in congested areas					
V. Ambulation					
1) Rise to standing					
2) Balance while standing					
3) Walk within cubicle					
4) Walk forward (20 feet)*					
5) Turn 180°					
6) Sit from standing					
VI. Bathroom Activities					
1) Enter and approach					
2) Transfer onto toilet					
3) Manage clothing before					
4) Use toilet paper					
5) Manage clothing after					
6) Transfer off toilet					

	Date				
VII. Feeding					
1) Cold or hot drinks					
2) Soup or cereals					
3) Finger foods					
4) Solid foods					
5) Hard to manage foods					
6) Cut meat					
END OF DAY ACTIVITIES					
VIII. Undressing					
1) Shoes off					
2) Slippers off					
3) Socks off					
4) Trousers or dress off					
5) Shirt or slip off					
6) Sleepwear on					
IX. Transfer to Bed					
1) Prepare for transfer					
2) Transfer to edge of bed					
3) Position self					
4) Place feet under covers					
5) Lie down					
6) Adjust position for comfort					
MISCELLANEOUS ACTIVITIES					
X. Care of Possessions					
1) Manage drawer					
2) Manage cabinet					
3) Manage curtain for privacy					
4) Manage use of safety pin					
5) Put garment on hanger					
6) Pick up object from floor					
XI. Personal Relations					
1) Count change					
2) Use a dial phone					
3) Understand signs (for safety & direction)					
4) Pick up pencil & write name					
5) Interest in own appearance					
6) Seek social activity**					
SUMMARY					
I. Sum: transfer from bed					
II. Sum: grooming					
III. Sum: dressing					
IV. Sum: wheelchair					
V. Sum: ambulation					
VI. Sum: bathroom activities					
VII. Sum: feeding					
VIII. Sum: undressing					
IX. Sum: transfer to bed					
X. Sum: care of possessions					
XI. Sum: personal relations					

*see Special Note on back

**see Special Note on back

APPENDIX C

SHORT SCALE OF FIGURE-DRAWING ITEMS

1M WEAK BODY POSTURE. Global impression of weakness, depletion, collapse, or "falling apart" (in content or structure). Scored on self-figure. (May or may not occur in context of primitive body types.)

IF INACTIVE POSTURE. Global impression of passivity and absence of movement or active self-display. Scored on self-figure only.

2MF MARKED DISPROPORTION. Global impression concerning adequacy of proportion in size and placement of major body parts. Specific disproportion of hands and feet in drawings by men and women, and large head in drawings by women, are not included in this item, as they reflect special problems. Scored on either figure. (Disproportion reflects disharmony in character and behavior.)

3MF SKILL RATING OF 5 OR LESS ON A 9-POINT SCALE. Scored on either figure. (A high level of interest in and respect for the body are implied in good skill.)

4M EXCESSIVE ERASURES. Scored if either figure has three or more erasures, or if head is erased. (Erasures reflect dissatisfaction.)

4F FEW ERASURES. Two or fewer erasures. Scored on self-figure only.

5MF TRANSPARENCY. Scored when any part of the figure "shows through" a superimposed part or through clothing. Scored on either figure.

6MF VERTICAL MIDLINE NOT INDICATED, OR OFF-AXIS. "midline" refers to explicit indication of body axis. In "simple" drawings, it may be represented by a vertical line in center of trunk; in more "sophisticated" ones by sufficient details (such as a row of buttons, elaborate zipper, long tie, etc.) to represent midline. The midline is "off-axis" if it is not parallel to body. It may be moved to side in profile drawings. Scored on either figure.

7M CONTINUOUS LINE. Line essentially continuous, as if pencil had rarely been lifted from paper in process of drawing outlines of each of major body parts. Scored on either figure.

7F RIGIDITY OR TENSION RATING OF 5 OR LESS ON 9-POINT SCALE. Ratings based on global impression of tension or rigidity. Scored on either figure.

8MF REINFORCEMENTS ABSENT OR RARE. Reinforcement defined as going over line, usually with heavier pressure. Scored on either figure.

9MF CONSISTENCY RATING OF 5 OR LESS ON A 9-POINT SCALE. Consistency within a single figure refers to consistency in quality, skill, amount and balance of detailing in various areas, freedom from combination of childish or animal-like elements with mature elements. Consistency of mood or action is included in the score, but variation in line quality is not. Scored on either figure.

10MF EXCESSIVE MOUTH DISTURBANCE. Deviations such as unusual size or shape, persistent erasures, uncontrolled shading, or omission of mouth when eyes and nose are present. Scored on either figure.

11MF LARGE HEAD. Scored on self-figure only.

12MF LARGE EYES. Score based on relation of size of eyes to rest of the face. Scored on self-figure only.

13M NO SENSUOUS MOUTH. A sensuous mouth is heavily shaded, full-lipped, very curved. Scored on self-sex only.

13F CONCAVE OR CUPID'S-BOW MOUTH. Scored on self-sex only.

14F NOSTRILS EMPHASIZED, OR GIVEN AS ONLY INDICATION OF NOSE. Scored on either sex.

15M EAR EMPHASIS. Ear may be very large, displaced, distorted, detailed, incorporated in head outline, heavily reinforced, erased, or shaded. Scored only when present in both drawings.

15F LACK OF EAR EMPHASIS. Scored on male drawing only.

16MF PECULIAR OR CIRCLE HEAD. Head misshapen or crude circle. Scored on either figure.

17MF SELF-SEX FIGURE PLEASANTER. Ordinarily scored on basis of facial expression. If facial features are omitted in either or both figures, scored on basis of mood expressed in total figure.

18MF OPPOSITE SEX MORE HOSTILE. Absence of features is also taken as expression of hostility. Does not necessarily overlap with Item 17.

19MF HOSTILE OR FEARFUL EXPRESSION. Scored on basis of facial expression. Absence of facial features on either figure is also taken as expression of hostility. Scored on either figure.

20MF ARMS RELATIVELY WEAK OR OMITTED. Impression may be conveyed by faint lines, amorphous shape, etc. Scored on male figure only for subjects of both sexes.

21MF SHORT ARMS. Normal arm is roughly two-fifths of length of figure. Short arms are defined as less than one-third of figure. This item may or may not occur with Item 20. Scored on self-sex only.

22M ARM OR ARMS OUT OR AT SIDE. Scored on either figure.

22F HAND OR HANDS EXPOSED. Scored on either figure.

23M HAND OR HANDS NOT POINTING TOWARD BODY. Bases of scoring self-explanatory. Scored on basis of direction of arm even if hands are omitted. Scored on self-figure only.

23F HEAD NOT COCKED. Head not tilted down, nor at angle to body and "looking" at it. Scored on self-figure only.

24MF FOOT BLURRING, PECULIARITY OR OMISSION. Feet blurred, unrealistically shaped, or distorted. Scored on either figure.

25MF NO TIGHT STANCE. Tight stance defined as legs pressed close together. Scored on either figure when this feature is absent.

26F ABSENCE OF INDICATIONS OF CONFLICT IN LEG AREA. Absence of reinforcements, erasures, or shading around legs. Legs not covered by long gown. Scored on self-sex only.

27M CRUDE CLOTHING. Clothing indicated by belt or buttons at most. Does not refer to realistically drawn nudes. Scored on either figure.

27F CRUDE OR CHILDISH CLOTHING. Crude clothing as defined above. Childishness is a qualitative feature which may appear in the context of elaborate clothing. Scored on either figure.

28MF NO TIE. Scored on male drawing only when a shirt is buttoned up, a hat is indicated, or a business suit is drawn.

29MF ACCESSORIES EMPHASIZED MORE THAN ESSENTIALS. Figure too "fussy", contains too many ideas or very special items, at the expense of essential parts of figure and clothing. Scored on either figure.

30MF NO DRESSING TO NECKLINE, NO SPORT CLOTHING, NO NUDES. No dressing of figure to neck, no sport attire or bathing suit, no nudes. Scored on self-sex only.

31MF MEAGER SEX CHARACTERISTICS. Basis for judgment was the absence of or minimization of sex characteristics. For drawings of the male figure, broad shoulders, appropriate hair treatment, clothing, and accessories were considered indicators of masculinity. For drawings of the female figure, breasts, hips, buttocks, as well as coiffure, clothing, and accessories, were considered indications of femininity of the figures. Scored on either figure.

32MF MEAGER MALE-FEMALE DIFFERENTIATION. May occur with or without Item 31. Scored when both figures look "alike."

33M HAIR SHADING UNCONTROLLED. Scored when shading is disorderly, lacking in structure, not encased, without coiffure lines. Scored on either figure.

33F HAIR SHADED. Scored on either figure.

34MF BODY SHADING UNCONTROLLED. Item similar to 33M, but in different area. Scored in either figure.

35M ABSENCE OF USUAL INDICATORS OF MASTURBATORY GUILT. Absence of such features as: hand or hands in pocket or in genital area; rigid, conspicuous, or deformed finger; swelling or reinforcement of hand or hands; pipe or cigarette, pencil, or baseball bat. Scored on self-sex only.

35F NO INDICATIONS OF DISTURBANCE IN SEX AREA. Absence of conflict indicators such as erasures, disturbed shading, transparencies, reinforcements, or other evidence of disturbance in skirt, hips, and buttocks. Scored on self-sex only.

36F ABSENCE OF BREAST EMPHASIS. Scored on self-sex only.

37F HEMLINE DEVIATIONS. Emphasis, confusion, or breaks in hemline. Addition of extra lengths or tiers. Scored on self-sex only.

38M ABSENCE OF SOFT HAIR ON F. Meager, severe, harshly scribbled hair, or complete absence of hair. Scored on F drawing only.

38F BANGS OR HAIR ON FOREHEAD. Scored on self-sex only.

39M F HAS HIGHER DRIVE. Drive is derived from global impression of all aspects of the drawing and scored on a nine-point scale. Refers mainly to energy level. Scored if numerical rating assigned to F is higher than the numerical rating assigned to M.

39F DRIVE RATING OF 5 OR LESS ON A 9-POINT SCALE. Scored on self-figure only.

40M NO EFFEMINACY ON M. Absence of effeminate features such as small feet, small hands, large hips, rouged mouth, fancy hair-do, shoe heels. Scored on self-sex only.

40F NO MASCULINITY ON F. Absence of masculine features such as broad shoulders, large hands or feet, muscle emphasis, severe hair treatment, scored on self-sex only.

41MF OPPOSITE SEX DRAWING EQUAL IN SIZE TO OR SMALLER THAN SELF-SEX.

42M F IN PROFILE. Scored on opposite sex only.

42F SAME PERSPECTIVE OF F AND M.

43F HEAVY WAISTLINE EMPHASIS. Cutting off the area below the waist by a very heavy, elaborate, or otherwise emphasized waistline. Scored on self-sex only.

44M ABSENCE OF MARGINS AND ENCASEMENTS. Margins, refer, e.g. to cuffs on shirtsleeves or trousers. Encasements may consist of a line around the fingers, or around hair. Scored on either figure.

44F ABSENCE OF CHOKER. Choker refers to beads, necklace, or similar ornament around the neck. Scored on self-figure only.

45MF NECK VERY LONG OR ABSENT. Neck considered long if its length is 10 percent or more of the length of total figure. Scored on either figure.

APPENDIX D

CORRELATIONAL MATRIX a FOR ALL SUBJECTS N=70

	Sex	Age	Verbal Index	Anal. Index	RFT	FDT	TAT	ADL	Soc. ADL	Anal. Ind.D	RFT D	FDT D	TAT D	ADL D
Age	-.09													
Verbal	-.04	.16												
Anal.	-.11	.05	.51[a]											
RFT	.24[b]	-.05	-.20	-.34[a]										
FDT	-.10	.03	-.12	-.53[a]	.40[a]									
TAT	-.21	-.14	-.03	.09	.08	.09								
ADL	.32[a]	-.10	.01	-.04	.15	.17	.25[b]							
S. ADL	.16	.00	-.12	-.03	.12	.20	.22	.67[a]						
Anal.-D	.13	-.24[b]	-.16	-.30[b]	.13	.11	.02	.00	.03					
RFT D	.13	.11	.00	-.09	-.15	.04	-.11	-.02	-.11	-.15				
FDT D	.12	.17	-.03	-.17	-.18	-.19	-.11	-.11	-.07	-.49[a]	.18			
TAT D	.10	.03	.17	-.01	-.06	-.09	-.59[a]	-.10	-.20	.02	.10	.00		
ADL D	.18	.00	.01	-.09	-.23	-.16	-.07	-.58[a]	-.43[a]	.47[a]	.12	.59[a]	.01	
S. ADL D	.09	.03	-.02	-.18	-.18	-.14	-.06	-.22	-.57[a]	.24[b]	.19	.39[a]	.00	.54[a]

Note: 1. a=significant at .01.
b=significant at .05.

2. D=Difference Score

APPENDIX D (continued)

CORRELATIONAL MATRIX b FOR REHABILITATION GROUP N=50

	Sex	Age	Verbal Index	Anal. Index	RFT	FDT	TAT	ADL	Social ADL	Anal. Ind.D	RFT D	FDT D	TAT D	ADL D
Age	.05													
Verbal	-.03	.07												
Anal.	-.14	.07	.43[a]											
RFT	.17	.09	-.11	-.25										
FDT	.06	.15	-.03	-.47[a]	.29[b]									
TAT	.22	.02	-.16	.00	.00	.07								
ADL	.43[a]	.02	.03	-.04	.11	.25	.17							
S. ADL	.19	.09	-.10	.00	.13	.27[b]	.23	.74[a]						
Anal.-D	.01	-.20	.03	-.25	.16	.02	.00	-.05	-.04					
RFT D	.33[b]	.05	-.32[b]	-.33[b]	-.08	.15	-.05	.07	-.06	-.06				
FDT D	.12	.17	-.08	.16	-.18	-.13	-.08	.01	-.06	-.23	.06			
TAT D	.00	-.25	.21	.17	-.03	-.24	-.66[a]	-.10	-.13	.19	-.04	.03		
ADL D	-.21	-.11	-.10	.00	-.23	-.17	-.03	-.64[a]	-.49[a]	-.21	.06	.42[a]	-.02	
S. ADL D	-.11	.00	-.10	-.23	-.16	-.15	.00	-.36[a]	-.61[a]	-.26	.14	.41[a]	-.21	.64[a]

Note: 1. a=significant at .01
b-significant at .05

2. D=Difference Score

APPENDIX D (continued)

CORRELATIONAL MATRIX c FOR NON-REHABILITATION GROUP N=20

	Sex	Age	Verbal Index	Anal. Index.	RFT	FDT	TAT	ADL	Social ADL	Anal. Ind.D	RFT D	FDT D	TAT D	ADL D
Age	-.37													
Verbal	-.03	.25												
Anal.	-.03	-.01	.57[a]											
RFT	.41	-.35	-.32	-.48[b]										
FDT	.17	-.17	-.22	-.63[a]	.63[a]									
TAT	.19	-.47[b]	.19	.28	.31	.12								
ADL	.03	-.34	.10	.04	.23	-.06	.42							
S. ADL	-.05	-.29	.00	.14	-.18	-.26	.24	.38						
Anal.-D	.29	-.28	-.26	-.27	.03	.17	.04	.08	.17					
RFT D	-.12	.15	.19	.05	-.21	-.04	-.21	-.12	.08	-.09				
FDT D	-.10	.12	-.13	.09	-.11	-.24	-.16	-.30	.25	-.69[a]	.16			
TAT D	-.33	.54[b]	.00	-.49[b]	-.05	.31	-.45[b]	-.03	-.14	.01	.14	-.20		
ADL D	-.11	.17	.03	.12	-.15	-.09	-.13	-.48[b]	.12	-.75[a]	.04	.82[a]	-.25	
S.ADL D	.00	.03	.08	-.39	-.14	-.01	-.26	-.26	.28	-.04	.10	.13	.37	.03

Note: 1. a=significant at .01
b=significant at .05

2. D=Difference Score