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The Effects of Putative Equipment Bias and Previous Success and Failure on Competitive Performance, Level of Aspiration and Causal Attribution

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THE EFFECTS OF PUTATIVE EQUIPMENT BIAS AND PREVIOUS SUCCESS AND FAILURE
ON COMPETITIVE PERFORMANCE, LEVEL OF ASPIRATION, AND CAUSAL ATTRIBUTION

by

John E. Dalton

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University of Chicago in Partial Fulfillment
of the Requirements for the Degree of
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VITA

The author, John E. Dalton, is the son of Harold Joseph Dalton and Celestine (Adam) Dalton. He was born December 4, 1950, in Oak Park, Illinois.

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CHAPTER I

INTRODUCTION

Experimental psychologists have long been concerned with the study of goal-setting behavior. During the 1930's, German psychologists studied such behavior under the rubric, "level of aspiration." The early research on level of aspiration (LOA) centered around the relationship between success and failure feelings and a person's aspirations or goals. The study of LOA soon became popular in America, since it was amenable to the degree of scientific rigor that was sought by experimental psychologists of that era. The research in America was done with a strong emphasis on mathematics, objectivity, and strictly behavioral observation. The operational definition that was used almost exclusively (Frank, 1935a) rested on the assumption that the LOA that a subject expressed to the experimenter was in fact his true aspiration. There was little or no effort to determine the extent to which this stated aspiration was actually representative of true aspirations. Experimental psychologists generally tried to avoid this problem, since it would have meant a return to less "rigorous" scientific methods.

Psychomotor tasks have traditionally been used most extensively in studies on LOA. Such tasks have been used to examine the effects of reference groups on aspirations (Anderson & Brandt, 1939; Chapman & Volkmann, 1939; Gould & Lewis, 1940; Hertzman & Festinger, 1940;

Payne & Hauty, 1955), and the relationship of personality factors to goal-setting behavior (Atwal, 1971; Festinger, 1942; Kay, 1973; Lefcourt & Steffy, 1970; Rutchik, 1971; Sears, 1940). Perhaps the primary focus in this area of research has been the study of the manner in which LOAs change after experiences of success or failure. In these experiments success and failure have been operationally defined according to whether or not the subject's performance reached his stated LOA. Again this carries the implicit assumption that the stated aspiration is the true aspiration. This is a dubious assumption, and, if it is false, the subjects would not be experiencing success and failure in the manner that the experimenters have assumed. The literature on the effects of success and failure on LOA has shown that success tends to be followed by increases in level of aspiration and failure by decreases, but the questions regarding the validity of the operational definitions cast some doubt upon the accuracy of the findings.

One of the glaring deficiencies in this area of research has been the failure to reasonably determine the relationship between LOA and subsequent performance. There is still considerable doubt concerning whether or not the specific aspiration level chosen acts as a determinant of subsequent performance. Early research by Mace (1935) indicated that persons who are given specific and reasonably difficult goals perform better than those who are told to strive for vague and/or easy goals. Mace worked in the area of applied psychology, and there has been little attempt to relate his work to LOA. However, Hertzman and Festinger (1940) did propose that subjects tend to use LOA as an

incentive. Others (Bayton, 1943; Holt, 1946; Payne & Hauty, 1955) have supported the contention that aspirations can sometimes be determinants of performance, although the degree to which subjects are ego-involved in the performance task seems to be a crucial variable. More recent research by Locke and his associates (Bryan & Locke, 1967; Locke, 1965, 1966a, 1966b, 1967a, 1967b; Locke & Bryan, 1966a, 1966b, 1967; Locke, Bryan, & Kendall, 1968; Locke, Cartledge, & Koepfel, 1968) supported the early work of Mace (1935), suggesting that goals are much more important determinants of performance than was previously believed. But once again, there has been little attempt to integrate the work in applied psychology (this time by Locke) with that in LOA studies.

The study of attribution is currently popular among social psychologists, and causal attributions seem to be clearly relevant to aspirations and performance. A person's goals and performance are affected by the manner in which he attributes the cause of a task outcome to the four factors discussed by Heider (1958): ability, task difficulty, effort, and luck. Furthermore, such attributions have been shown by McMahan (1973) to be a function of a person's original expectations or confidence. Since an aspiration level can be considered a type of expectation, the relationship of causal attributions to LOA deserves exploration.

The present study clarifies some of the interrelations between the three areas of research that have been mentioned: LOA, goals and performance (Locke and his associates), and causal attribution. In doing so, this study used operational definitions that differed from

those traditionally used in LOA studies. A subject's LOA was defined as his written (as opposed to oral) response to the question of what he expects his performance to be. Presumably, a written LOA minimized the possible effects of a public announcement of goals. Ricciuti (1951), in his comprehensive review of procedural variations in LOA research, made no mention of this technique ever being used. The manner in which subjects explicitly state LOAs has not been given sufficient attention. Considering the social implications of stating goals, the distinction between oral and recorded goals may be an important one, and it is unfortunate that many researchers have ignored this distinction. The performance task was a competitive one such that there was one winner and one loser, and success and failure were defined accordingly. Although this operational definition does have a disadvantage in that feelings of success and failure do not necessarily have a one-to-one correspondence with winning and losing, this definition probably corresponds more closely to feelings of success/failure than a definition based on whether the stated LOA was reached.

The performance task used (electronic table tennis) had some advantages over more commonly used psychomotor tasks, such as dart throwing (Hausmann, 1933; Irwin & Mintzer, 1942; McGehee, 1940; Preston, Spiers, & Trasoff, 1947; Ricciuti, 1951; Snedden, 1936). It provided head-to-head competition, and the participants displayed a fairly high level of interest and ego-involvement in the task. This task also has more generalizability to everyday activities than do tasks such as dart throwing and ring tossing, in that the subjects

were faced with a complex array of options and decisions.

To determine whether LOA does act as a determinant of performance, the experimenter artificially raised or lowered the aspiration levels of the student participants by telling them they would have either an advantage or a disadvantage in their competitive game due to a putative bias in the game equipment. One of the problems in trying to determine the relationship between aspiration level and performance has been the difficulty in separating ability from aspiration level. The method selected attempted to achieve this separation. The feasibility of this deception was suggested by the work of McGehee (1940), who noted that many of his subjects blamed bad dart throws on the darts themselves. The use of these procedural variations also provided an opportunity to replicate the findings of McMahan (1973) and also clarify the inconsistencies he found.

The following hypotheses were therefore tested:

- 1) Subjects having a success experience tend to set higher LOAs for their next performance than those subjects having a failure experience.
- 2) There is a positive relationship between LOA and subsequent performance, irrespective of ability.
- 3) Subjects who believe themselves to be at a disadvantage in a competitive task because of equipment bias tend to set lower LOAs and perform at a lower level than subjects who believe themselves to be at an advantage because of equipment bias.
- 4) Subjects who are successful tend to attribute task outcome more to internal factors (ability and effort) than do subjects who

fail; subjects who fail tend to attribute task outcome more to external factors (task difficulty and luck) than do subjects who succeed.

5) Subjects whose original expectations about task outcome are confirmed tend to attribute task outcome more to stable factors (ability and task difficulty) than do subjects whose original expectations are disconfirmed; subjects whose original expectations about task outcome are disconfirmed tend to attribute task outcome more to variable factors (effort and luck) than do subjects whose original expectations are confirmed.

6) Subjects who lose in a competitive task consider equipment bias to be a more important factor in game outcome than do subjects who win the competitive task.

CHAPTER II

REVIEW OF RELATED LITERATURE

Level of Aspiration

Historical perspective. The concept of "level of aspiration" was first used by the German psychologist Dembo (1931) in relation to her research on the manner in which feelings of success or failure are related to previously-set goals. Dembo proposed that such feelings depend not only upon objective performance but also upon the individual's "level of aspiration" or performance goals. Using paper and pencil mazes, Jucknat (1937) found that the effect of success or failure in one task on the level of aspiration (LOA) in a second task depended upon the similarity between the two tasks. These early German studies were basically qualitative and lacking in experimental rigor, with success and failure being defined by the E's evaluation of the subject's feelings.

The first American psychologist to investigate this area was Frank (1935a), who operationally defined LOA as "the level of future performance in a familiar task which an individual, knowing his level of past performance in that task, explicitly undertakes to reach" (p. 119). Level of past performance was operationally defined as "the goodness of the individual's past performance, as he knows it" (p. 119). In contrast to the previous research in Germany, the American investigations of LOA relied on explicit, quantitative, and

behavioral definitions. Success was defined as a performance which reached or surpassed the stated IOA, and failure was merely any performance which fell below the IOA. Ricciuti (1951) described the typical experiment on IOA:

the subject is given a series of trials on a task; after each trial some sort of score is reported to him. He is then asked to make some type of estimate, either in terms of goals or expectations, of his anticipated level of performance on the following trial. Various scoring techniques may then be applied to the results in an attempt to study objectively such factors as the characteristic level of the individual's goals with respect to previous performance, the tendency of the individual to adjust his aspirations realistically in accordance with previous success and failure, and other related characteristics.
(p. 2)

The most popular measure used in IOA studies has been the goal discrepancy score, defined by Spitzer (1958) as "the difference between a stated level of aspiration and the previous performance score" (p. 1). Other measures, such as the average goal discrepancy score, have also been used widely. In general, there has been a strong quantitative emphasis in this area of research.

Psychological determinants. In addition to the quantitative aspects of this research, there has been a continued effort to discover the psychological determinants of the IOA and related ramifications of goal-setting behavior. Frank (1935a, 1935c) cited three psychological needs that act as determinants of the stated IOA: (a) the need to keep the IOA as high as possible, (b) the need to keep the IOA realistic, so that it matches future performance, and (c) the need to avoid failure. The relative strengths of these factors varies across persons, situations, and times, prompting Rotter (1942) to speak of a hierarchy of goals in a state of flux. In an attempt to

evaluate the relative strengths of these three needs, Frank (1937) asked his subjects "whether they preferred to come close to their guesses, or whether they preferred to do a lot better" (p. 56). The largest group of subjects claimed to have both of these goals. In a similar vein, Gould (1939) asked her subjects what they would do next time, and thereby classified the subjects into three groups: (a) those who set their IOAs at a minimum to be surpassed, (b) those who set their IOAs at a maximum which they hoped to approach but were prepared not to reach, and (c) those who set their IOAs at about the average of their performance. Thus the stated IOA can be an incentive, a protection against failure, or an accurate estimate. One of the unanswered questions in this area of research is whether the need to avoid failure is exaggerated by the peculiarities of the experimental situation; the extent of external validity has not been clearly established. In the same study Gould described the factors she found to be operating in the observed goal-setting behavior:

anxiety and insecurity feelings; desire to excel, to succeed, to avoid failure; actual level of momentary strivings and the disparity between this level and the explicit estimates; and general past experiences which have helped determine the subject's personality organization and thus his reactions to such demands of inner and outer forces. (pp. 111-112)

Another study that tried to examine these psychological forces was done by Hertzman and Festinger (1940). They found that subjects set their IOAs slightly higher than their ability and then try to reach it, thus using IOA as an incentive. Using different statistical techniques, Lezak and Raskin (1950) contradicted the conclusions of Hertzman and Festinger. Instead of obtaining the usual goal discrepancy score by subtracting the level of performance on the immediate

past trial from the stated LOA, Lezak and Raskin subtracted the mean of all previous performances. While the conventional goal discrepancy score generally shows the subjects to have a tendency to overestimate, this measure showed a tendency to be cautious and to state a LOA slightly lower than the mean of past performances. If this is indeed a more accurate measure of goal-setting behavior, it supports the possibility that fear of embarrassment may be an important factor operating in the laboratory situation.

Siegel (1957) compared goal-setting behavior to the process of decision making. In setting a LOA, the subject tries to strike a balance between the probability of success and the probability of failure in obtaining an incentive or achieving a given performance level. Need states and personal history are other relevant factors. Siegel stressed that the subject's evaluation of the probabilities for success and failure are quite subjective.

Other studies have investigated the effects of external forces on the setting of LOA. Irwin and Mintzer (1942) told half of their subjects that their names and performances scores were to be made public, while the other half were told that they were only practicing. They found no significant results for these two levels of motivation on either performance or LOA. In the research on group LOA, Zander and Ulberg (1971) observed that social pressures arising outside a group influence the LOAs that members choose. However, external standards are less influential if they are in conflict with the group's prior performance or with a member's degree of desire for group success. Dugas (1971) found that the racial composition of an audience did not

have a significant effect on the aspiration levels of performers. In general, attempts to clarify the internal and external forces that determine LOA have been disappointing. Although several needs have been shown to exist, the relative strengths and interrelations between these factors is not at all clear.

Personality traits. The issue of psychological needs or forces as determinants of LOA led researchers into the field of personality types or traits. If goal-setting behavior is at least partially determined by psychological needs and if various needs could be clearly related to different personality types or traits, then there should also be differences in goal-setting behavior related to personality characteristics. Rutchik (1971) found no significant differences between the goal-setting behaviors of depressed and non-depressed college students under either competitive or non-competitive conditions. Atwal (1971) hypothesized that persons high in anxiety would be "more susceptible to written suggestions, perform more poorly and exhibit a greater degree of unrealistic aspiration values" (p. 5190). The results showed that written suggestions had a significant effect regardless of anxiety level. Kay (1973) studied LOA as a personality trait but generally failed to support the contention that self-concept determines the LOA. In another effort to study LOA as a relatively stable personality characteristic, Gould (1938) measured the consistency in the amount and direction of the discrepancy between performance scores and estimates of future performance for a given subject using unrelated tasks, but she did not obtain definitive results.

Several psychologists have classified their subjects as either realistic or unrealistic on the basis of how they set their IOAs. Festinger (1942) concluded that subjects with a realistic attitude had smaller goal discrepancy scores; their IOAs were more flexible and responsive to changes in performance. Comparable results were obtained by Sears (1940) and by Irwin and Mintzer (1942). Preston, Spiers, and Trasoff (1947) stated that realistic persons focus on the objective demands of their situation, while unrealistic persons are more subjective. In setting their IOAs, realistic persons depend primarily on their performance or ability and not on other such statements of expectancy; the reverse is true for unrealistic individuals. These authors hypothesized that increasing subject motivation would intensify hopes and fears and lead to more unrealistic aspirations, and that increasing knowledge and familiarity with the task would lead to more realistic aspirations. However, these hypotheses were not supported. While degrees of realism have generally been shown to be relatively stable personality characteristics in goal-setting behaviors, it is unfortunate that such characteristics have not been clearly related to other types of behavior or other personality characteristics. Again, it may be that the artificiality of the laboratory situation has clouded such relationships, in that there is an important difference between the private goals that one sets and goals that must be announced to an experimenter.

Using the Rotter level of aspiration board as the performance task, Lefcourt and Steffy (1970) related IOA to the Rotter Internal-External Control Scale. Persons with expectancies of internal control

of reinforcement tend to believe that they can control outcomes and perform accordingly. Persons with expectancies of external control perform as if the outcomes depended upon fate. Since skill was a factor in the performance task, persons expecting internal control set more reasonable goals. The results showed that subjects who behaved confidently and realistically in the performance task made fewer shifts in a gambling task, indicating a more reasonable approach to that game. Supportive results were obtained in another study (DuCette & Wolk, 1972), with subjects expecting external control making more atypical shifts in their LOAs.

McClelland, Atkinson, Clark, and Lowell (1953) related LOA to the need for achievement (n Ach). For the measure of aspiration level students were asked to state their expected examination grades, and n Ach was determined from TAT stories. The correlation between n Ach and LOA was low and insignificant for those students whose midterm standing was commensurate with grades in other courses; this correlation was high (.45) and significant for those students whose midterm standing was not commensurate with grades in other courses. The authors concluded that there is little relation between LOA and n Ach when reality is the main determinant of LOA, but the two are related when the facts of reality conflict. There are many additional studies (Ausubel & Schiff, 1955; Frank, 1937; Gardner, 1940; Gould & Kaplan, 1940; Gruen, 1945; Hanawalt, Hamilton, & Morris, 1943; Hausmann, 1933; Klugman, 1948) which have related personality traits to LOA. Others (Attkisson & Anker, 1970; Eysenck & Himmelweit, 1946; Fineman, 1970; Himmelweit, 1947) have investigated the manner in which

various clinical populations set their LOAs. The research on clinical groups has shown that these individuals show greater variability in their goal-setting behavior than do normals, tending to set their goals unrealistically high, unrealistically low, or both. This seems to represent a protection against feelings of failure, in that the individual aspires to goals that are either too hard or too easy.

The research on the relationships between personality traits and goal-setting behavior has been both promising and frustrating. It is true that many specific relationships have been found, but there is also a marked lack of theory to integrate these findings and give meaning to them. It would seem that the lack of theoretical frameworks is at least partly attributable to the lack of theory regarding LOA itself. This concept has traditionally been studied with great quantitative emphasis, but without corresponding emphasis on giving meaning to the numbers.

Success and failure experiences. When the concept of LOA was first introduced, it was used to examine the manner in which persons experience feelings of success or failure. However, this line of research was quickly dropped because American psychologists in the 1930's thought that it was lacking in scientific rigor. Instead, psychologists studied the shifts that subjects make in their LOAs following experiences of either success or failure. Several studies (Ausubel & Schiff, 1955; Festinger, 1942; Frank, 1941; Jucknat, 1937; McGehee, 1940; Snedden, 1936) investigated such shifts within a series of trials on the same task. In all of these studies, LOAs tended to increase after a success and decrease after a failure. However,

subjects were generally more responsive to success than to failure in that the decreases following failures tended to be smaller than the increases following successes. Also, there were more upward shifts after successes than downward shifts following failures. Steisel and Cohen (1951) pointed out the quantitative emphasis in this line of research: success and failure were defined according to whether or not the performance reached the stated LOA. Although these operational definitions certainly are advantageous in their clarity, they also have distinct disadvantages in light of the previously seen strategies in goal-setting behavior. These operational definitions are probably only valid for realistic goals. This area of research has suffered from a decided lack of multiple operationism (Crano & Brewer, 1973).

Others working in this field have examined the effects of success or failure in one task on the LOA in another task. Jucknat (1937) found results comparable to those for a series of trials using the same task, but with the size of the transference effects depending on the similarity between the two tasks. Frank (1935b) found that LOAs on a task of moderate difficulty tended to be higher when following an easy task than when following a hard task. Using sample questions as the first "task," Koulack (1971) cited supportive results. Pennington (1940) asked college students to estimate grades and found that one of the factors entering into these estimates was past performance in related areas. This study differed from those of Jucknat, Frank, and Koulack in that the earlier success or failure experiences did not take place in the laboratory situation. Thus success and

failure experiences affect goal-setting behavior both in the laboratory and in the real world, with the size of the effect depending at least partially on task similarity.

Reference groups. Another factor which affects the manner in which individuals set their personal goals is the existence of reference groups. Hilgard, Sait, and Magaret (1940) described the existence of "a frame of reference in which the individual's performance is placed on the scale formed by the performance of his group" (p. 341). Anderson and Brandt (1939) provided a group of subjects with the performance scores of the group and then asked for LOAs. They found that subjects above the group performance average tended to have negative goal discrepancy scores, subjects close to the group average tended to have slightly positive goal discrepancy scores, and those subjects below the group average tended to have large and positive goal discrepancy scores. Thus subjects tended to align their LOAs with the group's mean performance score. Such effects have also been demonstrated when subjects are told the scores of other groups. Gould and Lewis (1940) and Hertzman and Festinger (1940) found that the effects of reference groups depend on the characteristics of these groups relative to the individual subjects. Festinger (1942) found that, the higher the status of a group, the more influential it is if one is scoring above it and the less influential it is if one is scoring below it. While the influence of reference groups has been clearly demonstrated, Chapman and Volkmann (1939) found that such effects are negligible when the subjects have had a great deal of practice and know how well they did in this practice.

The results of a study by Payne and Hauty (1955) suggested that the reported scores of reference groups not only affect stated IOAs but also performance. Subjects were told the typical scores of persons like themselves, but actually the reported scores were one standard deviation above that which they were purported to be. These subjects performed significantly better than a control group who were given the actual typical score.

This study by Payne and Hauty raises a critical issue that was almost completely ignored in earlier studies, that is, the unclear relationship between IOA and performance. As Ryan (1970) explained, most of the researchers in the field of IOA have assumed that goal-setting behavior does affect performance, but there is considerable doubt about the exact relationship. There are two factors which seem to be important causes of this confusion: (a) the lack of understanding as to what the stated IOA really represents, and (b) the lack of clear differentiation between the actual IOA and its operational definition, the stated IOA.

Goals and performance. At about the same time that psychologists in Germany and the United States were studying IOA, Mace (1935) was working in Great Britain on incentives and "intention." Although this work was not directly related to IOA, there were strong similarities. In Mace's study, subjects were given instructions as to how they should set their performance goals, and thus the situation was akin to supplying subjects with IOAs or at least making suggestions to them as to how they should set their goals. The focus in this research was on the relationship between goals and performance. It is unfortunate

that these early workers in experimental psychology and applied or industrial psychology did not combine the work in the two fields.

Mace gave different instructions to each of four groups of subjects, and these group instructions, listed in increasing order of ultimate performance, are as follows: (a) the first group was told to try to surpass their previous performance, (b) the second group was told to try for a specific and constant score on each day's performance, (c) the third group was simply told to do its best to improve, and (d) the fourth group was given a specific performance for each day which they were supposed to surpass if possible. The performance task was a computational one which had a considerable practice effect. The fourth group showed the greatest rate of improvement, and therefore a specific and difficult intention resulted in the best performance.

Bayton (1943) proposed that the psychological needs which affect a person's LOA also affect his subsequent performance, as well as the manner in which he evaluates that performance. Under this assumption, LOA should then be positively related to performance. Bayton asked each of his subjects for three LOAs: the most they hoped to do, the least they expected to do, and what they actually expected to do. Using two separate performance tasks, he found a positive relationship between LOA and performance for the more ego-involving of these two tasks, with LOA referring to the subjects' actual expectancies. Thus Bayton concluded that LOA only has incentive value for ego-involving tasks. In a later study, Bayton (1948) generally supported his earlier findings. The author stated that "establishing specific aspirations,

whether expressed or non-expressed, creates more rapid learning in the early trials than occurs in a relatively unstructured learning situation" (p. 294). However, he did not obtain significant results for the hypotheses that performance increases with more specific aspirations and that the expression of aspirations is associated with increases in level of performance, although the results were in the predicted direction. He again pointed out that ego-involvement is a mediating variable.

Holt (1946) was not fully satisfied with the conclusions drawn by Bayton; he set out to ascertain whether LOA was primarily an incentive (goal, ambition, or motivation) or an ego defense. Holt recognized that this was a difficult question to answer, since both may be true for different people and different situations. Furthermore, depending on exactly how the subjects are asked to state their LOAs, the stated answers can refer to different entities: hoped-for goals, realistic expectations, estimates of minimum performance, etc. According to the incentive hypothesis, LOA should be positively correlated with performance, while this correlation should not exist under the ego-defense hypothesis. Holt asked students to predict grades on important tests and did not find a significant correlation "between aspiration and achievement" (p. 415). On the basis of these results, Holt claimed to have supported the ego-defense theory. This conclusion is dubious, since a failure to support the alternate hypothesis does not necessarily constitute support for the null hypothesis.

Citing these results and also the earlier results of Bayton

(1943), Holt proposed three hypotheses: (a) when there is minimal ego-involvement LOAs are basically realistic estimates with little motivational value, (b) when there is a low degree of ego-involvement, LOAs are somewhat representative of the degree of motivation and have little significance as an ego-defense, and (c) when ego-involvement becomes sufficiently high, ego-defensiveness is an important factor and the LOA is then a complex hybrid of the two considerations. In effect, Holt was hypothesizing a curvilinear relationship in which LOA would have incentive value at moderate levels of ego-involvement.

During the 1950's there were relatively few researchers who attempted to further explore the relationship between LOA and performance. In the mid 1960's there was renewed interest in this area, but this more recent research followed the emphasis of Mace on applied and industrial interests. Studies by Locke (1966a) and by Locke and Bryan (1966a) supported the previous findings of Mace that subjects performed better when given specific, high goals to strive for. The subjects who were allowed to choose their own goals tended to set moderately easy ones or vague ones, like doing their best. The overall performance of these subjects was lower than that of the subjects given specific and difficult goals. However, when a subject did set a difficult goal without being specifically told to do so by the experimenter, his performance tended to be higher. Combining these results, the conclusion is that subjects perform better when they adopt specific and difficult goals.

According to Ryan (1970), some have criticized these studies on the grounds that those subjects with higher goals might be more

motivated in other ways, and thus there is no necessary causal relationship between goals or intentions and subsequent performance. However, other studies contradict this contention. On the basis of performance and attitude ratings on an addition task, Bryan and Locke (1967) divided their subjects into high motivation and low motivation groups. The subjects in the high motivation group were then told to simply do their best on the next task, while the subjects in the low motivation group were given specific goals by the experimenter. By the end of the second retest on the task, the differences between the two groups were largely erased in regard to both performance and favorable attitudes toward the task. The authors concluded that the use of specific and difficult goals can be used to increase the performance of those subjects who have little motivation in the task situation. These authors summarized their results as follows:

The assigning of specific and reasonably hard goals to these Ss raised performance level and favored the development of more positive attitudes toward the task. On the other hand, telling the high-motivation Ss to do their best resulted in little performance increase and the development of increasingly less favorable attitudes toward the task. (p. 277)

Several other studies (Locke, 1967a, 1967b; Locke & Bryan, 1966b, 1967) supported the existence of a positive relationship between level of performance and the difficulty of the goal assigned to the subject. The contention that persons who are given more difficult goals not only perform better but also like the task better has been supported in other studies (Locke, 1965, 1966b; Locke & Bryan, 1967).

Although these experiments left little doubt that the goals for which a person strives are at least partial determinants of ultimate performance, further work by Locke and his associates showed that this

relationship is even stronger than was previously thought. Locke (1967a) was not fully satisfied with the previous research showing that knowledge of results (KR) acts as an incentive to better performance. In his experimental design Locke separated the effects of KR from those of goal-setting and found that, while the subjects given specific and hard goals again performed better, there was no significant effect for knowledge of results. Locke concluded that the "effects previously attributed to differential KR were actually due to different levels of motivation produced by the different goals" (p. 324). In subsequent research, Locke, Cartledge, and Koepfel (1968) hypothesized that KR may result in better performance if it provides the subject with feedback on the type of errors he is making, but they disputed the motivational or incentive value of KR. According to the authors, KR appears to have motivational value merely because subjects can use this knowledge to set their goals, and thus "goal setting mediates the effects of KR" (p. 476). The results supported their hypotheses, although their conclusions were based on a failure to reject the null hypothesis.

Relating these findings to the effects of monetary incentives on performance, Locke, Bryan, and Kendall (1968) hypothesized that "monetary incentives would affect task performance only through or by means of their effects on the individual's goals or intentions" (p. 104). The results showed a significant relationship between goals and performance but an insignificant relationship between monetary incentive and performance. Thus there was some support for the authors' assumption that "goals and intentions are the most immediate determinants

of an individual's behavior" (p. 104). However, the authors warned that the use of incentives to increase level of performance can be very effective, since they can serve to change a person's intentions. The authors attempted to show how such incentives work--through their effect on goals. The authors found that all-or-none incentives, in which a goal was automatically imposed upon the subjects, resulted in overall better performance than a piece-rate incentive, which allowed the subjects to set their own goals. Subjects under the piece-rate system tended to set lower goals than those under the all-or-none system. Goals and intentions do seem to be mediators of the effects of incentive on behavior, but further research is needed (Ryan, 1970).

Locke and his associates have obviously collected an impressive amount of experimental data to support their belief that inducing subjects to strive for specific and reasonably difficult goals results in a higher level of performance. What is almost equally impressive, however, is the fact that the relevance of this research to the field of LOA has barely been explored. Both areas deal with goal-setting behavior and ultimate performance--one with the goals that a person adopts of his own volition and the other with the goals that a person is under some type of pressure to adopt. The only psychologist to make a serious effort to bridge this gap is Ryan (1970). The explanation for this may lie in the current lack of popularity of LOA studies.

Methodological considerations. Another possible explanation is the confusion related to methodological differences in LOA studies. Sutcliffe (1952) cited methodological problems as one of the reasons

for the following inconsistencies in the research on LOA: (a) generalization across tasks and situations, (b) the effects of success and failure, (c) goal-setting behavior as a personality trait, and (d) the relationship between goals and performance. Ricciuti (1951) stated that, "The problem of methodology thus constitutes a consideration of major importance both in the interpretation and evaluation of previous studies, and in the planning of new research" (p. 2).

One source of the methodological differences is the wording of the question designed to elicit the subjects' LOAs. While this may seem to be a minor consideration, research has shown otherwise. Diggory (1949) found that goal discrepancy scores were twice as great when he asked subjects what they "hope" to do as opposed to asking them what they "expect" to do. Irwin and Mintzer (1942) obtained comparable results using the words "hope" and "predict," as did Festinger (1942) using the words "think" or "expect" as opposed to "like" or "intend." Preston and Bayton (1941) asked each of their subjects to state three LOAs: the best they expected to do, what they actually expected to do, and the least they expected to do. The actual and the maximum estimates were highly correlated. Since these subjects placed their actual estimates closer to their maximum than to their minimum estimates, the authors concluded that the subjects tended to be somewhat optimistic in their actual estimates. Despite these differences in stated LOA based on the wording of the questions, neither these authors nor Irwin and Mintzer found corresponding differences in performance.

Another methodological problem is the performance task used. The majority of the experiments on IOA have featured tasks that can be individually administered, that easily yield performance scores, and that require a short period of time. Ricciuti (1951) stated that psychomotor tasks have been the most popular. Examples of such tasks are dart throwing (Irwin & Mintzer, 1940; McGehee, 1940; Preston, Spiers, & Trasoff, 1947; Snedden, 1936), ring toss (Fineman, 1970; Rutchik, 1971), a target game (Mace, 1935), and printing (Frank, 1935). Others have used tasks emphasizing cognitive abilities, such as arithmetic problems (Gould, 1939; Steisel & Cohen, 1951), scrambled words (Rutchik, 1971), logical and spatial relations (Frank, 1935), mazes (Jucknat, 1937), coding (Snedden, 1936), synonyms (Gould, 1939; Hertzman & Festinger, 1940), symbol-digit substitution (Gould, 1939), and information (Hertzman & Festinger, 1940). Athletic games (Harvey, 1971) and school grades (Holt, 1946; Pennington, 1940) have also been employed. Locke and his associates have used psychomotor, perceptual, and computational tasks.

According to Ricciuti (1951), most psychologists working in the IOA field have generally agreed that the ideal task is an interesting one with fairly high ego-involvement and a moderate level of difficulty. Few, if any, of the aforementioned experimental tasks match this ideal, particularly since many of the experiments required a great number of repetitions of the same task. On the contrary, it seems that most of these tasks can best be described by the single word, "boring." In a person's actual life, issues of aspirations and goal-setting behavior are primarily related to tasks that are far more

complex and multivariate, with multiple options of both quantity and quality. The nature of the tasks that have been used severely limits the generalizability of the research on LOA.

Causal Attribution

Because of these and other frustrations that have been encountered, LOA now seems to be a "dead" area of research. But in recent years, social psychologists have carried out research that is relevant to LOA. Experimental results indicate that the manner in which a person attributes causality has a direct effect on the aspirations or goals that he sets and on his subsequent performance. This research is particularly important in light of Siegel's (1957) discussion of the role of subjective probability and expectations in setting LOAs.

Heider (1958) described four sources that people use to explain and to predict task performance and task outcome: (a) ability, a stable and internal factor, (b) effort, a variable and internal factor, (c) task difficulty, a stable and external factor, and (d) luck, a variable and external factor. Thus the two dimensions of causal attribution are stable-variable and internal-external, the latter dimension referring to locus of control. In evaluating past performance or future action, a person attributes various degrees of causality to each of these four factors. Naturally, people must depend on numerous sources of evidence to make their causal attributions. When an individual attributes ability as the cause of his performance, he often bases this attribution on past performance in the same or a similar task, on the pattern of his performance over

time, and on the performance of others. In making attributions of causality to task difficulty, a person depends primarily on prior success, and, in the absence of that, on the performance of others. The pattern of performance or outcome over time is the most important factor in attributions to luck. Attributions to effort are based on factors which are often difficult to delineate. Relevant factors seem to be the degree of incentive, bodily cues, pattern of performance, and attributions to the other three sources. Two needs which influence these causal attributions are the needs to see oneself with as much ability as possible and to see oneself realistically (Jones, Rock, Shaver, Goethals, & Ward, 1968).

One of the major determinants of causal attributions is the initial expectations that a person has in regard to outcome. Feather and Simon (1971a, 1971b) described two theoretical models that predict how initial expectations relate to subsequent attributions of outcome. The first model (Feather & Simon, 1971a) adheres closely to Heider's (1958) formulations:

The naive analysis of action predicts that when a person's expectation of success is disconfirmed by an outcome, then he will tend to appeal to variable factors (luck and/or effort) to explain the outcome, since the other possible causes of outcomes (those involving ability and task difficulty) are assumed to be stable. (p. 185)

According to the naive action model, a person's assumptions regarding the causes of an outcome will be confirmed if his original expectation is confirmed. One of the basic assumptions of this model is that a person's expectations are based on those factors in the situation that are stable, that is, ability and task difficulty. When the original expectation is confirmed, previous assumptions about cause are confirmed;

when expectations are not confirmed, the person then tends to attribute the outcome to variable factors, that is, effort and luck.

Feather and Simon (1971b) explained the balance model in the following manner:

good outcomes (success) will be attributed to self (internal attribution) when there is positive self-evaluation with respect to the performance task (high expectation of success) but will be disowned (external attribution) when there is negative self-evaluation (low expectation). It also assumes that bad outcomes (failure) will be attributed to self (internal attribution) when there is negative self-evaluation (low expectation) but will be disowned when there is positive self-evaluation. (pp. 537-538)

Both of these models were derived from Heider's formulations and the two are not necessarily contradictory--they often make the same predictions. The naive action model is more broad because, unlike the balance model, it takes into account stable external factors (task difficulty) and variable internal factors (effort). In this regard the naive action model adheres more closely to Heider's theory. However, the balance model makes stronger hypotheses. Whereas the naive action model proposes that unexpected outcomes are more likely to be attributed to variable factors than are expected outcomes, the balance model predicts that expected outcomes will be internally attributed and unexpected outcomes will be externally attributed. It must be emphasized that, under the balance model, internal attribution refers only to ability (and not effort) and external attribution to luck (and not task difficulty). Thus the balance model does not provide for the stable-variable dimension.

Feather (1969) attempted to determine which of these two models is more accurate. He asked subjects to make causal attributions of task outcome to ability and/or luck. Feather found that expected

results were generally attributed to ability (internal) and that unexpected results were generally attributed to luck (external). Although this experiment gave no consideration to the stable-variable dimension, Feather believed that the results not only supported the weaker (naive action) hypothesis but also the stronger (balance model) hypothesis.

In a subsequent study, Feather and Simon (1971a) asked subjects to make attributions on a single scale with luck at one pole and ability at the other pole. The results showed that unexpected results were attributed to luck more often than were expected results. However, the authors did not find that unexpected results were generally attributed to luck while expected results were generally attributed to ability. The authors concluded that the results supported the weaker hypothesis but did not also support the stronger hypothesis. They qualified this conclusion with the observation that subjects tended to make intermediate ratings and avoided the internal and external poles; they suggested that the results might therefore be misleading.

To clear up this confusion, Feather and Simon (1971b) conducted a similar experiment, but this time they asked each subject to make ratings of causal attribution on four scales: ability, luck, task difficulty, and effort. As in the earlier study by Feather (1969), they found that unexpected outcomes were generally attributed to luck (a variable and external factor) and that expected outcomes were generally attributed to ability (a stable and internal factor). The authors interpreted the results as being supportive of both the

weaker (naive action) and the stronger (balance) hypotheses. McMahan (1973) pointed out that this interpretation is not fully warranted. In their research, Feather and Simon focused primarily on the relative strength of the two hypotheses--the naive action model predicting in terms of "more likely" and the balance model making definite predictions of causal attribution. In this regard the results did support the balance model. However, these authors overlooked one crucial element, the stable-variable dimension. The results simply showed that unexpected outcomes were attributed to luck while expected results were attributed to ability. They interpreted luck as an external attribution and ability as an internal attribution, and thus the experiment was supportive of the balance model. One could make an alternate interpretation, citing luck as a variable factor and ability as a stable factor. Considering that the balance model makes no provision for effort or task difficulty, the designation of this model as the stronger hypothesis is certainly debatable. The fact that the results of their study (Feather & Simon, 1971b) did not support the predictions of the naive action model regarding attributions to effort does not provide conclusive support for the contention that the balance model is better.

Interestingly, Feather and Simon cited an experiment by Frieze and Weiner (1971) as supporting their conclusions. Yet the results obtained by Frieze and Weiner seem to be more in line with the naive action model. The authors asked each subject to imagine that he or another person was to engage in an achievement-like activity. Each subject was given the following information about the task situation:

percentage of previous successes and failures at the same and at similar tasks, percentage of successes and failures for others, amount of time spent on the task, task structure, whether the subject himself or another person is performing the task, and task outcome. The authors believed that this was enough information to allow each subject to make essentially the same type of causal attributions that they would make in everyday life. Each subject attributed causality to the four factors discussed by Heider (ability, luck, task difficulty, and effort) on a rating scale from 0 (not a cause) to 3 (very much a cause). They found that success was more likely to be attributed to internal factors than was failure, while failure was more likely to be attributed to external factors. The results also showed that the subjects tended to attribute expected outcomes to stable factors and unexpected outcomes to variable factors. Feather and Simon (1971b) were correct in citing this experiment as supportive of the stronger hypothesis, but they should also have emphasized that the predictions of the naive action model relating to variable factors were also supported. The data obtained by Frieze and weiner actually seem to suggest a hybrid of the two models, with the basic predictions of the naive action model and the strength of the balance model.

Citing the Frieze and weiner study, McMahan (1973) suggested that an "attributional" approach using all four of Heider's factors would be preferable to the "locus of control" approach advocated by Feather and his associates. The attributional approach assumes that people try to avoid making changes in relatively fixed perceptions. Thus there is a tendency to attribute unexpected outcomes more to

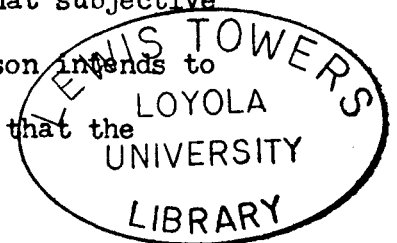
variable than to stable factors, and vice versa for expected outcomes. Accordingly, a person who attributes an unexpected or novel outcome to a stable factor must ordinarily make some alterations in that factor which would affect future expectancies. However, an individual who attributes an outcome to a variable factor need not change his future expectancies, since expectancies are generally based on stable rather than variable factors. For example, a student who expected an A in an examination but received an F would not have to change his expectancies for future examinations of a comparable nature if he were able to attribute the unexpected outcome to bad luck or lack of effort. If, however, he were to attribute his F to lack of ability or task difficulty, he would feel a need to change his future expectations. Thus the stability dimension is more salient than the locus of control dimension.

McMahan acknowledged that previous research (Rotter, 1966; Rotter, Liverant, & Crowne, 1961) has shown that greater shifts in expectancy occur when attributions are made to skill rather than chance. However, he took issue with the interpretations offered by the authors of these studies, who claimed that they supported the importance of the locus of control dimension in expectancy shifts. The two variables studied (skill and chance) differ along both the stable-variable and the internal-external dimensions, and thus there is no reason that the results necessarily support the importance of the locus of control dimension. McMahan criticized Feather (1969) on the same grounds.

McMahan's theoretical position is in agreement with that of weiner, Frieze, Kukla, Reed, Rest, and Rosenbaum (1971), who proposed

that "expectancy shifts are primarily determined by the stability, rather than the locus of control, of the attributional element" (p. 3). Using anagrams as the experimental task, McMahan tested the following hypotheses: (a) the relationship between attributions to stable factors and subsequent expectancy is positive following success and negative following failure; attributions to variable factors are generally unassociated with subsequent expectancy or may even be negatively related following success and positively related following failure, and (b) unexpected outcomes tend to be attributed to variable factors (luck and effort) more than to fixed or stable (ability and task difficulty) factors; expected outcomes tend to be attributed to stable factors more than to variable factors. The results supported all of the first hypothesis, and the second hypothesis was supported in regard to ability, luck, and effort but not task difficulty. Overall, this study was generally supportive of McMahan's position, although further research is clearly needed.

Kukla (1972) has attempted to combine attributional theory and expectancy theory, on the assumption that "the way people attribute the causes of task outcomes is an important determinant of the characteristics of their performance on these tasks" (p. 454). Kukla took the basic mathematical tenets of expectancy theory regarding subjective probability of some occurrence and its subjective value and extended this to attribution. Looking at intensity of effort rather than direction of behavior, the author stated that subjective probability depends in part on how much effort the person intends to expend. Kukla reported that Atkinson (1958) had found that the



relationship between perceived difficulty and intended effort formed an inverted U-curve, with subjects intending to expend little effort if the task was seen as either too hard or too easy. The degree of intended effort also depends on the individual's perception of his own ability; less ability requires greater effort and more ability requires less effort. The research found that perceived difficulty decreases with continued success experiences and increases with continued failure experiences. Relating this to effort, a subject who first sees a task as easy but then has successive failures should then try harder, while a subject who first sees the task as being difficult but has continued success experience should also then try harder. Increased effort should result in a higher level of performance for both types of subjects. Kukla cited his data as being supportive, but neither his formulation nor Atkinson's accounted for all of it.

The literature from the three general areas that have been discussed (LOA, intentions and performance, and attribution) show obvious interrelations. All three are concerned with performance in achievement-like activities as a function of the manner in which a person evaluates the task situation. Several of the variables which enter into this evaluation are: ability, task difficulty, luck, intended effort, and various types of goals and aspirations. It is believed that this study clarifies certain interrelations.

CHAPTER III

METHOD

Subjects. The subjects were 112 male undergraduate students enrolled in the introductory psychology course at Loyola University of Chicago. Those persons who had previously played with the Magnavox Odyssey were not allowed to participate. Each participant was randomly assigned to one of the eight experimental conditions.

Design. This study employed a $2 \times 2 \times 2$ design: previous success or failure experience (win or loss), previous success or failure experience of the subject's opponent, and putative advantage or disadvantage due to equipment bias. The following dependent measures were obtained: written LOA following the practice game, written LOA following the information that a "bias" existed, game performance, and ratings of causal attribution on five scales. All measures of LOA and performance were obtained in terms of both winning/losing and point differential. Because of a statistical dependency, only the data from one student of the competing pair was analyzed.

Apparatus. A game of electronic table tennis was the performance task. This game is one of several that can be played using an electronic device marketed by the Magnavox Corporation; this device is known as the Magnavox Odyssey and is available to the public. The Odyssey is attached to a television and the game is played on the

television screen using electronic controls.

Procedure. At the start of the testing session, each student individually practiced playing this game with the male experimenter (the author) for approximately 3 minutes. The experimenter then asked the subject to play a practice game up to a score of 11. The experimenter had sufficient expertise to control the outcome of this game. Depending on the experimental condition to which the student had been assigned, the experimenter either won or lost this game, with the loser always scoring from 3 to 7 points.

Upon completion of this game the subject was told that he was to play another game, this time with another student. The subject was then asked to write his LOA on a sheet of paper (see Appendix A) in response to the written question, "Do you expect to win or to lose the game you are about to play?" This sheet also asked the student to predict the final score of the game, with the winner being the first person to reach a score of 21. Presumably, the wording of these questions tapped the subjects' realistic aspirations. The use of a written LOA was designed to minimize the possible effects of a public announcement of goals.

This entire procedure was then repeated with the student who was scheduled to be the opponent of the first subject. Since the first student was idly waiting during this time, this factor was counter-balanced in all experimental conditions. The two competing students were then brought together for their game, but were not told how well their opponent did in the practice game.

At this point the experimenter stated that he was going to

adjust the game equipment such that one of the players would be at a disadvantage, and consequently, the other at an advantage. The subjects were told which of the players would have the advantage and which the disadvantage, but were also told that the degree of the bias would not be divulged. The source of the putative bias was the amount of "play," or the responsiveness, in the players' individual control units. In actuality, there was no physical bias. While the experimenter adjusted a bogus control on the back of the television set, the students were instructed to write new IOAs, in the same manner as before. The justification for this was the new information regarding equipment bias.

Upon completion of the experimental game, each subject made causal attributions (see Appendix B) on five scales: ability, task difficulty (including the ability of the opponent), luck, effort, and equipment bias. Each of these factors was rated on a 7-point scale, ranging from 1 (not at all a cause of the outcome of the game) to 7 (very much a cause of the outcome of the game). In order to minimize any detrimental effects of deception, a summary of the completed experiment was made available to the participants.

CHAPTER IV

RESULTS

For all hypotheses regarding performance and/or LOA, two dependent measures were used: win/lose and point differential. Accordingly, each of the relevant hypotheses was subjected to two forms of statistical analysis, depending on the measure under consideration. Each of these dependent measures has a particular advantage. Point differential provides a more sensitive measure by considering not only winning/losing (positive/negative differential) but also the degree of the differential. However, in game competition the opponents probably consider point differential to be a minor consideration as compared to winning or losing. The difference between victories of 2 and 4 points is not the same as the difference between a victory by 1 point and a loss by 1 point. To the opponents, the point differential may have little motivational value, and thus players may show a decrease in effort when a game is "in the bag." In general, comparisons of the two forms of statistical analyses indicated that winning/losing is probably the more accurate measure of both LOA and performance.

Hypothesis 1: The Effects of Practice Game Experience on LOA

The data were first analyzed by means of the chi-square test to determine whether those students who had a success experience (winning the practice game) set higher LOAs in terms of win/lose than those students who had a failure experience. The analysis of these data,

as depicted in Table 1, supported this hypothesis ($\chi^2 = 8.45$, $df = 1$, $p < .005$). The correlation between these two measures, as determined by the phi coefficient, is .39. A t test on point differentials also indicated that students who had won the practice game set significantly higher LOAs than those who had lost the practice game ($t = 2.50$, $df = 54$, $p < .01$). The point biserial correlation between these two measures was .32. Thus previous success or failure and subsequent LOA were more strongly related when both were measured only in terms of winning/losing.

Hypothesis 2: A Positive Relationship Between LOA and Performance

The second hypothesis proposes a positive relationship between LOA and performance. This contention was tested for both the original LOA and the second LOA (recorded after being told of the putative bias). Using the dependent measure of win/lose, the results, shown in Table 2, indicate the existence of a significant and positive relationship between the original LOA and performance ($\chi^2 = 4.42$, $df = 1$, $p < .025$, $\phi = .28$). Using point differentials, supportive results were also obtained by the Pearson product-moment correlation coefficient ($r = .31$, $df = 54$, $z = 2.33$, $p < .01$). The mean of the original LOAs was 0.32 and the standard deviation was 6.11; the mean of the performances was -0.16 and the standard deviation was 9.74. As in the first hypothesis, the strength of the relationship was greater when the dependent measure of win/lose was used.

As shown in Table 3, the relationship between the second LOA and performance was positive but not significant when considering only winning/losing ($\chi^2 = 2.30$, $df = 1$, $p > .05$, $\phi = .20$). However, this

Table 1

The Effects of Practice Game Experience on Original LOA

(a) Dependent measure: win/lose

		Experience in Practice Game	
		Win	Loss
Original LOA	Win	25	14
	Lose	3	14

(b) Dependent measure: point differential

		Experience in Practice Game			
		Win		Loss	
		<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Original LOA		2.29	3.92	-1.64	7.35

Table 2

Relationship Between Original LOA and Performance

		Original LOA	
		Win	Lose
Performance	Win	25	5
	Lose	14	12

Table 3

Relationship Between Second LOA and Performance

		Second LOA	
		Win	Lose
Performance	Win	23	7
	Lose	14	12

relationship was found to be both positive and significant by the Pearson correlation on point differentials ($r = .25$, $df = 54$, $z = 1.87$, $p < .05$). The mean of the second LOAs was 0.46 and the standard deviation was 6.71; as stated before, the mean of the performances was -0.16 and the standard deviation was 9.74. In this case, the strength of the relationship was greater when point differentials were used as the dependent measure.

The hypothesis stating that there is a significant, positive relationship between LOA and performance was supported by three of the four statistical tests used, and even the fourth test showed the relationship to be positive albeit nonsignificant. Performance was more strongly related to the original LOA than to the second LOA. The second LOAs had greater variance than the original LOAs, probably because the students were given no information about the degree of the putative bias. All four of the computed correlations were low, ranging from .20 to .31. Thus the relationship between LOA and subsequent performance was relatively weak.

Hypothesis 3: The Effects of Putative Equipment Bias on LOA and Performance

A chi-square test (shown in Table 4) indicated that students with the putative advantage set significantly higher LOAs than those students with the putative disadvantage ($\chi^2 = 15.61$, $df = 1$, $p < .0005$, $\phi = .53$). Supportive results were also obtained in an analysis of variance on point differentials ($F_{(1,52)} = 28.09$, $p < .001$). Thus the deception of equipment bias was effective in artificially raising and lowering LOAs in the anticipated manner. Furthermore, both a

Table 4

The Effects of Putative Equipment Bias on LOA

(a) Dependent measure: win/lose

		Putative Bias	
		Advantage	Disadvantage
Second LOA	Win	26	11
	Lose	2	17

(b) Dependent measure: point differential

Two-Way Fixed Effects ANOVA

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Bias	848.64	1	848.64	28.09	<.001
S/F*	52.07	1	52.07	1.72	n.s.
Interaction	52.07	1	52.07	1.72	n.s.
Error	1571.14	52	30.21		
Total	2523.93	55			

*Success or failure in practice game

chi-square test and an ANOVA (see Table 5) indicated that the students with a putative disadvantage in the competitive game performed at a significantly lower level than the students with a putative advantage ($\chi^2 = 5.82$, $df = 1$, $p < .01$, $\phi = .32$; $F_{(1,48)} = 5.42$, $p < .025$). Thus the results supported all of the third hypothesis.

Hypothesis 4: The Effects of Winning/Losing on Causal Attributions

Four ANOVAs were used to test the hypothesis that successful persons attribute task outcome more to internal factors (ability and effort) than do persons who fail, while persons who fail attribute task outcome more to external factors (task difficulty and luck) than do successful persons. Since statistical analysis of this hypothesis involved four ANOVAs, a significance level of .01 was chosen. These ANOVAs, as shown in Table 6, did not reveal any significant differences in the ratings on the four sources of causal attribution. Table 7 depicts mean ratings on the four scales.

Hypothesis 5: The Effects of Winning/Losing and Confirmed/Disconfirmed Expectations on Causal Attributions

Four ANOVAs were used to test for differences in ratings of causal attribution as a function of whether personal expectations were confirmed or disconfirmed. As shown in Table 8, no significant differences were found in the ratings on the four scales (for reasons previously stated, an alpha level of .01 was again chosen). Mean ratings are provided in Table 9.

Hypothesis 6: The Effects of Winning/Losing and Putative Bias on Ratings of Equipment Bias

The ANOVA depicted in Table 10 indicated that students who won

Table 5

The Effects of Putative Equipment Bias on Competitive Performance

(a) Dependent measure: win/lose

Performance	Putative Bias	
	Advantage	Disadvantage
	Win	Lose
	20	10
	8	18

(b) Dependent measure: point differential

Three-Way Fixed Effects ANOVA

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Bias	498.02	1	498.02	5.42	<.025
S/F*	189.45	1	189.45	2.06	n.s.
OS/OF**	4.02	1	4.02	0.04	n.s.
Bias x S/F	46.45	1	46.45	0.51	n.s.
Bias x OS/OF	17.16	1	17.16	0.19	n.s.
S/F x OS/OF	135.16	1	135.16	1.47	n.s.
Bias x S/F x OS/OF	7.88	1	7.88	0.09	n.s.
Error	4411.43	48	91.90		
Total	5309.55	55			

*Success or failure experience in the practice game

**The opponent's success or failure experience in the practice game

Table 6

ANOVAs (Least Squares) on the Effects of Winning/Losing
on Causal Attributions

(a) Ratings on ability

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
W/L*	1.01	1	1.01	.66	n.s.
A/D**	0.56	1	0.56	.36	n.s.
Interaction	0.60	1	0.60	.39	n.s.
Error	80.33	52	1.54		
Total	82.50	55			

*Winning or losing the competitive game

**Advantage or disadvantage in the competitive game

(b) Ratings on task difficulty

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
W/L	0.85	1	0.85	.41	n.s.
A/D	0.00	1	0.00	.00	n.s.
Interaction	0.28	1	0.28	.14	n.s.
Error	106.99	52	2.06		
Total	108.12	55			

Table 6

(contd)

(c) Ratings on luck

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
W/L	8.00	1	8.00	2.79	n.s. ($p > .01$)
A/D	7.02	1	7.02	2.44	n.s.
Interaction	0.74	1	0.74	.26	n.s.
Error	149.22	52	2.87		
Total	164.98	55			

(d) Ratings on effort

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
W/L	9.96	1	9.96	5.61	n.s. ($p > .01$)
A/D	6.26	1	6.26	3.53	n.s.
Interaction	0.41	1	0.41	.23	n.s.
Error	92.35	52	1.78		
Total	108.98	55			

Table 7

Mean Ratings of Causal Attribution According to
Game Outcome and Putative Bias

	Skill	Task Difficulty	Luck	Effort	N
Winners (overall)	5.17	5.00	3.17	5.03	30
with advantage	5.10	4.95	2.95	4.85	20
with disadvantage	5.30	5.10	3.60	5.40	10
Losers (overall)	5.35	5.27	2.85	4.39	26
with advantage	5.62	5.38	3.50	3.75	8
with disadvantage	5.22	5.22	2.56	4.67	18
With advantage (overall)	5.25	5.07	3.11	4.54	28
With disadvantage (overall)	5.25	5.18	2.93	4.93	28

Table 8

ANOVAs (Least Squares) on Ratings of Causal Attribution
as a Function of Winning/Losing and
Confirmed/Disconfirmed Expectations

(a) Ratings on ability

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
C/D*	0.34	1	0.34	.22	n.s.
W/L**	0.67	1	0.67	.43	n.s.
Interaction	0.54	1	0.54	.35	n.s.
Error	80.95	52	1.56		
Total	82.50	55			

*Confirmed or disconfirmed expectations about winning or losing the game

**Winning or losing the competitive game

(b) Ratings on task difficulty

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
C/D	1.93	1	1.93	.96	n.s.
W/L	1.93	1	1.93	.96	n.s.
Interaction	0.24	1	0.24	.12	n.s.
Error	104.02	52	2.00		
Total	108.12	55			

Table 8

(contd)

(c) Ratings on luck

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
C/D	6.83	1	6.83	2.30	n.s. ($p > .01$)
W/L	3.83	1	3.83	1.29	n.s.
Interaction	0.02	1	0.02	.01	n.s.
Error	154.30	52	2.97		
Total	164.98	55			

(d) Ratings on effort

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
C/D	2.67	1	2.67	1.35	n.s. ($p > .01$)
W/L	3.19	1	3.19	1.61	n.s.
Interaction	0.16	1	0.16	.08	n.s.
Error	102.97	52	1.98		
Total	108.98	55			

Table 9

Mean Ratings of Causal Attribution as a Function of Winning/Losing
and Confirmed/Disconfirmed Expectations

	Skill	Task Difficulty	Luck	Effort	N
Confirmed (overall)	5.29	5.23	2.80	4.97	35
won the game	5.26	5.13	3.00	5.17	23
lost the game	5.33	5.42	2.42	4.58	12
Disconfirmed (overall)	5.19	4.95	3.38	4.33	21
won the game	4.86	4.57	3.71	4.57	7
lost the game	5.36	5.14	3.21	4.21	14

Table 10

ANOVA (Least Squares) on Ratings of Equipment Bias
as a Function of Winning/Losing and Putative Bias

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
W/L*	20.33	1	20.33	6.55	<.05
A/D**	38.47	1	38.47	12.39	<.01
Interaction	3.20	1	3.20	1.03	n.s.
Error	161.43	52	3.10		
Total	223.43	55			

*Winning or losing the competitive game

**Having the putative advantage or disadvantage in the competitive game

the competitive game gave significantly lower ratings to the importance of equipment bias on game outcome than did students who lost the game ($F_{(1,52)} = 6.55, p < .05$). Furthermore, students with the putative disadvantage rated this factor significantly lower than students with the putative advantage ($F_{(1,52)} = 12.39, p < .01$). There was no significant interaction effect.

CHAPTER V

DISCUSSION

Level of Aspiration

The results were in accordance with the findings of Festinger (1942) and many others that LOA tends to be higher following success and lower following failure. This tendency has been consistently reported throughout the history of research on LOA, and thus the present replication was hardly unexpected. However, the present study generalized this tendency to a situation in which success and failure were defined not in terms of reaching a previously stated LOA, but rather in terms of winning or losing a competitive task. It can then be said that subjects do at least partially respond to the realities of their past experience when setting LOAs. This also implies that at least one factor in the setting of aspirations is realistic expectations. But the data also indicate that LOA is far from the realistic prediction that a computer might make; LOA is much more than a prediction. Of the 56 students whose data was analyzed, 39 aspired to win their competitive games and only 17 expected to lose. In part, this may be a result of the possibility that losing to the experimenter was less of a failure experience than defeating the experimenter was a success experience, as the students generally suspected the experimenter of being an expert at the game task. Yet a sizable majority (37 of 56) aspired to win on the second LOA, even though half (28) were told that they would have

a disadvantage in their game. Thus it seems that, in addition to realistic expectations, personal hopes and wishes are also significant elements in the setting of aspiration levels and goals.

The results reveal an interesting contrast between those who aspire to win and those who aspire to lose. Despite the fact that 70% of the students (39 of 56) aspired to win, the mean aspiration level was a victory by a score of 21.00 to 20.68. Overall, students with winning IOAs expected closer games (mean point differential of +3.92, with a range of +1 to +9) than students with losing IOAs (mean point differential -7.94, with a range of -3 to -16). The reason for this contrast between aspiring winners and aspiring losers is not clear. It may be that aspiring losers have a greater need to psychologically prepare themselves for the worst possible outcome or for failure of any type. Also, it may be psychologically hazardous to hope for a resounding victory. In any case, the two groups seem to employ different strategies in the setting of IOAs. This probably accounts for the higher correlation between previous success/failure and IOA when the dependent measure was winning/losing ($\phi = .39$, point biserial $r = .32$).

As hypothesized, the putative bias turned out to be a real bias, albeit a psychological rather than a physical one. Those students with the "advantage" performed significantly better than those students with the "disadvantage." This provides a possible explanation for the following phenomena often experienced by athletes: hot streaks, slumps, and "psyching out" the opponent. It is the author's opinion that the source of the psychological bias was a self-fulfilling

prophecy. The mean rating of causal attribution to equipment bias was 3.22 (on a scale of 1 to 7). This mean rating is relatively high considering that absolutely no physical bias existed, and this should have been readily apparent to the competitors. It appears that the students simply believed themselves to be at an advantage/disadvantage and performed accordingly. Although the best explanation of the performance differences seems to be that a self-fulfilling prophecy occurred, two alternate explanations will also be considered.

The first alternate explanation is as follows: persons who believe themselves to be at a disadvantage tend to set lower aspiration levels, and, as a result of the decreased LOAs, perform at a lower level than persons believing themselves to be at an advantage. Thus performance differences were the result of the artificially raised or lowered LOAs.

This explanation is plausible but not probable. The experimental deception of equipment bias was indeed effective in manipulating the students to artificially raise or lower LOAs. Yet performance was more strongly related to the original LOAs than to the second LOAs. If changes in LOA were the cause of performance changes, the opposite should have been found. Furthermore, even the relationship between performance and original LOAs was weak although significant and positive, with .31 being the largest correlation found in this study. It is thus unlikely that changes in LOA resulted in performance changes.

Before the data were collected, the author had considered the possibility that one way to increase the performance of certain

individuals would be to get them to raise their aspiration levels. But the results of this study suggest that such an approach would have little if any effectiveness. Instead, it appears that higher IOAs are more often the result of, rather than the cause of, an individual "psyching himself up" for a performance. Unrealistically low IOAs probably represent a need to prepare for the possibility of negative outcomes (an ego defense). It is possible that getting certain individuals to raise their IOAs might result in better performance, but this effect would be primarily due to factors other than the higher aspiration levels chosen, such as the instillation of hope or greater confidence. The method used by Locke and his associates (giving persons specific and reasonably difficult goals for which to strive) offers far more promise for improving performance. Moreover, the results of this study indicate that IOA is an ineffective operational definition for the study of realistic goals or expectations. The setting of a IOA is a complex behavior, and IOA offers most promise as one way to examine personality traits.

The other alternate explanation for the observed performance differences is that the putative bias provided the students having the disadvantage with a social excuse for losing and thus they had less motivation to give their full effort. Conversely, the students having the putative advantage might be more motivated to give full effort, since a loss would be more bruising to the ego than if the game had been fair. This is certainly the more plausible of the two alternate explanations being offered, but this explanation is still weaker than that of the self-fulfilling prophecy. From the author's

observations of the participating students, there was a high degree of interest and involvement in the electronic table tennis games. With one exception, all the students appeared to be doing their best to win. Furthermore, there were no significant differences in the ratings on the amount of effort expended (the "disadvantaged" students rated this factor only slightly higher, 4.93 to 4.54).

The question then arises as to how a self-fulfilling prophecy might have operated to alter performance, if not through the amount of effort expended. Non-systematic observations by the experimenter suggested that the self-fulfilling prophecy operated by changing the playing strategies of the opponents, that is, the "game plans" were altered. The students with the advantage tended to play a more confident game, combining caution, risk, and patience. The students with the disadvantage tended to be more prone to adopting one of two strategies: a very cautious defensive game or a somewhat reckless offensive game. These two strategies may have resulted from the putative bias being in the defensive controls. For whatever reason, the game strategies used by the "disadvantaged" students were less effective. It must be emphasized that these observations concerning game strategies were not systematic and may have been affected by the experimenter's expectations. Further research is needed to determine how such a self-fulfilling prophecy might operate. It may be that the explanation lies in both altered game strategies and a social excuse for failure resulting in decreased effort.

Causal Attribution

The ratings of causal attribution showed remarkable similarity

among the groups studied. There were no significant differences in the ratings on any of the four factors discussed by Heider (1958): ability, task difficulty, luck, and effort. Neither of the hypotheses suggested by prior research on causal attribution (the fourth and fifth hypotheses) were supported.

The fourth hypothesis tested was that successful students tend to attribute task outcome more to internal factors (ability and effort) than do students who fail, while students who fail tend to attribute task outcome more to external factors (task difficulty and luck) than do successful students. This hypothesis was based on the findings of Frieze and Weiner (1971), who asked subjects to make causal attributions after being given imaginary situations. The failure to replicate the findings of Frieze and Weiner can be explained in two ways. First, the results of either study could be statistically improbable events, that is, chance happenings. This is an often-overlooked possibility, but it must be emphasized that the present findings merely represent the failure of one attempt to support earlier findings. An alternate explanation, favored by the author, is that the different findings may be the result of differences in the experimental tasks. The results of Frieze and Weiner were based on causal attributions in fantasized situations, and attempts should be made to generalize these findings to in vivo situations. Furthermore, the present study used a very special experimental task: competition in an athletic-like game. Athletic competition seems to have its own ethics of causal attribution; there is a code of good sportsmanship that calls for gracious winners and good losers. In the present study ability and task difficulty

(including the opponent's ability) were the two factors rated highest, with mean ratings of 5.25 and 5.12 respectively. Effort received a mean rating of 4.74, while luck received a lowly 3.02. No claims are being made about the degree to which these findings can be generalized to other forms of game competition, as any such conclusions are clearly beyond the scope of this experiment. What is being suggested is that future researchers be aware that causal attributions take place in a social situation, and, as such, are affected by social norms and expectations. Theories and findings on causal attribution may have varying significance depending on the nature of the experimental task and the relevant social expectations. Social norms relating to causal attribution may not be the same for the successful politician as they are for the successful golfer. The social context of causal attributions should be given greater attention.

The results also failed to support the fifth hypothesis, that causal attributions are meaningfully related to a person's original expectations. The results supported neither the naive action model nor the balance model. The failure to support either model can be explained in several ways. As before, the results can be due to a chance happening or to differences in the experimental tasks. But it seems more reasonable to suggest that this hypothesis was not given a fair test. In order to test this hypothesis, it was assumed that the LOA represented the student's original expectations. However, the author has already concluded that LOA is a poor operational definition for a person's realistic expectations. Since a basic assumption was probably violated, no definitive conclusions regarding the fifth

hypothesis can be made.

The finding of significant differences in the ratings on equipment bias must be interpreted with caution. Losers gave significantly higher ratings to this factor than did winners, and students with the putative disadvantage rated this factor significantly lower than did students with the putative advantage. The meaning of these findings is vague because of unanticipated sources of bias. First, the students with the disadvantage were in a far better position to determine that no physical bias existed, since it was their control unit that had allegedly been altered. Thus these students rated this factor significantly lower than the students having the advantage. Second, it makes sense that this factor would be given lower ratings by those students who won despite having a disadvantage or lost despite having an advantage. Yet there were no significant interaction effects to negate the tendency of losers to rate this factor higher than winners. The only conclusion to be made is a cautious one: losers are more likely to blame failure on equipment bias than winners are to give credit for success to equipment bias.

Methodological Considerations

The present study is a high-risk candidate for experimenter effects. The experiences of the students in the practice game probably had a sizable effect on performance in the actual competition. The experimenter tried to keep the practice game experience as constant as possible, but this was a formidable task. Those students who were beaten in the practice game probably received better playing experience than those students who were allowed to win. When the experimenter

played better, the student had a better learning experience. The experimenter may then have unconsciously affected game outcome by giving differential learning experiences. Although every conscious attempt was made to be fair (perhaps even going in the opposite direction), it would have been better to use a confederate who was unaware of the expected results.

As a final note, the experimenter's casual observations provided strong indications of the social factors in stating LOAs. With very few exceptions, the students deliberately placed their recorded LOAs face down on their desks. No students were observed to inquire about the LOAs of their opponents. In general, the students acted as if these sheets carried their private secrets, and tried to minimize disclosure even to the experimenter. This supported the author's previously-stated emphasis on differentiating between LOA (goals communicated to another in a social setting) and private goals. These observations also suggest that written goals may represent more realistic expectations, and thus should be given more widespread usage.

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APPENDIX A

I

Do you expect to win or to lose the game you are about to play?

WIN _____ LOSE _____

What do you expect the final score to be?

21 to _____

II

Do you expect to win or to lose the game you are about to play?

WIN _____ LOSE _____

What do you expect the final score to be?

21 to _____

APPENDIX B

The results of the game you have just finished can be attributed to several factors. Please rate each of the factors below according to how important they were in the outcome of your game. Each factor is to be rated on a scale from:

1 - not at all a cause of the outcome of the game to,

7 - a very important cause of the outcome of the game.

The higher the rating, the more important you consider that factor to be. Please read all the factors before rating them. To make your rating, just circle the appropriate number.

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. Your skill or ability. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The difficulty of the game, including the skill of your opponent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Luck, whether good or bad. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. How hard you tried (your effort). | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Having the advantage or disadvantage with the equipment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Did you win or lose this game? WIN _____ LOSE _____

By what score? 21 to _____

APPROVAL SHEET

The thesis submitted by John E. Dalton has been read and approved by the following Committee:

Dr. Richard A. Maier, Director
Associate Professor, Psychology, Loyola

Dr. Emil J. Posavac
Associate Professor, Psychology, Loyola

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

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

April 30, 1975
Date

Richard A Maier
Director's Signature