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THE EFFECTS OF SUCCESS AND FAILURE EXPERIENCES ON CHRONIC SCHIZOPHRENIC PATIENTS

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	iii
LIST OF TABLES	v
LIST OF ILLUSTRATIONS	vi
Chapter	
I. INTRODUCTION AND PROBLEM	1
II. EXPERIMENTAL DESIGN AND PROCEDURE	14
III. RESULTS	30
IV. DISCUSSION OF RESULTS	38
V. SUMMARY AND CONCLUSIONS	48
REFERENCES	53
APPENDIX	57

LIST OF TABLES

Table		Page
1.	Judges' Classification of Patients' Verbal Reports	29
2.	Pre-treatment Mean Autokinetic Indices for All Patient Groups	31
3.	Mean Autokinetic Indices Before and After Treatment Conditions with Direction and Amount of Change	32
4.	Autokinetic Indices for Individual Patients Before and After Treatments with Direction and Amount of Change	58

LIST OF ILLUSTRATIONS

Figure — Page

1. Indices of Direction and Amount of Autokinetic Movement for All Patients Before and After Treatments 35

THE EFFECTS OF SUCCESS AND FAILURE EXPERIENCES ON CHRONIC SCHIZOPHRENIC PATIENTS

CHAPTER I

INTRODUCTION AND PROBLEM

In the author's review of the literature concerning the effects of success and failure experiences on the personality adjustment of chronic schizophrenic patients it was found that relatively little work has been done in this area. Although there have been experimental studies on the reactions of normal and neurotic individuals to failure situations (3, 9, 15, 18, 28), noticeably less research has been concerned with the effects of success situations upon personality adjustment. Actually, there have been all too few fruitful attempts to discover the effects of both success and failure on the adjustment of hospitalized mental patients. Barring the speculation of those who are dedicated to helping and being of service to the mentally ill, it has yet to be determined experimentally whether success and failure experiences help or hinder those individuals who come to maintain a psychotic mode of adjustment. Due to the ever-increasing number of individuals who enter our mental hospi-

tals every day, it would seem that research and experimentation dealing with the variables which conceivably affect the personality adjustment of mental patients is a vital necessity. Thus, the present study is concerned with what effects success and failure experiences have upon the adjustment of chronic schizophrenic mental patients in a hospital setting. Aside from its immediately practical significance, knowledge obtained from such a research project could contribute to the refinement or development of psychological theories of personality and provide a firmer foundation upon which to base some of the clinical treatment of the chronic schizophrenic patient.

Success and Failure Studies

One of the earliest researches on success, failure and personality variables is that of Gates and Rissland (3). In their study, subjects who were relatively poor in achievement on a certain performance task were more unfavorably affected in their performance on the same task by discouragement than relatively proficient individuals. Encouragement, however, did not have a more favorable effect upon non-proficient individuals. Along somewhat similar lines, an experiment by Hutt (8) differentiated between the effects of success and failure upon a group of maladjusted children and a group of well-adjusted children. In this study two methods of administration of the Stanford-Binet were used. Under

the "adaptive" method a failed item was followed by one upon which success was likely, while under the "standard" method easy items were given at the start and then were followed by increasingly more difficult items until all items were failed. The "adaptive" method produced greater confidence and resulted in higher I.Qs. for the maladjusted group. No significant difference in I.Q. scores was found between the two testing procedures for the well-adjusted group.

Taylor and Farber (31), testing the hypothesis that failure leads to differential effects in submissive and ascendent individuals, found that the performance of the submissive group was significantly inferior and more variable than that of the ascendent group on a series of form boards on which they were allowed to succeed or fail according to the discretion of the examiner.

In a study that presents great difficulty in interpretation, Meadow (19) found that women with low dominance test scores were more emotionally disturbed by failure than women with high dominance test scores. The index of emotional disturbance in this study was each individual's subjective report. The author also found that those who were emotionally shaken by failure showed poorer performance on arithmetic and memory tests for emotionally loaded words than those who reported little or no emotional disturbance after failure.

Investigating differences in both test performance

and behavior change relative to success and failure situations, Lantz (12) obtained significant increases in performance on the Stanford-Binet for children who had been exposed to a success condition and significant decreases for those children who had been exposed to a failure condition. According to examiner ratings on various personality traits, the success group was significantly higher than the failure group in personal-social adjustment. From her study, Lantz concluded that significant variations in personality and behavioral patterns are related to experiences of success and failure.

Using paper and pencil tests and questionnaires to single out various personality correlates, certain investigators (15) found no relationship between neurotic tendency scores or self-professed attitudes and performance under failure conditions. Such findings, however, are not too surprising since paper and pencil tests of personality assessment and the questionnaire method of diagnosis are considered, in some quarters (16), to be poor instruments for measuring and evaluating an individual's real feelings and attitudes.

Studying the frustration reactions of normal and neurotic children, Sherman and Jost (28) obtained results that seem to bear out the implication that individuals respond to failure in terms of their personality patterns. In this study, neurotic children were found to be more easily

frustrated than normal children. Also, it was found that the frustration reactions of the neurotic child lasted longer than the reactions of the normal child.

Although Katz (9) did not deal with personality differences in response to success and failure, his research concerned with the changes in emotional expression under conditions of failure, is relevant. His subjects showed a highly significant difference in their drawings before and after exposure to a simulated condition of failure. After failure, the drawings of college students were found to be constricted, depressed, and somewhat pathological.

A study by Miller (17) has a slightly more direct bearing on the present research. Investigating the level of aspiration of psychiatric patients after a failure situation, Miller discovered that various clinical groups responded differentially to the threat of failure. His data suggest that neurasthenics and anxiety hysterics are most unrealistic in setting a level of aspiration, certain character disorders and compulsives maintain low aspiration levels, and conversion hysterics are most realistic in setting their levels of aspiration. It would seem that failure situations have a tendency to make certain neurotic groups more unrealistic in their aspirations and possibly more pathological.

A study (24) conducted at the Veterans Administration Hospital in North Little Rock, Arkansas, appears to be the

only research that is directly related to the current experiment. In a problem solving experiment using fudge candy as an initial reward for successful achievement on certain performance tasks and later using praise and approval for socialized behavior, it was found that reward and interpersonal success situations were effective as methods of improving the resocialization of mental patients with a diagnosis of chronic schizophrenia.

None of the studies mentioned previously deal adequately with the problem of whether success and failure experiences have a therapeutic or detrimental effect upon the adjustment of the chronic schizophrenic patient. While they have shown that success and failure do modify behavior in certain situations (3, 12, 18, 28, 31), they have dealt either with neurotic and normal children (8, 12, 28) or adults (15, 18, 31), or they have dealt primarily with motor performance or intellectual achievement as a measure of behavior change under success and failure conditions. Other studies mentioned previously (9, 17), although tangential to the problem, are not directly related. Only the study (24) conducted at the hospital in North Little Rock, Arkansas, suggests that success situations aid in the adjustment of the chronic schizophrenic patient.

The Autokinetic Phenomenon

Autokinesis, or the apparent movement of a pin-point

of light in a totally dark background, is a familiar term in the psychological literature of today. Past research with the autokinetic phenomenon was primarily concerned with the nature and conditions of this apparent movement phenomenon and extensive experimentation was conducted by many investigators (2, 5, 11). An exhaustive review of the literature on apparent movement, including autokinesis, was presented by Hovland in 1934 (7). This earlier research, however, is not highly pertinent to the present study. Most of the recent literature on the autokinetic phenomenon refers to the use of autokinesis as a method or technique for studying other psychological problems (6, 10, 25, 27, 32, 36). For Voth (32) it specifically provided a means of studying abnormal behavior and became a projective response from which clues to the diagnostic classification and evaluation of mental patients could be obtained. The present experiment uses the autokinetic phenomenon in a manner similar to that of Voth.

Using the autokinetic phenomenon in a mental hospital setting, Voth (32) found that mental patients differ in regard to their perception of apparent movement according to their particular psychiatric diagnosis or classification. For example, patients with a diagnosis of manic-depressive psychosis, as a group, showed significantly less autokinetic movement than a group of schizophrenic patients. He also found that prognostic indications are associated with the

amount of apparent movement perceived by a given patient. In Voth's words, "Limited or medium movement may be considered prognostically more favorable than extensive or no movement" (32, p. 804). Among the many findings of his study Voth showed that 1) normals, as a group, have limited or medium amounts of movement, 2) patients exhibiting limited or medium amounts of autokinetic movement present, in the aggregate, the best remission records, 3) patients remaining in the hospital with medium autokinetic movement indices are more productive and better adjusted to the hospital situation than patients with extensive movement, and 4) patients receiving metrazol or electro-shock treatment tend to reduce their movement whereas those patients who did not receive shock treatment tended to maintain their extensive movement patterns. Voth concluded that for a given patient the relationship between recovery and reduction of movement on the autokinetic phenomenon tends to be a positive one.

In addition to the above, Voth discovered that repeated autokinetic performances are fairly constant for individuals, whether normal or psychotic. He obtained a test retest reliability correlation of +.92 in his sample of mental patients. He also found that schizophrenic patients, excluding the paranoid type, tend to have the highest percentage of extensive movement patterns when compared to other psychiatric groups tested.

As mentioned earlier, Sherif (25) and other investi-

gators (6, 10, 27, 36) have profitably used the autokinetic phenomenon as a measure of behavior and behavior change. Concerning the problem of the present study, Sherif and Harvey (27) found that normal subjects who were placed in a highly unstructured and uncertain autokinetic situation, and who were given no assurance from the examiner, had significantly greater ranges of movement than subjects who were placed in a more structured and reassuring autokinetic situation. These authors concluded that, "The more uncertain the situation, the greater the scale within which judgemental reactions are scattered" (27, p. 303).

From the findings of Voth (32) and Sherif and Harvey (27) it may be inferred that the extent of autokinetic movement seen by an individual is positively related to psychological states of insecurity, uncertainty, instability, and anxiety. According to Sherif and Harvey, the consistency and stability of an individual's reactions is dependent upon the stability of his physical and social anchorages at a given time. As these physical and social anchorages become more uncertain, vague, and unstable, the individual's personal bearings and reactions become more uncertain and unstable. In their own words,

> The psychological consequences of the actual or experienced loss of physical and social bearings are at least initially increased fluctuations, variations in reactions, floundering around in search of something to hold on to, strivings to re-establish some level of stability through stable anchorages (27, p. 302).

The findings of Voth (32) could be interpreted as being consistent with the experimental results and the theoretical approach of Sherif and Harvey (27). Voth's schizophrenic patients, with the exception of the paranoid type, who may be considered as a special group, showed extensive autokinetic movement patterns. Since schizophrenic patients, as a group, are considered to be highly unstable, emotionally insecure, and disorganized individuals with poor contacts, ties, relationships, or anchorages with the everyday world of reality, they would be expected to have extremely extensive apparent movement reactions in a physical and social situation as vague and unstructured as the autokinetic situation. Literally speaking, schizophrenic individuals are people who have lost their personal bearings and, in such a situation, what little internal stability and security is present in these individuals would tend to be lessened for they would have few anchorages or personal stable frames of reference with which to control the apparent movement phenomenon. The tendency for paranoid schizophrenics to show constricted or no perceived movement in the autokinetic situation may not contra-indicate underlying instability, disorganization, and insecurity, but may merely reflect their super-imposed rigid, intellectual defenses against underlying loss of personal bearings.

Relative to the problem of the present study, it would be reasonable to expect that success situations lead-

ing to an increase in self-esteem and self-worth could enable chronic schizophrenic patients to achieve, at least momentarily, sufficient internal stability and personal security (anchorage or reference point) to reduce their perception of autokinetic movement. It would also be reasonable to expect that failure situations leading to a decrease in self-esteem and self-worth on the part of chronic schizophrenic patients could result in their loss of internal stability and personal security (anchorage or reference point) and increase their perception of autokinetic movement.

The information gleaned from Sherif and Harvey (27) and Voth (32) suggests that the autokinetic phenomenon not only provides a method for studying an aspect of behavior and behavior change, but also enables one to give meaning to the particular amount of apparent movement perceived by an individual since extensive autokinetic movement seems to be associated with mental illness _per se_ and with poor prognosis, poor remission records, and poor adjustment of mental patients in a hospital setting. On the other hand, a little or moderate amount of autokinetic movement appears to be associated with good prognosis, good remission records, and good adjustment of mental patients, as well as being typical of individuals considered to be normal. Because of these attributes, the autokinetic method was chosen as a device to measure the effects of success and failure variables on the

behavior of chronic schizophrenic patients in the present study.

While the success and failure studies mentioned earlier in the chapter define success and failure in many ways, in this study success is defined as any experience which is favorable to the self-esteem or self-worth of a particular individual. Failure is defined as any experience which is unfavorable to the self-esteem or self-worth of a particular individual.

Statement of Hypotheses

The purpose of the present study is to determine whether success and failure experiences have any effect on the amount of autokinetic movement perceived by mental patients with a psychiatric diagnosis of chronic schizophrenia. A change in the amount of such movement could be considered rather directly reflective of the psychological adjustment of the individual, considering the findings of Voth (32) concerning the relationship of autokinetic movement to the personal adjustment of mental patients and to psychiatric status.

In light of the experimental method designed to measure the effects of success and failure, the specific hypotheses to be tested are as follows:

1. Success experiences on the part of chronic schizophrenic patients will be followed by a decrease in the

amount of autokinetic movement perceived.

2. Failure experiences on the part of chronic schizophrenic patients will be followed by an increase in the amount of autokinetic movement perceived.

CHAPTER II

EXPERIMENTAL DESIGN AND PROCEDURE

In order to investigate the influence of success and failure experiences on the perceived autokinetic movement of chronic schizophrenic patients, a treatment by levels design was used where one level was composed of male and another level composed of female patients. The patients were assigned randomly within each level to receive one of three treatment conditions, success, failure, or neutral. Each patient was tested individually in the autokinetic situation before and after he was individually administered the treatment condition. This provided a control for before-after variations in autokinetic behavior due to initial individual differences while the control group had the function of providing for a high degree of precision in discovering differences due to the effects of the treatment variable.

Subjects

A total of 60 hospitalized schizophrenic patients were used in this experiment, thirty males and thirty females. They were drawn from the institutionalized patient population of Central State Griffin Memorial Hospital in

Norman, Oklahoma, on the basis of having an official hospital diagnosis of either catatonic, hebephrenic, simple, mixed, or undifferentiated schizophrenia and being between the ages of 20 and 50 years. Patients who had been exposed to shock treatments within a one month period prior to the experiment and patients who had been classified as mentally deficient were omitted from the population from which this sample was drawn. It was decided that only those schizophrenic patients who have extensive autokinetic movement records would be included in this experiment. Voth's data (32) revealed that paranoid schizophrenic patients tend to have constricted autokinetic movement which is atypical of all other schizophrenic diagnostic categories. Paranoid schizophrenic patients were therefore omitted from the schizophrenic population from which this sample was drawn. All patients from the other above-mentioned schizophrenic diagnostic categories were treated as homogeneous.

In the initial stages of selecting a population of chronic schizophrenic patients for this research, it was felt that Central State Griffin Memorial Hospital contained more than enough patients to meet the criteria for selection. Voth's published study (32) led the author to believe that a greater number of disturbed patients could cooperate in the autokinetic situation than were actually found able to cooperate in a preliminary investigation made by the author. Out of an original population of 200 male and female

patients, 100 patients were too disturbed to comprehend what was expected when the experimenter approached them on their various wards. Approximately 40 others either refused to enter the autokinetic room or, once inside, became so severely disturbed and disoriented that they could not follow directions. A handful of patients, who seemed to be following the instructions for the autokinetic situation, became disturbed and disorganized and started whimpering and crying. At least three patients became incontinent during the autokinetic testing and had to be taken out of the situation and disqualified. Thus, after much time spent in interviewing patients in order to determine whether they were in sufficient reality contact to comprehend what was expected of them in the experimental situation, it was found that relatively few chronic schizophrenic patients were available for the necessary samples. In addition, it was found that due to recent and major changes in the administration, treatment, and discharge procedures at the Hospital, the treatment and rate of discharge of patients had so improved that only a small number of patients remained who were not so severely disturbed and grossly out of contact with reality that they could participate in the experiment.

Those patients who met all the requirements and were able to cooperate on all phases of the experiment became the subjects of the study. They appeared to be influenced and highly motivated by the therapeutic atmosphere

of the Hospital. Most of the patients verbalized their eagerness to cooperate with the experimenter and expressed a desire to be evaluated with the hope that they would receive some form of treatment, privileges, special activities, or home visitation which had been denied them up until the time of the experiment.

Procedure

Most of the experimentation took place in two small rooms with only the experimenter and the patient present. A light-free room served as the autokinetic room and a normally lighted room adjacent to the dark room was used to administer the various treatment conditions. The procedure during the autokinetic periods was identical for all subjects. Differential procedure for the three treatment sub-groups (success, failure, and control) occurred only during the interpolated period between the two administrations of the autokinetic test.

Each patient was escorted from his hospital ward to the location of the experimental setting by the experimenter. After the experimenter had introduced himself to the patient as a psychologist on the hospital staff, he told each patient:

> You are going to receive a short series of judgment, personality, and intelligence tests so that your progress at the hospital can be evaluated. These tests will tell us how well you are getting along and whether you have been helped since coming to the hospital.

Initial Autokinetic Procedure

Each subject was given a pair of dark sun glasses and instructed to wear them. He was then told that the glasses were to be worn for the purpose of adapting his vision to the completely dark room in which the judgment tests were to be administered. The experimenter subsequently led the subject to the room adjacent to the autokinetic room and announced:

> You are about to enter a completely dark room, do not be afraid, I will be with you all the time. This test will take ten minutes. When you enter the dark room, I will put my arm around your shoulder and lead you to a table and chair. You will see a small pin-point of light in front of you when you are seated.

After entering the dark room and seating the subject, the experimenter removed the subject's glasses and switched on the autokinetic light. Each subject was given a five minute dark adaption period and during this period the experimenter handed the subject a pencil and said:

> Here is a pencil, hold it at the center of the board in front of you. (The experimenter placed the pencil at the center of the board). Now, do you see the pin-point of light? Keep your eyes directly on the light in front of you until the test is over. Hold your head as steady as is comfortable. When the light begins to move, you are to move your pencil around on the board in the same direction and at the same speed that the light moves. Each time the light stops moving, make a heavy dot with your pencil at that point and when the light begins to move again, continue moving your pencil from that dot. The only time you are to return your pencil to the center of the board and begin again is when your lines happen to lead out of bounds against any edge of the board. Such returns are to be made by raising your pencil and moving it back to the center of the board. You are then to continue moving your pencil on the board in the direction

> of movement of the pin-point of light. Do not move your pencil as long as the light is stationary or standing still.

The experimenter asked whether the subject understood the instructions and then answered questions of the subject related to what was expected of him. When the subject was ready to begin, the experimenter remarked:

> I will be here with you but at no time are you to ask any questions until the test is over. The test is about to start. I will tell you when the ten minute period is over. Ready! Begin!

The experimenter at the same time tripped an automatic timer which was set for a ten minute period. When the timer rang, the experimenter said, "Stop!" After this ten minute autokinetic period the subject was led to a table in the adjacent room where the procedure differed depending on whether the subject was from a success, failure, or control group.

Failure Procedure

Subjects in the failure groups were told that the next test was a personality-intelligence test. At this time Form A of the Minnesota Spatial Relations Test was exposed. When a subject in a failure group signified readiness to begin this so called personality-intelligence test, the experimenter announced:

> This test is a personality-intelligence test. Your performance on this test will tell us how well you are getting along at the hospital. This test is one of the best single tests available to let us know how you are progressing. Now, you are to put the blocks before you in their proper places on the board. You

> should have no trouble completing this test within the expected time limit. Ready! Go!

The experimenter simulated keeping time with a stop watch and when each subject in the failure groups was within five blocks of completing the test, he was stopped. The experimenter jotted down on a sheet of paper, in full view of the patient, his name and ward and made notations pertaining ostensibly to the patient's "poor personality," "poor intelligence," and "poor ability." The subject was told, "You failed to complete the test in the required time limit. Your score is very poor, you failed this test." All subjects in the failure groups were then asked whether they would like a second trial on the personality-intelligence test. If the subject's answer was in the affirmative, a second form board was presented immediately (Minnesota Form Board B) with similar instructions to those given on the first trial. If the subject was reticent to try again, the experimenter endeavored to encourage him to do so and when he signified readiness to try the test a second time, the second form board was presented. This time, however, when the subject was within eight blocks of completing the form board, the experimenter said:

> Stop! You are definitely below average on both forms of this test. You did very poorly in terms of personality, intelligence, and ability. I did not know that you would get such a poor score. You failed the test. Most patients are able to do much better than you did. You have failed this important test.

The experimenter once again made notations denoting

that the patient had a "poor personality," "poor intelligence," and "poor ability." Immediately following the experimenter's simulated evaluation of the subject in each failure situation, each subject was asked the following questions and his answers were recorded:

1. How do you feel about how you did?
2. Are you satisfied with how you did?

Success Procedure

Each subject in the success groups was given the same instructions as those in the failure groups before the form board tests were presented. However, the subjects in the success groups were allowed to complete both their trials on the form boards and, after completion of the first trial, were told:

> Good! Good! You did very well on this test. You passed. You achieved a much higher score than I thought you would get. You completed the test before the time limit was up. This shows that you did very well and that you have a good personality, good intelligence, and good ability.

The experimenter wrote the patient's name on a sheet of paper and made notations pertaining ostensibly to the subject's "good personality," "good intelligence," and "good ability." After each subject in the success groups signified readiness to try the second personality-intelligence test in order to better his initial score, the second form board was presented with the same instructions that were given on all presentations. All subjects in the success

groups were highly cooperative on the second form board test. Once again, upon completion of the test, the experimenter wrote down statements pertaining to the subject's excellent personality, intelligence, and ability, in full view of the subject, and repeated out loud the above remarks relative to the subject's success on the personality-intelligence test. Immediately following the experimenter's evaluation of the subject in each success situation, each subject was asked the same questions posed at this time to the subjects in the failure groups and his answers were recorded.

Control Procedure

Each subject in the control groups was lead from the autokinetic situation into the adjacent room and allowed to relax and play with the "puzzles" on the table, if he desired (Forms A and B of the Minnesota Spatial Relations Test). These subjects were kept in the adjacent room for approximately 15 minutes, a period comparable to the time that success and failure subjects were in the room during their treatment condition. The experimenter endeavored to avoid verbal interaction with subjects in the control groups.

Final Autokinetic Procedure

When each subject in the success, failure, and control groups had completed the treatment phase of the experiment, the experimenter remarked:

You are now going back into a completely dark room.

> I will be with you all the time so just follow me. You will be given the second part of the judgment test at this time. It will be similar to the very first test that you took before in the dark room.

The experimenter led each subject back into the autokinetic room and repeated the same instructions and procedure as that used in the first autokinetic situation. After obtaining the second autokinetic record, all subjects, with the exception of those in the failure groups, were told that the examination was over and they were returned to their respective wards.

None of the subjects in the control groups inquired about a special personality-intelligence test; therefore, it was assumed that they thought of the autokinetic test as a combined judgment and personality-intelligence test.

In order to insure that subjects in the failure groups were not psychologically injured by their failure situation, each subject in the failure groups was again escorted into the room adjacent to the autokinetic room, but this time was given a success situation. The experimenter said:

> I am not very satisfied with the results of your performance on the personality-intelligence tests. I am sure that you can do better than you did before. I want you to try this test once more and this time I think you will make it. You are to place these blocks in their proper places on the board as quickly as you can.

Each subject in the failure groups, for the most part, offered resistance and was negativistic before being per-

suaded to cooperate on the third presentation of the simulated personality-intelligence test (Form A of the Minnesota Test). After much cajoling and a great deal of support and persuasion, each subject in the failure groups consented to take the third test. This time, however, these subjects were allowed to complete the form board test after which the experimenter then remarked:

> Good! Good! I knew you could do it. You completed the test in the required time limit. You did very well this time. You were able to pass the test. Apparently you were somewhat nervous on the first two tries. I'm glad to see that you were finally able to do well on this important test of personality and intelligence. You passed. Now, I will take you back to the ward. The test is over and you did well.

Before leaving the room, the experimenter crossed out the previous notations on the subject's record sheet and made additional notations pertaining ostensibly to the subject's "good personality," "good intelligence," and "good ability," in full view of the subject. On the way back to the ward the experimenter continued to reassure the subjects in the failure groups that they had finally done well and that they had passed the test.

Dependent Variable

Autokinetic Situation

In this study, the dependent variable is defined as the amount of change in perceived movement from the first to the second autokinetic measurements. The autokinetic

situation consisted of a completely dark room and a small light-tight box containing a 7-watt bulb suitable for 110 volt current. A pin-point of light, exposed through a circular hole in the light-tight box, served as the autokinetic stimulus. The autokinetic stimulus was situated at a distance of 12 feet in front of each subject. Essentially, the autokinetic apparatus was the same as that used by Voth (32). During the ten minutes the light remained on in each autokinetic session, the subject recorded his perception of apparent movement by drawing with a pencil on a large sheet of heavy paper, 22 by 28 inches in size, which was framed by and mounted to the surface of a horizontal graph board. After the subject's first autokinetic recording, the sheet of paper was merely turned over in preparation for the second recording. This provided a permanent record on paper for each subject which could be evaluated in leisure at a later date.

Measurement of Autokinetic Protocols

The amount of change in perceived movement from one autokinetic situation to another was determined by the use of Voth's formula (32) which was applied individually to the amount of movement recorded by the subject in each of the two ten minute autokinetic periods. Data thus obtained were directly comparable with some of Voth's findings. The Voth formula used to calculate the movement index for each indi-

vidual's penciled movements for the ten minute periods is as follows:

$$\sqrt{\frac{L \times DC \times ME}{(S + 1)}}$$

In this formula, (L) equals the total length of the path of movement; (DC) equals the maximum distance attained from the center; (ME) equals the maximum expanse of the path, that is, the distance between the two points farthest apart on the graph; and (S) equals the number of stops. In line with Voth, all linear measures were made in centimeters. Since stops may be viewed as a psychological reciprocal of movement, their number (S + 1) is used as the denominator with a constant of one added to the number of stops to insure some value above zero in the denominator of the formula.

Independent Variable

Apparatus

In this study the independent variable was either a success or failure experience. The success or failure experiences were defined in each case, on the one hand, in terms of a situation to which the subject was exposed and, on the other hand, in terms of the subject's subjective report of his reaction to the situation. The Minnesota Spatial Relations Test was used as one of the two stimulus components to create success and failure experiences. Only two of the Minnesota Form Boards were utilized (Forms A and B). Each

of the boards contains 58 cut outs and a set of corresponding blocks. These Form Boards were referred to as the "personality-intelligence tests" when administered to the subjects in the success and failure groups. It was expected that completion or lack of completion of the form boards, in light of a high degree of motivation to pass the "personality-intelligence test," would result in a success or failure experience for the subjects. The second stimulus component used to induce a success or failure experience was the experimenter's behavior. It was expected that a person of relatively high authority or professional status to the patient, verbalizing his evaluation of the patient's success or failure, would contribute to the patient's experience of success or failure.

Measurement of Patients' Reactions to Success and Failure

It could only be assumed that the success and failure situations described above would lead to actual success and failure experiences on the part of the patients exposed to one of these situations. Therefore, the subjective reports of patients were obtained by the use of the previously mentioned standard questions. These were asked of the patient by the experimenter immediately following each success and failure situation. These questions were not asked of patients in the control groups. The patients' responses were submitted to three graduate clinical psychology students

at the University of Oklahoma who served as judges. The judges were instructed to classify the verbal reports of the patients into one of three experience categories (Success, Failure, or Neutral). All responses were coded and then randomized before being submitted to the judges in order to avoid judgmental bias. The following written instructions were given to the judges:

Instructions for Judges

> You are to read the following statements made by individual subjects during an experiment and judge whether each individual's statements are indicative of a success, failure, or neutral experience.
>
> 1. Success is defined as any experience which is favorable to the self-esteem or self-worth of a particular individual.
>
> 2. Failure is defined as any experience which is unfavorable to the self-esteem or self-worth of a particular individual.
>
> 3. A neutral experience is defined as one which is not detectably favorable or unfavorable to the self-esteem or self-worth of a particular individual.
>
> After you have determined the category (Success, Failure, or Neutral) which is most indicative of each subject's statements, you are to place a check in the appropriate column alongside the subject's code number.

It was decided beforehand that in the event of a disagreement between judges, the majority opinion was to determine the placement category of a response. According to the judges' evaluations, all subjects who were exposed to a success situation gave verbal reports which were classified in the success experience category, and all sub-

jects who were exposed to a failure situation gave verbal reports which were classified in the failure experience category. The results of judges' selections are shown in Table 1.

TABLE 1

JUDGES' CLASSIFICATION OF PATIENTS' VERBAL REPORTS

Situation	Subjects	Experiences		
		Success	Failure	Neutral
Success	20	20	0	0
Failure	20	0	20	0

A detailed analysis of each judge's choices revealed only three cases in which there was not perfect agreement among judges. In these cases, however, one judge disagreed with the choices of the other two judges. Also, in cases of disagreement, the deviating selection was always in the neutral experience category. Thus, on the basis of the above perfect relationship, one can state with a high degree of confidence that subjects who were exposed to a success situation experienced success and subjects who were exposed to a failure situation experienced failure. At this point it was felt that the success and failure treatments could rightfully be referred to as experiences rather than "situations."

CHAPTER III

RESULTS

In order to determine whether there were significant differences in the perception of autokinetic movement on the part of various chronic schizophrenic groups prior to exposure to the treatments of this study, the pre-treatment autokinetic indices for all patient groups were analyzed prior to an analysis of movement changes from pre-treatment to post-treatment conditions.

Conceivably, differences between the groups might initially be found due to sex (row differences), due to treatment assignment (column differences), and/or due to the interaction of treatment assignment and sex. The initial sample differences, specified above and seen in Table 2, were tested for significance by Wilcoxin's unpaired replicates test, Friedman's Chi-square test, and Wilcoxin's interaction test respectively (34). Using the 5% level of confidence in each case, none of the above group differences was found to be significant. Differences between the patient groups prior to the introduction of treatments is therefore attributable to chance sample fluctuations.

TABLE 2

PRE-TREATMENT MEAN AUTOKINETIC INDICES FOR ALL PATIENT GROUPS

Sex	Groups		
	Success	Failure	Control
Male	196	209	281
Female	466	382	365

In order to test for significant differences which may have occurred between chronic schizophrenic groups as a consequence of exposure to success, failure, or neutral experiences, it was decided that change scores, that is, scores representing the difference between pre-treatment and post-treatment indices for each subject would be submitted to statistical analyses. Non-parametric tests were applied to these change scores which are given for each treatment group in Table 3. Using Wilcoxin's formula for unpaired replicates (34) to test for sex differences, and his interaction test (34) to test for interaction of sex and treatments, neither the sex nor interaction variables was found to be significant at the required 5% level of confidence.

Since no significant difference was found in the autokinetic change scores of the two sexes, these scores were combined under each treatment condition before

TABLE 3

MEAN AUTOKINETIC INDICES BEFORE AND AFTER TREATMENT CONDITIONS WITH DIRECTION AND AMOUNT OF CHANGE

Sex	Groups								
	Success			Failure			Control		
	Before	After	Change	Before	After	Change	Before	After	Change
Male	196	88	-108	209	414	+205	281	283	+ 2
Female	466	253	-213	382	583	+201	365	352	-13
Combined Mean	331	170	-161	296	499	+203	323	318	- 5

evaluating the differences between treatment groups. The application of Friedman's Chi-square test (34) revealed the treatment groups to be significantly different beyond the 0.001% level of confidence.

An inspection of the combined mean change scores under each treatment condition as seen in Table 3 reveals that, after exposure to the success condition the success group decreased its mean autokinetic index, after exposure to the failure condition the failure group increased its mean autokinetic index, and after exposure to the neutral condition the control group's mean index remained rather constant. Wilcoxin's unpaired replicates formula (34) was used to test the significance of the differences in the

combined mean change scores between the control and each of the treatment groups independently. It was found that the success group and the failure group differed significantly from the control group beyond the 0.01% level of confidence. On the basis of these findings it was concluded that the decrease in autokinetic movement after success, and the increase in autokinetic movement after failure, were highly significant.

A treatment by levels analysis of variance was the original statistical method of choice, but due to failure in meeting the test's assumptions non-parametric analyses were employed. However, it is of interest to note that the treatment by levels analysis of variance test (14, ch. 4), when applied to the data in Table 3, showed results which were consistent with the non-parametric analyses in revealing no significant differences as a function of the sex variable or the interaction of sex and treatment variables, but a significant difference due to the treatment variable. Although it failed to meet the necessary assumptions along with the analysis of variance, when the t formula for independent measures (14, ch. 1) was applied to the differences in the combined mean change scores between the control and each of the treatment groups independently, the findings were also consistent with the non-parametric analyses, revealing significant differences between each of the treatment groups and the control group.

Since the patients were all chosen, in part, because they were known from previous research to be people with a tendency to perceive large amounts of autokinetic movement, the possibility of a regression effect influencing the amount of their perceived movement in a downward direction on the second autokinetic measure had to be considered. The regression effects would be expected to be most clearly apparent in the scores of the control group which was by design excluded from the influence of a known treatment variable. Inspection of Figure 1 shows that in the control group 7 patients increased their movement, 12 patients decreased their movement, and 1 patient showed no change, and almost in every case the amount of movement change was negligible. Inspection of the direction of movement on the part of the treatment groups shows that all patients in the success group had a decrease in movement while all patients in the failure group had an increase in the amount of movement perceived. Therefore, it may be concluded that regression effects played an insignificant role with respect to the differences in the amount of perceived movement which occurred between the first and second autokinetic measures.

By employing Voth's formula as stated in Chapter II, it was possible to obtain autokinetic measurements which could be compared with the previous findings of Voth (32). A review of the pre-treatment indices for chronic schizophrenic patients (see Table 4 in Appendix A) indicated that

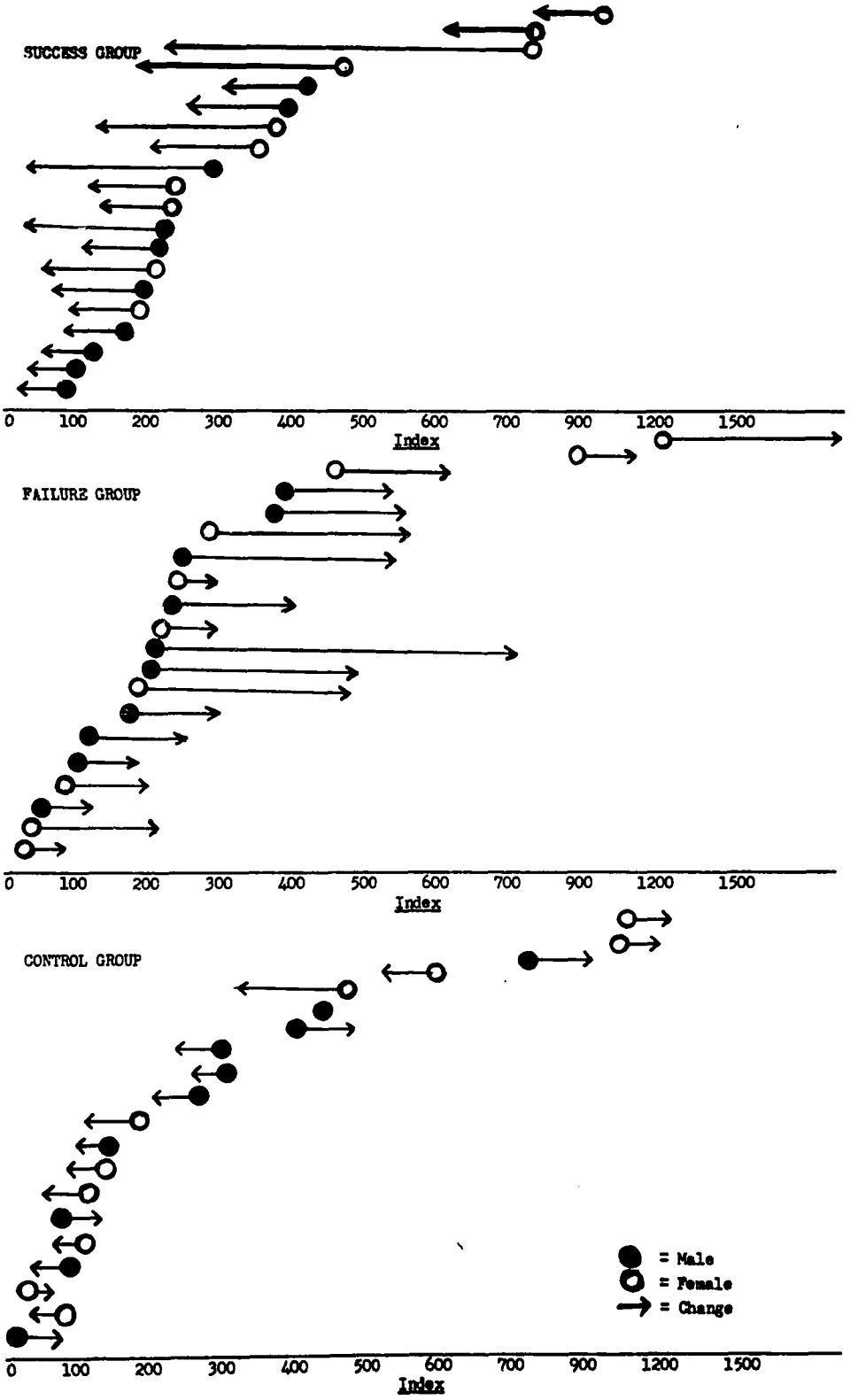

Fig. 1. Indices of Direction and Amount of Autokinetic Movement for all Patients Before and After Treatments.

all but two patients in the male and female samples had an autokinetic index beyond 50. While Voth's sample of schizophrenic patients was apparently made up of both chronic and acute schizophrenic patients, most of his patients obtained an autokinetic movement index of 50 or higher. According to Voth's findings, it was believed that the more severely disturbed and chronically ill schizophrenic patients would have more extensive autokinetic indices than those considered to be acutely ill patients. Since a selected sample of chronic schizophrenic patients was used in the present study, these patients could be expected to have more extensive autokinetic indices than Voth's patients who were diagnosed as schizophrenics without reference to duration of illness. A comparison of Voth's results and the results of the pre-treatment indices of this study (see Table 4 in Appendix A) shows this to be the case. Most of the patients in the present study obtained an autokinetic index of about 100 or higher. In the main, however, Voth's conclusion that extensive autokinetic movement indices is typical of schizophrenic mental patients appears to be corroborated by the current findings.

In testing the constancy of autokinetic reactions, Voth obtained a test re-test reliability coefficient of +.92 for a sample of mental patients from different diagnostic categories through the use of the rank difference method. Applying the rank difference method to the pre-treatment and post-treatment scores obtained by the 20 patients in the

male and female control groups of the present study, a test re-test reliability of +.94 was obtained. It was concluded that the autokinetic reactions of chronic schizophrenic patients are highly constant from one autokinetic situation to another and that Voth's data related to the constancy of autokinetic reactions is substantiated.

CHAPTER IV

DISCUSSION OF RESULTS

The findings of Voth (32) seem directly related to the interpretation which may be given to the findings of the present study. He found that a relatively low or moderate amount of autokinetic movement was associated with good prognosis, good remission records, and good adjustment of mental patients to a hospital setting, as well as being most typical of people who could be considered to be psychologically normal. Extensive amounts of autokinetic movement, on the other hand, were found to be associated with severe mental illness, poor prognosis, poor remission records, and poor adjustment of mental patients to a hospital setting. Inasmuch as the initially extensive amounts of movement seen by chronic schizophrenic patients in the current study shifted in the direction of moderate movement after a success experience, and since failure experiences were followed by significantly increased amounts of autokinetic movement, the conclusion is suggested that experiences which are favorable to self-esteem or self-worth of a chronic schizophrenic have at least a temporary therapeutic effect for him

and that experiences which are unfavorable to his self-esteem or self-worth have at least a temporary detrimental effect on him. Since no attempt was made in the present study to measure the duration or long range effects of the success and failure experiences in this experiment, the interpretation of results is necessarily confined to the time period within which the autokinetic measures were taken. However, it is logical to assume that the effects of such experiences would be persistent for varied amounts of time according to known psychological principles, and that the effects would be augmented or diminished dependent upon the frequency, intensity, and importance to the individual of such experiences.

The findings of the present study, that success experiences are of therapeutic value to the chronic schizophrenic patient, appear to be consistent with the results of a Veterans Administration study (24) conducted at the North Little Rock, Arkansas, mental hospital, in which satisfying experiences in the form of receiving fudge candy for successful performances and personal praise for socialized behavior were found to be effective methods of improving the resocialization of chronic schizophrenic patients. While one must be ever-cautious in over-generalizing, it is reasonable to assume that prolonged and intensive hospital treatment of the chronic schizophrenic patient, in terms of providing certain situations in which he can experience a

sense of personal worth and esteem continuously, would effect a more lasting positive change in his adjustment.

The experimenter's informal observations of the patients' behavior in the present experiment were consistent with the implications drawn from the autokinetic movement changes resulting from the success and failure experiences. Prior to the success experiences, most patients behaved in a typically psychotic manner; they were more or less withdrawn within themselves, they were delusional, hallucinatory, and disassociated. Many patients appeared to be either severely depressed, fearful, or highly unsure of themselves. After experiences of success (more self-esteem, self-worth, self-adequacy, or self-achievement), these same patients momentarily dropped some of their psychotic symptoms to the extent that they became more friendly and talkative with the experimenter. Some stopped hallucinating and others smiled for the first time during the experiment proper. In each case, the experimenter felt that after the success treatment the patients behaved more like "normal people" and seemed more confident in themselves as human beings.

The behavior of the patients in the failure group appeared to the experimenter to be quite opposite to that of the patients in the success group. After failure, these patients seemed to become more withdrawn and terrified. Failure seemed to destroy any remnants of self confidence still existent within them. They became extremely tense,

unhappy, and severely disoriented. In the judgment of the experimenter, they became more delusional, hallucinatory, and disassociated than they had been before exposure to the experimental failure treatment. Many of the patients in the failure group remarked after this experience that their failure was similar to the many experiences they had encountered throughout their lives.

According to the present findings, it may be inferred that the chronically ill schizophrenic patient would receive beneficial treatment in a hospital milieu which is oriented toward protecting patients from experiences unfavorable to their personal worth or self-esteem. Since failure experiences in the study tended to elicit more severe psychotic reactions in already mentally disturbed individuals, the effect of such experiences must be considered anti-therapeutic. However, it remains to be explained why such experiences have the effects found.

An explanation of the findings of the current study may be found in the psychological theory and experimental work of Sherif (26) and Sherif and Harvey (27). Sherif and Harvey's approach appears to encompass the present findings and is particularly relevant to the present study. In the Sherif and Harvey paper, which is a study dealing with ego functioning and the effects of eliminating stable anchorages in the autokinetic situation, it was found that,

1) The more uncertain the situation, the greater the scale within which judgmental reactions are scattered.

2) The more uncertain the situation, the greater the magnitude of the norm or standard around which judgments are distributed (27, p. 303).

At another point in this paper they make the following statement:

> The basic assumption is that the ego of the individual which implies his characteristic relatedness to his surroundings, as reflected in his characteristic reactions, is built up in relation to physical and social anchorages from childhood on. The stability of his ego, hence the consistency of his reactions, is dependent upon the stability of these physical and social anchorages. As the physical and social anchorages become more unstable, more uncertain, the individual's personal bearings become more unstable, more uncertain. This condition of instability, of uncertainty is thus at the basis of the experience of insecurity. Psychological states of insecurity or anxiety always involve ego reference. Insecurity is that state of ego tension produced by actual or perceived shattering of physical or social anchorages, or actual or perceived uncertainty of one's physical or social grounds in the present or future.
>
> The psychological consequences of the actual or experienced loss of physical and social bearings are at least initially increased fluctions, variations in reactions, floundering around in search of something to hold on to, strivings to re-establish some level of stability through available anchorages (27, p. 302).

Following this reasoning, it would be logical to expect that schizophrenic patients, individuals who may be considered to have few or false stable anchorages and to have lost their personal bearings, would have little stability and security in a vague and ill-defined external field of stimulation such as that in the autokinetic situation. It would also be expected that such individuals would have few anchorages and personal frames of reference with which to

stabilize and control the apparent movement of a pin-point of light in a completely unstructured situation. What little stability and personal bearings the schizophrenic had prior to his introduction into an unstructured situation would be expected to diminish and even become disintegrated in such a situation. This appeared to be the case with many of the schizophrenic patients who became so severely disoriented and disturbed after entering the initial autokinetic situation that they could not be included in the study. The extremely high amount of movement perceived by all chronic schizophrenic patients in the study on the initial autokinetic test, and their remarks typified by, "The light is running away with me and I can't stop it," lends support to Sherif and Harvey's theory (27).

Relative to the results of the present study, it is theorized that the success experiences of the chronic schizophrenic patients enabled them to achieve a greater personal and social bearing and hence greater stability and personal security so that they were less disoriented and more certain of themselves which in turn became a factor in their perception of apparent movement. The psychological consequences of this experienced gain in personal and social bearings was reduced movement in the autokinetic situation. After exposure to the success conditions of the experiment, patients reported verbally that they had seen less movement than they had seen in the initial testing situation and that they were

better able to control the light rather than the light controlling them.

On the other hand, the failure experiences in this study conceivably resulted in the patients' loss of personal and social bearings so that they were more disoriented and more uncertain of themselves as a factor in the perception of apparent movement. The psychological consequences of this experienced loss in personal and social bearings was increased autokinetic movement. After exposure to the failure conditions of the experiment, patients reported verbally that they had seen much more movement than in the initial autokinetic testing situation and that the pin-point of light seemed to take control of them. Some patients reported that the light took complete control over them and moved them around the room against their will.

In analyzing the data of the current study which is comparable with rather than supplementary to Voth's findings (32), a high degree of consistency was found to exist. In Voth's study, schizophrenic mental patients, as a group, obtained extensive autokinetic indices of 50 or above. All but two of the patients in the present study obtained pre-treatment indices of 50 or higher and the majority of patients in the study were found to have indices far beyond 100. The fact that most initial autokinetic indices were greater than 100 in the present study may be attributed to the exclusive selection of chronic schizophrenic patients

whereas the patients in Voth's sample were not exclusively selected from a chronically ill schizophrenic population. Voth's findings that more extreme autokinetic indices are associated with greater psychological disturbance also appears to be consistent with the findings of this study. Voth also observed that under ordinary circumstances autokinetic reactions were very constant and highly reliable (Rho of +.92). The test re-test reliability of autokinetic movement for the patients in the neutral treatment or control group of the present study was also extremely high (Rho of +.94). Thus, Voth's conclusion that the extent of autokinetic movement as measured by Voth's index is highly constant appears to be corroberated.

In reviewing Voth's study (32) one finds data showing that metrazol and electro-shock tend to decrease the extensive autokinetic movement of mental patients in a manner similar to the experimental success treatment of this research. One might question whether intensified success treatment in the form of psychotherapy, occupational therapy, recreational therapy, music therapy, and other therapies providing a close satisfying interpersonal experience could not accomplish the goals that shock treatment is supposed to achieve. In other words, is it possible that variations of success treatment can bring the chronic schizophrenic patient back into better contact with his environment and return him to society as a functionally productive member? One might

also question whether the combination of shock and success treatment concomitantly administered would not be of greater worth than shock alone. Obviously, these questions can be answered only by future study going beyond the scope of this research.

In the present experiment, the autokinetic phenomenon was used as a measure of behavior and behavior change as well as a means with which to evaluate an aspect of change in psychological functioning. Like all research tools, its use must be restricted to those individuals who can and will cooperate. In this endeavor to use the autokinetic method of pencil-recorded movement with a chronic schizophrenic hospital population, it was found that many of the patients in the present study either would not or could not cooperate in the autokinetic test situation. Therefore, the use of this particular type of autokinetic testing appears to be restricted to a limited sample. Inasmuch as the autokinetic method of pencil recorded movement is slightly more complicated in its procedure than the verbal report method popularized by Sherif (25), it is quite possible that the latter method could be more successfully administered to chronic schizophrenic patients.

As a result of this investigation, further research along the following lines appears to be warranted:

1. It would be valuable to determine whether "normal" and neurotic individuals would react in the auto-

kinetic situation in a manner similar to that of chronic schizophrenic patients after exposure to success and failure treatments. Such findings would afford either wider or more restricted generalizations about the applicability of the current findings.

2. Inasmuch as this research was concerned with momentary autokinetic reactions of chronic schizophrenic patients after exposure to success and failure treatments, it would be important to determine a) how long the changes resulting from success and failure experiences persist, b) whether prolonged success experiences or a series of such would result in greater and/or more lasting changes, c) what the effects would be of different forms or more life-like experiences of success and failure, and d) whether differential effects would obtain with normal, psychotic, and neurotic individuals.

3. Since it appears that metrazol, electro-shock, and success treatments have a similar therapeutic effect upon the adjustment of the chronic schizophrenic patient as reflected in his perception of autokinetic movement, studies designed specifically to compare the effects of these two seemingly diverse types of treatment are suggested in order to obtain more effective treatment plans for the mentally ill.

CHAPTER V

SUMMARY AND CONCLUSIONS

Due to the ever-increasing number of individuals who enter our mental hospitals every day, it is apparent that research and experimentation dealing with the variables which conceivably affect their behavior and personality adjustment is of vital necessity. Of such variables, success and failure were considered to be of great importance in their influence upon personality adjustment. Thus, the present study was concerned with the effects of success and failure experiences upon the behavior and, by inference, the personality adjustment of hospitalized chronic schizophrenic patients, exclusive of the paranoid type. It seemed that research in this area would provide a firmer foundation upon which to base some of the treatment of the mentally ill and add further information to a psychological theory of human functioning.

Following the reported experimental findings of Sherif and Harvey (27) and Voth (32), it appeared that the autokinetic phenomenon not only presented a method for studying an aspect of behavior and its change, but that it also

would enable one to give meaning to the direction and amount of autokinetic movement perceived at any given time. In other words, the previously mentioned authors' research, especially that of Voth, suggested that extensive autokinetic movement was associated with loss of personal stability, mental illness, particularly schizophrenic reactions, and with poor prognosis, poor remission records, and poor adjustment of mental patients in a hospital setting. On the other hand, limited or moderate amounts of autokinetic movement was reported to be associated with personal stability and "normal" individuals, as well as good prognosis, good remission records, and good adjustment of mental patients in a hospital setting. Therefore, the autokinetic method was used to measure the effects of success and failure since changes in the amount of movement perceived by a patient after exposure to either a success or a failure experience could be evaluated in terms of change in the direction of a more or less satisfactory position on the extent of movement continuum.

In light of the method used to measure the effects of success and failure experiences upon the adjustment of chronic schizophrenic mental patients, the specific hypotheses were as follows:

1. Success experiences on the part of chronic schizophrenic patients will be followed by a decrease in the amount of autokinetic movement perceived.

2. Failure experiences on the part of chronic schizophrenic patients will be followed by an increase in the amount of autokinetic movement perceived.

In order to investigate experimentally the above hypotheses, a group of 30 chronic schizophrenic male patients and a group of 30 chronic schizophrenic female patients, each divided into three sub-groups composed of individuals who had been assigned randomly to receive one of three treatment conditions, were tested individually in the autokinetic situation before and after success, failure, and control treatments were administered. The autokinetic method used was essentially the same as that used by Voth (32) in previous research concerning the autokinetic movement of hospitalized mental patients.

All subjects in the experiment were obtained from a population of chronically ill hospitalized schizophrenic mental patients between the ages of 20 and 50 years at Central State Griffin Memorial Hospital, Norman, Oklahoma. The subjects were patients who had been officially diagnosed by a psychiatric staff as either catatonic, hebephrenic, simple, mixed, or undifferentiated schizophrenia. Patients who were classified as mentally deficient, or schizophrenia, paranoid type, were omitted from the population sample. Also omitted were those patients who had received shock treatments within a one month period prior to the experiment and those who were known to have organic brain damage

accompanying their psychosis.

As a check on whether those patients who were exposed to situations designed to produce experiences of success or failure had experienced actual feelings of success and failure, verbal reports, after exposure to the above mentioned experimental treatments, were elicited and then submitted to judges for evaluation. According to judges' ratings, an extremely high positive relationship was found to exist between the type of situation and the patient's report of his experience.

From the results obtained and subsequent statistical analyses in which non-parametric statistical tests were employed, it was possible to accept the previously stated specific hypotheses. According to the results, the following conclusions appeared to be warranted concerning the reactions of chronic schizophrenic patients to success and failure experiences exclusive of the paranoid type on which no information was obtained.

1. Experiences of success decrease the amount of autokinetic movement perceived by chronic schizophrenic patients and thereby reflect a therapeutic effect upon their adjustment.

2. Experiences of failure increase the amount of autokinetic movement perceived by chronic schizophrenic patients and thereby reflect a detrimental effect upon their adjustment.

Inasmuch as it was possible to obtain certain data which was comparable with Voth's findings (32), from a further analysis of the data it was concluded that:

1. Chronic schizophrenic patients have extremely high autokinetic movement indices.

2. Chronic schizophrenic patients have extremely constant autokinetic movement indices.

These findings were consistent with those obtained by Voth.

The results of the present study also appeared to be consistent with and supported, in part, the experimental and theoretical work of Sherif and Harvey (27) relative to ego functioning and anxiety.

While the autokinetic method of pencil-recorded movement was not found to be easily administered to severely disturbed chronic schizophrenic patients, the data obtained from the present research suggested a need for further research in the area of this study and several specific research suggestions were given.

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APPENDIX

TABLE 4

AUTOKINETIC INDICES FOR INDIVIDUAL PATIENTS BEFORE AND AFTER TREATMENTS WITH DIRECTION AND AMOUNT OF CHANGE

Success Group			
Male Subjects	Before	After	Change
1.	40	24	- 16
2.	73	26	- 47
3.	113	56	- 57
4.	150	77	- 73
5.	167	41	-126
6.	173	120	- 53
7.	179	23	-156
8.	288	21	-267
9.	401	205	-196
10.	410	326	- 84
Failure Group			
Male Subjects	Before	After	Change
1.	78	139	+ 61
2.	120	173	+ 53
3.	127	257	+130
4.	153	329	+176
5.	182	486	+304
6.	216	741	+525
7.	221	391	+170
8.	250	549	+299
9.	370	550	+180
10.	379	533	+154
Control Group			
Male Subjects	Before	After	Change
1.	43	74	+ 31
2.	73	52	- 21
3.	90	103	+ 13
4.	114	95	- 19
5.	252	200	- 52
6.	274	255	- 19
7.	278	222	- 56
8.	406	433	+ 27
9.	414	414	0
10.	864	978	+114

Indices of male patients ordered from low to high according to each patient's pre-treatment index.

TABLE 4

(Continued)

Female Subjects	Success Group Before	After	Change
1.	155	98	- 57
2.	171	31	-140
3.	207	162	- 45
4.	211	82	-129
5.	343	206	-137
6.	357	104	-253
7.	466	136	-330
8.	813	195	-618
9.	839	651	-188
10.	1099	864	-235
Female Subjects	**Failure Group Before**	**After**	**Change**
1.	58	85	+ 27
2.	69	233	+164
3.	91	224	+133
4.	168	476	+308
5.	219	287	+ 68
6.	231	298	+ 67
7.	299	580	+281
8.	417	633	+216
9.	930	1183	+253
10.	1346	1840	+494
Female Subjects	**Control Group Before**	**After**	**Change**
1.	65	53	- 11
2.	67	80	+ 13
3.	79	71	- 8
4.	98	60	- 38
5.	106	93	- 13
6.	131	122	- 9
7.	430	311	-119
8.	549	526	- 23
9.	1021	1049	+ 28
10.	1104	1154	+ 50

Indices of female patients ordered from low to high according to each patient's pre-treatment index.