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A Study of the Influence of the Temporal Position of Success and Failure upon Level of Aspiration

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A STUDY OF THE INFLUENCE OF THE TEMPORAL
POSITION OF SUCCESS AND FAILURE
UPON LEVEL OF ASPIRATION

by

Robert Clair Nicolay

A Dissertation Submitted to the Faculty of the Graduate School
of Loyola University in Partial Fulfillment of
the Requirements for the Degree of
Doctor of Philosophy

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LIFE

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CHAPTER I

THE PROBLEM

A. Level of Aspiration: A Measure of Goal Directed Behavior

One of the most active functions within a personality is the process of striving towards goals. In this way behavior is organized, given direction and intensity.¹ Were the individual human self sufficient there would be no need for externally directed behavior. Only the most sterile, descriptive behaviorism could deny man's goal directed behavior. Even Maier, a thoroughgoing behaviorist speaks of the important role of goals.

In problem solving the goal serves not only as a selective factor, but may also influence the nature of the integration or restructuring of past experiences. Thus a child may have used tables and chairs in a certain way in the past, but with jam on the top shelf of the cupboard this furniture may be combined in a particular fashion and constitute a route to the jam. In such cases the goal serves as an important determiner of the combination of elements used.

Thus goal oriented behavior is always a means to an end rather than an end in itself. When the end is changed the behavior loses its place. The new behavior may be random, i.e., selected because of its chance success, or it may be an insightful restructuring of past experience, but its survival depends on the end it serves. A knowledge of the goal toward

¹ Gordon A. Allport, Personality A Psychological Interpretation, New York, 1937, 213.

which behavior is oriented makes such behavior understandable. To the extent that behavior is goal oriented it may be thought of as the person's solution to the problem of reaching a goal. Thus much of the familiar behavior represents an individual's solution to problems. Even where routine habits are involved there is evidence that the habit was established and is maintained because it is either successful in achieving desirable objectives or does not achieve an undesirable one. If undesirable ends are reached by habits a new problem is presented, and the new solution to the problem involves a habit change.²

B. Origin and Value of the Level of Aspiration Technique

An experimental approach to the study of goal directed behavior was made possible by the level of aspiration technique which had its origin in the work of Kurt Lewin and his students. He tells us:

The concept of level of aspiration, introduced by Dembo (published in 1951), made explicit the possibility of observing goal levels occurring in the course of a relatively specific activity designating some of the factors associated with fluctuation of such goals and linking the experimentally observed manifestations of goal striving to the individual's behavior in other situations. The experimental results stemming from her observations and those of Hoppe (1950), who performed the first experiment directed toward analysis of the aspiration phenomena, have mounted until at the present time there is a considerable body of data bearing on the problems of that goal striving behavior which occurs within a range of difficulty, i.e., level of aspiration.⁵

Since the origin of this technique investigations have been concerned with the establishment of a methodology and definition of terms, an understanding of the determinants of level of aspiration, the significance

2 Norman R.F. Maier, Frustration: The Study of Behavior Without a Goal, New York, 1949, 10-11.

5 Kurt Lewin, Tamara Dembo, Leon Festinger, Pauline S. Sears, "Level of Aspiration," Personality and the Behavior Disorders: A Handbook Based on Experimental and Clinical Research, ed. Joseph McV. Hunt, I, New York, 1944, 555.

of the findings for the entire personality, that is, the problem of generality, and practical applications. These various aspects of the problem will be treated in the review of related literature.

When an individual pursues a goal he is obviously influenced by the events intervening between the outset of the pursuit and the achievement of the goal. If his experiences are perceived as successful he will find the task pleasant and in all likelihood continue in that particular mode of adjustment until he reaches his goal or finds this adjustment no longer useful as a means to his end. If, on the contrary, he finds the present techniques fail to make progress toward the goal his reaction may be to change the nature of the goal, height of the goal, or mode of approach.

The development of the level of aspiration technique has given us a problem situation in which the individual cannot adjust to it by changing the nature of the goal nor the manner of approach, but must manipulate the height of his goal in accordance with his experiences.

A further contribution of level of aspiration methodology is that it gives a technique for quantifying the subjective meaning of success; that is, the score on this task which represents a success to the individual. If he fails to reach his self chosen goal, the score can be regarded as a measure of degree of failure. Success and failure then, are not defined by the experimenter but by the subjective choice of a goal. The experimenter assumes only that the subject experiences success when he achieves a goal and failure when he does not achieve it.

The experimenter need not deny a hierarchy of goals but merely assume that this statement of a goal represents progress toward a more remote goal and that such progress will yield an experience of success. We are dealing with an action goal rather than an ideal goal.

In the typical level of aspiration experiment the subject is requested to predict how well he will do, i.e., what his score will be on his next trial. This statement by the subject constitutes his level of aspiration. It is studied in relation to his previous performances and represents an intention on his part to accomplish this goal. It reflects his interpretations of past performances as they influence his hopes and expectations.

C. Purpose of the Present Investigation

Since the earliest studies in this field experimenters have assumed that the effect of success and failure remains constant in its influence upon level of aspiration. For example, ten units of success or failure were assumed to have the same meaning on the initial, middle or late trials. It is this assumption which is to be challenged in the present investigation. While there may be other factors which influence the relative significance of success and failure, the present study will be limited to the effect of temporal sequences. The hypothesis states that the significance of success and failure is a function of position in a series of trials.

D. Significance of the Problem

If differences are found, they will have certain psychological implications. There may be some application in the field of learning. When

should success and failure be provided in a learning situation? Lest it seem overly ambitious let the reader be reminded that the information which is secured in this study would not be of particular value in directly increasing efficiency of learning, but rather in aiding the learner to modify his conative activities so as to be more realistic. Because this experiment was designed primarily to study level of aspiration, the findings will not apply directly to the field of learning. Experimental groups were not equated for learning ability and each group had a differing sequence of experiences. However, the experiment assumes that the subject interprets the situation as a learning experience. Consequently, the results should apply to the levels of aspiration in a learning situation in which there is a definite sequence of success and failure.

For the psychotherapist, this would also be of value since he is actually providing his client with a learning situation. Furthermore, the psychotherapist is concerned with the modification of the individual's goals and attitudes toward goals. Hence, any information about conditions which aid in modifying the subject's conative activities would be of considerable use to the psychotherapist.

E. Summary

Level of aspiration studies have provided us with an experimental technique to examine the effects of subjectively defined success and failure experiences. By this method it is possible to observe the influence of success and failure upon the selection of future goals. The present study is limited to evaluating the influence of the temporal position of failure upon

level of aspiration. Should such temporal position effects be found, they would have widespread practical applications for modifying conative activities. Failure to find effects would discount common sense observations and raise further problems for research.

CHAPTER II

A REVIEW OF RELATED LITERATURE

A. Methodology

In this comparatively new field a methodology has grown which deals with the nature of the experimental tasks, proper conditions for establishing level of aspiration, and recording and analyzing data.

With regard to the selection of a task there is general agreement that it must be of moderate difficulty.¹ Extremes of ease or difficulty must be avoided. This requirement is sometimes problematical because of the wide variation of skills among individuals. To meet this problem, Rotter² proposed a board which he attempted to standardize. The Rotter Board has a long wooden groove. Different spots are marked with numbers along the board. The subject pushes a steel ball toward the marked areas. Varying credit is given depending upon the numerical marking of the area in which the ball stops. There are several advantages in using this instrument. It is compact and relatively easy to carry. Its simplicity is such as to pro-

1 Hans J. Eysenck, Dimensions of Personality, London, 1947, 129; Jerome D. Frank, "Recent Studies of the Level of Aspiration," Psychological Bulletin, XXXVIII, 1941, 218-228.

2 Julian B. Rotter, "Level of Aspiration as a Method of Studying Personality: II Development and Evaluation of a Controlled Method," Journal of Experimental Psychology, XXXI, 1942, 410-422.

vide for widely varying abilities. The Rotter Board in its original and subsequent uses has proven useful in studies with psychotics.

Among normals and neurotics a wide variety of tasks have been used.³ Many forms of motor tasks have been found useful, such as card sorting, digit symbol substitution, cancellation, dotting, pursuit rotors, key punches, dart throwing, and other such skills. The choice of task is determined principally by the criterion of challenging difficulty.

The second step in the procedure is the establishment of the performance level to be reached.⁴ This is the crucial step. It is this which is to be observed and quantified. The subject must choose within a specific frame of reference. Slight variations of instructions or attitude can influence this decision.⁵ It is this very fact that makes the level of aspiration amenable to study. We can control and systematically vary such conditions and measure the changes which they effect. These conditions are the independent and dependent variables in the study of goal striving.⁶

3 Eysenck, Dimensions of Personality, 129-152.

4 Max Hausmann, "A Test to Evaluate some Personality Traits," Journal of General Psychology, IX, 1935, 179-189.

5 Leon Festinger, "Wish Expectation and Group Standards as a Factor Influencing Level of Aspiration," Journal of Abnormal and Social Psychology, XXIII, 1942, 184-200.

6 Max Hertzman and Leon Festinger, "Shifts in Explicit Goals in a Level of Aspiration Experiment," Journal of Experimental Psychology, XXVII, 1940, 439-452.

The establishment of a level of aspiration which the subject intends to reach, presupposes that the subject is familiar with the task. In most cases such familiarity is afforded by practice sessions.

Some investigators⁷ have suggested the use of tasks that permit no improvement. These have been of particular value in crucial experiments designed to test hypotheses of the dynamics of goal striving,⁸ and in experiments which study frustration of goal striving.

External forms of punishment have been used frequently, particularly in the form of the bid technique. The subject makes a bid as to what he thinks his score will be. He is subsequently penalized by the experimenter according to the error of his prediction. This technique provides a means to enhance the importance of the objective judgment. It has been used frequently among psychotics. Among normals and neurotics, knowledge of results is sufficient for an experience of failure.

A number of quantitative measures have been developed in this field. The first measure to achieve widespread use was the goal discrepancy score, sometimes called average difference score when the mean of goal discrepancy scores is computed for an individual or a group.⁹ This discrepancy score is computed by subtracting his preceding score on a task from his pre-

7 John W. Gardner, "Level of Aspiration in Response to a Pre-arranged Sequence of Scores," Journal of Experimental Psychology, XIV, 1959, 601-621.

8 Kurt Lewin, Personality and Behavior Disorders, ed. Joseph McV. Hunt, 333.

9 Ibid.

dicted score for the next trial. If a subject has sorted 85 cards and predicts that he will sort 95 in the next trial, he has a goal discrepancy score of positive ten. Positive scores indicate expected increases and negative scores reflect expected decreases.

A second measure is the attainment discrepancy score which is the difference between the predicted score and the actual achievement which follows. Eysenck and Hillelweit found a positive correlation of .95 between the goal discrepancy and attainment scores.¹⁰ This relationship eliminates the need to calculate both measures when one follows Eysenck's procedure.

Another measure commonly used in quantifying results is a measure of rigidity or conversely, motility, in terms of the number of shifts to the number of trials. Some authors refer to this as the index of flexibility.¹¹ The reader should keep in mind that this is the sum of all changes in level of aspiration, regardless of direction or reason. This is of particular value in the study of neurotics and in frustration experiments. Using cross sectional techniques Adams found greatest flexibility among children, moderate amounts among adults, and greatest rigidity among older age groups.¹²

A variation on the index of flexibility is the index of respon-

10 Eysenck, Dimensions of Personality, 132.

11 Ibid, 133.

12 Donald K. Adams, "Age, Race and Responsiveness of Level of Aspiration to Success and Failure," Psychological Bulletin, XXXVI, 1959, 573.

giveness, which is the number of times the level of aspiration moves in the same direction as the preceding performance. It measures the tendency to raise one's level of aspiration with success and lower it with failure.

The decision time is a recent development. It is the time taken by the subject to choose his level of achievement.¹³ This has been used with normals and neurotics,¹⁴ but has not utilized a wide variety of tasks. What is probably of more value to the experimenter is not the measured time, but the use to which it is given. Does the subject stand perplexed, beset by conflicting drives? Is he tense and trembling? Or, on the other hand, is he carefully deliberating the pros and cons of the situation? Is he calculating, logically, the decision he is to make? On the one hand, one has an individual driven by ego defenses to devote a specified period of time to the choice of a goal. On the other hand, one has an individual devoting the same period of time to an objective study of the choice. It is not the period of time that is important, but the use to which the time is put. The quantitative measure can obscure this significant feature.

Hausmann suggested that these various quantifications could be graphically recorded.¹⁵ His own experiment demonstrated this form of representation. Subjects in this experiment threw darts at a target.

13 Sibylle K. Escalona, An Application of the Level of Aspiration Experiment to the Study of Personality, Teachers College Columbia University Contribution to Education No. 987, New York, 1948, 1.

14 Ibid., 47.

15 Max Hausmann, "A Test to Evaluate Some Personality Traits," Journal of General Psychology, II, 1935, 179-189.

The target was a series of concentric circles with graduated credits for transfixing the target near the center. After a practice series of ten throws the subject was given thirty series of ten throws. The subject predicted his score before each series. The predictions were plotted on cartesian coordinates; the X-axis for the trial number and the Y-axis for the score. The predicted scores were plotted and connected by a broken line. For each point by which the subject missed his prediction, he was penalized two points. A series of small circles was plotted and connected by an unbroken line to represent his actual achievement minus his penalty.

This method has the advantage of visually presenting the subject's performance in relation to his predictions. His sensitivity to success and failure are shown by the similarity of the three curves. Since this method gives only crude estimates it should be considered a supplementary one. It is of use in studying individuals but not groups. The bid technique has value with abnormals because it is a form of pressure to force the individual to become more realistic. Further research has yet to be performed to demonstrate the influence varying graded pressures have upon deviate groups. Such a technique might be useful to quantify the degree to which the abnormal has divorced himself from reality. As shown previously, neither the bid technique nor the dart throwing has received exclusive use by investigators. It is probably a healthy reflection of development, that methodology has retained its flexibility and is adjusted to meet the need of the individual experiment.

Eysenck says that results should be recorded in such a fashion that they can be evaluated only by the experimenter.¹⁶ This is true in certain experiments where fictitious results are given the subjects. In general, however, investigators have not adhered to this rule as evidenced by dart throwing, the Rotter Board, and other skills where the results are immediately known by the subjects. The importance of secrecy is also useful when one is interested in the judgment of past performances.

The study of level of aspiration has been done largely in terms of correlations. The product moment method was generally used in the earlier investigations. Preston challenged this because of certain theoretical considerations.¹⁷ He believed that differences in performance ability endangered the interpretation of the average difference scores. He suggested instead the rank difference method. The reasoning behind this opinion is based on the formula for the product moment coefficient of correlation.

$$r_{xy} = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{N}}{\sqrt{\left[\sum X^2 - \frac{(\sum X)^2}{N} \right] \left[\sum Y^2 - \frac{(\sum Y)^2}{N} \right]}}$$

X represents the average difference score for the performance variable and Y represents the other variable. If a subject has greater proficiency in the task than others in the group he is likely to have greater absolute

16 Eysenck, Dimensions of Personality, 151.

17 Malcolm G. Preston, "Use of the Coefficient of Correlation in the Study of the D-Score for Level of Aspiration," American Journal of Psychology, LV, 1942, 442.

discrepancies than a subject having less ability. This would indicate a quantitatively greater shift for the more skilled individual; yet in relation to his previous performance the shifts might be of equal proportion. Hence, it is argued, the quantity by which this individual affects the correlation is out of proportion to the other individual. The correlation is then weighted by the performance ability, which is generally not the significant aspect of the experiment.

B. Determinants of Level of Aspiration

Why does the individual choose this goal rather than another? Why do individuals differ as to the goals they choose? In brief, what are the determinants of a level of aspiration? Experimental evidence indicates eight known influences which will now be considered. These are, (1) the intellectual factors, i.e., objective judgments, (2) ego defenses, (3) cultural influences, (4) external factors, e.g., comparison with some group, (5) attitudes towards the task, (6) personality factors, (7) age and (8) sex.

In the original investigation into level of aspiration Hoppe found that individuals differed among themselves in the goals which they established for themselves and in their evaluations of past performances.¹⁸ Hoppe believed that three needs were operative in each situation where the individual sets a goal for himself. These are:

- (1) The desire to do well.

¹⁸ F. Hoppe, "Erfolg und Misserfolg: Untersuchungen zur Handlungs- und Affectpsychologie," Psychologische Forschung, ed by Kurt Lewin, XIV, 1-82.

(2) The desire to predict level of aspiration accurately.

(3) The desire to avoid failure.

Are these three needs basic components of goal striving? If they are, and if they can be investigated by means of the level of aspiration procedure, then indeed this is a valuable tool in this technique.

It is readily seen that these three needs are divided into two components. On one hand is the desire to do well and the desire to avoid failure. These are ego defenses. They are concerned with the protection of the self esteem. This is the hopeful element of ambition tempered by caution. The individual who has a desire to do well which is stronger than the desire to avoid failure would set relatively higher goals for himself. The person driven more by the desire to avoid failure would then, by the same reasoning, establish very conservative goals.

Opposed to these ego defenses is postulated a desire to keep the level of aspiration equal to performance. This is greatly a function of the experimental instructions. This was demonstrated by Irwin and Mintzer,¹⁹ in their study of the differences between results when the subjects were asked to state what they hope to do, as contrasted with results when they were instructed to state what they think they will achieve. In the hoped for trials, the subjects showed greater discrepancies between their previous scores and their prediction of future scores.

¹⁹ Francis W. Irwin and Milton G. Mintzer, "Effects of Differences in Instruction and Motivation upon Measures of the Level of Aspiration," American Journal of Psychology, LV, 1942, 400-406.

Can the presence of these needs be experimentally demonstrated? Can it be shown that the ego defenses, which incline the individual to do well and avoid failure, interact with the opposing need for an objective judgment? To investigate this problem, Frank²⁰ presented five tasks to an experimental group of college students:

- (1) printing with small letters
- (2) printing with capital letters
- (3) copying designs
- (4) logical relations
- (5) spatial relations

The levels of aspiration were recorded, and the following facts were observed. Changes in level of aspiration affect the height of the first level of aspiration in a subsequent task. This transfer of level of aspiration is in accordance with the theory of transfer according to identical elements. That is, the extent of the effect depends upon the degree of similarity. Changes in the level of performance in one task affect the average height of the remaining levels of aspiration for another, in some cases.

These results, which Frank obtained, were interpreted as being in accordance with the hypothesis that the level of aspiration represents the compromise of the opposing elements, ego protection and objective judgment. This would seem plausible since the transfer according to similar elements illustrates how the similarity of the performances affects our objective judgment and reflect an expectation of similar results. These expectations

²⁰ Frank, "The Influence of Level of Aspiration in one Task on the Level of Aspiration in Another," Journal of Experimental Psychology, XVIII, 1935, 159-171.

of similar results are reflected by the new level of aspiration, which have some basis in the facts of previous experience.

The fact that the performance in one task has corresponding effects upon the remaining levels of aspiration shows that tension is released or increased, so that the ego defenses are lowered or raised. The fact that this phenomenon occurred in some, but not all cases, will be discussed when reviewing the generality problem in the level of aspiration effects.

The results of Frank's experiment could be explained as an objective judgment based on past experience, not necessarily indicating the influence of ego defenses. Hartzman and Festinger²¹ conducted an interesting experiment to test this problem. Their simply designed experiment utilized twenty college students performing two intellectual tasks. In neither of these tasks could any improvement be expected. At the end of the first task the students were told the average score of a fictitious college group, which supposedly approximated their own scores. In the second task the subjects lowered their goals. This, the authors believe, was a situation in which tension was created and subsequently reduced. This study seems to indicate and confirm the influence of the ego defenses, and to eliminate the theory that level of aspiration represents only objective judgments.

21 Hartzman and Festinger, "Shifts in Explicit Goals in a Level of Aspiration Experiment," Journal of Experimental Psychology, XXVII, 1940, 439-452.

Holt²² designed a crucial experiment to determine whether level of aspiration reflects the degree of a person's motivation in a task being performed, or whether level of aspiration can be understood as a defensive behavior of a person whose self esteem is threatened. For this study he chose college examinations in psychology and physics as ego involved tasks. The tests were of graduated importance to the subjects. When the tests were of no significance in the determination of grades the results showed that the level of aspiration had little motivational significance, being primarily objective judgments. When ego involvement was low but present, that is, when the tests were of minor importance for grades, the levels of aspiration reflected a low degree of intensity of motivation. When the tests were of major importance, defensive considerations became paramount and levels of aspirations were more complexly determined. At intensely motivated levels it seems that anxieties, fears and hopes become dominant. In less ego involved situations, objective judgments emerge as the dominant factor. There is a direct proportion between the degree of ego involvement and the importance of the ego defenses. Conversely, there is an inverse proportion between ego involvement and objective judgments. Expressed in formula form it is:

$$\text{Degree of ego involvement} = \frac{\text{Degree of importance of ego protectors}}{\text{Degree of importance of judgments}}$$

22 Robert R. Holt, "Level of Aspiration: Ambition or Defense," Journal of Experimental Psychology, XXXVI, 1946, 598-415.

What has occurred here is the consideration of ego involvement as an intervening variable, which is measured by the presence of these observable events. When establishing a goal one is in effect identifying with that goal. The ego is thus involved in a pursuit to possess, actually or psychologically, this particular object. Increasing the need, which the individual has for the goal, increases the need to defend the ego, with a resulting loss of objectivity. The intellectual factor does not disappear from the scene but, rather, takes on a new function; that is, it is directed by personality needs rather than a perception of the objective situation.

Studies of cultural determinants give evidence to support the belief, that level of aspiration is influenced by social factors. The directions that goal seeking take are readily seen to be functions of social norms and values. Among Australian aborigines there would be little incentive to become a bacteriologist. However, direction is not the only characteristic which is influenced by culture. The height of the goal is also influenced. Margaret Mead²³ reports that the Samoans provide their children with an environment favorable to the development of mediocrity. Competition is frowned upon and excellence is punished rather than rewarded. Escalona²⁴ has found experimental differences in levels of aspiration among western nations. Germans were found to be more responsive to failure than Americans.

23 Margaret Mead, Coming of Age in Samoa, New York, 1928, 78-120.

24 Escalona, "The Effects of Success and Failure Upon the Level of Aspiration and Behavior of Manic-Depressive Psychosis," Welfare, XVI, No. 3, University of Iowa Studies, 1940, 197-302.

Could²⁵ conducted a study among persons having inferior socio-economic backgrounds. This inquiry found that persons on relief had higher levels of aspiration in the experimental situation than were found among middle and higher income groups. The needs of these persons, in their drive for financial success and their desire to achieve status, seems to be reflected in the level of aspiration situation. These results argue also for the generality of level of aspiration effects.

Group situations of a more restricted nature have also been found to influence level of aspiration. Anderson and Brandt²⁶ studied one hundred children in the fifth grade. They found that when results are known to the group, those above the average tend to keep their levels of aspiration at the group level. Those performing below the group average tend to keep their levels of aspiration at the group level. Thus, there is a centralization of goals around the group average.

Hilgard, Sait and Magaret²⁷ performed a variation of this procedure. Seventy-four college students, operating in groups of three to six were given

25 Rosalind Could, "Some Sociological Determinants of Goal Striving," Journal of Social Psychology, XIII, 1941, 461-472.

26 Harold H. Anderson and Herman F. Brandt, "Studies of Maturation Involving Self Announced Goals of Fifth Grade Children and the Concept of Level of Aspiration," Journal of Social Psychology, X, 1939, 209-232.

27 Ernest R. Hilgard, Edward M. Sait and G. Ann Magaret, "Level of Aspiration as Affected by Relative Standing in an Experimental Group," Journal of Experimental Psychology, XXVII, 1940, 411-421.

tasks in subtraction. Some members of the group were given more difficult tasks. Another group was given relatively simple tasks. None of the students were aware of the difference in difficulty. All subjects knew the scores of the other groups as well as their own. It was found that all subjects tended to estimate future scores towards the mean of the entire class. As in the previous experiment, the centralization toward the group mean illustrated the effect of the group in such situations.

Gould and Lewis²⁸ set up a study to determine the effects of an external standard upon level of aspiration in a general information test. A control group was compared with two experimental groups. The first experimental group was given the average score of a fictitious group of college professors before setting their levels of aspiration. The second group was given the scores of a fictitious group of W.P.A. workers. Differences among the levels of aspiration of all three groups were significant. The attitude of the students, towards the groups with which they were compared, is seen to be a significant factor.

The ramifications of such a technique could mean a useful instrument for the social psychologist. If one can infer attitudes from levels of aspiration, interesting studies could be made. This might be a subtle approach to the study of the origin and development of attitudes.

28 Rosalind Gould and Helen B. Lewis, "An Experimental Investigation of Changes in the Meaning of Level of Aspiration," Journal of Experimental Psychology, XXVII, 1940, 422-438.

A number of studies have shown levels of aspiration to differ with differences in the attitudes of the subjects toward the task at hand.²⁹ When a self-competitive or play attitude is established, high average difference scores are noted. At the opposite extreme, when over sensitivity is brought about, low average difference scores are noted. In the self-competitive or play attitude, the goal is a source of motivation for the subject. It is an attempt to "lift himself by the bootstraps." On the other hand, the exaggerated sensitivity, which is usually brought about by a bid technique, penalizing errors in estimation, simply nullifies the influence of the need to succeed and emphasizes the need to avoid failure.

A considerable amount of study has been conducted to relate level of aspiration to the study of personality. These studies can be roughly grouped into two kinds. In the first group are attempts to correlate level of aspiration to specific personality traits and personality inventory scales.³⁰ The second group have concerned themselves with the relation of level of aspiration to certain diagnostic categories.

29 Frank, "Individual Differences in Certain Aspects of the Level of Aspiration," American Journal of Psychology, XLVII, 1935, 119-128; Pauline S. Sears, "Levels of Aspiration of Academically Successful and Unsuccessful Children," Journal of Abnormal and Social Psychology, XXXV, 1940, 498-506; Gould, "An Experimental Analysis of Level of Aspiration," Genetic Psychology Monograph, XXI, 1939, 115.

30 Samuel F. Klugman, "Relationship Between Performance on the Rotter Aspiration Board and Various Types of Tests," Journal of Psychology, XXIII, 1947, 51-54.

One of the experiments conducted to discover correlations between the average difference score and various personality measures was performed by Gould.³¹ Industrial workers were given rating scales to evaluate their satisfaction or dissatisfaction with their status. She found a low but suggestive correlation indicating that dissatisfied workers tended to have higher average difference scores than satisfied workers. Gardner³² found that fear of failure among subjects tended to be accompanied by low average difference scores. Sears³³ found that children who were self or socially motivated had high average difference scores. Children who were not so motivated had low average difference scores. Murray³⁴ rated students on tests of rigidity and tenacity of purpose. He found a low but suggestive correlation between these two factors and high average difference scores.

Gould and Kaplan³⁵ gave eighty-two college sophomores, at Columbia

31 Gould, "Some Sociological Determinants of Goal Striving," Journal of Experimental Psychology, XIII, 1941, 461-472.

32 Gardner, "Relation of Certain Personality Variables to Level of Aspiration," Journal of Psychology, IX, 1940, 191-206.

33 Sears, "Levels of Aspiration of Academically Successful and Unsuccessful Children," Journal of Abnormal and Social Psychology, XXIV, 1940, 498-508.

34 Henry A. Murray, Explorations in Personality, New York, 1938, 461-471.

35 Rosalind Gould and Norman Kaplan, "The Relationship of Level of Aspiration to Academic and Personality Factors," Journal of Experimental Psychology, XXVII, 1940, 422-458.

University, a group of personality inventories. Among these were Maslow's Social Personality Inventory, extroversion-introversion test, intelligence test scores and the student's scholastic record. Average difference scores were obtained on performances in addition, digit symbols, vocabulary, manual steadiness, cancellation and dart throwing. The analysed results yielded no significant relationships.

Work with psychotics has been primarily aimed at the establishment of a methodology for level of aspiration with this group. The findings of Hausman⁵⁶ were verified by other investigators. The paranoiacs were found to maintain very rigid inflexible levels of aspiration.⁵⁷ This was interpreted as being in accordance with our general view of the personality structure of these persons. Their mental life seems to be controlled by certain inflexible ideas and all objective information is interpreted in this light. They can bend external reality but not internal reality. The schizophrenics were conspicuous because of a total lack of relationship between level of aspiration and level of performance. They do not misinterpret reality; they ignore it. The greatest single characteristic of the manics was an extreme motility.

A huge quantity of enlightening work was performed by Eysenck and his colleagues.⁵⁸ He began by establishing rigid criteria for his particular

⁵⁶ Hausman, "A Test to Evaluate Some Personality Traits," Journal of General Psychology, IX, 1933, 179-189.

⁵⁷ Rotter, "Analysis of Patterns of Sequence," Journal of Social Psychology, XXI, 1945, 159.

⁵⁸ Eysenck, Dimensions of Personality, 1947, 128-144.

type of research. He stated that the nature of the task must be such that:

- (1) It permits a wide range of scores.
- (2) It permits ample practice effects to appear.
- (3) There are moderately high correlations between trials.
- (4) Success can be evaluated only by the experimenter.
- (5) It has an intrinsic interest for the subject.³⁹

It will be seen that while these conditions were essential to his work, they are not necessary requirements for other experimentation.

To fulfill the requirements for the task he chose two instruments.⁴⁰ He ascribes one of these to Doctor Craik, of Cambridge University. This was called the triple tester. The task consisted in maintaining a small metal ball on a revolving miniature highway. To keep the ball on the path the subject had to anticipate his moves, since the steering was accomplished through an integrating gear.

The second instrument chosen was called the punch press. It was a typewriter-like apparatus. The subject has before him a number of keys bearing symbols. In front of him is a single exposed symbol on the carriage. When he depressed the key having the symbol corresponding to the exposed one, the carriage moved one space exposing another symbol. Punch cards were kept, and trials of one minute were scored for speed and accuracy.

Having chosen his tasks, Eysenck began a study of quantitative measure.⁴¹ He began with the assumption that level of aspiration is positive

³⁹ Eysenck, Dimensions of Personality, 1947, 128-144.

⁴⁰ Ibid., 128-130.

⁴¹ Ibid., 130-133.

when raised above previous performance levels and negative when placed below such levels. Finding a correlation of .95 between the goal discrepancy scores and the attainment discrepancy scores, he concluded that there was no need to calculate both scores.⁴²

Another measure studied was the subject's judgment of his past performances. If the subject's judgment of his last performance is subtracted from his actual achievement, the resultant is called the judgment discrepancy score. Goal discrepancies were found to correlate $-.60$ and $-.70$ with judgment discrepancy scores. That is to say, high goals are associated with low opinion of past performances. Similarly, low goals were found with higher opinions of performances.⁴³

By subtracting the judgment discrepancy from the goal discrepancy score a new measure was found, which Eysenck called the affective discrepancy score. This was said to be the index of subjectivity.⁴⁴ This measure is supposed to be indicative of the subject's ability to keep his judgments and levels of aspiration in touch with reality. Lastly, Eysenck used the index of flexibility and the index of responsiveness, which was previously discussed. Using the triple tester with adult males, Eysenck found⁴⁵ a product moment

42 Ibid., 132

43 Ibid., 137-139

44 Ibid., 132

45 Ibid., 136

correlation of $-.57$ between judgment discrepancy scores and intelligence quotients. Using the index of responsiveness as a measure of rigidity, hysterics were found to be less rigid than dysthymics.⁴⁶ The term dysthymic is used to include all neurotics whose mental illness was not in a conversion form.

The affective discrepancy scores were found to be high in specific situations.⁴⁷ Soldiers were used as subjects in a study in which a correlation of $+.58$ was found between high affective discrepancy scores and failure to secure rank as non-commissioned officers. Another correlation of $+.40$ was found between high affective discrepancy scores and unsatisfactory conditions in the homes and families of the soldiers. A correlation of $+.58$ was found between high affective discrepancy scores and aggressiveness. A low but suggestive correlation of $+.24$ was found when the relationship between abnormality in parents and siblings and high affective discrepancy scores was studied. All these results, which were found with the triple tester, were verified for men and women with the key punch.⁴⁸

The work with neurotics was of particular interest.⁴⁹ If high in-

⁴⁶ Ibid., 137

⁴⁷ Ibid., 138

⁴⁸ Ibid., 137

⁴⁹ Eysenck, "The Effects of Incentives on Neurotics and the Variability of Neurotics as Compared with Normals," British Journal of Medical Psychology, XX, 1944, 100-103.

centives were offered to the two groups, that is, the dysthymics and the hysterics, to double their achievement on the triple tester, the dysthymics actually increased their scores while the hysterics did not. The affective discrepancy scores were larger for the dysthymics under these conditions. This measure actually dropped in the case of the hysterics. The judgment discrepancy scores of the dysthymics fell and those of the hysterics rose.

Following these studies with neurotics, a number of investigations were made to find differences between normals and neurotics.⁵⁰ The normals were found to have higher performance levels. The correlations between the judgment discrepancy scores and index of responsiveness were negative for neurotics and positive for normals. Among the neurotics there was greater interpersonal variability. They showed smaller negative judgment discrepancy scores than normals. The variability of all discrepancy scores was larger for the neurotics than for the normals.

From his study with neurotics and normals Eysenck concluded:

- (1) Men were clearly distinguished from women.
- (2) Hysterics were distinguished from dysthymics.
- (3) Normals were clearly distinguished from neurotics.⁵¹

Such distinctions, however, are in terms of groups rather than individuals.

Through these extensive investigations, Eysenck has shown the

⁵⁰ Eysenck, "An Experimental Study of the Reactions of Neurotics to Experiences of Success and Failure," Journal of General Psychology, XXV, 1946, 152-154.

⁵¹ Ibid., 140.

application of level of aspiration to the understanding of neurotics. The level of aspiration technique has been advanced so that it is approaching the status of a diagnostic instrument.

The most recent study of the level of aspiration as a diagnostic instrument was conducted by Escalona.⁵² She compared two groups. The first was a control group of nineteen overtly well adjusted persons, ranging in age from 14 to 18 years. They were high school students of both sexes. The experimental group was similar in all respects except that they were overtly maladjusted. The subjects were given a series of puzzles of increasing difficulty. They were told to work as rapidly as possible after choosing the level of difficulty that they wished to attempt. Success and failure was artificially induced by means of a timing device. Following the experiment proper, and introspective interview was administered. The experimenter formulated a clinical impression on the basis of the interview and the performance. A brief family and social history was obtained for each student. The California Personality Adjustment Scale Form A was also given to each subject.

A number of significant differences were found between the well adjusted and maladjusted groups. The well adjusted used more efficient work methods, tended to enjoy the experiment and showed a lesser degree of help-

⁵² Escalona, An Application of the Level of Aspiration Experiment to the Study of Personality, Teachers College Columbia University Contribution to Education No. 937, New York, 1948.

lessness when faced with failure than the maladjusted group. The maladjusted group showed a greater emotional reaction to failure, disclaimed responsibility for their choices and were less realistic in choices than the well adjusted groups.

As a result of these findings the author proposed a tentative list of maladjustment indicators, such that the presence of two or more in a single record was considered to suggest the presence of maladjustment. This technique may be of clinical value for the exploration of adjustment problems in persons who resist the interview method, as well as the usual type of personality testing.

The quantity of information concerning the level of aspiration among children is very limited. Fajan, Greenburg and Rosenzweig⁵³ found that levels of aspiration await the development of self-awareness. Among young children, levels of aspiration are unpredictable and often fantastic. This may possibly be explained by the child's insecure anchorage to reality. The levels of aspiration among adolescents react according to the same principles as adults.⁵⁴

53 Samuel Fajan cited by Jerome D. Frank, "Recent Studies of the Level of Aspiration," Psychological Bulletin, XXVIII, 1941, 218-228; Paul D. Greenburg, "Competition in Children," American Journal of Psychology, XXXIV, 1932, 221-248; Saul Rosenzweig, "Preferences in the Repetition of Successful and Unsuccessful Activities as a Function of Age," Journal of Genetic Psychology, XLII, 1933, 425.

54 Escalona, An Application of the Level of Aspiration Experiment to the Study of Personality, Teachers College Columbia University Contribution to Education No. 957, New York, 1948.

Anderson and Brandt, and Frank⁵⁵ reported significant differences between the average difference scores from men and women. Sumner and Johnson⁵⁶ reported similar results from an investigation among college students in classroom situations. Thirteen matching type tests were given to a class of general psychology students. Women were found to give a closer estimate to their actual performances than men. This is probably explained by the greater sensitivity of women to social influences in the classroom.

C. Generality of Level of Aspiration

The generality-specificity problem was first investigated by Gardner⁵⁷ who demonstrated that the average difference score is highly consistent within a single task. Not only did persons tend to show similar levels of aspiration, but they held their same relative rank in the group. Bayton⁵⁸ made a trial by trial analysis of data and confirmed the fact that needs

55 Anderson and Brandt, "Studies of Maturation Involving Self Announced Goals of Fifth Grade Children and the Concept of Level of Aspiration," Journal of Social Psychology, X, 1939, 209-232; Frank, "A Comparison Between Certain Properties of the Level of Aspiration and Random Guessing," American Journal of Psychology, III, 1936, 43-62.

56 Francis C. Sumner and Edward E. Johnson, "Sex Differences in Level of Aspiration and in Self Estimates of Performance in Classroom Situations," Journal of Psychology, XXVII, 1949, 483-490.

57 Gardner, "Level of Aspiration in Response to a Prearranged Sequence of Scores," Journal of Experimental Psychology, XXV, 1939, 601-621.

58 James A. Bayton, "Interrelations between Levels of Aspiration, Performance and Estimates of Past Performance," Journal of Experimental Psychology, XXXIII, 1945, 1-21.

operating in a single level of aspiration continue to be operative through successive trials. This appeared to indicate that level of aspiration tendencies of an individual are continuous within a single task. The consistency of these findings was in marked conflict with the results reported earlier by Frank.⁵⁹ He found that early shifts of level of aspiration in the task affect the average height of the following levels of aspiration in some tasks, but not in others. Level of aspiration seems to be influenced by the nature of the task.

Gould and Lewis⁶⁰ conducted a study in which the subjects were given widely varying kinds of tasks to perform. Statistically, significant differences were found between the levels of aspiration on the various tasks. The experimenters interpreted this to mean that levels of aspiration are specific to each situation. If this is true, then nothing can be argued about a person's behavior by means of this test. If there is no generality to the level of aspiration, then this is a fruitless field for investigation. This was a mortal threat to the entire field of level of aspiration.

In Gardner's study of levels of aspiration to prearranged sequences, thirty-one college men were tested on four tasks consisting of card

⁵⁹ Frank, "The Influence of Level of Aspiration in one Task on the Level of Aspiration in Another," Journal of Experimental Psychology, XVIII, 1935, 159-171.

⁶⁰ Gould and Lewis, "An Experimental Investigation of the Changes in the Meaning of Level of Aspiration in Another," Journal of Experimental Psychology, XXVII, 1940, 422-453.

sorting, digit symbol substitution, multiple choice test and cancellation.⁶¹ Subjects were not told their actual scores but prearranged patterns, which were the same for all four tasks. High intercorrelations between tasks resulted in all cases. The author concluded that the underlying behavior was characterized by a considerable degree of generality. Individuals tended to retain their group rank with respect to the average difference scores. The similarity of the tasks was a weakness in this experiment. The proponents of individuality of levels of aspiration could point to this as the cause of the correlations.

Bayton designed an experiment⁶² to examine the generality of level of aspiration in which he used a wide variety of tasks, such as cancellation, dotting, problem solving, dart throwing and other tasks. He asked his subjects to choose tasks that they would like to do, and also those tasks which they would not like to do. A trial by trial analysis was made of performances thus rated as liked and disliked. He assumed that those tasks in which the subject wanted to do well were ego-involved. In a non-ego involved task there was no relation between past performance and future estimates. However, in ego involved situations there were two significant results; first, there was a tendency for those with higher levels of aspiration to follow those with higher estimates of past performances; secondly, the trial by trial

61 Gardner, "Level of Aspiration in Response to a Prearranged Sequence of Scores," Journal of Experimental Psychology, XIV, 1939, 601-621.

62 Bayton, "Interrelations Between Levels of Aspiration, Performances and Estimates of Past Performance," Journal of Experimental Psychology, XXXIII, 1945, 1-21.

analysis showed that individuals retained their relative rank in the group with respect to level of aspiration. The results seem to indicate that ego-involvement is the crucial phase of the level of aspiration experiments.

The generality of level of aspiration is, in the author's opinion, dependent upon the stability of the determinants. Ego defenses, personality factors, cultural influences, age and sex are stable factors. Objective judgments depend upon the nature of the experiences, which along with external standards of comparison can be readily controlled by the experimenter. The principal source of instability seems to arise from the subject's attitude toward the task. If one can be assured that the subject is interested in doing well in the experimental task, one can believe that he will react similarly in other life situations in which he wishes to do well.

D. The Position of Success and Failure in Relation to Level of Aspiration.

With the generality-specificity problem, one is concerned with the effects of previous experiences upon the subsequent levels of aspiration. The experiments show that the subject's level of aspiration is influenced by the nature of his previous experiences.

The recent work of Steisel and Cohen⁶⁵ indicates that the sequence of success within an experiment will influence the significance of later failure. In this experiment two degrees of failure were administered to the subject on the third, sixth and ninth trials of a task. All other trials

⁶⁵ Ira M. Steisel and Bertram D. Cohen, "The Effects of Two Degrees of Failure on Level of Aspiration," Journal of Abnormal and Social and Social Psychology, XLVI, 1951, 79-82.

were successes. The results indicated that amount and shift in level of aspiration were in the direction of, and in proportion to, the preceding success or failure. Further, it was found that failure became less effective with an increasing number of performances. Lastly, with persistent failure there is a tendency for the level of aspiration to be affected less and the immediate reaction to failure was an increase in speed of performance.

This experiment demonstrates the influence of a sequence of success and failure, but does not describe it systematically. One does not know from these findings what the significance of success and failure is at specific times in the sequence. In particular, one does not know what effect success or failure might have on the first, second, fourth, fifth or any specific trial. Quantitative values of failure at various positions are obscured by the use of two degrees of failure with each subject. The experiment being reported is an attempt to remedy these deficiencies. By varying the position of a single failure in an otherwise success sequence, it is hoped to give quantitative description of the effect that the position of failure in a series has upon level of aspiration.

E. Summary

A level of aspiration is essentially the choice of a goal. An elaborate body of experimentation has been developed, providing a technique for quantitative studies of choosing goals. Involved in all level of aspiration techniques are two elements: knowledge of past performance and a verbal statement of a future goal. This latter element assumes that the verbalized goal is the individual's real level of aspiration. This assumption is a weakness

that methodological studies have not remedied. This reliance upon verbal reports is somewhat justified by the realization that whether it is his real goal at least it is the goal which he is willing to make known to someone else.

This verbalized statement of a goal is a function of the individual in a social setting. He brings into this situation a set of past experiences, personality characteristics, cultural influences, personal and external standards of comparison. By careful control of variables it is possible to use level of aspiration as an instrument to study and compare individuals, as well as social, pathological and cultural groups and their values.

Level of aspiration may contribute greater understanding of personality dynamics. The studies cited revealed widespread individual reactions to success and failure. While the level of aspiration protocol does not yield a rich description of the individual's personality, it is one of the few methods which investigates the volitional aspects of personality. Such simple quantitative derivatives as the goal discrepancy score reflect complex interrelations between demands for success, avoidance of failure and the individual's need to deal with the reality of his cognitions.

A level of aspiration is a miniature life situation. As with other samples of human behavior, one wonders whether the experimental reaction is typical of reactions in other life situations. This is a question which cannot be answered simply. It is probably safe to assume that generality of level of aspiration is dependent upon the stability of its determinants. By careful experimental study of these determinants and a consideration of their

relation to the particular problem an answer may be given for specific types of situations. It has never been established that there is a trait of goal seeking. To establish a trait, that is, a characteristic manner of goal seeking, research would of necessity combine data from clinical and experimental areas. Establishment of such a trait would make possible wider generalization from experimental studies.

Level of aspiration involves striving toward as well as choosing a goal. The striving aspects of level of aspiration have not been explored as extensively as the prediction of future performance. Methodology has been developed and techniques applied more effectively to the study of goal setting. If the accompanying goal striving can be studied in relation to goal setting, level of aspiration will have achieved broader theoretical and practical value. Goal striving is related to such theoretical problems as fixation, regression and frustration. Its practical applications are to such problems as vocational guidance, maladjustment and mental hygiene.

An important factor which determines the prediction of a future goal is the past experience of the individual. A given sequence of achievements will cause the individual to set up certain subjective expectancies. The research cited indicates that if the preceding experience is accompanied by feelings of success the level of aspiration rises and feeling of failure is accompanied by lowered level of aspiration. In general, this lowering or raising of level of aspiration is roughly proportional to the degree of success or failure. Previous experiments indicate the probability that the significance of success and failure may be a function of the position at which

they are experienced. The present experiment is designed to study this problem.

CHAPTER III

METHODOLOGY

A. Selection and Description of Subjects

Between the first of February and the first of September of 1952, two hundred college sophomore males were subjects for the experiment. Eighty of these were students taking courses in general psychology from the author. They were volunteers solicited by a brief classroom statement, which stated that subjects were needed for an experiment involving hand and eye coordination, and in addition they were told that the test was similar to one used in the selection of aviation cadets. A sheet of paper was passed around with the available times listed. The subject signed his name opposite the most convenient time.

The remaining one hundred and twenty subjects were contacted individually in the student lounge. The author introduced himself and told the prospective subject that an experiment involving hand and eye coordination was being conducted and inquired as to whether he would like to be a subject. It was also stated that the test was similar to one used to select aviation cadets.

College males were chosen because of their availability and cooperativeness. Results obtained from this group can be compared with data obtained in previous investigations. Furthermore, it contributes toward a more

homogeneous socio-economic group, thus avoiding variances found in levels of aspiration of varying cultural groups.¹ Variance due to sex differences is similarly avoided.²

No subject was selected who said that he had ever worked on a pursuitmeter or who was familiar with the level of aspiration technique. This control was imposed to assure a similar degree of experimental naivete.

B. Selection of a Task

Investigations conducted in the field of level of aspiration have been marked by wide variability of tasks. In general, this flexibility is a result of varying purposes. The task is suited to the particular purpose of the experiment. In general, however, certain rules have been established.

- (1) The task must be moderately difficult; such that it serves as a challenge.
- (2) The task must permit a wide variation of scores.
- (3) The establishment of a level of aspiration presupposes that the subject is familiar with the task, In general, such familiarity is afforded by practice sessions.
- (4) The subject must be interested in doing well or as

1 Gould, "Some Sociological Determinants of Goal Striving," Journal of Social Psychology, XIII, 1941, 461-475.

2 Sumner and Johnson, "Sex Differences in Levels of Aspiration and in Self Estimates of Performance in Classroom Situations," Journal of Psychology, XVIII, 1946, 483-490.

some investigators state it, he must be ego-involved.³

To meet these requirements, a pursuitmeter with a silent timer was used. Thus, the subject had to depend upon the reports of the experimenter to know his score, and a prearranged set of scores was reported to him. The pursuit rotor has been used in level of aspiration experiments by Eysenck who reported finding the usual level of aspiration effects.⁴

Two pursuitmeters were used in the experiment. Eighty subjects were tested on a pursuitmeter constructed from a Victrola Model UE 7-23K. This model is $8\frac{1}{2}$ inches in height, 20 inches in length and 13 inches in width. The turntable is $13\frac{3}{4}$ inches in diameter, and can be regulated in speed. The actual experimental speed was sixty revolutions per minute. A circular silver contact, $\frac{1}{2}$ inch in diameter, was inset $11\frac{1}{2}$ inches from the center of the brown masonite turntable. Any contact with this target was recorded on the silent timer. Contact was made with a stylus. The stylus was constructed of a $1/8$ inch metal bar attached to a tape wrapped wooden spool which served as a handle. The stylus was jointed at the handle permitting the handle to move up or down independent of the metal bar, and making the stylus bend rather than remain rigid. This flexibility made the task more difficult. The stylus extended $11\frac{1}{2}$ inches from the handle, and then made a sixty degree bend and extended two inches.

3 Frank, "Recent Studies of the Level of Aspiration," Psychological Bulletin, XXXVIII, 1941, 218-228.

4 Eysenck, Dimensions of Personality, 152.

One hundred and twenty subjects were tested with a similar pursuit-meter operating at the same speed. The base of this model was nine inches in height, width and length. The turntable was the same size as the former one and the same stylus was used.

C. Experimental Groups

To test the hypothesis, nine experimental groups and one control group were used. There were twenty subjects in each group. The control group received nine success experiences. Each remaining group received eight success experiences and one failure. In this way twenty subjects received failure in each of the nine possible positions.⁵

There is a tendency for individuals to have a consistent type of prediction. If such a tendency was to be unequally distributed among the ten groups, so that one group was populated with overestimators and another group with underestimators, the experimental data would be vitiated. The first level of aspiration is given at the least structured position where such a tendency is most free to operate. Group D has the lowest average level of aspiration and group G has the highest average level of aspiration. Since the difference between the means of these extreme groups is not significant (critical ratio = 1.19) it may be concluded that lesser differences are not significant. It will be assumed that all groups represent the same statistical population.

From the work of previous investigators it is known that certain

5 See appendix table XVIII.

important variables must be controlled so that either they do not occur, or they are distributed equally among all the groups.⁶ Among these are the fac-

TABLE I
GROUP LEVELS OF ASPIRATION BEFORE THE FIRST TRIAL

Group	Sum of Levels of Aspiration	Mean	Median	Mode	Standard Deviation	Standard Error of the Mean
A	7280	365	350	350	65.5	14.88
B	7414	371	350	400	52.5	11.95
C	6875	344	350	325	57.0	8.49
D	6830	342 ^a	350	350	48.6	11.15
E	7285	364	350	400	62.9	14.45
F	6870	344	335	300	65.6	19.64
G	7575	379 ^b	388	400	85.6	19.84
H	7580	388	382	400	64.5	14.80
I	7340	367	350	300	79.9	18.85
J	7015	351	353	400	45.2	10.57

a - Note that group D has the lowest total level of aspiration.

b - Note group G has the highest total level of aspiration.

⁶ Frank, "Recent Studies of Levels of Aspiration," Psychological Bulletin, XXVIII, 1941, 218-226.

tors of sex, socio-economic status, mental illness or severe neurosis. The sex factor was controlled by using all male subjects. The selection of subjects from one community attending the same college should reduce variations due to socio-economic factors. In order to secure a population without mental illness, the subjects were screened for history of mental illness, and no subjects having such a history were used.

The Cornell Index Form M2 was given to all subjects. This questionnaire consists of 101 questions, which are to be checked yes or no. The first score to be considered will be the total number of questions which a subject answered unfavorably.

The mean score is 5.02 unfavorable answers. The median score is 5.65 unfavorable answers. The mode is zero unfavorable answers. The standard deviation is 5.27. The standard error of the mean is .58. The standard error of the standard deviation is .26.

These statistics compare favorably with norms established for male college freshmen.⁷ A mean of 7.35 was found for a group of 836 subjects. The standard deviation was 6.76.

Because the subjects were college males the experimental population represented a restricted age group. The ages ranged from 17 to 28 years. The mean was 20.30 years; the median was 19.50 years; and the mode was 20 years. The standard deviation was 1.77 years.

The Cornell Index Form M2 is divided into ten scales. The first

7 Arthur Weider, Harold G. Wolff, Keeve Brodman, Bela Mittelman and David Wechsler, Manual: Cornell Index Form M2, 1949, 7.

scale consists of 18 questions aimed to find defects in adjustment, as expressed by feelings of fear and inadequacy. This scale has the largest number of questions of any scale on the index.

Item number seven, the most frequently checked question, indicates that a common source of fear is the approach of superiors, which causes the individual to become nervous and trembling. The next most frequently checked item, question nine, asks, "Does your work fall to pieces when the boss or a superior is watching you?" The third most frequent unfavorable answer is to question 14 which asks, "Do you always sweat and tremble a lot during inspections or examinations?"

The average subject answered 1.02 questions unfavorably on this scale. The median and mode are zero. The highest number of unfavorable answers is 15. The standard deviation is 1.18 unfavorable answers. The standard error of the mean is .08 unfavorable answers. The standard error of the standard deviation is .06 unfavorable answers.

The highest percentage of unfavorable responses is found on the seventh scale of the Cornell Index Form N2. The questions attempt to elicit symptoms of neurasthenia or hypochondriasis. The second highest percentage is found on scale three which includes anxiety and "nervous" symptoms. The ninth scale is somewhat similar to the third scale. The ninth scale contains "Nervousness" and sensitivity symptoms. The fourth scale is the neurocirculatory scale and has received the fourth highest percentage of unfavorable responses.

Questions thirty-two, 33, 55, 56, 57, 78, 79, 88, 90, 91, 95 and 96

are referred to as "stop questions". The questions concern symptoms of such significance as to be almost diagnostic. At least they are considered of sufficient import to require investigation.

No subject answered questions 52 or 55 positively. These questions ask if the subject has ever had a nervous breakdown or resided in a mental hospital. No subject replied affirmatively to questions 55 or 56. These questions inquire as to whether the subject is a bed wetter or a sleep walker. Similarly, no subject answered question 91 unfavorably. This question asks the subject if he has been arrested more than three times. Although question 92 is not a "stop question", it seems worthwhile to state that no subject answered it in the affirmative. This question asks, "Have you ever taken dope regularly (like morphine or reefer)?"

One subject answered question 57 affirmatively, indicating that he had had a fit or convulsion. Inquiry revealed that he had had one seizure-like state as a child of which his parents had told him, and which he does not recall. Two subjects answered question 79 unfavorably saying that a doctor had told them they had ulcers of the stomach. Both subjects later stated that they had no suffered from gastrointestinal troubles and one subject stated that it was an incorrect diagnosis. Two subjects answered affirmatively to question 88 which asks, "Does your work go to pieces if you don't constantly control yourself?" Since this was the only unfavorable response on their indexes they were retained in the experimental group. One subject answered question 93 unfavorably. This question asks, "Do your enemies go to great lengths to annoy you?" This subject gave no other unfavor-

able answers and was included in the group even though he could not be reached for further inquiry. One subject answered question 90 unfavorably, and two subjects answered question 95 unfavorably. None of these subjects had any other unfavorable responses and were not able to be reached for further inquiry. No subject answering two or more "stop questions" unfavorably was retained in the group. A subject answering one stop question unfavorably was retained in the group if there were no other unfavorable answers, or if further inquiry diminished the significance of the answer.

Eighty subjects were tested in a classroom at the lake shore campus of Loyola University. The Cornell Index was given several weeks after the level of aspiration task. The conditions were more favorable than those existing when the remaining one hundred and twenty were tested at the downtown campus of the university. These latter subjects were tested individually at the end of the level of aspiration task.

The mean of the downtown group is 4.51. The standard deviation is 4.17. The mean for the lake shore campus group is 6.22. The standard deviation is 6.66. Dividing the difference between these means by the standard error of the difference, which is .84, yields a critical ratio of 2.04. This value is significant at the five percent level of confidence.

It can be seen that under more favorable testing conditions the Cornell Index scores approached the norms for college male students. Although the mean for the experimental population is 1.12 less unfavorable answers than the mean of the standardization group, this difference is not significant at the five percent level of confidence ($C.R. = 1.45$).

If the poorer score can be assumed to be the more accurate, it would still appear that the group is fairly normal. Among this relatively normal group the most frequent symptoms to be found are hypochondriasis and neurasthenia. The second most frequent symptoms are concerned with nervousness and anxiety. The third most frequent symptoms are sensitivity and nervousness. The fourth most frequent symptoms are of a neurocirculatory nature. The Cornell Index Form N2 results suggest that the experimental population is generally free of serious character defects, psychotic and severe neurotic symptoms.

The change in the place of experimentation might possibly influence the levels of aspiration data. However, the difference between the means is not significant at the 5 percent level of confidence ($C.R. = 1.59$). Similarly, the difference between standard deviations is not significant at the 5 percent level of confidence ($C.R. = 1.07$). The two groups will be considered to represent the same statistical population.

D. Experimental Procedure

Upon entering the experimental booth the experimenter took the stylus in his hand and explained to the subject:

This is a pursuitmeter. Your task will be to keep the tip of this stylus (pointing) on the metal disc as it revolves. You must chase it, catch it, and stay on the disc as long as you can. Now, I will show you the best technique.

At this point the experimenter demonstrated to the subject for a brief period and then continued:

You will find this much more difficult than it appears. Now, I will give you four practice trials and

then we will begin. Do you have any questions?

After answering any queries, the subject was given four trials of thirty seconds each. No scores were given until after the fourth trial, when the experimenter said:

On the four practice trials you averaged 300 units. If you were to get a perfect score, that is, if you kept the stylus on the disc for the entire time, you would get a score of 3000 units. No one ever gets 3000 units, but at the same time everyone gets some score. I'm going to give you nine trials and after each trial I will tell you your score and mark it on this graph so that you can see it. What will your score be on the first trial?

The subject was then given nine thirty second trials. After each trial he was told his score, which was prearranged and did not represent actual achievement. A verbal statement was also given to convey an impression of success or failure. The score was then plotted on the graph and connected to the previous score by a straight line. The subject was then asked, "What will your score be on the second trial?" Rest periods of $1\frac{1}{2}$ minutes were given at the end of the fourth and seventh trials. After the ninth trial the subject was told his score as usual and was asked, "What would your score be if you had one more trial?" This level of aspiration was necessary to see the influence of failure on the group who had failed in the ninth trial, and on the other groups, so that there were groups with which they could be compared. The following are the verbal statements given the subjects after their "success" trials:

- (1) You are doing well.
- (2) That was good.

- (3) You are very good at this.
- (4) You are getting better.
- (5) You succeeded again.
- (6) That was fine.
- (7) You made it again.
- (8) That was a very good performance.
- (9) That was quite good.

Only the all success group had a ninth "success" trial. After the "failure" trial the subjects were told, "You went down ten units that time; that was quite poor."

A change of inflection or tone of voice might cause a variable influence by indicating a greater or lesser amount of success or failure to individuals. Care was taken to avoid this by the awareness of such a possibility, and by memorizing these statements. This variability was also reduced by the use of the prearranged sequences seen in Table XVIII.

All subjects reached a top score of 370 units, except the all success group.⁸ All groups excepting the latter had a total of 80 units of success and ten units of failure. The actual increments of success vary from 8 to 12 units in order to make the "score" seem more realistic. The average increment was 10 units increase for each "success" trial.⁹

Consider the actual increments as given to the subjects. The positive increments represent an increase in score above the previous trial.

⁸ See Appendix Table XIX.

⁹ See Appendix Table XX.

Negative increments represent a decrease in score below the previous trial. These increases and decreases indicate the "success" and "failure" trials. After the final trial the subjects were asked:

- (1) What did you think of the experiment?
- (2) How did you feel about it?
- (3) Did you like it?
- (4) Were you interested in doing well?
- (5) Did you think you were doing well?
- (6) What do you think was the purpose of the experiment?
- (7) What had you heard about the experiment before?

At times the answers to these questions required further inquiry.

These questions were asked in an effort to determine, primarily, the degree of naivete. Three subjects were eliminated from the experimental population because they did not believe the scores were real. The experimenter was desirous of knowing whether or not the subject was sufficiently involved in the experimental situation so that he really wanted to do well. All subjects in the experimental group indicated a desire to do well.

After the experiment and the brief interview the subject was told that the experiment was concerned with estimates of future performance. Further, he was asked not to discuss his scores or estimates with other students in that this could influence persons who might become subjects for the experiment. In this way it was hoped that future subjects would have a similar degree of naivete and would not be influenced by the scores or estimates of classmates or friends. All the subjects agreed to comply with the

request, and no subjects had to be eliminated from the experimental population because of foreknowledge of the experiment.

CHAPTER IV

ANALYSIS OF DATA

Three general types of data were gathered from the experiment: level of aspiration data, learning data from actual performances and Cornell Index data. The level of aspiration data will be considered first.

A. Level of Aspiration Data

The level of aspiration data is best reflected in the goal discrepancy scores. This is found by subtracting the score given the subject from the goal stated by the subject. A positive number indicates that the subject expects to improve. A negative score indicates that the subject expects to do more poorly.

To make an over-all analysis of these scores, it is necessary to compute the total sum of squares of the entire group. The group, in this analysis, was composed of two hundred subjects. Each subject has nine goal discrepancy scores. The total sum of scores includes eighteen hundred individual scores. The mean goal discrepancy score is 12.91 for all subjects on all trials. Subtracting each score from this mean and squaring it, gives the variance for that score. The sum of these squared variances is the total sum of squares, and for this group it is 483,270.52.

The total variance is analyzed into two parts, variances caused by

intra-group differences and inter-group differences. The intergroup variance is found by summing the squared difference between each subgroup mean and the mean for the entire group. In the present analysis, there are ten groups having nine trials or ninety subgroup means. The total variance caused by differences between means is 66,711.52.

Variance caused by differences within the groups is found by summing the squared deviations from the subgroup means. In the present analysis, there are eighteen hundred deviations from ninety means. The total variance caused by differences within groups is 418,559.20.

Each of these sums of squares is divided by the appropriate degrees of freedom, to give an estimate of the population variance. In the present analysis, there are eighteen hundred scores in ninety groups. The degrees of freedom of the within group are eighteen hundred minus ninety or 1,710. Since there are ninety groups, there are 89 degrees of freedom between groups.

Dividing the sum of squares between groups by 89 yields an estimate of population variance of 749.56. Similarly, dividing the sum of squares within groups by 1,710 gives an estimate of population variance of 245.60.

On the assumption that the groups making up the total series of measurements are random samples from a homogeneous population, the two estimates of variance can be expected to differ only within the limits of chance fluctuations. This null hypothesis is tested by dividing the variance between the groups, by the variance within the groups. When the between group variance of 749.56 is divided by the within group variance of 245.60, a variance ratio of 3.08 is found. This value is significant beyond the one

percent level of confidence.

TABLE II

ANALYSIS OF VARIANCE OF GOAL DISCREPANCY SCORES OF TEN EXPERIMENTAL
GROUPS EXPERIENCING SUCCESS AND FAILURE IN DIFFERENT
SEQUENCES

Source of Variation	Sum of Squares	Degrees of Freedom	Estimate of Variance
Between Groups	66,711.52	89	749.56
Within Groups	416,559.20	1710	243.60
Total	483,270.52	1799	

Variance Ratio = $\frac{749.56}{243.60} = 3.08$, significant beyond one
per cent level of confidence.

The significance of this variance ratio is such, that the null hypothesis must be rejected. The significantly greater variance between groups than within groups excludes the likelihood of chance, and is explained in terms of the experimental conditions.

There are three sources of variance in the experimental procedure. The first source of variation due to the experiment is the sequence of trials; that is, the informative value of nine experiences. The second source is the nature of the trial; that is, whether it is a success or failure trial. The third source is the result of the joint effect of these two conditions. This

is ordinarily referred to as interaction.

By analyzing the sum of squares between groups, the variation caused by these three conditions can be determined. A sum of squares for groups can be computed by squaring the sum of each group, and dividing this value by the number of cases, and then subtracting a correction term for the origin. In the present analysis, there are ten groups, which squared, divided by one hundred and eighty and corrected for origin, gives a sum of squares of 7601.68.

A sum of squares for trials can be computed for trials by summing the squares of each trial, dividing this value by two hundred and correcting for origin. In the present analysis there are nine trials, which squared, divided by two hundred and corrected for origin, yield a sum of squares of 55,269.56.

Totaling the sum of squares of goal discrepancy scores for groups, and the sum of squares for trials, yields a total of 40,871.04. This is 25,840.28 less than the sum of squares between groups. This residual, or remainder, is the interaction. Interaction is, as has been said, the joint effect of the two variables.

Since there are nine trials, there are eight degrees of freedom, which divided into 55,269.56, yields an estimate of population variance of 4158.67. Since there are ten groups, there are nine degrees of freedom, which divided into 7601.68, yields an estimate of population variance of 844.65. Having eight degrees of freedom for trials and nine for groups yields 72 degrees of freedom for interaction. Dividing the sum of squares

due to interaction by 72 yields an estimate of population variance of 330.77.

The estimate of population variance within groups has been previously shown to be 243.60. Dividing this into the estimate of variance due to trials, and groups, yields variance ratios of 17.07 and 3.47. These values are significant beyond the 1 per cent level of confidence. Dividing the estimate of population variance caused by interaction, yields a variance ratio of 1.38. This value is significant beyond the 5 per cent level of confidence. Table III summarizes the computations discussed here.

TABLE III

ANALYSIS OF VARIANCE OF GOAL DISCREPANCY SCORES ON NINE TRIALS BY
TEN GROUPS HAVING DIFFERING SEQUENCES OF SUCCESS AND FAILURE

Source of Variation	Sum of Squares	Degrees of Freedom	Estimate of Variance
Trials	33,269.36	8	4158.67
Groups	7,601.68	9	844.63
Interaction	25,840.28	72	330.77
Within Groups	416,559.20	1710	243.60
Total	483,270.52	1799	

If the estimates of population variance of the trials, groups and interaction are divided by the variance within groups, the following values of variance ratios are found:

Groups: $\frac{844.85}{245.80} = 3.47$, significant beyond the one per cent level of confidence.

Trials: $\frac{4158.67}{245.80} = 17.07$, significant beyond the one per cent level of confidence.

Interaction: $\frac{350.77}{245.80} = 1.36$, significant beyond the five per cent level of confidence.

Summarizing what has been accomplished by analyzing variances, it can be seen that the total sum of squares has been divided into two parts. One part is associated with variance within groups. The other part is associated with variance between groups. Since the variance between groups is significantly greater than the variance within groups, this must be the result of the experimental conditions. Analyzing this difference between groups reveals three sources of variances.

The first source of significant variance between groups is the sequence of trials. Nine successive experiences cause groups to significantly modify their goal discrepancy scores. The common element present is the informative effect of the trial.

The second source of variance is the nature of the sequence of trials. That is, each experimental group had a differing sequence of success and failure trials. This difference in sequence of success and failure trials is a source of significant variance between groups.

Lastly, the joint effect of trials and particular sequence of success and failure cause a significant difference between groups. Although another interpretation of the interaction would be to consider it as an error term. A possible source of error could be intraindividual variances.

Since the analysis of variance yields significant results, comparisons can be made between individual groups. Further, from the within group variance, a single measure of variance can be calculated which is free of methodological influences. The standard deviation calculated in this manner can be used to compute the standard errors of the means which are used to determine the various critical ratios. Tables IV and V give a summary of the critical ratios between means and between standard deviations of the failure groups and those experiencing success.

An examination of Table IV reveals that the critical ratios between mean goal discrepancy scores of groups having experienced failure do not vary significantly from those having experienced only success. In a group of 45 critical ratios, on the basis of chance, one would expect to find two means differing significantly at the 5 per cent level and one at the 2 per cent level of confidence. In Table IV group I is found to differ significantly at the 5 per cent level of confidence on trial one and two. Similarly, it is found that group Q differs significantly at the 2 per cent level of confidence on the fourth trial. Although these differences may be results of position, they are probably best considered to be results of chance. Since failure does not significantly raise or lower mean goal discrepancy scores, its influence cannot be said to be the same upon all persons. If failure had uniform meaning one would expect that all subjects would (or at least there would be a group tendency) react to increase or decrease the level of aspiration. The absence of significant differences and the inconsistencies in the direction (plus or minus) of the critical ratios support

the belief that the influence of failure is not reflected in a simple consistent fashion.

TABLE IV

CRITICAL RATIOS BETWEEN MEAN GOAL DISCREPANCY SCORES OF GROUPS HAVING EXPERIENCED FAILURE AND GROUPS HAVING EXPERIENCED ONLY SUCCESS

Trial Number	Critical Ratios Between Mean Goal Discrepancy Scores of Groups Having Experienced Failure and Groups Having Experienced Only Success								
	A	B	C	D	E	F	G	H	I
1									* +2.22 ^a
2								-.50	* +2.55 ^b
3							-.01	-.05	-.54
4						+1.67	+2.54	+.65	+.41
5					+.65	-.65	+.55	-.52	+.15
6				+.74	+.20	-.82	+.35	+.08	-.01
7			+1.63	-1.34	-1.09	-1.45	-.07	-.92	-.52
8		+.51	-.69	-1.08	-.04	-.50	-.08	-.46	-.21
9	+.01	-.16	-.91	-.81	-.10	-.55	+.09	-1.15	-.17

a A plus or minus sign preceding the critical ratio indicates that

the average score of the failure group is greater or less than the average score of the all success group.

b A single, double or triple asterisk indicates that the critical ratio is significant beyond the 5, 2 or 1 per cent level of confidence, respectively.

While failure does not significantly differentiate the means, Table V reveals significant influence upon the variability of the levels of aspiration. Groups experiencing failure on the first three trials vary significantly more than groups experiencing success. Not only do their levels of aspiration scatter more than the success groups on the failure trial, but this variability tends to persist on subsequent trials. At no time does failure cause a significantly smaller scatter of levels of aspiration. Apparently, early failure causes greater variability of reactions in a level of aspiration. Furthermore, this variability tends to persist. There is one exception to these findings. The fifth or middle trial does not reflect significantly greater scatter among the failure groups. In spite of these somewhat unaccountable occurrences on the fifth trial, the overall view is a cluster of significantly greater variabilities in the groups experiencing failure on early trials. The absence of similar findings for groups experiencing failure on later trials suggests that the effect of failure at these points is not as great.

TABLE V

CRITICAL RATIOS BETWEEN THE STANDARD DEVIATIONS OF GOAL DISCREPANCY
SCORES OF GROUPS HAVING EXPERIENCED FAILURE AND GROUPS HAVING
EXPERIENCED ONLY SUCCESS

Trial Number	Critical Ratios Between Standard Deviations of Goal Discrepancy Scores of Groups Having Experienced Failure and Groups Having Experienced Only Success								
	A	B	C	D	E	F	G	H	I
1									*** +6.54a
2								*** +3.74	+6.25b
3							* +2.14	** +2.45	*** +4.28
4						+ .06	*** +5.32	*** +2.95	+ .80
5					-.85	-1.56	-1.71	-1.42	+ .10
6				-1.04	-.09	-.60	*** +2.90	** +2.44	*** +5.11
7			-.84	-.08	+ .27	-.45	*** +3.50	*** +3.25	-.11
8		+1.02	+1.32	-.24	+1.95	+2.21	* +1.60	*** +2.67	+1.45
9	+1.55	+1.42	+1.55	+1.64	+2.25	+1.94	* +3.57	*** +3.75	+1.80

a A plus or minus sign preceding the critical ratio indicates that the standard deviation of the failure group is greater or less than the standard deviation of the all success group.

b. A single, double or triple asterisk indicates that the critical ratio is significant beyond the 5, 2, or 1 per cent level of confidence, respectively.

B. A Trial by Trial Analysis of Levels of Aspiration

The first stated level of aspiration enjoys a unique position. The subject knows nothing of his learning progress and has no external standards of comparison. In this relatively unstructured situation the subject makes his initial prediction. He knows only that his average score was three hundred units on the practice trials, and the realm of possibility ranges from zero to three thousand. This experience differs from the other trials, also, in that it is not accompanied by any evaluating comment. He does not know if a score of three hundred units is good or bad. There is at this point a fluid psychological field in which personality needs operate freely. That such needs do operate freely in the absence of structuring information can readily be seen in the variability of the scores at this position. Levels of aspiration range from two hundred to six hundred. The average level of aspiration is 359.30; the median is three hundred and fifty; and the mode is four hundred. The standard deviation is 69.80. The standard error of the mean is 4.95. This standard error was not computed from the within group variance because the initial levels of aspiration were not included in the analysis of variance. On future trials the standard errors of the means computed from the individual data of the trial will be reported in the tables. Critical ratios reported in the text of the dissertation will be computed from the total variance within the groups on all nine trials. The standard deviation computed from the within group variance is 15.60. The

standard deviations reported in the tables are calculated from the raw data of each trial.

The second level of aspiration follows the announcement of an increase of ten units for all groups except group I. This group experiences a decrease of ten units and is told, "That was quite poor." The mean for the total group is 336; the standard deviation is 28.6; the standard error of the mean is 1.10 and the mode for the total group is 325. Levels of aspiration range from 275 to 500. In Table VI the statistics are compared between the first level of aspiration and those given at the end of trial one.

From Table VI it can be seen that the experience of one trial and the statement of an increment of ten units is sufficient to change the various statistics. Both the measures of central tendency and variability are significantly modified. All measures of central tendency decreased, and the difference between the means is 25.10. When the mean is divided by its standard error of the difference of 5.48, a critical ratio of 4.22 is found. This is significant beyond the one per cent level of confidence.

The measures of variability also decrease with one trial. The standard deviation drops from 69.60 to 55.60. The standard error of the difference between the standard deviations is 3.88, which when divided into the difference between the standard deviation of 55.60, gives a critical ratio of 9.23, which is significant beyond the 1 per cent level of confidence.

At the end of trial one nine groups received an increment of ten units, and were told that they had done well. There were one hundred and eighty subjects who received success. The other group of twenty subjects

TABLE VI
 STATISTICAL COMPARISON OF LEVELS OF ASPIRATION
 PRECEDING AND FOLLOWING TRIAL ONE

Statistical Measure	Levels of Aspiration	
	Before First Trial	After First Trial
Range	800.00	225.00
Mean	559.10	536.00
Median	550.00	550.00
Mode	400.00	525.00
Standard Deviation	89.60	55.80
Standard Error of the Mean	4.95	2.58
Standard Error of the Standard Deviation	5.48	1.89
Number of Subjects	200	200

received failure on this trial.

While the differences between the measures of central tendency are not significant, it is interesting to compare the variability of the two groups. The range of scores for the groups, when computed from raw scores, rather than the frequency distribution, shows that the failure group had both the highest and the lowest level of aspiration. Furthermore, the difference

between the standard deviations of 18.28, when divided by the standard error of the difference, yields a critical ratio of 6.54 which is significant beyond the 1 per cent level of confidence.

TABLE VII

STATISTICAL COMPARISON OF THE LEVELS OF ASPIRATION FOLLOWING
SUCCESS AND FAILURE ON THE FIRST TRIAL

Statistical Measure	Levels of Aspiration	
	Success Group	Failure Group
Range	225.00	310.00
Mean	334.40	330.00
Median	330.00	305.00
Mode	325.00	300.00
Standard Deviation	31.80	48.08
Standard Error of the Mean	2.87	11.50
Standard Error of the Standard Deviation	.12	2.59
Number of Subjects	180	20

It is apparent then, that failure upon the first trial causes a greater variability of level of aspiration than success. Success tends to cause greater homogeneity, perhaps by its informative nature. Success should

indicate that the subject is using correct methods and would give him confidence in his ability to improve. On the other hand, failure not only tells him he is doing poorly, but that his methods are wrong. At the same time, it does not tell him what he should do. While success structures the situation for the individual, failure destroys any such structuring as he might previously have had, and permits a more random type of response.

The levels of aspiration given after the second trial follow a ten unit increase for the nine groups totalling one hundred and eighty subjects, and a ten unit decrease for the twenty subjects in group H. For one hundred and sixty subjects this is the second success experience. Group I has had one failure, and this is their first success. Group H has had one success trial followed by failure on this trial. It can be seen that there are really three different conditions at this point. Levels of aspiration will be considered individually for these groups.

Up to the present trial, all groups were at the same score of three hundred units, except the failure group I. At the present time group I has received a score of 502 units, an increase of 12 units from 290. Group H has decreased from 510 to 300 units. All other groups have received an increase of 12 units and have 522 units as a reference point. As the experiment continues, such differences in the last given score will continue to be present.

Group I having experienced failure on the first trial continues to deviate from the all success groups. The mean of 23.00 is 8.60 units greater than the mean for the all success groups. The standard error of the difference between the means is 5.70. When this is divided into 8.60, a critical

ratio of 2.58 is found. This critical ratio is significant at the 5 per cent level of confidence.

The comparison of standard deviations reveals a significant finding. The standard deviation of group I is 18.27 units larger than that of the all success group. The standard error of the difference is 2.61, which when divided into 18.27, yields a critical ratio of 6.23. This is significant beyond the 1 per cent level of confidence.

Group H having succeeded on the first trial and failed on the second will now be considered. As with group I there is no significant difference between the means of group H or either of the other two groups. The difference between the mean of group H and the all success group is 1.10. When divided by the standard error of the difference, which is 3.70, a critical ratio of .30 is found. This is clearly not significant, and as stated before the difference between the mean of group I and H is not significant.

When the standard deviations are compared, we find that group H has a standard deviation 9.77 units larger than the all success group. When divided by the standard error of the difference, which is 2.61, a critical ratio of 3.74 is achieved. This critical ratio is significant at the 1 per cent level of confidence.

It can be seen that failure on the second trial significantly modified the scatter of levels of aspiration of a previously successful group. Secondly, it appears that one success trial is not sufficient to cause the group who failed initially to achieve the homogeneity that the all success groups possess. Thirdly, a second success trial is sufficient to signifi-

cantly increase the homogeneity of the all success group. Table VIII gives the measures of central tendency and variability of the three groups.

TABLE VIII

STATISTICAL COMPARISON OF GOAL DISCREPANCY SCORES COMPUTED FROM THE LEVELS OF ASPIRATION AFTER THE SECOND TRIAL

Statistical Measure	Goal Discrepancy Scores			
	All Success Groups	Group H, Having Failure on Second Trial	Group I, Having Failure on First Trial	Total Group
Mean	14.40	15.50	23.00	15.37
Median	10.80	14.50	14.50	11.90
Mode	8.00	23.00	8.00	2.00
Range	92.00	95.00	105.00	118.00
Standard Deviation	17.13	26.90	33.40	23.80
Standard Error of the Mean	1.42	6.17	17.50	1.89
Standard Error of the Standard Deviation	.90	4.25	5.27	1.54

At the end of the third trial levels of aspiration are stated by four groups which are differentiated by their varying histories of success and failure. Group I has now experienced an initial failure and two suc-

cesses. Group H has experienced one failure preceded and followed by one success. Group G failed on this trial having experienced two previous success trials. The remaining groups had three success experiences.

Group G experienced failure on the third trial. The mean for this group is 15.70 which does not differ significantly from the mean of any other group. However, the standard deviation of 18.70 is 5.65 units greater than that of the groups having three consecutive success experiences. When this difference is divided by the standard error of the difference between standard deviations, a critical ratio of 2.14 is obtained. This value is significant at the 5 per cent level of confidence. Again, as in previous trials the effect of failure is to increase the spread of scores. However, the scatter is not nearly so great as if the failure occurred on the first or second trial. The influence of failure upon level of aspiration is diminishing if it follows a series of success trials.

Group H experienced failure on the second trial. The mean goal discrepancy score on the third trial is 14.75, which does not differ significantly from the success group.

Group H has a standard deviation which is 6.41 units greater than the groups having had three consecutive success trials. When this difference is divided by the standard error of the difference between standard deviations of 2.64, a critical ratio of 2.43 is obtained. This value is significant at the 2 per cent level of confidence. Group H still has a significantly though diminishingly greater spread of goal discrepancy scores than does the group having all success experiences.

Group I failed on the first trial and had success on the two succeeding trials. The mean of 14.50 is 1.25 units less than the average for groups having success on all three trials. This is the lowest mean of any group, but does not differ significantly from the mean of the all success groups. When the standard deviation of group I is compared with the all success group, one substantiates the conclusion that the influence of the initial failure persists in spite of the two success trials. The standard deviation of group I is 11.25 units greater than the all success group. When this difference is divided by the standard error of the difference between standard deviations, a critical ratio of 4.26 is found. This value is significant at the 1 per cent level of confidence.

Failure on the third trial does not appear to be as drastic in its results as when it occurs after earlier trials. Table IX gives the statistics for the four groups. As on previous trials it is not the measures of central tendency, but the measures of variability which show the significance of failure on this trial. It is these measures of variability which also show the persistence of the results of previous failure.

Groups A,B,C,D,E and J have had four consecutive success trials. These groups, as shown in Table X, have the lowest measures of central tendency and scatter. The difference between the mean of 4.81 for groups A,B,C,D,E and J, and the mean of 11.10 for group F, is 6.29. When this difference is divided by the standard error of the difference, a critical ratio of 1.67 is obtained. This critical ratio is not significant at the 5 per cent level of confidence. A failure on the fourth trial is inadequate to cause a sig-

nificantly greater goal discrepancy score than continued success.

TABLE IX

STATISTICAL COMPARISON OF GOAL DISCREPANCY SCORES COMPUTED FROM
THE LEVELS OF ASPIRATION AFTER THE THIRD TRIAL

Statistical Measure	Goal Discrepancy Scores				
	Groups ^a A,B,C,D,E,F,J	Group ^b G	Group ^c H	Group ^d I	Total Group
Mean	15.75	15.70	14.75	14.50	15.52
Median	8.24	10.00	7.00	10.00	18.50
Mode	8.00	10.00	2.00	10.00	8.00
Range	90.00	100.00	55.00	95.00	105.00
Standard Deviation	15.05	18.70	19.46	24.30	15.58
Standard Error of the Mean	1.10	4.29	4.46	5.57	1.08
Standard Error of the Standard Deviation	.78	2.99	5.12	5.89	.77

a Groups having three consecutive successes.

b Group failing on third trial.

c Group failing on second trial.

d Group failing on first trial.

Groups A,B,C,D,E and J have a standard deviation of 8.15 which does not differ significantly from the standard deviation of 8.31 for group F. This is the first time that the failure group has not indicated wider variability than the all success group. This tendency toward less variability was seen after the third trial when the difference between the failure and all success groups was significant only at the 5 per cent level. Failure at this point is not as disorganizing as it is at earlier trials. This may be a result of greater self-confidence, interpreting failure as temporary rather than a trend.

Group G failed on the third trial and had success on the fourth trial. This group has a mean goal discrepancy score of 14.40. The difference of 9.59 between group G and the all success groups is divided by the standard error of the difference, which is 3.77, to yield a critical ratio of 2.54. This critical ratio is significant at the 2 per cent level of confidence.

This is the only mean of any group having experienced failure which differs significantly from the success group. As mentioned previously this is probably a chance finding. The levels of aspiration of this group continue to scatter significantly more than the success group. The critical ratio is 5.52. This is significant beyond the 1 per cent level of confidence. Similarly, group H scatters significantly more than the success group. The critical ratio is 2.95. This is significant beyond the 1 per cent level of confidence.

Group I failed on the first trial and was given three success tri-

als. The mean of 6.55 for this group does not differ significantly from the mean of the groups having all success experiences. Similarly, the standard deviation of 10.10 does not differ significantly from the standard deviation of the all success groups. Group I recovered from the influence of failure on the first trial and is predicting future performance in a fashion very similar to an all success group.

An overall view of the fourth trial would suggest that there are significantly less individual differences in prediction of future progress. Also, the predictions are in closer contact with the rate of progress and might be described as more realistic. Failure on this trial does not cause dramatic individual variations, nor a significantly higher goal discrepancy score than that of the all success group. The group having failed on the first trial appears to be recovering.

The fifth trial is in the center of the series. Five groups have had five consecutive successes. Group E has received failure on the fifth trial. Groups F, G, H and I have each received failure on one previous trial and have had four successes. Group E was given a score of three hundred and forty units after this trial. Group F received a score of three hundred and twenty-nine units. Groups G, H and I received scores of three hundred and thirty units. The groups having five successes received a score of three hundred and fifty units.

Group E failed on the fifth trial after experiencing four successes. The difference of 2.50 between the mean for this group and the group having all success experiences is not significant at the 5 per cent level of

confidence. This is a continuation of the tendency seen previously. The subject who fails on a trial after four successes tends to expect further progress just as much, and in fact, a little more than the all success group.

TABLE X

STATISTICAL COMPARISON OF GOAL DISCREPANCY SCORES COMPUTED FROM THE LEVELS OF ASPIRATION AFTER THE FOURTH TRIAL

Statistical Measure	Group Goal Discrepancy Scores					
	A,B,C,D,E & J ^a	F ^b	G ^c	H ^d	I ^e	Total Group
Mean	4.81	11.10	14.40	7.25	6.35	6.80
Median	7.70	10.00	11.00	10.00	9.00	8.20
Mode	7.00	10.00	12.00	10.00	9.00	7.00
Range	60.00	50.00	80.00	60.00	50.00	102.00
Standard Deviation	8.15	8.51	21.12	15.54	10.10	10.43
Standard Error of the Mean	.75	1.91	4.84	3.52	2.52	.74
Standard Error of the Standard Deviation	.55	1.51	3.55	2.42	1.80	.52

a These groups experienced four consecutive successes.

b This group failed on fourth trial.

- c This group failed on third trial.
- d This group failed on second trial.
- e This group failed on first trial.

The standard deviation for group E is 5.87. This is 2.25 units greater than the standard deviation of the all success group. Dividing this difference by the standard error of the difference, which is 2.70, yields a critical ratio of .85 which is not significant at the 5 per cent level of confidence. Four success trials seem to be adequate to cushion the group against the damaging effects observed when failure occurred after an earlier trial. As in previous trials, the means of the failure groups do not differ significantly from the means of the success groups. However, this is the only trial where there is no significant difference between the standard deviations of the success and failure groups. One might speculate that this is a chance result or a function of the middle trial. Table II gives a comparison of various statistics for the total group and six component groups.

Failure on the fifth trial indicated a continuation of trends seen previously. The measures of central tendency are not significantly varied. The effects of failure do not appear to be as disorganizing as they were on earlier trials. The cumulative influence of success trials seem to offset the influence of a failure at this point. Nor do the effects of earlier failure appear to continue to influence these groups.

The mean goal discrepancy score for the failure group on the sixth trial is 10.55. This average is 2.90 units greater than the mean of the all success group. Dividing this difference by the standard error of the differ-

ence yields a critical ratio of .74. The value is not significant at the 5 per cent level of confidence.

TABLE XI

STATISTICAL COMPARISON OF GOAL DISCREPANCY SCORES COMPUTED FROM THE LEVELS OF ASPIRATION AFTER THE FIFTH TRIAL

Statistical Measure	Group Goal Discrepancy Scores						
	A,B,C,D & J ^a	E ^b	F ^c	G ^d	H ^e	I ^f	Total Group
Mean	8.00	10.50	6.50	10.05	6.00	8.50	8.16
Median	6.45	10.00	11.00	10.00	5.00	10.00	7.82
Mode	8.00	10.00	11.00	10.00	5.00	10.00	10.00
Range	70.00	30.00	11.00	60.00	60.00	40.00	70.00
Standard Deviation	8.10	5.87	3.88	3.43	4.28	8.38	6.64
Standard Error of the Mean	.81	1.55	.61	.80	.98	1.92	.47
Standard Error of the Standard Deviation	.58	.98	.61	.55	.68	1.32	.55

a Groups A,B,C,D and J have experienced five success trials.

b Group E experienced failure on the fifth trial.

c Group F experienced failure on the fourth trial.

d Group G experienced failure on the third trial.

e Group H experienced failure on the second trial.

f Group I experienced failure on the first trial.

Similarly, the mean goal discrepancy scores of the other failure groups do not differ significantly from the success group. However, the standard deviation of the early failure groups reappears as significantly greater than the standard deviations of the success groups. The critical ratio of group G to the success group is 2.90. This is significant beyond the 1 per cent level of confidence. The critical ratio of 2.44 between group H and the success group is significant at the 2 per cent level of confidence. The critical ratio of 5.11 between group I and the success group is significant beyond the 1 per cent level of confidence. The reappearance of significant differences between groups G, H and I attests to the persistence of the influence of early failure. Table XII gives the statistics for the various groups.

Group C failed on the seventh trial after having had six consecutive success experiences. The mean goal discrepancy score for group C is 10.85. This mean is 2.55 greater than that of the all success group. Dividing this difference by the standard error of the difference, which is 4.03, yields a critical ratio of 1.83. This value is not significant at the 5 per cent level of confidence. No failure group mean differs significantly from the mean of the success group.

The standard deviation of group C is 3.29. This is 2.36 less than the standard deviation of the all success group. Dividing this difference by the standard error of the difference yields a critical ratio of .84. This value is not significant at the 5 per cent level of confidence.

TABLE XII

STATISTICAL COMPARISON OF GOAL DISCREPANCY SCORES COMPUTED FROM
THE LEVELS OF ASPIRATION AFTER THE SIXTH TRIAL

Statistical Measure	Group Goal Discrepancy Scores							
	A,B,C & J ^a	D ^b	E ^c	F ^d	G ^e	H ^f	I ^g	Total Group
Mean	7.45	10.85	8.25	4.25	8.80	7.75	7.00	7.62
Median	10.00	10.00	10.00	5.00	10.00	7.50	10.00	10.00
Mode	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Range	30.00	25.00	20.00	10.00	30.00	50.00	35.00	30.00
Standard Deviation	5.55	2.68	5.51	3.88	13.58	12.29	6.96	7.23
Standard Error of the Mean	.62	.61	1.22	.89	3.11	2.82	1.80	.51
Standard Error of the Standard Deviation	.89	.45	.85	.62	2.17	1.97	1.11	.55

a Groups have had six success trials.

b Group failed on sixth trial.

c Group E failed on fifth trial.

d Group F failed on fourth trial

e Group G failed on third trial.

f Group H failed on second trial.

g' Group I failed on first trial.

The standard deviation of groups experiencing failure on the second and third trials continues to be significantly greater than the success groups. The critical ratio of group G to the success group is 5.50. This is significant beyond the 1 per cent level of confidence. The critical ratio of group H to the success group is 5.25. This is significant beyond the 1 per cent level of confidence. The persistent variation of groups G and H requires an explanation. It may be speculated that these groups experience failure at a crucial point. Failure on the first trial is offset by subsequent successes. The subject may feel that although he failed initially, "now I have caught on." Failure on the fourth or later trial is probably offset by feelings of confidence established by consistent success.

Group B experienced failure on the eighth trial. The mean age goal discrepancy score for this group is 12.49. Although this continues the tendency to overestimate after a late failure, the difference between this mean and the mean of the all success group is not significant statistically.

The standard deviation of the failure group is 8.00. This is 5.07 greater than the standard deviation of the all success group. Dividing this difference by the standard error of the difference yields a critical ratio of 1.02, which is not significant at the 5 per cent level of confidence.

As on previous trials no failure group mean differs significantly from the mean of the success group. However, the standard deviation of group H remains significantly larger than the success group. The t value (since only sixty persons are being compared) is 2.67. This is significant beyond

TABLE XIII

STATISTICAL COMPARISON OF GOAL DISCREPANCY SCORES COMPUTED FROM
THE LEVELS OF ASPIRATION AFTER THE SEVENTH TRIAL

Statistical Measure	Groups								
	A, B & J ^a	C ^b	D ^c	E ^d	F ^e	G ^f	H ^g	I ^h	Total Group
Mean	8.30	10.85	2.90	5.90	2.45	8.00	4.80	6.20	6.58
Median	9.14	10.00	5.90	4.00	2.00	8.00	8.00	10.00	6.57
Mode	9.00	10.00	5.50	2.00	3.00	8.00	8.00	8.00	5.50
Range	38.00	20.00	19.00	25.00	10.00	90.00	67.00	25.00	100.00
Standard Deviation	5.67	5.29	5.44	6.44	4.44	1.09	14.92	5.56	11.14
Standard Error of the Mean	.74	.76	1.25	1.48	1.03	3.46	3.42	1.25	.79
Standard Error of the Standard Deviation	.52	.53	.66	1.05	.72	2.45	2.45	.67	.56

a Groups A, B & J had seven success experiences.

b Group C failed on the seventh trial.

c Group D failed on the sixth trial.

d Group E failed on the fifth trial.

e Group F failed on the fourth trial.

f Group G failed on the third trial.

g Group H failed on the second trial.

h Group I failed on the first trial.

the 1 per cent level of confidence. The standard deviation of group G is larger than that of the success group, but the difference is not significant at the 5 per cent level of confidence. The standard deviation of group F differs significantly from the success group. The t value is 2.21. This is significant at the 5 per cent level of confidence. Because it is the only time that group F does differ significantly, this is probably best explained as a chance finding.

The subjects anticipated only nine trials. They were reminded, before they stated their levels of aspiration after the eighth trial, that this would be the last trial. In order to ascertain the effect of failure on the last trial, another level of aspiration was needed. Each subject was then asked, "What would you do if you had another trial?" Not only did this yield another level of aspiration, but the willingness to take another trial was taken as an indication of interest in the task. All subjects included in the experimental population agreed to an additional trial.

Group A experienced failure on the ninth trial. The mean for this group is 9.65. This mean goal discrepancy score is only .05 greater than the success group. This difference is not significant. However, the standard deviation of group A is 5.96. This is 4.61 greater than the standard deviation of the all success group. Dividing this difference by the standard error of the difference yields a critical ratio of 1.33. This value is not significant at the 5 per cent level of confidence.

TABLE XIV

STATISTICAL COMPARISON OF GOAL DISCREPANCY SCORES COMPUTED FROM
THE LEVELS OF ASPIRATION AFTER THE EIGHTH TRIAL

Statistical Measure	Groups									
	A & J ^a	B ^b	C ^c	D ^d	E ^e	F ^f	G ^g	H ^h	I ⁱ	Total Group
Mean	10.50	12.48	7.35	5.70	10.15	9.00	9.95	8.35	9.40	9.80
Median	10.00	10.00	10.00	5.00	10.00	5.00	10.00	10.00	10.00	9.54
Mode	10.00	10.00	10.00	5.00	10.00	0.00	10.00	10.00	10.00	10.00
Range	22.00	40.00	30.00	15.00	40.00	40.00	50.00	60.00	50.00	60.00
Standard Deviation	4.93	8.00	5.91	4.22	10.83	11.60	9.76	12.99	9.25	5.47
Standard Error of the Mean	1.13	1.84	1.36	.97	2.48	2.66	2.24	2.98	2.12	.59
Standard Error of the Standard Deviation	.79	1.28	.95	.68	1.75	1.86	1.56	2.08	1.48	.27

a Groups A & J experienced success on eight consecutive trials.

b Group B failed on eighth trial.

c Group C failed on seventh trial.

d Group D failed on sixth trial.

e Group E failed on fifth trial.

f Group F failed on fourth trial.

- g - Group G failed on third trial.
- h - Group H failed on second trial.
- i - Group I failed on first trial.

No failure groups mean differs significantly from the mean of the success group. However, the standard deviations of group G and H are significantly greater than the standard deviation of the success group. The t values are 5.87 and 5.75. Both these values are significant beyond the 1 per cent level of confidence. The standard deviation of group E is also significantly greater than the standard deviation of the success group. The t value is 2.25. This is significant at the 5 per cent level of confidence. Because it is the only point at which group E differs significantly from the success group it is probably best explained as a result of chance.

Table XVI shows a comparison of the mean goal discrepancy scores for the total group; those groups experiencing all success and those having one failure. An examination of the means of all groups shows a continuous drop in levels of aspiration through the seventh trial. It should be kept in mind that this does not mean the subjects are underestimating their performance. Rather, it indicates that they intend to increase their performance, but by a smaller amount. On the eighth trial there is an increase in the level of aspiration. This level of aspiration precedes the trial which the subject believes to be his last trial. One might speculate that the rise in level of aspiration indicates the anticipation of an "end-spurt." On the last level of aspiration, which is given as an additional trial, the subjects return toward their previous level but remain higher than the seventh level

TABLE XV

COMPARISON OF GOAL DISCREPANCY SCORES COMPUTED FROM LEVELS OF
ASPIRATION AFTER THE NINTH TRIAL

Statistical Measure	Groups ^a										
	A	B	C	D	E	F	G	H	I	J	Total Group
Mean	9.65	8.80	5.10	5.60	9.10	7.00	10.05	4.05	8.75	9.60	7.77
Median	10.00	10.00	10.00	5.60	10.00	3.00	10.00	5.00	10.00	10.00	9.07
Mode	10.00	10.00	10.00	0.00	10.00	5.00	10.00	10.00	10.00	10.00	10.00
Range	22.00	30.00	20.00	40.00	40.00	30.00	50.00	60.00	40.00	6.00	60.00
Standard Deviation	5.98	6.30	6.31	7.60	9.10	8.09	13.07	14.31	7.62	1.37	8.46
Standard Error of the Mean	1.37	1.44	1.38	1.74	2.09	1.86	3.00	3.29	2.01	.31	1.94
Standard Error of the Standard Deviation	.96	1.01	.97	1.22	1.46	1.26	2.09	2.29	1.40	.22	1.36

of aspiration. Figure 1 gives a graphic picture of this curve.

A comparison of mean goal discrepancy scores indicates that the all success group reaches its lowest score on the fourth trial. The group having experienced one failure reaches its lowest goal discrepancy score on the seventh trial. This lowest level of aspiration may be thought of as an extreme of caution or constriction.

After reaching its lowest level of aspiration, the all success group reaches a plateau of rather realistic predictions. That is to say, realistic, in terms of the past history of scores. The group experiencing one failure continuously lowers its predictions until the "end-sprint" trial. If this lowering of levels of aspiration results from fear of failure, it must be concluded that fear of failure is present in both success and failure groups. It seems more likely that this lowering of levels of aspiration is caused by the subject's adaptation to the experimental situation.

The effects of failure have been observed not only as increasing the cautiousness of predictions, but also as a disorganizing factor. Failure permits individual tendencies to be expressed, and in this way affects the variability of the levels of aspiration. The variability of levels of aspiration following failure has been discussed previously. It is of interest to study the variability of response of the all success groups. Table XVII shows the standard deviations of goal discrepancy scores for the total group, the all success group and the failure group.

Failure at early or late trials has been shown, in comparison to success, to cause greater variability of goal discrepancy scores. Failure on the fifth, sixth and seventh trials decreases variability of levels of

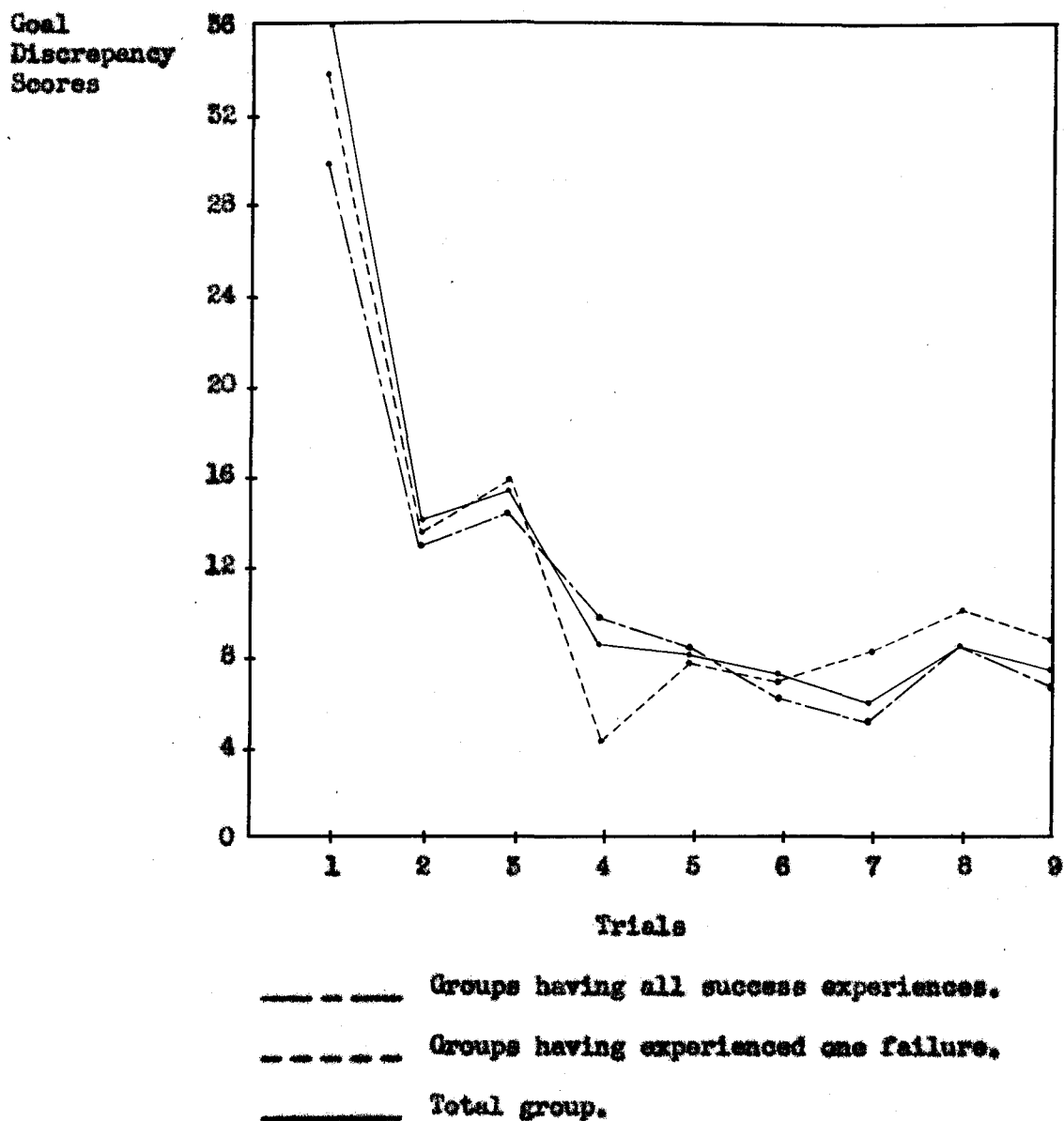


FIGURE I
DISTRIBUTION OF THE MEAN GOAL DISCREPANCY
SCORES ON NINE TRIALS

aspiration. Contrast this differential effect of failure with the consistent effects of success. From Table XVII it is readily apparent that success causes a gradual but consistent decrease in variability in levels of aspiration. Group J who experienced nine consecutive successes and no failures has a standard deviation of only 1.57 on the last trial.

D. Cornell Index Data

Investigations of personality traits have not revealed significant relationships to level of aspiration. However, various investigators have found that the goal discrepancy scores are useful in identifying certain broad clinical categories.¹ The Cornell Index Form N2 used in the present study does not attempt to identify particular characteristics. Rather, it attempts to differentiate persons into two groups: persons with serious personality disturbances and persons without such disturbances.²

It would seem possible that persons having the highest number of unfavorable answers on the Cornell Index Form N2 would have goal discrepancy scores differing significantly from those persons having no unfavorable answers. There are 55 subjects who have no unfavorable answers on the Cornell Index Form N2. The average goal discrepancy score of this group is 85.74.

1 Hausmann, "A Test to Evaluate Some Personality Traits," Journal of Experimental Psychology, XXVII, 1940, 422-426; Eysenck, Dimensions of Personality, 129-132; Escalona, An Application of the Level of Aspiration Experiment to the Study of Personality, Teachers College Columbia University Contribution to Education No. 957.

2 Weider, Wolff, Brodman, Mittelsmann and Wechsler, Manual Cornell Index Form N2, 2.

THE MEAN COAL DISCREPANCY SCORES OF THE TOTAL GROUP, THE ALL SUCCESS GROUP AND THE GROUPS HAVING ONE FAILURE TRIAL

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TABLE XVII

STANDARD DEVIATIONS OF GOAL DISCREPANCY SCORES OF THE TOTAL
GROUP, THE ALL SUCCESS GROUP AND THE
GROUPS HAVING ONE SUCCESS
TRIAL

Trial	Standard Deviation of Goal Discrepancy Scores for Groups									
	A	B	C	D	E	F	G	H	I	All Success
1									48.80	31.80
2								26.90	33.40	17.13
3							18.70	19.46	24.30	13.05
4						8.31	21.12	15.34	10.10	8.15
5					5.87	3.88	3.48	4.23	8.38	8.10
6				2.68	5.31	3.88	13.56	12.28	6.96	5.55
7			3.29	5.44	6.44	4.44	15.09	14.92	5.36	5.67
8		8.00	5.91	4.22	10.83	11.61	9.76	12.99	9.25	4.93
9	5.98	6.30	6.04	7.60	9.10	8.09	13.07	14.31	7.62	1.37
										33.80
										26.80
										15.38
										10.43
										6.64
										7.23
										11.14
										5.47
										8.46

The standard deviation is 88.71. The standard error of the mean is 15.21. There are 46 subjects who have eight or more unfavorable responses on the Cornell Index Form N2.⁵ The average goal discrepancy score of this group is 106.33. The standard deviation is 106.40. The standard error of the mean is 15.86. The group having the greatest number of unfavorable responses has a mean that is 21.58 greater than the other group. Dividing this difference by the standard error of the difference yields a critical ratio of .98. This value is not significant at the 5 per cent level of confidence. This failure to distinguish the groups is probably caused by two factors. The first probable cause is the crudeness of the Cornell Index Form N2. The second plausible explanation is the relative heterogeneity of the mean goal discrepancy scores.

A further factor to consider is the fact that this initial investigation is based on the sum of goal discrepancy scores. Any deviations in goal discrepancy scores resulting from personality disturbances should be reflected most noticeably in the initial level of aspiration. This trial has a further advantage for purposes of comparison; all subjects have had the same experience up to this time. In the previous comparison, subjects had various sequences of success and failure influencing the sum of the goal discrepancy scores.

5 Eight or more unfavorable answers was selected as a cutoff point because the average number of unfavorable answers for college students is 7.35 according to the Cornell Index Manual page 5. An examination of appendix Table XXIV will reveal that this was a convenient point in view of the distribution of scores in the experimental population.

Considering only the first goal discrepancy score of each subject, the group having no unfavorable responses on the Cornell Index Form N2 has an average goal discrepancy score of 28.86. The standard deviation is 33.51. The standard error of the mean is 6.60. The standard error of the standard deviation is 4.67. The average goal discrepancy score of the subjects having eight or more unfavorable responses on the Cornell Index Form N2 is 35.50. The standard deviation is 41.45. The standard error of the mean is 6.18. The standard error of the standard deviation is 4.57. The mean of the groups having the largest number of unfavorable responses is 4.64 greater than the mean of the other group. Dividing this difference by the standard error of the difference yields a critical ratio of .51. This value is not significant at the 5 per cent level of confidence.

It is possible that the two groups might be distinguished by scatter or variability of goal discrepancy scores on the initial trial. The standard deviation of the group having the largest number of unfavorable responses is 2.95 greater than the standard deviation of the other group. Dividing this difference by the standard error of the difference yields a critical ratio of .46. This value is not significant at the 5 per cent level of confidence.

Since these analyses reveal differences within the limits of chance variations, it is safe to assume that they represent the same population sample. These results give evidence to support the belief that personality disturbances do not vitiate the level of aspiration data. However, the failure to substantiate the findings of previous investigators is probably

due to the absence of severely disturbed individuals in the experimental group and the crudeness of the Cornell Index Form N2.

In summary, the Cornell Index Form N2 was used primarily to assure a generally normal experimental population. Analysis of data substantiates this belief and suggests principle areas of disturbance and most frequent symptoms. No statistically significant differences in levels of aspiration are found between the subjects having the highest and the lowest scores on the Cornell Index Form N2. These findings support the belief that the level of aspiration findings are not vitiated by personality disturbances.

CHAPTER V

SUMMARY AND CONCLUSIONS

By means of the level of aspiration technique it is possible to examine experimentally the effects of subjectively defined success and failure experiences. A considerable body of research has accumulated to demonstrate the practical applications of the technique. Other studies have concerned themselves with the methodology, generality and determinants of levels of aspiration.

The present study is limited to a study of the effects of the position at which a failure occurs. Previous research has indicated the probability that temporal position of a failure is a determinant of level of aspiration.¹ These studies have not given a systematic description of this variable. To fill this gap in our existing body of knowledge, the present study was conducted.

To investigate this problem, ten groups of twenty subjects were used. These groups were equated according to their initial level of aspiration. Nine of the groups were used to systematically study the effects of

1 Steisel and Cohen, "The Effects of Two Degrees of Failure on Level of Aspiration," Journal of Abnormal and Social Psychology, XLVI, 1951, 72-82.

failure at each of the nine trials. One group had nine success trials and no failure. Success and failure were controlled by giving the subjects prearranged sequences of scores, and by comments designed to reinforce the subject's belief that he succeeded or failed.

The task used in the experiment was a pursuitmeter revolving at the rate of sixty revolutions a minute. Each subject was given a total of 14, thirty second trials. The subjects never received their real scores. A casual interview was conducted after the experiment to determine whether the subject accepted the prearranged scores. A silent timer attached to the pursuitmeter permitted the experimenter to record the actual performances of the subjects. The Cornell Index Form M2 was given to eliminate seriously disturbed individuals and to aid in describing the experimental groups.

Analysis of level of aspiration data revealed significantly greater variance of goal discrepancy scores between experimental groups than within experimental groups. The variance ratio is 3.03. Further analysis indicated that this variance could be ascribed to three sources. One source of variance was the sequence of nine trials. The variance ratio is 17.07. The informative effect of each trial was sufficient to modify goal discrepancy scores. The difference in sequences of success and failure trials among the experimental groups was another source of variance. The variance ratio is 3.47. These statistically significant variances between groups having different sequences of success and failure support the hypothesis of the present experiment. A third source of variance is the joint effect of trials and particular sequences of success and failure. The variance ratio is 1.36.

All these variance ratios are significant beyond the 1 per cent level of confidence. Since analysis of variance reveals significant differences, those individual differences between groups can be considered significant when they meet the requirements of a confidence level.

Failure did not significantly influence the means of goal discrepancy scores. In a group of 45 critical ratios, between success and failure groups, only two means were found to differ significantly at the 5 per cent level of confidence. Similarly, the mean of only one failure group differed significantly from the mean of the success group at the 2 per cent level of confidence. In a group of 45 critical ratios one would expect to find two critical ratios that are significant at the 5 per cent level of confidence and one at the 2 per cent level of confidence. These differences between means, which are significant beyond the 5 per cent level of confidence, may be caused by experimental procedures. However, it is probably safer to ascribe these differences to chance factors. The absence of significant differences between means supports the belief that failure did not produce predictions consistently differing in direction from those following success.

The hypothesis that failure does not influence individuals in a uniform consistent manner is substantiated by the variability of levels of aspirations in the failure groups. The levels of aspiration of groups failing on the first three trials vary significantly more than those of the success groups. Not only do the levels of aspiration scatter more, but this variability tends to persist on subsequent trials. At no time does failure cause a significantly smaller scatter of levels of aspiration. The effect

of failure on early trials appears to cause a greater scatter of levels of aspiration than does success. This increased variability of the levels of aspiration in failure groups tends to persist through subsequent trials with one notable exception. The fifth or middle trial does not reflect significantly greater scatter among the failure groups. In spite of these occurrences on the fifth trial, the overall view is a cluster of significantly greater variabilities in the early failure groups. The absence of similar findings on later trials suggests that the effect of failure at these points is not as great.

From these findings failure may be interpreted as a disorganizing factor. Its influence is greatest in early trials where structuring occurs most rapidly. It may be suggested that failure disorganizes because of its informative nature. Failure may inform the individual that his present technique is inadequate, but does not suggest what he should do. Success, conversely, may be interpreted to structure the situation and tell the individual to continue in his present manner. A few early success experiences seem to act as a buffer so that later failure does not significantly alter the individual's mode of predicting.

Success acts to narrow the scatter of the levels of aspiration. The group experiencing only success has a consistently lower standard deviation on each trial. With consistent success experiences, more accurate prediction of goal striving is possible. The standard deviation of the all success group on the ninth trial is 1.57. On this trial 19 of the 20 subjects predicted that they would achieve the same score. The individual's reaction

to failure is not predictable, but with consistent success his levels of aspiration become more predictable. Success appears to smooth the progress of the individual's predictions.

In a learning situation, a smooth progression of predictions could be induced by providing success experiences. If consistent success was not easily given, then at least success on early trials would be valuable. Failure would seem to be of value in diagnostic work, since it elicits a wide scatter of individual reactions. The individual's reaction to failure is probably a more valuable response than his reaction to success. If one wishes to use level of aspiration to learn more about the individual's personality, or perhaps more correctly his character, early failure would be most efficacious.

The Cornell Index Form N2 was given to all subjects in the experimental group. The purpose of the inventory was to assure a generally normal experimental population. Analysis of test scores substantiates this belief and suggests that the most frequent unfavorable responses in the group were symptoms of anxiety, hypochondriasis and asthenia. No statistically significant differences in levels of aspiration were found between subjects having the highest and the lowest scores on the Cornell Index Form N2. These findings support the belief that the level of aspiration results were not vitiated by personality disturbances.

Certain limitations of this experiment should be considered. It is apparent that these findings are limited by the nature of the experimental population. These findings apply directly to a moderately homogeneous, well

adjusted group of college men working at a perceptual motor task. In view of the existing body of literature concerning level of aspiration, it seems likely that other types of subjects and tasks would probably verify these results qualitatively, though perhaps differing quantitatively. This seems particularly likely with clinical groups. The failure to find a relationship between levels of aspiration and personality disturbance is probably due to the absence of large numbers of disturbed persons in the group, and the crudeness of the personality inventory used. The generality of these results is limited, in that the individual working at a task is not always as explicitly aware of temporal position as in this experiment.

Further study in this area seems profitable. In particular, studies which vary the intensity of success and failure would seem valuable. Also, particular patterns of success and failure should be systematically examined. If temporal effects are of value in identifying clinical groups, this would be a worthwhile contribution with obvious value for psychodiagnostics.

The results of this experiment suggest that in the future, experiments concerned with level of aspiration must consider the position at which success and failure occur to be a determinant of levels of aspiration. One technique to control this factor is the use of prearranged sequences of scores.

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APPENDIX I

TABLE XVIII

SEQUENCE OF SUCCESS AND FAILURE TRIALS ADMINISTERED
TO EXPERIMENTAL GROUPS

Group	Trials								
	1	2	3	4	5	6	7	8	9
1	S	S	S	S	S	S	S	S	<u>F</u>
2	S	S	S	S	S	S	S	<u>F</u>	S
3	S	S	S	S	S	S	<u>F</u>	S	S
4	S	S	S	S	S	<u>F</u>	S	S	S
5	S	S	S	S	<u>F</u>	S	S	S	S
6	S	S	S	<u>F</u>	S	S	S	S	S
7	S	S	<u>F</u>	S	S	S	S	S	S
8	S	<u>F</u>	S	S	S	S	S	S	S
9	<u>F</u>	S	S	S	S	S	S	S	S
10	S	S	S	S	S	S	S	S	S

a S represents a success trial and F
represents a failure trial

APPENDIX II

TABLE XIX

PREARRANGED SEQUENCE OF SCORES STATED BEFORE TRIALS

Group	Trial Number									
	1	2	3	4	5	6	7	8	9	10
A	500	510	522	550	541	550	560	570	560	570
B	500	510	522	550	541	550	560	570	560	570
C	500	510	522	550	541	550	560	550	560	570
D	500	510	522	550	541	550	540	552	560	570
E	500	510	522	550	540	550	540	552	560	570
F	500	510	522	550	520	529	540	552	560	570
G	500	510	520	510	521	530	540	552	560	570
H	500	510	500	508	520	530	540	552	560	570
I	500	290	502	510	521	530	540	552	560	570
J	500	510	522	550	541	550	560	572	580	590

APPENDIX III

TABLE XX

PREARRANGED INCREMENTS OF SCORES ADDED TO SCORES
OF PREVIOUS TRIALS

Groups	Trials									Total
	1	2	3	4	5	6	7	8	9	
A	+10	+12	+8	+11	+9	+10	+12	+8	-10	+70
B	+10	+12	+8	+11	+9	+10	+10	-10	+10	+70
C	+10	+12	+8	+11	+9	+10	-10	+10	+10	+70
D	+10	+12	+8	+11	+9	-10	+12	+8	+10	+70
E	+10	+12	+8	+10	-10	+10	+12	+8	+10	+70
F	+10	+12	+8	-10	+9	+11	+12	+8	+10	+70
G	+10	+10	-10	+11	+9	+10	+12	+8	+10	+70
H	+10	-10	+8	+12	+10	+10	+12	+8	+10	+70
I	-10	+12	+8	+11	+9	+10	+12	+8	+10	+70
J	+10	+12	+8	+11	+9	+10	+12	+8	+10	+90

APPENDIX IV

TABLE XXI

MEAN GOAL DISCREPANCY SCORES FOR TWO HUNDRED
SUBJECTS ON NINE TRIALS

Trials	Mean Goal Discrepancy Scores		
	Failure Group	All Success Group	Total Group
1 ^a	38.25	23.59	25.05
2	15.50	14.40	16.50
3	15.70	15.75	15.72
4	11.10	4.81	8.66
5	10.50	8.00	8.18
6	10.35	7.45	7.62
7	10.85	8.50	6.58
8	12.49	10.50	9.50
9	9.65	9.60	7.77

a The goal discrepancy score is lower for the failure group only on the first trial.

APPENDIX V

TABLE XXII

STANDARD DEVIATIONS OF GOAL DISCREPANCY SCORES FOR
TWO HUNDRED SUBJECTS ON NINE TRIALS

Trials	Standard Deviation of Goal Discrepancy Scores		
	Failure Group	All Success Group	Total Group
1	48.80	31.80	53.80
2	26.90	17.13	31.65
3	18.70	13.05	15.38
4	8.31	8.15	10.43
5	5.87	8.10	6.64
6	2.68	5.55	7.25
7	3.29	5.67	11.14
8	8.00	4.93	5.47
9	5.98	1.37	8.46

APPENDIX VI

TABLE XXIII

PERCENTAGES OF UNFAVORABLE RESPONSES TO THE TEN SCALES
OF THE CORNELL INDEX FORM N2

Scale Number	Possible Number of Unfavorable Responses	Actual Number of Unfavorable Responses	Percentages of Unfavorable Responses
1	5,800	203	5.54
2	1,400	70	5.00
3	1,400	110	7.86
4	1,000	61	6.10
5	1,600	65	4.06
6	5,000	124	4.15
7	1,400	143	10.21
8	2,200	53	2.41
9	1,200	75	6.25
10	3,200	100	3.12
Total Scale	20,200	1,004	4.97

APPENDIX VII

TABLE XXIV

DISTRIBUTION OF CORNELL INDEX SCORES FOR TWO HUNDRED SUBJECTS

Cornell Index Scores	Number of Subjects	Cornell Index Scores	Number of Subjects
0	58	16	1
1	24	17	1
2	18	18	0
3	14	19	0
4	13	20	0
5	20	21	0
6	15	22	0
7	14	23	0
8	18	24	1
9	5	25	1
10	6	26	0
11	4	27	0
12	2	28	2
13	2	29	0
14	2	30	0
15	4	31	1

APPENDIX VIII

TABLE XXV

PURSUITMETER SCORES OF TWO HUNDRED SUBJECTS ON
TEN PERFORMANCE TRIALS

Seconds of Contact with Disc	Number of Subjects	Seconds of Contact with Disc	Number of Subjects
.00 - 2.99	112	53.00 - 55.99	2
3.00 - 5.99	27	56.00 - 58.99	0
6.00 - 8.99	12	59.00 - 61.99	0
9.00 - 11.99	7	62.00 - 64.99	0
12.00 - 14.99	13	65.00 - 67.99	0
15.00 - 17.99	6	68.00 - 70.99	0
18.00 - 20.99	4	71.00 - 73.99	0
21.00 - 23.99	2	74.00 - 76.99	0
24.00 - 26.99	5	77.00 - 79.99	0
27.00 - 29.99	5	80.00 - 82.99	2
30.00 - 32.99	3	83.00 - 85.99	0
Total		1579.85	200

APPROVAL SHEET

The dissertation submitted by Robert Clair Nicolay has been read and approved by five members of the Department of Psychology.

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the dissertation is now given final approval with reference to content, form, and mechanical accuracy.

The dissertation is therefore accepted in partial fulfillment for the Degree of Doctor of Philosophy.

February, 1954
Date

Frank H. Hobler
Signature of Adviser