



Locus of control and propensity for risk taking as related to achievement in higher education  
by Margie Cassell

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education  
Montana State University  
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Abstract:

The purpose of the study was to explore the constructs of locus of control (LOC) and risk-taking propensity and to examine the relevance of these constructs to achievement in higher education. Four hundred ninety-nine students were examined on two instruments, the Rotter Focus of Control Scale and the Choice Dilemma Questionnaire (risk taking) during randomly selected courses at Eastern Montana College in Billings, Montana. Achievement was measured by GPA which was acquired from student academic records. Correlational methods and comparative analyses were utilized to test the hypotheses.

It was concluded that there was no significant multiple relationship between achievement and locus of control, risk-taking propensity, year in school, age, and family-of-origin income level. It was determined that there was a significant difference between males and females in locus of control. There were also significant differences in the means of married, single, divorced and widowed students in LOC scores.

Contrary to much of the available literature, there were no statistically significant differences in GPAs of individuals with an internal or external LOC. Females scored significantly higher on achievement than males, contrary to traditional beliefs. Males and females do not show a significant difference in risktaking propensity.

Additional research is recommended on the relationship between LOC and achievement with the relatively new Academic Locus of Control Scale (Trice, Ogden, Stevens & Booth, 1982), particularly in regard to women. Also highly recommended is additional research into academic risk taking.

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TAKING AS RELATED TO ACHIEVEMENT  
IN HIGHER EDUCATION

by

Margie Cassell

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## TABLE OF CONTENTS

	Page
LIST OF TABLES .....	viii
ABSTRACT .....	x
1. INTRODUCTION .....	1
Locus of Control .....	3
Risk Taking .....	8
Purpose of the Study .....	13
General Questions to be Answered .....	13
General Procedures .....	15
Limitations .....	17
Definition of Terms .....	17
2. REVIEW OF THE LITERATURE .....	20
Introduction .....	20
Gender Differences in Achievement .....	24
Locus of Control .....	24
Locus of Control and Cognitive Functioning .....	27
Information Assimilation .....	27
Attention and Decision Making .....	30
Perceptual Sensitivity .....	32
Measures of Locus of Control .....	33
Achievement in Children .....	34
Achievement in College-Age Subjects .....	37
Gender Differences .....	38
Locus of Control and Age .....	42
Race and Locus of Control .....	43
Socioeconomic Status and Locus of Control .....	47

## TABLE OF CONTENTS--(Continued)

	Page
Propensity for Risk Taking .....	48
The Illusion of Control .....	49
Chance Versus Skill .....	53
Risk Taking and Achievement .....	55
Risk Taking and Sex Differences .....	59
Risk Taking and Socioeconomic Status .....	61
Risk Taking and Age .....	61
Risk Taking and Locus of Control .....	62
Summary .....	63
3. PROCEDURES .....	64
Introduction .....	64
Population Description and Sampling Procedure .....	64
Setting of the Study .....	65
Description of Measurement Instruments .....	66
Choice Dilemmas Questionnaire .....	66
Rotter's I-E Locus of Control Scale .....	68
Description of Variables .....	70
Data Collection .....	71
Statistical Hypotheses .....	72
Analysis of Data .....	74
Test for Interaction .....	74
Precautions Taken for Accuracy .....	75
4. RESULTS .....	76
Demographic Description of Survey Participants .....	76
Gender .....	76
Year in School .....	77
Age .....	78
Race .....	78
Marital Status .....	79
Family Income .....	80
Statistical Hypotheses .....	82



## TABLE OF CONTENTS--(Continued)

	Page
5. CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS .....	95
Conclusions .....	95
Discussion .....	96
Locus of Control and Achievement .....	96
Locus of Control, Achievement and Gender .....	97
Locus of Control and Helping Services Major .....	98
Locus of Control and Marital Status .....	98
Locus of Control and Risk Propensity .....	100
Sex Differences in Risk Taking .....	100
Academic Risk Taking .....	101
Gender Differences in Achievement .....	101
Minority Group Representation .....	102
Recommendations .....	102
REFERENCES .....	105
APPENDICES .....	118
Appendix A--Consent Form .....	119
Appendix B--GPA Release Form .....	121
Appendix C--Demographic Data Form .....	123
Appendix D--Survey Questionnaires .....	125

## LIST OF TABLES

Table	Page
1. Gender .....	76
2. Year in School .....	77
3. Age .....	78
4. Race .....	79
5. Marital Status .....	80
6. Family Income .....	80
7. Norms on the Rotter Internal-External Locus of Control Scale .....	81
8. Norms on the Choice Dilemma Questionnaire (Risk Taking) .....	82
9. Multiple Regression .....	83
10. t-test for Differences in Means of Internal- External Locus of Control .....	84
11. Analysis of Variance: by Locus of Control, Risk Propensity Categories, Marital Status .....	86
12. t-test for Differences in Means of GPA .....	87
13. Analysis of Variance: Grade Point by Marital Status and Helping Services .....	89
14. Analysis of Variance: Grade Point by Helping Services and IE Categories .....	90

## LIST OF TABLES--(Continued)

Table		Page
15.	t-test for Differences in Means of Risk Categories (Helping vs. Non-Helping Curriculum) .....	92
16.	t-test for Differences in Means of Risk-Taking Propensity .....	93
17.	Analysis of Variance: Grade Point by Risk Categories. ....	94

## ABSTRACT

The purpose of the study was to explore the constructs of locus of control (LOC) and risk-taking propensity and to examine the relevance of these constructs to achievement in higher education. Four hundred ninety-nine students were examined on two instruments, the Rotter Locus of Control Scale and the Choice Dilemma Questionnaire (risk taking) during randomly selected courses at Eastern Montana College in Billings, Montana. Achievement was measured by GPA which was acquired from student academic records. Correlational methods and comparative analyses were utilized to test the hypotheses.

It was concluded that there was no significant multiple relationship between achievement and locus of control, risk-taking propensity, year in school, age, and family-of-origin income level. It was determined that there was a significant difference between males and females in locus of control. There were also significant differences in the means of married, single, divorced and widowed students in LOC scores.

Contrary to much of the available literature, there were no statistically significant differences in GPAs of individuals with an internal or external LOC. Females scored significantly higher on achievement than males, contrary to traditional beliefs. Males and females do not show a significant difference in risk-taking propensity.

Additional research is recommended on the relationship between LOC and achievement with the relatively new Academic Locus of Control Scale (Trice, Ogden, Stevens & Booth, 1982), particularly in regard to women. Also highly recommended is additional research into academic risk taking.

## CHAPTER 1

## INTRODUCTION

In reviewing the literature on achievement, it was found that there were well over 16,000 research reports catalogued dealing with achievement. The great majority of these were concerned with intellectual variables. A similar interest in non-intellectual variables in achievement has come to the forefront in relatively recent years. Prior to the research of David McClelland and his colleagues, scholastic failure was usually attributed to a low level of intelligence. Success, on the other hand, was attributed to a high level of intelligence. The work of McClelland and his associates encouraged an interest in research into motivation of achievement. This research alerted psychologists and educators to the importance of variables, other than those related to intelligence, for the prediction of achievement (McClelland, Atkinson, Clark, & Lowell, 1953).

In *Missions of the College Curriculum* (1979), the authors pointed out that 1960 marked the beginning of a new era in education. From 1870 to 1960, the emphasis in higher education was on the production of new knowledge and new technology. The emphasis in higher education was on the increase in the gross national product and in individual personal incomes. Curriculum was oriented, at this time, to "knowledge for use" rather than culture. Beginning in 1960,

administrators and educators in institutions of higher education began to respond to a new consumerism and this consumer sovereignty resulted in significant changes in curriculum, such as more time allowed for electives, more courses presented in the arts, more courses for nonmajors, and more courses designed for personal growth. Colleges and universities responded to the expressed needs in their communities for "life-long learning." Students were beginning to be better organized and demanded direct input into curricular policy and admission standards (Carnegie Foundation, 1979).

During the decade of the 1960s, pressure continued to build from minority groups, who were under-represented in most colleges and universities. They complained that the standard criteria for admission to college were biased in favor of white traditional students. Educators were forced to consider that scholastic achievement tests and high school grade point averages, good predictors of academic success for non-minorities, may not accurately predict success for minorities. During this period, many educational institutions introduced flexible admission policies for minorities (Astin, 1982).

Research into non-intellectual variables of achievement began to expand significantly as educators recognized their importance and significance for both traditional as well as non-traditional students (Goodstein, Crites, and Heilbrun, 1963).

The Coleman report contained extensive information about the status of the educational systems and the effectiveness or ineffectiveness of education particularly

in regard to minority group members. Coleman and associates were concerned with the tremendous impact of cultural disadvantage and family background differences on achievement. They reported that differences in family background accounted for significant variation in achievement. They also found that attitudinal variables such as students' interest in school, self-concept and locus of control accounted for more of the variance in achievement than family background variables and school variables. (Coleman, Campbell, Hobson, McPharland, Mood, Weinfeld, & York, 1966)

As noted above, educators have presented much research evidence supporting the fact that many non-intellectual factors contribute to problems with achievement (Coleman et al., 1966). It is the belief of this investigator that there is a need for research which focuses on non-intellectual psychological issues that affect achievement. This paper will focus on two non-intellectual variables, i.e., locus of control and the propensity for risk-taking as each relates to achievement in higher education. It is expected that a greater understanding of variables which contribute to the success or lack of success in an academic setting will be helpful in plotting new approaches to student advising and education.

### Locus of Control

Locus of control, which refers to the degree to which individuals believe that they can control their environment, is a concept which has triggered enormous interest in educators and psychologists since it was initially proposed in 1954. A

sense of personal control appears to be profoundly important to most individuals (Lefcourt, 1982).

In 1971, B. F. Skinner wrote a book, *Beyond Freedom and Dignity*, which quickly became a best seller and became a primary topic of conversation among therapists. Skinner suggested that man must relinquish his belief in freedom and self-determination. He felt that man must accept the fact that he is controlled by forces external to himself. He believed that such acceptance would cause mankind to become more responsive to those forces which control them. Thus the world would be a more orderly environment. He suggested that the determination of behavior must shift from autonomous man to the environment, most certainly to save the environment and the evolution of the species. He speculated that, by accepting that we are controlled by external factors, most men would become altruistic and pleasant with each other (Skinner, 1971).

Skinner stated that the "literature of freedom" has branded all control as wrong and has misrepresented many advantages to be gained from a socially controlled environment. Therefore, people are unprepared for the next step, which is not to free men from control but to analyze and change the kinds of control to which they are exposed (Skinner, 1971).

These ideas alarmed many psychologists who believed that vagaries in personal experiences produce creative individuals. Many psychologists believe that it is essential to have freedom to become self-actualized (Lefcourt, 1982).



While Skinner felt that the chance elements of childhood produce psychotic and deviant individuals, many psychologists, such as Carl Rogers, believed that a world without freedom would have the effect of squelching creative individuals. Rogers felt that the salvation of the world, with its fragile environment, was the process of creativity which would lead to scientific development and adaptations to the environment. He felt strongly that psychological freedom is essential to foster creativity (Rogers, 1961).

In 1962, Rogers debated with Skinner at a conference. The transcripts of that meeting were not published until 1989. Rogers stated very strongly at this conference that, "to the extent that a behavioristic point of view in psychology is leading us toward a disregard of the person, toward treating persons primarily as manipulable objects, toward control of the person by shaping his behavior without his participant choice, or toward minimizing the significance of the subjective--to that extent I question it very deeply." He continued to state in the strongest of terms that behaviorism would take man down a pathway with destructive consequences (Kirschenbaum & Henderson, 1989).

Lefcourt agreed with Rogers. He suggested that the very surrender of the belief in free will is a source of increased prosocial violence. He said that man can only perceive himself as the master of his own fate if he can become comfortable with himself in the world. He cautioned, however, that the encouragement of individuality and privacy may also encourage more loneliness and discontent among the less privileged resulting in more antisocial criminality. Man must, he said,

become more competent in helping these least privileged individuals in order to avoid losing our personal freedom (Lefcourt, 1982).

Coleman and associates attempted to examine the degree to which children feel in control of their environment. They found that black Americans and other minority group members show a much lower sense of control of their environment than do whites. Particularly in metropolitan areas, about twice the proportion of blacks than whites give responses indicative of feelings of low control. This is also true of other minority group members, most significantly among the Puerto Ricans, and least so of Oriental Americans (Coleman et al., 1966).

The construct of locus of control may be conceptualized as a continuum ranging from internal to external control. An internal locus of control refers to the expectancy that an individual is in control or instrumental in obtaining rewards from his/her environment. An external locus of control refers to the expectancy that rewards or failures are determined by chance, luck, fate, etc. (Massari & Rosenblum, 1972).

There is a logical assumption that internal locus of control may be related to achievement in higher education. This expectation stems from the assumption that if a person believes his successes and failures are the result of his own behaviors, he is more likely to exhibit more initiative and persistence in the classroom, thus acquiring knowledge and greater problem solving skills.

Numerous investigators have attempted to verify this assumption. The studies do not always provide consistent results, but there is an obvious trend in the

literature with indications that the perception of locus of control is related to academic achievement, particularly for children. The relationship is not nearly so clear or so consistent for adults, including college students.

It is particularly in the area of sex differences that additional research seems to be important. In the relationship between locus of control and achievement for women, the research is conflicting. For example, Nowicki and Walker (1973) and Duke and Nowicki (1974) found that externality, rather than internality, was associated with achievement for females, defined by grade point averages, but internality was associated with achievement in males. The literature poses interesting related assumptions about the fear of success among females, i.e., that there has not been a significant change in the feelings many women continue to have that it is not feminine to demonstrate success (Chandler, Shama, & Wolf, 1982; Olson, 1988).

Gordon (1977) found that with male children locus of control was related to grade point average but not to achievement test scores. The reverse was true of females, that the locus of control was related to achievement test scores, but not to grade point average. It may be possible that grade point average is a more conflict-ridden index of achievement activity than is an achievement test.

In the research on locus of control and achievement, there has been a trend toward using interactionist models. Researchers want to know when and under what conditions locus of control may offer predictions of academic success (Wright & DuCette, 1976).

### Risk Taking

Risk is defined in the Oxford English Dictionary as: "to expose to the chance of injury or loss." References to a concept of risk date back to the seventeenth century. In order to qualify as risk-taking, it is necessary for there to be a potential loss (or injury). Second, there must be a chance of loss. A certain loss is not considered a risk. Also, "to expose" means that action may be taken that can increase or decrease the chance of loss. Risk, therefore, suggests the availability of a choice (MacCrimmon, Wehrung, & Stanbury, 1986)

The concept of risk taking may be applicable to most human action whenever the consequences are uncertain. Risk taking may be viewed as a selection of one alternative among many in which the choice of one alternative may leave an individual in a decidedly worse position than if he/she had selected otherwise or decided not to decide (Carney, 1971).

Mathematicians have long been interested in risk-taking. The interest demonstrated by psychologists in risk taking issues has been relatively recent. Even so, there seems to be limited research in the field.

There are two terms that are significant to the field and will be referred to occasionally in Chapter 2: expected value and expected utility.

Expected value may be defined as the average net gain or loss of each possible outcome. This is a mathematical concept.

Expected utility is a psychological concept and means the subjective value of any experience, object, quality. For example, if one needed to make an emergency phone call and needed a quarter to make the call, but only had a dollar bill, one would be willing to pay one dollar for a quarter. In this case, one has more utility for a quarter than for a dollar.

Obviously, most people do not gamble or risk according to a mathematical formula because humans have their subjective ideas of probabilities. Most people who gamble realize that the expected value in most gambling situations is very low. Many continue to gamble, however, and this is the point at which the social scientists become interested, for such individuals seem to gamble for less than logical reasons (Carney, 1971).

On the surface it would appear that the distinction between luck and merit seems clear. Luck may be a fortuitous event and is seen as uncontrollable. When skill is involved, there may be a causal link between behavior and outcome.

Psychologically, the distinction between chance and skill may be blurred for many people. These people respond to chance events as if they are subject to control (Langer, 1983).

Feather (1969) demonstrated that if a person expects to be successful, and is, then he/she begins to attribute the success to his/her ability. However, if that person fails, then the failure may readily be attributed to bad luck.

It may be that the need for mastery, or skill, motivates individuals to perceive all events as potentially controllable. Ellen Langer, in 1983, presented a

model which she called the "illusion of control." This model suggested that the more a situation is perceived by the individual as requiring skills, the more the individual will develop a perception of an illusory control in regard to it. Different factors contribute to this illusion of control, such as familiarity with the task, personal involvement, a positive sequence of results, etc.

Some interesting research by Kogan and Wallach in 1964 suggested that people are more likely to be moderately risky when they feel that skill is involved. When just chance is involved, individuals become much more risky or much more conservative (Kogan & Wallach, 1964).

In the early 1960s, there was considerable research into individual differences in risk-taking as related to achievement motivation. J. W. Atkinson in 1958 and 1964 explored the relationship between achievement motivation and preference for risk (Atkinson, 1964). Atkinson stated that individual differences in the strength of achievement-related motives influence behavior in situations which are competitive. His theoretical model involves six variables: the subjective probability (expectancy) of success ( $P_s$ ), the subjective probability of failure ( $P_f$ ), the incentive value of success ( $I_s$ ), the incentive value of avoiding failure ( $-I_f$ ), the achievement motive ( $M_s$ ), and the motive to avoid failure ( $M_f$ ). The subjective probabilities refer to expectancies aroused in situations concerning the probability of outcomes or consequences of certain acts or behaviors. Positive incentives refer to possible rewards and goals, and negative incentives refer to possible

punishments. Motives may be described as dispositions to approach classes of possible incentives or, of course, to avoid classes of negative incentives.

Atkinson suggested that the attractiveness of success may be positively related to the difficulty of the task. Also, the unattractiveness of failure may be negatively related to difficulty, holding the type of activity constant. He suggested that the degree of difficulty can be inferred from the subjective probability of success ( $P_s$ ). When an individual finds a task difficult, his subjective probability of success ( $P_s$ ) is very low. When an individual finds a task easy, his subjective probability of success ( $P_s$ ) is very high. Thus one can make assumptions about the incentive values of success or failure. Assume that the incentive value of success ( $I_s$ ) is a positive linear function of difficulty. The value  $(1-P_s)$  can represent  $I_s$ , the incentive value of success. When  $P_s$  is high, as with an easy task,  $I_s$  is low. When  $P_s$  is low, as with a difficult task,  $I_s$  is high. One can say that the negative incentive value of failure ( $I_f$ ) can be taken as  $(-P_s)$ . Obviously, when  $P_s$  is high, as with a very easy task, the sense of humiliation accompanying failure is great, for example,  $(-.90)$ . Conversely, when  $P_s$  is low, with a very difficult task, there may be little humiliation in failing, for example,  $(-.10)$ . In other words, the negative incentive value of failure is a negative linear function of difficulty.

The above variables may be combined multiplicatively:

$$\text{Resultant Motivation} = (M_s \times P_s \times I_s) + (M_f \times P_f \times -1).$$

Atkinson demonstrated with experiments that predictions may be made from this model concerning the effects of individual differences in the strength of

achievement motive and motive to avoid failure, on both level of performance and risk-taking (Atkinson, 1957).

Atkinson believed that whether the motive to achieve or the motive to avoid failure is stronger, a person's performance level should be the greatest when there is uncertainty about the outcome or the result. He stated that individuals in whom the achievement motive is stronger than the motive to avoid failure would prefer intermediate risk, while those for whom the motive to avoid failure is stronger than the motive to achieve success would prefer either very easy and safe tasks or extremely difficult tasks. He believed that an individual with a strong motivation to avoid failure will prefer to succeed with the safe task than risk failure with a very speculative task. In other words, a very difficult task will explain failure and thus the individual can avoid humiliation.

Charlotte Gilson in 1968 conducted research for the Office of Naval Research on individual differences in risk taking. She demonstrated that high-achievers preferred intermediate risks. The low-achievers' risk preferences were strongly affected by the risk-taking situation. When tested individually, they preferred small risks. When tested in groups they preferred large risks. The high-achievers, however, individually preferred larger or greater risks and as a group preferred smaller risks than the low-achievers. The effect of reward on the risk-taking behaviors of subjects was not clear, but it appeared that when a reward was offered for success, the low-achievers did not take quite as extreme risks as they did when no reward was offered. Gilson offered only partial support for



Atkinson's theory. In Gilson's study there was no evidence that the low-achievers avoided the humiliation of failure by choosing the other extreme as Atkinson had suggested. She admitted, however, that the conditions under which testing took place had differed from the conditions in Atkinson's study. She felt that the differences may have been partly attributed to the effect of grouping and the effect of reward.

Relatively few studies have been conducted about the relationship of risk taking to locus of control. In several studies, individuals with internal and external locus of control have been observed responding to gambling tasks. The results have been conflicting. This research will be reviewed in Chapter 2.

#### Purpose of the Study

The purpose of the study is to explore the constructs of locus of control and risk-taking propensity and to examine the relevance of these constructs to achievement in higher education.

#### General Questions to be Answered

1. Is there a significant multiple relationship between achievement, locus of control, risk-taking propensity, year in school, age, and family-of-origin income level?
2. Is there a statistically significant interaction between gender and ethnicity on locus of control?

- (a) Is there a statistically significant difference between means of male and female participants?
  - (b) Is there a statistically significant difference in means of five ethnic groups?
3. Is there a statistically significant interaction between risk-taking propensity and marital status on locus of control?
- (a) Is there a statistically significant difference in means for high or low risk-taking propensity?
  - (b) Is there a statistically significant difference in means for marital status?
4. Is there a statistically significant interaction between gender and ethnicity on achievement in higher education as measured by grade point average (GPA).
- (a) Is there a statistically significant difference between means of male and female participants?
  - (b) Is there a statistically significant difference in means of the five ethnic groups?
5. Is there a statistically significant interaction between marital status and choice of helping services (Y or N) on achievement in higher education as measured by GPA.
- (a) Is there a statistically significant difference between means of choice of helping services (Y or N)?

- (b) Is there a statistically significant difference between means for marital status?
6. Is there a statistically significant interaction between locus of control and choice of helping services (Y or N) on achievement in higher education as measured by GPA?
- (a) Is there a statistically significant difference between means of internal and external locus of control?
  - (b) Is there a statistically significant difference between means of choice of helping services (Y or N)?
7. Is there a statistically significant difference between mean scores of students who choose the helping services as a major course of study and students who choose other majors in terms of propensity for risk-taking?
8. Is there a statistically significant difference between males and females in propensity for risk?
9. Is there a statistically significant difference among mean GPA scores of the three categories of propensity for risk.

#### General Procedures

The investigator completed a request to do research on human subjects at Eastern Montana College. It was reviewed by the Human Subjects Research Committee of the institution. Dr. John Dodd was the faculty sponsor at Eastern Montana College. Once approved, the following procedures were implemented.

Seven hundred students were selected from different courses randomly selected in various departments at Eastern Montana College. Departments utilized included Psychology, Institute for Habilitative Services (includes Special Education), Education, Science, Sociology, Mathematics, and Business.

Students were asked to complete the Rotter Locus of Control test and the Choice Dilemmas Questionnaire. These students also completed a consent form giving consent to participate in the study, a GPA release form to grant permission to obtain GPAs from the registrar's office, and a survey for demographic information.

This study is passive-observational in nature. Hypothesis 1 required correlational methods and multiple regression was utilized (multiple correlation coefficient squared,  $R^2$ ). The remaining hypotheses required comparative analysis. Factorial analysis of variance was the statistical method utilized to analyze the independent and interactive effects of two or more independent variables on the dependent variable. The t-test for differences in means was utilized in several hypotheses.

The Statistical Package for the Social Sciences (SPSS) was utilized in the computer center at Eastern Montana College to compute the statistical procedures.

### Limitations

The study may have had several limitations. The data for this study were gathered in one particular year and are therefore limited to those circumstances. There were factors for which no control was attempted, such as the physical facilities and the time of day during which tests were administered.

The findings of this study were limited by the reliability and validity of the Rotter I-E scale and the Choice Dilemmas Questionnaire.

### Definition of Terms

Academic achievement: Educational outcomes as demonstrated by the cumulative GPA.

Class standing: Freshman: 0 - 29 hrs; Sophomore: 30 - 59 hrs; Junior: 60 - 89 hrs; Senior: 90 and up.

Graduate status: Graduated from a four-year college and accepted as a graduate student.

Expected value: Average net gain or loss of each possible outcome.

Expected utility: The subjective value.

External locus of control: A belief that reinforcements are controlled by external forces such as luck, chance, fate, or powerful others.

Family-of-origin income level: The income level of family of origination (usually parents).

Freedom of movement: The mean expectancy of obtaining positive satisfactions as a consequence of related behaviors which are directed toward the accomplishment of reinforcements.

GPA: Cumulative grade point average. It is computed by dividing the total cumulative grade points earned by the total credits attempted for courses taken. Grade points are calculated by multiplying the number of credits by the numeric value of the grade in each course. Then the sum of the grade points are divided by the total credits attempted (Montana State University registrar).

Helping services curriculum: Generally regarded as psychology, social work, counseling (school or rehabilitation).

Illusion of control: The more a situation is perceived by an individual to require skill, the more an individual will develop a perception of an illusory control to it.

Internal locus of control: An individual's belief that reinforcements are contingent upon his/her ability and effort, rather than fate or chance.

Locus of control: The generalized expectancy for internal or external control of reinforcements.

Motive: A strong affective association, characterized by an anticipatory goal reaction and based on past association of certain cues with pleasure or pain (McClelland, 1955).

Minorities: People described as American Indian, Alaskan natives, Asians, black, and Hispanics.

Reinforcement: Positive or negative outcome in response to behavior, usually offered to encourage or discourage repetition of behaviors.

Risk taking: To expose to the chance of risk or loss.

Self-actualized: The process of achieving one's greatest potential.

Social learning theory: A school of psychology, the basis of which suggests that a reinforcement acts to strengthen an expectation that a particular behavior will be followed by that reinforcement (Rotter, 1966).

Subjective probabilities: Personal estimates of probability not based on fact.

## CHAPTER 2

### REVIEW OF THE LITERATURE

#### Introduction

The prediction of academic success in institutions of higher learning has been a perpetual problem for educators and psychologists. It is clear that tests of aptitude or intelligence have long been seen as good predictors of academic success, at least for the traditional student. However, Goodstein and Heilbrun (1962) reported that such aptitude measures account for less than half of the variance in academic performance.

Goodstein and Heilbrun (1962) noted that interest in non-intellectual factors, especially personality variables, was developing in the educational community in the early sixties. They suggested that these non-intellectual variables may be an additional relevant source of variance in the prediction of academic achievement. They used the Edwards Personal Preference Schedule on 357 undergraduates, with the variance attributable to a brief test of scholastic ability partialled out. They concluded that personality factors are significantly related to academic achievement when the influence of ability or intelligence is statistically removed. They cautioned that the nature of the relationships depended upon the



general ability level of the group being studied. They expressed concern with other studies in which levels of ability are ignored as a variable, which causes the true relationships between personality factors and achievement to be concealed. In their research, endurance is significantly ( $r = .48$ ) related to achievement in the middle ability male subgroup. In the high ability subgroup, however, endurance is insignificantly negatively correlated with achievement. Abasement, while negatively correlated with achievement in the low ability female subgroup, is positively (minimally) correlated in the middle and high ability female subgroups. Goodstein and Heilbrun concluded that the success in college of relatively bright and dull males may be more determined by intellectual factors than with average ability males where intellectual factors are less predictive of success and where personality factors are the more important determiners of actual academic success and failure.

One year later Goodstein and Heilbrun continued research in this vital area. They designed a study to determine if nonintellectual variables operate to either facilitate or interfere with efficient use of academic ability. They concluded that college achievement, measured by GPA, consists of several general variance components: intellectual (35%), non-intellectual (15%), unknown (40%), and error and other (10%). They stated that almost one-half of the total variance cannot be predicted from intellectual and non-intellectual variables, or by errors in measurement. Goodstein and Heilbrun concluded that personality factors do appear to make a significant contribution to the prediction of academic achievement, beyond that which can be attributed to aptitude. They added,

however, that no consistent pattern of personality factors may clearly be associated with academic success. They stated that the Minnesota Multiphasic Inventory (MMPI), which they used in this configural and within-levels method of analysis, may not have been the appropriate instrument to use. They pointed out, again, that the Edwards Personal Preference Schedule is a better predictor of academic achievement in the middle range of ability (Goodstein & Heilbrun, 1963).

Hoyt and Norman (1954) and Drake (1962), however, both used the MMPI in their research of personality variables relating to achievement and concluded that maladjustment does significantly affect college achievement, producing both under- and over-achievement.

John Holland, in 1959, designed a study to demonstrate the usefulness of the California Psychological Inventory (CPI) and the Scholastic Aptitude Test (SAT), both separately and in combination, as predictors of scholastic achievement in high ability students. He found that the CPI and SAT are useful in predicting freshman grades in a high ability group of high school seniors. He stated that multiple regression equations for the CPI and SAT in combination cross-validate, and result in multiple  $R$ s two to three times as great as zero-order  $r$ 's for the SAT alone. He found that the CPI may generally be more effective than the SAT in the prediction of achievement, at least with this high functioning population (Holland, 1959).

In 1960, Fishman and Pasanella reviewed admission selection studies. In regard to non-intellectual variables, they reported that, in 26 studies, the correlation between psychological variables and intellectual criteria, on the average, was .22

(range of .01 to .62). Study-habits tests correlated between .26 and .66 with freshman grades in college. They also reported that correlations with college grades and biographical information ranged from .01 to .63 (Fishman & Pasanella, 1960).

In 1965, Bloom and associates conducted an extensive survey of the literature and concluded that in the majority of studies concerning the relationship between home background and academic performance, this relationship resulted in significant correlations (.30 to .50) (Bloom, Davis & Hess, 1965).

In 1989, Kanoy and Latta designed a study in which they used the traditional predictors of college performance, that is, SAT scores and high school GPA, along with cognitive and psychological variables, i.e., cognitive complexity, locus of control, academic self concept and effort, to predict the GPA of college women in their freshman year. They believed that their study revealed important information for college administrators involved with admission policies, at least in regard to women. They pointed out that not one traditional predictor of successful academic performance predicted the GPA of the lower-achieving students. For the higher-achieving students, the high school GPA and the SAT significantly predicted success and predicted 56% of the variance in GPA. In the lower-achieving group, two psychological variables, the internal locus of control and amount of effort applied accounted for 46% of the variance in GPA (Kanoy & Latta, 1989).

### Gender Differences in Achievement

Mickelson (1989) reports that female underachievement is a myth. He reports that women are certainly matching men in academic achievement, and in many areas are surpassing men. More girls than boys graduate from high school and more women than men graduate with a baccalaureate degree. Specialization continues to differ: there are more women in the social sciences and humanities and, consistent with tradition, men may excel in mathematics and the sciences. This seems to be slowly changing too.

Duckwall, Arnold, and Hayes in 1990 found no significant gender differences in learning styles and success. Robertson (1991), however, found that women experience more slowing in academic progress than men, probably as a function of more diverse role demands experienced by women than men. Again, non-intellectual variables may be more of an issue in the prediction of academic success than intellectual variables, at least in regard to women.

The remainder of this chapter deals with locus of control and propensity for risk taking as they relate to achievement.

### Locus of Control

Rotter, in 1954, initially introduced the concept of locus of control. This concept is based upon social learning theory. In social learning theory, a reinforcement acts to strengthen an expectation that a particular behavior will be

followed by that reinforcement. If the expected reinforcement does not follow, the expectation will subsequently be reduced. Obviously, when a reinforcement does not appear to be contingent upon an individual's behavior, the expectancy that the reinforcement will follow upon completion of the behavior will be reduced.

Individuals may differ in the degree to which they attribute reinforcements to their activities, considering the variances of experiences (Rotter, 1954).

Rotter suggested that individuals, once they recognized the causal relationship of behavior and reinforcement, begin to generalize from this belief so that it may affect a variety of behavioral choices in many different but similar situations. Generalized expectancies will assist in the determination of behavioral choices along with the value of potential reinforcements. Characteristic differences in behavior will result from these generalized expectancies in situations which may culturally be categorized as chance versus skill determined (Rotter, 1966).

Rotter offered a general formula which easily explains his theory:  $NP = f(FM \& NV)$ . Need potential (NP) is a function of the expectancy that these behaviors will lead to these reinforcements (freedom of movement) and, or plus, the strength or value of these reinforcements (need value). An understanding of the freedom of movement concept is essential in understanding the development of the locus of control construct in social learning theory (Rotter, 1954; Lefcourt, 1982).

Rotter defined freedom of movement as "the mean expectancy of obtaining positive satisfactions as a result of a set of related behaviors directed toward the

accomplishment of a group of functionally related reinforcements." If a person has a high expectancy of failure or an aversive experience as a result of his behavior, his freedom of movement is low. Conversely, if he has a high expectancy of success as a result of his behavior, his freedom of movement is high (Rotter, 1954).

Essentially, freedom of movement is a generalized expectancy of success which results from one's ability to remember a lifetime of specific expectancy-behavior-outcome sequences (Lefcourt, 1982).

Perceived control may be defined as a generalized expectancy for internal as opposed to external control of reinforcements. Freedom of movement concerns the likelihood of success; however, the generalized expectancy of internal versus external control of reinforcement involves an analysis of success and failure in terms of causation (Rotter, 1954).

It is important to note that it is the interpretation of the cause of success and failure that is pertinent to the generalized expectancy of internal versus external control. It is one's belief about how rewards are determined that provide a contribution along with freedom of movement and need value to the prediction of goal-directed activity (Rotter, 1954).

## Locus of Control and Cognitive Functioning

### Information Assimilation

Lefcourt suggested that locus of control may be a correlate of the kinds of cognitive activity that facilitate the perception of and maintenance of personal causation. He felt that individuals with an internal locus of control would be open to self-examination and nondefensive and would readily assimilate information about themselves. He believed that individuals described as internal would be more cautious and calculating about their choices and personal involvements than external individuals. He stated that self-direction in internals should entail more active cognitive processing of information in regard to the attainment of valued goals (Lefcourt, 1982).

In 1962, Seeman and Evans conducted the first study which linked locus of control and cognitive activity. Using a 12-item "alienation" scale, derived from Rotter's I-E scale, they attempted to predict the knowledge that tuberculosis patients had about their own disease processes. They used a 20-item knowledge test and a staff survey in which staff were asked to estimate their patient's knowledge about tuberculosis to determine that their prediction that high alienation and poor learning are associated. Alienation, in this instance, is described as a sense of powerlessness. Internals were rated as significantly more knowledgeable than externals (Seeman & Evans, 1962).

The research suggested that internals avail themselves of information, even with negative implications, because they believe that they may be able to act in their own behalf. Externals may more readily accept their state of dependency on their care-givers and thus have less need for information. In addition, the unalienated group (internals) were happier with highly controlled wards. The externals appeared to prefer the less controlled wards. The researchers suggested that the internals may see the relationship between an orderly and controlled hospital setting and the intended outcome of successful treatment (Seeman & Evans, 1962).

In 1963, Seeman conducted research in a reformatory in which he demonstrated that the learning of information relevant to correctional matters is dependent upon the inmates' degree of alienation. He again demonstrated that the inmates' expectancies for control governed their subsequent attention to, and retention of, information (Seeman, 1963).

Phares, in 1968, conducted research to determine if internals are more effective in the utilization of information. In terms of retention of information, there appeared to be little difference between internals and externals in the equivalent amount of information retained. However, it was found that there was a significant difference in the correctness of items recalled. Phares concluded that internals may better utilize information. Phares pointed out that the results of his study further indicated that an internal orientation results in behaviors which permit individuals to cope with reality effectively (Phares, 1968).



Davis and Phares (1967) also produced findings that internals, to a greater extent than externals, engage in behaviors which will yield more information. They stated that internals have more knowledge which is important for later outcomes, remember more of this information and actively seek information that will be useful in the future.

Pines and Julian (1972) conducted similar research. They explored the hypothesis that internals and externals are oriented differently in a performance situation. They suggested that internals would be more responsive to task or informational demands and externals would be more responsive to social or experimenter demands. As predicted, internals were more concerned by the task difficulty manipulation, while externals were more concerned by the social evaluation and experimenter demands. They suggested that although internals and externals may be equally concerned about performance outcomes, they apparently adopt different performance strategies dependent upon where they believe the locus of control does exist.

Lefcourt (1982) suggested that internals may have better assimilation and use of information than externals and therefore may be more apt to recognize the pertinence of information. They may be more certain of their purposes and values than are externals.

This is supported by the research of John Paul McKinney, who found that subjects with internal locus of control scored higher on both value clarity and value relevance than externals (McKinney, 1975).

In 1989, Hollenbeck, Williams, and Klein found, in related research, that the commitment to difficult goals is negatively related to externality. This is consistent with Lefcourt's position that internals are more certain of their purposes and values than are externals (Lefcourt, 1982).

### Attention and Decision Making

Another aspect of cognitive functioning which is relevant to achievement is the ability to attend and concentrate. Extremely limited research has been conducted in this area.

In research conducted in 1986, the Intellectual Achievement Responsibility Scale, one of the first tests of internal-external locus of control, was used to determine that externals demonstrated decreased persistence to attend in the face of challenge. Using an attentional task, called the Span of Apprehension, both groups, internals and externals, demonstrated equivalent attentional functioning on the initial assessment. However, subsequent assessments indicated a variable diffused attention in externals, while internals demonstrated a trend toward improved focused attention in assessments (Soraci, Leggett, Dweck, & Valk, 1986).

One study by Rotter and Mulry (1965) demonstrated that internals better attend to and take longer to make a decision on a task that is defined as skill controlled rather than chance controlled.

Julian and Katz reported the results of their research which replicated, to some degree, the study by Rotter and Mulry. They found that as the difficulty of

decision making increased, internals needed more time to make decisions.

Externals, on the other hand, did not vary as much. They acted as if there were no differences between simple and difficult choices (Julian & Katz, 1968).

Lefcourt, Lewis, and Silverman prepared another design to further test these concepts. In their research, the investigators used the Level of Aspiration Board and attempted to alter the subjects' expectancies in regard to the skill or chance nature of the required tasks. The investigators found that internals did accept the investigator's instructions with less resistance than externals. The internals appeared to be biased toward accepting the directions referring to skill and rejected the directions referring to chance. Internals, perceiving the tasks as skill determined, spent more time in decision making and demonstrated greater ability to attend and concentrate than did internals who believed tasks to be chance determined. Again the reverse tended to be true of externals (Lefcourt, Lewis, & Silverman, 1968).

Also concerned with decision making, Wheeler and Davis (1979) conducted research which demonstrated that students with an internal locus of control showed greater difficulty arriving at decisions when those decisions had serious consequences for someone else than did externals.

In 1973, several investigators conducted research pertaining to time utilization (in decision making). They reasoned that internals may use specific test-taking strategies that result in obtaining higher achievement scores than externals may achieve. They believed that their research would demonstrate that

internals would spend less time on easy items and more time on difficult items, as opposed to externals who may not differentiate between item difficulty in their time utilization. Results did support this hypothesis (Gonzali, Cleary, Walster, & Gonzali, 1973).

Lefcourt summarized the research. He reported that internals' attentiveness, concern, and interest varied in response to the types of situations with which they were confronted. Internals were much more deliberate if the decision was important than were externals. It was found that externals may not draw such sharp distinctions about presented tasks. When instructions did seem to affect the externals, it was the chance-determined tasks that captured greater attention and deliberation (Lefcourt, 1982).

### Perceptual Sensitivity

Perceptual sensitivity is another area of interest in regard to the internal-external construct. Wolk and DuCette in 1974 concluded in two investigations that internals were more perceptually sensitive as they were shown to obtain higher levels of incidental learning. Such learning was interpreted as the product of a more attentive and organizing cognitive system. Most interesting was their finding that when researchers clearly instructed the subjects in the need to attend for particular important items, externals, like internals, showed a positive relationship between intentional and incidental learning. Internals showed no changes after clarifying information was offered. It appeared, reported the

investigators, that the external did not make full use of his/her "attentional system" until stimuli were made prominent. For the internal, however, such explication appeared to be redundant (Wolk & Ducette, 1974). Other investigators found that internals benefited from "self-discovered" feedback (intrinsic reinforcement) during tasks, but not externals. Externals, on the other hand, improved when the experimenter offered verbal feedback (extrinsic reinforcement) during the task. When extrinsic reinforcement was offered, the performance of externals was superior to that of internals (Baron & Ganz, 1972).

Lefcourt (1967) conducted research on cue explication. He assumed that externals suffer from the inability to recognize cues that might help them be successful in task performance and that they are more suggestible and conforming than internals. In his research he demonstrated that externals could behave like internals if the experimenter explicitly explained the meaning of the tasks. The internals, again, did not change their behavior with cue explication.

This research has specific implications for educational settings. This will be discussed in Chapter 5.

### Measures of Locus of Control

There are a number of different locus of control (LOC) scales presently in use. For adults, the Internal-External Rotter's scale (Rotter, 1966) may be the most widely used today. The James Scale of Internal-External Control, the

Nowicki-Strickland Personal Reaction Survey, and the Levenson's Internal Scale, have also been used for adults (Bar-Tal & Bar-Zohar, 1977).

In regard to children, Bailer's Locus of Control Scale, the Intellectual Achievement Responsibility Questionnaire, and the Nowicki-Strickland Internal-External Control Scale have been extensively used. In addition, a number of other scales, Gruen, Korte, Stephens, the Children Locus of Control Scale of Cromwell, and the Children's Picture Test of Internal-External Control, have also been used with children (Bar-Tal & Bar-Zohar, 1977).

A new locus of control scale was developed in 1985, called the Academic Locus of Control (ALC) Scale. While the use of this scale appears to be very limited, it may warrant further usage. Three studies have been recorded using this scale. In these studies, significant correlations between ALC scores and variables such as class participation, study time and homework were found (Trice, Ogden, Stevens, & Booth, 1987).

### Achievement in Children

The first investigations of locus of control were conducted on children using the Intellectual Achievement Responsibility Questionnaire (IAR). This was conducted in 1962 by Crandall, Katkovsky, and Preston. They evaluated the relationships between early-grade-school children's achievement motivations and attitudes and their performances in intellectual achievement situations. They found that the IAR was strongly related to time spent in intellectual free-play activities







































































































































































































































