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A social-psychological study of sex-role identity
and personality correlates in relation
to academic achievement

by

Douglas W. Kachel

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The Requirements for the Degree of
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TABLE OF CONTENTS

| | Page |
|--|------|
| PREFACE | 1 |
| CHAPTER I. INTRODUCTION | 3 |
| Statement of the Problem | 8 |
| Purpose of the Study | 10 |
| Need for the Study | 11 |
| Null Hypotheses | 12 |
| Null hypothesis 1 | 12 |
| Null hypothesis 2 | 13 |
| Null hypothesis 3 | 13 |
| Null hypothesis 4 | 13 |
| Null hypothesis 5 | 13 |
| Null hypothesis 6 | 14 |
| Null hypothesis 7 | 14 |
| Basic Assumptions | 14 |
| Limitations of the Study | 14 |
| CHAPTER II. REVIEW OF LITERATURE | 16 |
| Academic Achievement - Sex Differences | 17 |
| Sex-Role Behavior, Intelligence, and Achievement | 26 |
| Internal-External Locus of Control | 35 |
| Dogmatism | 45 |
| Dogmatism, learning, and sex | 45 |
| Dogmatism, religious conviction, and learning | 52 |
| Dogmatism and Locus of Control | 58 |
| CHAPTER III. METHOD OF PROCEDURE | 61 |
| Selecting the Sample | 61 |
| Description of the Instruments | 62 |
| Scale I - Bem's Sex-Role Inventory | 64 |
| Scale II - Rotter's Internal-External Scale | 67 |

| | Page |
|--|------|
| Scale III - Rokeach's Dogmatism Scale | 69 |
| Scale IV - Religious Attitudes | 72 |
| Scale V - English Aptitude | 76 |
| Data Collection | 77 |
| Treatment of the Data | 78 |
| CHAPTER IV. FINDINGS | 81 |
| Descriptive Data | 81 |
| Analysis of Hypotheses | 81 |
| Hypothesis 1 | 83 |
| Summary hypothesis 1 | 85 |
| Hypothesis 2 | 85 |
| Summary hypothesis 2 | 86 |
| Hypothesis 3 | 86 |
| Summary hypothesis 3 | 88 |
| Hypothesis 4 | 88 |
| Summary hypothesis 4 | 89 |
| Hypothesis 5 | 90 |
| Summary hypothesis 5 | 91 |
| Hypothesis 6 | 91 |
| Summary hypothesis 6 | 92 |
| Hypothesis 7 | 95 |
| Summary hypothesis 7 | 95 |
| CHAPTER V. SUMMARY, DISCUSSION, CONCLUSION, AND RECOMMENDATIONS | 98 |
| Summary | 98 |
| Discussion | 101 |
| Limitations | 106 |
| Recommendations for Further Research | 107 |
| BIBLIOGRAPHY | 110 |
| ACKNOWLEDGMENTS | 117 |
| APPENDIX A: INSTRUMENTS USED IN THE STUDY TO MEASURE SUBJECTS' ATTITUDES AND BELIEFS | 118 |
| APPENDIX B: THE USE OF PROJECTIVE INSTRUMENTS TO MEASURE ATTITUDES TOWARD EDUCATION | 130 |

LIST OF TABLES

| | Page |
|---|------|
| Table 1. ACT high school profile - national composite - distribution of high school grades, 1973-1974 school year | 18 |
| Table 2. ACT high school profile - State of Iowa - distribution of high school grades, 1973-1974 school year | 20 |
| Table 3. National 10 percent sample - ACT high school profile, 1973-1974 school year | 21 |
| Table 4. Iowa state composite - ACT high school profile, 1973-1974 school year | 21 |
| Table 5. Means, standard deviations, and numbers of scholastic aptitude test scores classified by candidate's sex and educational level | 22 |
| Table 6. Comparison between freshmen G.P.A.'s of 19,524 men and 17,057 women | 23 |
| Table 7. Descriptive data for the combined male and female subjects sampled in the investigation | 82 |
| Table 8. Total sample dichotomized by sex and age | 83 |
| Table 9. Academic grade-point means, standard deviations, and number of subjects categorized by their sex-identity endorsement | 84 |
| Table 10. Analysis of variance for sex, sex-identity endorsement (Bem), and grade-point average | 84 |
| Table 11. English aptitude (C.E.T.) means, standard deviations, and number of subjects categorized by their sex-identity endorsement | 85 |
| Table 12. Analysis of variance for sex, sex-identity endorsement (Bem), and English aptitude | 86 |
| Table 13. Dogmatism means, standard deviations, and number of subjects categorized by their sex-identity endorsement | 87 |
| Table 14. Analysis of variance for sex, sex-identity endorsement (Bem), and dogmatism scores | 87 |
| Table 15. Religious attitude means, standard deviations, and number of subjects categorized by their sex-identity endorsement | 88 |

| | Page |
|---|------|
| Table 16. Analysis of variance for sex, sex-identity endorsement (Bem), and religious attitude (conviction) scores | 89 |
| Table 17. Internal-external locus of control means, standard deviations, and number of subjects categorized by their sex-identity endorsement | 90 |
| Table 18. Analysis of variance for sex, sex-identity endorsement (Bem), and internal-external locus of control scores | 91 |
| Table 19. Correlation matrix for combined male and female subjects | 92 |
| Table 20. Correlation matrix for total female subjects | 94 |
| Table 21. Correlation matrix for total male subjects | 94 |
| Table 22. Grade-point average (G.P.A.) predicted by means of step-wise regression | 96 |

PREFACE

The impetus for this study was the 1964 Equality of Educational Opportunity study (the Coleman Report) and particularly the finding of the study that a student's sense of control over his environment was the single best predictor of academic achievement. A subsequent review of the locus of control literature revealed many contradictory findings, especially in those studies that investigated differences between males and females. While male subjects generally showed consistent behavior predictability from various measures of locus of control, studies of like samples of females often found the locus of control to be either nonsignificant in predicting female behavior or often opposite from that of males.

Concomitant with the interest in the locus of control concept was an interest in personality characteristics which could be related to academic achievement in college. While numerous studies have shown that such objective criteria as aptitude tests and high school grades were significant in predicting college achievement, these studies often failed to suggest the causes for students performing at different levels on these objective criteria. It was thought that students' self-concepts and attitudes could be fruitful in explaining differences in academic achievement and learning.

One particular self-concept attribute which began to receive considerable attention in the research literature of the 1970's was sex-role identity. If males' and females' behavior and personality attributes are merging into an androgynous personality-type, as the sex-role literature suggested, then research which continues to dichotomize males and females solely on physical gender could be misleading and detrimental for

androgynous individuals who possess personality traits of both sexes. It was thought that perhaps this changing sex-role identity of both males and females could affect the predictability of behaviors, such as locus of control, academic achievement, and learning.

An additional reason for undertaking this study was the belief that a research investigation should be evaluated on its interest and relevance for publication in professional journals. It was felt that a study of the effects and implications of changing sex-role identity on various behaviors and the questioning of research which has dichotomized the sexes based on a traditional sex-role orientation would have merit for publication.

CHAPTER I. INTRODUCTION

Traditionally, American society has viewed the personality characteristics of males and females as bipolar ends of a continuum. Until recently the masculine male and the feminine female have been widely considered the socially accepted and encouraged modes of behavior in American society. Males were generally expected and encouraged to be assertive, constructive, rational, and career-oriented, whereas, females were expected to be yielding, passive, compassionate, and family-oriented (14, 16, 32, 70). Not only was this sex-role stereotyping accepted by laypersons, but it was generally supported and perpetuated by many professionals, including psychologists and educators.

In the late 1960's, psychologists Rychlak and Legerski (77) in describing criteria for personal adjustment suggested that males should maintain an ascendent, domineering behavior pattern while females should be retiring and passive. They stated (p. 33):

We argue that males in our society, by and large, are expected to take the more ascendent-dominant sexual role, and vice versa for the female. . . . Individuals who depart from these sexual role expectancies, we are contending, will be more prone to personal maladjustments than will those who fulfill them.

In their extensive study of clinicians' judgments of mental health in the early 1970's, Broverman et al. (16) found that contemporary clinicians believed that a healthy female is submissive, dependent, noncompetitive, and unaggressive. Conversely, the male who was viewed as healthy or "adjusted" by these clinicians was the one who prescribed to the traditional masculine role, e.g., possessing attributes such as independence and aggression. Broverman et al. describe the implications of the sex-role

"double standard" which locks both males and females into stereotyped behaviors (p. 5):

Thus, while American society continually emphasizes equality of opportunity and freedom of choice, social pressures toward conformity to the sex-role stereotype tends to restrict the actual career choices open to women, and, to a lesser extent, men. A girl who wants to become an engineer or business executive, or a boy who aspires to a career as a ballet dancer or a nurse, will at least encounter raised eyebrows. More likely, considerable obstacles will be put in the path of each by parents, teachers, and counselors.

Professional educators, both as practitioners in the school and as researchers, have continued to dichotomize individuals according to sex-role stereotypes or physical gender. Extensive evidence exists suggesting that sex-role stereotyping perpetuated in the schools has a marked negative effect on students' self-esteem and academic achievement (27, 13, 33, 81, 15). Standardized achievement tests, vocational interest inventories, and college admission tests have been found to present sex-role biases which emphasize a male-oriented world (91, 94). Numerous researchers have also found strong evidence indicating that male students, particularly in the elementary and junior high schools, are at a distinct disadvantage in an educational system which is highly feminized and which rewards traditional feminine behavior, such as conformity and passivity (81, 10, 29, 66).

In addition, research by educators in which sex differences have been investigated has continued to perpetuate a dichotomy by physical gender without considering the extent of growing psychological similarities or alterations in traditional sex-role behavior. Almost without exception, as Brabant and Garbin note (13, p. 28), educational researchers have continued to use the "label assigned at birth" to differentiate individuals' behavior. The College Entrance Examination Board's SAT (4) and the

American College Testing Program's ACT (90) assessments are just two examples in which millions of individuals annually are dichotomized by physical gender in order to compare differences in aptitude performance and academic predictability. In addition, thousands of other studies have been conducted by researchers in education on various aspects of learning, motivation, self-concept, and so forth in which sex differences, based solely on physical gender, were variables of investigation and comparison. Seemingly, most researchers are assuming that sex differences in behavior are inherited and immutable rather than learned and socially defined.

During the 1960's and early 1970's, the feminist movement began to vehemently question institutional and personal sexism. While the larger feminist groups, such as the National Organization of Women, concentrated on specific goals such as equal employment and educational opportunities, abortion reforms, and the extension of child care centers, the smaller more revolutionary feminist groups argued that the class structure, the traditional family, and the values and attitudes of the American male (and the traditional female) needed to be radically altered before women could be truly liberated. Books, such as The Feminine Mystique (34), Sexual Politics (55), Sisterhood is Powerful (56), The Female Eunuch (40), and Women and Madness (19), as well as a voluminous number of magazine and journal articles, depicted the American woman as a repressed minority or as a dehumanized victim of male supremacy. The results seemed to be, as Robin Morgan (56, p. 19) stated, ". . . a growing consciousness of commonality among all women." Women seemingly were not only offered hope for change but cogent support for a direct attack on sexism within American society.

With women increasingly asserting their rights and with a greater expectation of having their own needs gratified, numerous authors have noted (14, 30, 76) that many men today seem threatened, defensive, and even emasculated by the questioning and growing unacceptance by women of the traditional male-female role dichotomy. Contemporary men seem to be caught in an era of what Filene (32, p. 201) called ". . . the twilight of patriarchy" where the old values of patriarchy clash with the emerging values of a sexual egalitarian society. While most men have made some adjustment, often grudgingly, to new definitions of sex-role behavior, a large number have continued to subscribe to an antiquated patriarchal stereotype in an attempt to preserve their privileges and supposed superiority. Perhaps more indicative of male defensiveness than actual truth is the belief held by many men (and some women) that American society is progressively becoming more feminized, voicing Wylie's (96, p. 72) concern with the ". . . wanton womanization of our national life."

Men, according to Brenton (14), are trapped by archaic belief and value systems which limit their views of what masculinity is and how they can express it. As Brenton stated (p. 39):

To be sure, there are outward manifestations of equalitarianism, of role flexibility, of a relaxation of the rigid sexual double standard. But the American male hasn't really integrated these new ways into his personality. . . . He's forced to behave in stereotyped ways that have little relevance in contemporary times. His choices of what to be and do and think are considerably narrowed. His scope as an individual is lessened. Frustrations and anxieties are heightened, and distorted compensatory behavior increase, when the out-moded masculine stereotypes clash with his real temperament. Paradoxically, adherence to stereotypes that aren't relevant to his unique personality cause him to become hostile or overdependent on the female sex.

However, as some writers note (37, 30), men seem to be enslaved like women to rigid sexual stereotypes which hamper their self-development and personal fulfillment. Male enslavement to sexual stereotypes, however, seems to be less obvious and less challenged but equally devastating to personality development. Perhaps a comment by Limpus (as cited by Reuger (75)) on sexual stereotyping has most accurately defined the problem both sexes share in their quest for liberation (p. 75):

When I speak of female liberation, I mean liberation from the myths that have enslaved and confined women in their own minds as well as in the minds of others; I don't mean liberation from men. Men and women are mutually oppressed by a culture and heritage that mutilates the relationships possible between them.

During the past decade a growing body of research and popular literature has appeared suggesting that the dichotomy between male and female role behavior, whether from a traditional or a contemporary separatist perspective, is not only dysfunctional for the individual by locking him or her into a stereotyped pattern of behavior but also incongruous with a democratic society which has continued to espouse equality for all members of society. In addition, as rapid social change is expected to continue, individuals who cannot adapt quickly or constructively and who are insensitive to the multiple stimuli of a rapidly changing society may be impaired in their ability to function. Thus, this trend seems to indicate that it is the flexible or open individual, regardless of gender, who will be the most compatible with social change by utilizing the traditional personality characteristics of either sex.

The term androgyny has recently been used to describe the individual who has combined the traditional personality traits of both sexes in a

functional pattern of behavior. In describing the viability of an androgynous society, Fasteau (30, p. 196) stated:

. . . each person has the potential to be--depending on the circumstances--both assertive and yielding, independent and dependent, job-and-people-oriented, strong and gentle, in short, both "masculine" and "feminine"; that the most effective and happy individuals are likely to be those who have accepted and developed both these "sides" of themselves; and that to deny either is to mutilate and deform; that human beings, in other words, are naturally androgynous.

Some recent evidence suggested that androgynous individuals are not only more flexible and independent of sexual stereotypes than traditional males and females, but they may also be more open to learning and change (6, 7, 30). Hartley (41), for example, believed that the androgynous individual is not only more effective in meeting role demands but is better adjusted to meet various life cycle changes (such as retirement), compared with individuals who adhere to traditional sex-role values. As she stated (p. 143):

It is not strange that the individuals who have been less conformist and who have somewhat deviated from the traditional sex role values in their development seem to sustain the succession of inconsistent sex-role demands most successfully. . . . Effective living at each stage seems to require individual and idiosyncratic emendations of the broad sex-role categories of training and activity society establishes.

Increasing evidence (6, 14, 32, 75) seems to imply that American society is on the threshold of fundamental changes in sex-role behavior for both men and women and that this change is congruent with the needs of the broader socio-economic structure.

Statement of the Problem

While the institution of the family has and will probably continue to receive the greatest impact and problems ensuing from changing sex-role

behavior, no institution will be immune to it. Formal education will continue to feel the impact and demands of a society which espouses egalitarian principles, not only for all racial-minority groups but for the sexes as well. Educators may need to become more aware of and concerned with changes in students' aspirations and values as new definitions of "appropriate" sex-role behavior become accepted by society. It would seem, therefore, that accompanying the traditional concern of schools with preparing students for instrumental roles in society there will also be an increasing need to prepare students who are both sensitive to the values of others and who are flexible and adaptive to continuous innovations in the social structure. At least one critic of education (92, p. 414) believes that "nothing should be included in a required curriculum unless it can be strongly justified in terms of the future." This belief may become an increasingly viable educational goal in a society in which personal values, life styles, and occupations are in a constant state of change. Conceivably, the change with the most profound impact upon society will be in the area of sex-role behavior.

Educators, perhaps more than those in any other profession, have the opportunity and hopefully will take the responsibility for preparing individuals for the future. The problem educators confront is expressed succinctly by Frazier (33, p. 178):

Educators have a choice--to wait for the pressures of social change to be exerted on them or to take the initiative. Rather than mirror social values, educators have the option and we believe the responsibility to lead the way. And we anticipate that as they become more aware of the harmfulness of sexism, they will not only be willing but anxious to do so. After all, it is nothing less than justice, freedom, and equality of opportunity that are in question.

If the trend of social egalitarianism continues, the demands for the flexible, open individual, sensitive to the needs of others, may become the criteria of the educated individual and thus one of the major goals of the educational system.

Specifically, if educators are to be accountable and responsive to the needs of the future, information is needed which will broaden the educator's knowledge of fundamental changes in sex-role behavior and how these changes will affect American society. Educators then face the challenge of being prepared to teach not only a different type of student (e.g., the androgynous individual) but teaching individuals to cope with a rapidly changing and complex world. Leonard Duhl aptly stated the problem educators face (28, p. 132):

Increasingly we are going to have to learn to deal with complexity and change, with new arrangements in new combinations of people, with interdependence. . . . We are going to require a new type of education geared to this kind of learning.

Purposes of the Study

There are three primary purposes of this study. The first purpose of the study was to investigate the extent and possible implications of differences in the sex-identity dispositions of college students and how sex-identity could affect standardized aptitude scores and academic achievement. While extensive research has been conducted on the achievement of males and females, few researchers have sought to investigate or control for personality similarities of college students, regardless of physical gender.

The second purpose of the study was to investigate the relationship of sex-identity differences to (1) flexibility or openness to change,

(2) personal conviction, and (3) the perceived ability to control one's life. All of these personality characteristics have been investigated extensively in educational research as independent variables in relationship to learning, motivation, and adjustment. However, most researchers employing these personality constructs have failed to control or consider psychological similarities between the sexes in their comparison of male and female behavior. This investigation attempted to determine if the androgynous individual was more flexible or open to change, had different personal convictions, and perceived a greater control of his or her life compared with the individual who endorsed either traditional male or female sex-role behavior.

The final purpose of this study was to investigate the interrelated and combined effects of the independent variables (sex-identity, openness to change, personal convictions, control of one's life, aptitude scores) on the academic achievement of college students.

Need for the Study

Limited empirical research has been conducted in the field of education on the effects and implications of a changing concept of student's sex-role identity in relationship to self-concept and academic achievement. Educators will increasingly need information that will optimize their interaction with and sensitivity to students who reject the traditional sex-role dichotomy. In addition, awareness of changing sex-role identity and the implications of this change for both school and society could help educators in formulating and implementing more viable educational goals.

It is also important that researchers in the field of education be familiar with the effects of a changing concept of students' sex-role identity. Researchers in their experimental designs have continued to compare and contrast males and females according to a traditional bipolar sex continuum. Much of this research which the educational practitioner utilizes in the school might be misleading as evidence, as well as detrimental to the personality development of an increasing number of students who do not want to conform to an outdated standard of masculinity or femininity.

In addition, while many studies have been conducted on individuals' flexibility, personal conviction, and the perceived control of one's life in relation to academic achievement, the results, when based on a traditional male-female physical dichotomy, have been highly inconsistent in predicting behavior by sex. Information is needed to determine how individuals' sex-role identity, irrespective of physical gender, would moderate flexibility, personal convictions, and the perceived control on one's life.

Null Hypotheses

Seven hypotheses were developed from the research literature. Hypotheses 1 through 5 were subdivided into three sections for purposes of clarity and testing precision.

Null hypothesis 1

- a. there is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their performance in college as measured by academic achievement.
- b. there is no significant difference between males and females in their academic performance.
- c. there is no significant interaction between sex-identity endorsement and sex (males and females) in relationship to academic performance.

Null hypothesis 2

- a. there is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their performance on a standardized English aptitude test.
- b. there is no significant difference between males and females in their performance on an English aptitude test.
- c. there is no significant interaction between sex-identity endorsement and sex (males and females) in relationship to performance on an English aptitude test.

Null hypothesis 3

- a. there is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their cognitive openness or closedness to new beliefs.
- b. there is no significant difference between males and females in their cognitive openness or closedness to new beliefs.
- c. there is no significant interaction between sex-identity endorsement and sex (males and females) in relationship to cognitive openness or closedness.

Null hypothesis 4

- a. there is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their personal convictions.
- b. there is no significant difference between males and females in their personal convictions.
- c. there is no significant interaction between sex-identity endorsement and sex (males and females) in relationship to personal convictions.

Null hypothesis 5

- a. there is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their perceived ability to control their lives.
- b. there is no significant difference between males and females in their perceived ability to control their lives.
- c. there is no significant interaction between sex-identity endorsement and sex (males and females) and their perceived ability to control their lives.

Null hypothesis 6

There is no significant interrelationship between students' sex, sex-identity endorsement, openness or closedness to new beliefs, personal convictions, the perceived ability to control their lives, grade-point average, and standardized aptitude scores.

Null hypothesis 7

There is no significant difference in utilizing students' sex, sex-identity endorsement, openness or closedness to new beliefs, personal convictions, the perceived ability to control their lives, and aptitude scores to predict academic achievement.

Hypotheses 1 through 5 will be tested by analysis of variance.

Hypothesis 6 will be tested by Pearson product-moment correlation and hypothesis 7 by stepwise multiple regression analysis.

Basic Assumptions

1. That individuals' behavior or personality is measurable and predictable.
2. That scales to measure individuals' behavior or personality characteristics can be constructed and can be utilized as valid measures of individuals' behavior (see Chapter III for scales employed in this study).
3. That a sample of individuals from a population can be a valid and reliable source of information on the behavior of the entire population.
4. That behavior of individuals can be measured and quantified to serve as a valid source in predicting behavior.
5. That the grade-point average of a student in an institution of higher education can be a valid measure of academic achievement and/or learning.

Limitations of the Study

The scope of the study was limited to an analysis of entering freshmen students at Grand View College, Des Moines, Iowa, during the 1975-1976 academic year. Only freshmen students who completed nine or more credit hours

in academic subjects in the fall semester 1975 or the spring semester 1976 were included in the study. The total number of subjects analyzed in the study was 371, derived from an initial sample of 412 students. Forty-one subjects either failed to complete their first semester or reduced their course load to less than nine credit hours.

While the conclusions of the study might be applicable to other freshmen college students, especially as admitted to small, religiously affiliated colleges such as Grand View, the interpretation of the findings can only be claimed for Grand View College.

CHAPTER II. REVIEW OF LITERATURE

Extensive research has considered sex differences in academic achievement and learning. The majority of these studies, however, has been conducted with students at the pre-senior high school level and have generally had certain methodological weaknesses in the research designs, such as restrictive sample sizes (under 100) or samples selected from only one particular academic discipline. In addition, studies investigating personality characteristics in relationship to academic achievement and learning have been extensive but have consistently dichotomized students according to physical gender, without considering the psychological similarities of the sexes.

This review includes five types of studies of academic achievement and learning. In part one only studies including a variety of grade levels, a number of academic areas, and large sample sizes are discussed. Part two of the review focuses on research investigating cross-sex personality differences and similarities of the sexes in relationship to academic achievement and learning. Part three of the review focuses on research derived from the Social Learning Theory of Julian Rotter (71) and his internal-external locus of control construct in relationship to sex and academic achievement.

Part four of the review discusses the theories of Milton Rokeach and his open- and closed-minded construct (69) in relationship to academic achievement and sex. In addition, studies investigating the relationship between the open- and closed-mindedness construct to personal convictions (based on religious beliefs) as they pertained to learning will be

reviewed. Last, part five of the review will cite studies investigating the relationship between the locus of control and the open- and closed-mindedness constructs as they pertain to academic achievement.

Academic Achievement - Sex Differences

The American College Testing Program (90), sponsors of the ACT tests and various academic profiles, and the College Board Admission Testing Program (4), sponsors of the Scholastic Aptitude Test (SAT) and the Achievement Test, are the largest organizations assessing the academic achievement and aptitude of America's youth. Both organizations have tested millions of students and have affected the decisions made by hundreds of colleges and their counseling services regarding the status of high school students and college freshmen.

The American College Testing Program annually assesses almost a million high school juniors and seniors and college freshmen. The ACT assessment includes four tests which measure basic abilities in English, mathematics, social studies, and natural sciences. The Student Profile Section (SPS) of the ACT assessment collects detailed information about the students' personal backgrounds, goals, and academic achievement in high school. The ACT testing service also publishes annually a profile of each state's ACT tests results and high school grades for all students within the state. In addition, a 10 percent national sample is reported each year on test results and high school grades of all students taking the assessment.

Table 1 shows the distribution of high school grades for four academic areas based on a 10 percent national sample of all students taking the ACT

Table 1. ACT high school profile - national composite - distribution of high school grades, 1973-1974 school year

| | <u>English</u> | | <u>Math</u> | | <u>Soc s</u> | | <u>N sci</u> | |
|-----------------------|----------------|----|-------------|----|--------------|----|--------------|----|
| | Freq | PC | Freq | PC | Freq | PC | Freq | PC |
| <u>Men students</u> | | | | | | | | |
| A | 7185 | 21 | 5831 | 17 | 9796 | 29 | 6422 | 19 |
| B | 14917 | 43 | 10173 | 30 | 13582 | 40 | 11968 | 35 |
| C | 10331 | 30 | 11676 | 34 | 8105 | 24 | 9973 | 30 |
| D | 1535 | 4 | 3829 | 11 | 1131 | 3 | 1761 | 5 |
| F | 159 | 0 | 540 | 2 | 77 | 0 | 153 | 0 |
| Not taken | 214 | 1 | 1982 | 6 | 1382 | 4 | 3523 | 10 |
| Mean | 2.80 | | 2.53 | | 2.98 | | 2.75 | |
| S.D. | 0.83 | | 0.98 | | 0.84 | | 0.87 | |
| No. of students | 34341 | | 34031 | | 34073 | | 33800 | |
| <u>Women students</u> | | | | | | | | |
| A | 14200 | 37 | 7451 | 20 | 13554 | 36 | 8560 | 23 |
| B | 17080 | 45 | 12228 | 32 | 14879 | 39 | 14147 | 38 |
| C | 6187 | 16 | 11883 | 31 | 7322 | 19 | 9427 | 25 |
| D | 602 | 2 | 3284 | 9 | 923 | 2 | 1348 | 4 |
| F | 60 | 0 | 289 | 1 | 45 | 0 | 73 | 0 |
| Not taken | 142 | 0 | 2723 | 7 | 1300 | 3 | 4065 | 11 |
| Mean | 3.17 | | 2.66 | | 3.12 | | 2.89 | |
| S.D. | 0.76 | | 0.94 | | 0.82 | | 0.84 | |
| No. of students | 38271 | | 37858 | | 38023 | | 37620 | |

assessment in the 1973-74 school year (90, p. 6). In all four academic areas, females had a higher percentage of A and B grades than males. Grades in English showed the widest discrepancy with 82 percent of the females obtaining B or better grades in comparison to 64 percent of the males. Males were almost twice as likely to obtain a C grade as females in English. The most similar grades of the four academic areas assessed were reported in mathematics where 47 percent of the males and 52 percent of the

females obtained a B or better grade. In the composite of the four academic areas, 70 percent of the males and 81 percent of the females obtained a B or better grade while 30 percent of the males and 20 percent of the females received a grade of C or less (p. 6).

The State of Iowa profile (Table 2), which includes assessment information about all Iowa students taking the ACT, and the Student Profile show results similar to the national sample (p. 6). In all four academic areas, Iowa high school students, both males and females, had a higher percentage of A and B grades than did the national sample. Like the national sample, the widest discrepancy in grades between males and females were in English while the most similar grades were reported in mathematics. In the composite for the four academic areas for the students, 72 percent of the males and 86 percent of the females obtain high school grades of A or B. Similar to the national sample, a significantly greater portion of males (25 percent) compared to females (14 percent) received grades of C or less (p. 6).

The ACT achievement test results show a pattern almost opposite from grades students received in high school for both the national and the State of Iowa samples (p. 5). Unlike high school grades, the ACT national sample composite achievement scores for the four academic areas show males' mean test scores to be higher than females (see Table 3). This difference was evident for students taking the test either as high school juniors or seniors. Males had higher achievement scores in mathematics, social studies, and in the physical sciences. Females had slightly higher mean scores in the English portion of the ACT assessment.

The mean ACT composite achievement scores for students of the State of Iowa (see Table 4) showed similar results to the national sample with males

Table 2. ACT high school profile - State of Iowa - distribution of high school grades, 1973-1974 school year

| | <u>English</u> | | <u>Math</u> | | <u>Soc s</u> | | <u>N sci</u> | |
|-----------------------|----------------|----|-------------|----|--------------|----|--------------|----|
| | Freq | PC | Freq | PC | Freq | PC | Freq | PC |
| <u>Men students</u> | | | | | | | | |
| A | 2344 | 24 | 1878 | 20 | 2907 | 30 | 2077 | 22 |
| B | 4434 | 46 | 3080 | 32 | 4001 | 42 | 3650 | 38 |
| C | 2573 | 27 | 3339 | 35 | 2225 | 23 | 2859 | 30 |
| D | 225 | 2 | 866 | 9 | 212 | 2 | 349 | 4 |
| F | 17 | 0 | 63 | 1 | 8 | 0 | 16 | 0 |
| Not taken | 65 | 1 | 398 | 4 | 287 | 3 | 642 | 7 |
| Mean | 2.92 | | 2.63 | | 3.03 | | 2.83 | |
| S.D. | 0.79 | | 0.93 | | 0.80 | | 0.83 | |
| No. of students | 9658 | | 9624 | | 9640 | | 9593 | |
| <u>Women students</u> | | | | | | | | |
| A | 4965 | 44 | 2362 | 21 | 4228 | 38 | 2664 | 24 |
| B | 4941 | 44 | 3936 | 35 | 4540 | 41 | 4554 | 41 |
| C | 1171 | 10 | 3562 | 32 | 1949 | 17 | 2840 | 26 |
| D | 59 | 1 | 679 | 6 | 197 | 2 | 280 | 3 |
| F | 5 | 0 | 32 | 0 | 6 | 0 | 7 | 0 |
| Not taken | 32 | 0 | 551 | 5 | 226 | 2 | 756 | 7 |
| Mean | 3.33 | | 2.75 | | 3.17 | | 2.93 | |
| S.D. | 0.68 | | 0.88 | | 0.78 | | 0.80 | |
| No. of students | 11173 | | 11122 | | 11146 | | 11101 | |

having higher ACT achievement mean scores than females (p. 5). Both male and female Iowa students had higher ACT mean scores than the national sample in all four categories. Iowa males, like the males in the national sample, only fell below female mean scores in the English portion of the test. Iowa males, compared to females, had a significantly higher percentage of standard scores in the upper range (25-36) in mathematics (males

Table 3. National 10 percent sample - ACT high school profile, 1973-1974 school year

| | Men | | Mean ACT comp | Women | | Mean ACT comp |
|-----------------|-------|----|------------------|-------|----|------------------|
| | Freq | PC | | Freq | PC | |
| HS juniors | 6890 | 20 | 21.8 | 8041 | 21 | 20.1 |
| HS seniors | 25676 | 74 | 19.4 | 28259 | 73 | 18.0 |
| Others | 2351 | 7 | 17.0 | 2512 | 6 | 15.7 |
| No. of students | 34917 | | | 38812 | | |

Table 4. Iowa state composite - ACT high school profile, 1973-1974 school year

| | Men | | Mean ACT comp | Women | | Mean ACT comp |
|-----------------|------|----|------------------|-------|----|------------------|
| | Freq | PC | | Freq | PC | |
| HS juniors | 3857 | 40 | 23.5 | 5257 | 47 | 22.0 |
| HS seniors | 5803 | 59 | 21.3 | 5912 | 53 | 19.9 |
| Others | 98 | 1 | 17.9 | 83 | 1 | 17.5 |
| No. of students | 9758 | | | 11252 | | |

62 percent, females 47 percent), social sciences (males 66 percent, females 57 percent), and physical sciences (males 75 percent, females 58 percent).

The College Board Admission Testing Program annually administers the Scholastic Aptitude Test (SAT) and various achievement tests to over a million secondary school students. Virtually all students who will be attending a College Board member college take the SAT. Students generally take the various achievement tests as stipulated requirements of the college the

student wishes to attend. Unlike the American College Testing program and its ACT assessments, the SAT program does not offer a profile of academic grades of students either in high school or college

Table 5 compares male and female SAT-verbal and SAT-mathematical scores by high school educational level (4, p. 89). Females scored higher than males on SAT-verbal section, but their advantage was only about five scaled score points. However, males substantially exceeded females on the SAT-mathematical section. The male advantage ranged from 39-45 points in the four basic groups of the mathematical section.

Table 5. Means, standard deviations, and numbers of scholastic aptitude test scores classified by candidate's sex and educational level

| Educational level | Males | | | Females | | |
|-------------------------|-------|-----|---------|---------|-----|---------|
| | Mean | SD | N | Mean | SD | N |
| <u>SAT-Verbal</u> | | | | | | |
| Juniors | 465 | 106 | 314,223 | 469 | 105 | 293,667 |
| Seniors | 457 | 110 | 498,462 | 464 | 110 | 415,925 |
| <u>SAT-Mathematical</u> | | | | | | |
| Juniors | 515 | 110 | 314,223 | 474 | 98 | 293,667 |
| Seniors | 510 | 116 | 498,462 | 465 | 105 | 415,925 |

In 1970, 350 College Board member colleges required candidates to take one or more of the 14 achievement tests (p. 5). English Composition was taken by nearly all candidates (86 percent) followed by Intermediate Mathematics (56 percent), American History and Social Studies (30 percent), Chemistry (19 percent), and French (18 percent). Females' average mean for English Composition scores was 30 points higher and French scores 26 points higher than the males' means. Males had significantly higher mean averages

than females in Chemistry (61 points), American History and Social Studies (39 points) and Mathematics Level I (34 points) (p. 97).

The National Council on Education (5) has investigated sex differences in relationship to various aptitude scales and to academic achievement. An extensive study conducted by the Council sampled 39,581 college freshmen enrolled in some 180 different colleges and universities. Table 6 shows the comparison of college freshmen G.P.A. for 19,254 men and 17,057 women. Women tended to obtain higher grades than men during the freshman year. Almost one-half of the women (49 percent) compared to about a third of the men (34 percent) obtained a G.P.A. of 2.50 or above. Men were twice as likely to receive a freshman G.P.A. of 1.50 or below. In other words, according to this study, men were twice as likely to obtain borderline or failing grades as college freshmen (p. 4).

Table 6. Comparison between freshman G.P.A.'s of 19,524 men and 17,057 women

| G.P.A. interval | Percent with G.P.A.'s in the interval | | Percent with G.P.A.'s in the interval | |
|-----------------|--|---------------|--|-------|
| | Men | Women | Men | Women |
| 3.50-4.00 | 4 | 6 | | |
| 3.00-3.49 | 10 | 16 | 4 | 6 |
| 2.50-2.99 | 20 | 27 | 14 | 22 |
| 2.00-2.49 | 30 | 30 | 34 | 49 |
| 1.50-1.99 | 22 | 15 | 64 | 79 |
| 1.00-1.49 | 10 | 5 | 86 | 94 |
| .50-.99 | 3 | 1 | 95 | 99 |
| .00-.49 | 1 | $\frac{1}{2}$ | 99 | 99+ |

For both males and females there was a significant decrease in the percentage of students earning A and B grades in college as compared to high school. While 72 percent of the male students received A or B grades in high school, the percentage receiving such grades during the freshman year in college was 34 percent. Females showed a similar significant decline to that of males in G.P.A. Almost 85 percent of high school females had grades of A or B in comparison to 49 percent of the females during their freshman year of college. However, more than twice as many males (14.3) as females (6.3) received grades of D or lower (p. 5).

The Council also compared male and female college freshmen who had G.P.A.'s of B or better in comparison to academic aptitude levels and high school grades (p. 10). Among students with aptitude test scores at level 5 or higher (range of 1 to 11) and with average grades in high school of B- or higher, females averaged about 15 percent higher than males and, in several instances, were over 20 percent higher in their college grades. The smallest difference (87 percent for males and 90 percent for females) occurred among students in the cell representing the highest aptitude and grade level. The Council suggested that motivational factors probably accounted for this difference between men and women.

Several other studies on academic achievement which have included large samples of students were conducted by individual researchers. Jackson (46) studied the academic achievement, course loads (12 to 19 hours) and drop-out records of all new full-time undergraduates at Michigan State University. Included in the sample were 1,687 males and 1,296 females. Females were found to have significantly higher grade-point averages than males during the first academic term, regardless of the number of credit

hours attempted. In addition, males who withdrew during the first term had significantly lower mean scores on various psychological and reading tests than male students who completed one term. Females who withdrew showed no difference in these tests compared to females who finished one term. The author, however, failed to include data on pre-college grades and achievement test scores and the possible relationship of these indices to college performance and persistence. The higher female achievement and persistence could have possibly resulted from admitting males with lower academic achievement backgrounds.

Northby (58) investigated the academic performance of 12,826 high school seniors from 83 schools in the State of Connecticut. The sample comprised 83 percent of all high school graduates from the state in 1956. Students were categorized into ten decile groups based on their class rank at the time of graduation. Northby found females to be "distinctly superior" to the males when class rank was used as the criterion for achievement. The percentage of females in the top decile was more than twice that of males (13.2 versus 6.3 percent). The percentage of males, however, in the bottom decile was nearly twice that of females (14.1 versus 6.5 percent). The percentage of females in the top five decile groups was 59.2 percent, while the percentage of males was 39.1 percent. Females, in other words, were almost twice as likely as males to be in the upper half of their high school graduating class.

Phelps (62) investigated the high school academic averages of freshmen who applied and enrolled at the University of Georgia for a three-year period, 1969-1971. Phelps found females to have significantly higher high school grade-point averages (.35 of a letter grade higher) than males.

There were 8,619 males and 7,280 females who enrolled during this period. The author, however, offers no data on admission criteria for new students; hence, the new freshmen (either male or female) could be a highly biased sample of the population.

In addition, Phelps investigated the percentage of males and females in the top academic 5 percent of the 1972 junior class in 261 Georgia high schools. Of a total of 46,096 students in the study, 1,474 or 59 percent of the top 5 percent were females while 1,041 or 41 percent were males.

In summary, evidence indicates that females' academic achievement both in high school and in the freshman year of college is superior to that of males. In several studies, males were found to be twice as likely to obtain borderline or failing grades as females. However, on standardized aptitude tests, such as the ACT and the SAT profiles, males performed significantly higher than females in such areas as mathematics and science, while females only slightly outperformed males on tests measuring various components of English and foreign languages.

Last, while all of these studies sampled large numbers of students from various grade levels and academic areas, no consideration was given to the sex-identity disposition of the subjects. Physical gender was the only consideration in dichotomizing the subjects.

Sex-Role Behavior, Intelligence, and Achievement

One of the first extensive investigations of sex-role behavior was conducted by Terman and Miles in 1936 (89). A masculinity-femininity scale (M-F) composed of 456 items divided into seven subtests or exercises was constructed. The seven subtests sampled a wide range of assumed sex

differences, including interests, opinions, knowledge, emotional and ethical considerations, ink-blot associations, and introvertive-extrovertive responses. Each response carried a weight of one and was scored either + or -, that is, masculine or feminine. The range of scores, according to Terman and Miles, of the general adult population is "roughly" from +200 to -100, with a mean of +52 and a standard deviation of 50 for males and +100 to -200, with a mean of -70 and a standard deviation of 47 for females (p. 5).

In order to investigate sex differences in the general population, Terman and Miles sampled individuals from many socio-economic and educational levels. However, college students were their principal subjects of investigation. With the college subjects, numerous other tests and scales, such as the Laird C-2 Personal Inventory, Strong's Vocational Interest Test, the Stenquist Mechanical Ability Test, and the Thorndike Intelligence Test were used in correlation with the M-F scale.

The authors found significant relationships between intelligence and masculinity-femininity scores for college students. Females with above average scores in intelligence scored significantly (.05 level) higher on the masculinity portion of the M-F test (mean -24.3) than females with below average intelligence (mean -46.2). The authors didn't define above or below average intelligence. However, females above average in academic achievement were somewhat more feminine on the M-F test than females below average in achievement (mean of -33.1 versus -27.9).

Terman and Miles divided high-achieving and low-achieving college males into two equally numbered groups. This comparison resulted in similar M-F means for the subjects above and below average in achievement.

When the same subjects were divided by levels of intelligence, the lower intelligence group rated slightly more masculine (77.1 versus 72.8). The authors then divided the male subjects into quartiles based on their academic grade-point averages for two or more years. A significant relationship "of considerable magnitude" was found between achievement and M-F scores. Males in the upper achievement quartile had a mean M-F score of 61.6 and lower quartile males a mean of 92.3, indicating that feminine males achieved significantly higher than masculine males. As Terman and Miles state: "It appears, therefore, that whatever the level of intelligence there is a considerable negative correlation between scholarship and mental masculinity in the case of men" (p. 108). Terman and Miles also suggested that if this magnitude would prove to be true for larger groups "then the M-F test might prove a useful aid in the prediction of college success" (p. 108).

Several other researchers lend support to Terman and Miles' findings. Kagan and Moss (49) undertook a longitudinal investigation of the psychological development of 45 females and 44 male white, middle-class children. The first phase of the investigation was an intensive study of the subjects from infancy to 14 years of age. This phase involved a systematic account of each subject's development based on narrative reports, ratings, and interviews of subjects, parents, and teachers by the researchers. In addition, various intelligence and personality tests were administered to the subjects. The original subjects were again assessed as adults, some 20 years later. The major behavioral areas evaluated for the 0-14 year olds and for the adults were achievement, aggression, dependence, recognition,

heterosexual behavior, fear of physical harm, quality of social interaction, and passive withdrawal.

Kagan and Moss found that the achievement behavior at 10 to 14 years of age was highly correlated (positive) with adult achievement for both sexes. Athletic mastery at ages 10 to 14 was negatively correlated with adult intellectual concerns and intelligence in men ($r = -.47; < .05$). Males who rejected a masculine image during early adolescence increasingly defined their self-esteem by intellectual pursuits and concerns as they become older. Conversely, females who were defined as masculine oriented during early adolescents, that is competitive, daring, and independent, valued intellectual pursuits more as adults, compared to the feminine females.

Thus, males and females who adopted or identified with the role personalities of the opposite sex by early adolescence were the highest in academic achievement as adolescents and continued to value intellectual pursuits as adults. Kagan and Moss' views are summarized below (p. 145):

There is one element of commonality between the high achieving boys and girls in our sample. These children did not adopt the traditional sex-role attitudes and behaviors. The boys were non-competitive, nonathletic, and fearful; the girls were fearless, independent, and competitive. It may be that intense involvement in intellectual activity is facilitated by a weak identification with the traditional sex-role values of the majority peer group.

More recent evidence by Sexton (81) offers support to both Terman and Miles' research and Kagan and Moss' findings on the feminine male. Sexton investigated the sex-role orientation of adolescent males (N around 500) in a large suburban high school. Using the masculinity scale of the California Psychological Inventory, in addition to questions solicited from counselors, teachers, and coaches about the subjects' interests, attitudes, and

personal characteristics, Sexton categorized males who were masculine or feminine in their sex-role orientations.

All the subjects were divided into three academic groups: high achievers (A and B grade averages); middle achievers (C average); and low achievers (D and F averages). The feminized males were found to have significantly higher mean grades than the masculine males. The greatest disparity was found in the subject of English. Half of the masculine males received D's or F's in English, while none received A's. Conversely, almost one-third of the least masculine males received A's. In addition, scores on the Differential Aptitude Test were found to be significantly related to sex-role orientation. Feminized males had the highest aptitude score on the D.A.T., which according to Sexton focuses on verbal ability (p. 63).

Sexton believes that America's educational system exerts a feminizing influence on both students and teachers. The top scholars in school are highly feminized and are rewarded by teachers for conforming, polite, obedient, and uncreative behavior. These traits, according to Sexton, are traditionally a part of female-role behavior and indicate why females are given better grades than males with comparable ability. Conversely, masculine males are "turned off" by their experiences in school and either drop out or become behavioral problems. Sexton offered no data on masculine-oriented females and if the same characteristics and consequences for these students would be comparable to masculine males.

Research has demonstrated that creativity in males is related to femininity. MacKinnon (53) investigated the personality characteristics of the 40 most creative architects in America. Editors of 11 architectural

journals and five "esteemed" architect professors were asked to submit a list of the 75 most creative architects in America. A total of 64 architects' names appeared more than twice from the names submitted by editors and professors, and these architects were then invited to attend a weekend of intensive study at the Institution of Personality Assessment and Research, University of California-Berkeley Campus.

At the Institution each architect was given a battery of personality tests, including the Minnesota Multiphasic Personality Inventory (MMPI), California Psychological Inventory, and the Strong Vocational Interest Blank. "The most striking aspect," as MacKinnon noted, "of the MMPI profiles of all our male creative group is an extremely high peak on the Mf (femininity scale) scale (p. 488). In addition, the author found that the subjects scored high on femininity on both the California Psychological Inventory and the Strong Vocational Interest Blank.

As MacKinnon concludes (p. 488):

The evidence is clear: The more creative a person is the more he reveals an openness to his own feelings and emotions, a sensitive intellect and understanding self-awareness, and wide-ranging interests including many which in the American culture are thought of as feminine. In the realm of sexual identification and interests, our creative subjects appear to give more expression to the feminine side of their nature than do less creative persons.

In another study, Holland (44) investigated nonintellectual factors in predicting college grades and found that femininity in both males and females was positively correlated with academic achievement. Subjects in Holland's investigation were 641 males and 311 females attending 277 colleges and universities. The sample was drawn from the 7,500 finalists of the National Merit Scholarship Program. The nonintellectual predictors

used were Cattell's Sixteen Personality Factor Questionnaire (16 PF), the National Merit Student Survey (NMSS), and the Vocational Preference Inventory (VPI).

Holland found that the highest single positive correlation with academic achievement for males on the 16 PF was femininity, while physical activity had the highest negative correlation. Both correlations were found to be significant at the .01 level. For Harvard University students with the highest male sample ($N = 66$) of all the institutions in the investigation, academic achievement was significantly related to femininity, naïveté, and emotionality.

However, female subjects in this study were rewarded for traditional female role behavior. Holland found that the personality traits most significantly related to academic achievement for females were conservatism, passivity, and submissiveness. Regardless of sex, as Holland notes, the colleges and universities from which the sample was drawn seem to "reward students characterized by passivity and dependence" (p. 251).

In contrast to Holland's study, Houts and Entwisle (45) found that masculine-oriented females had significantly higher academic goals and significantly higher achievement than feminine females. Houts and Entwisle investigated the sex-role orientation and attitudes in competing for grades of 405 females from four high schools (no mention of how they were selected). Sex-role orientation was measured by the authors' scale which consisted of a question in which the subjects rated the ideal woman on a ten-point scale. "This question," as the authors noted (p. 285), "permitted the girls to be classified as having a 'masculine' or 'traditional' sex-role orientation." Each subject was asked about her attitude in

competing for grades, while English and social studies grades were obtained from school administrators.

The authors found a significant relationship ($p = < .01$) between competitive attitudes toward males and academic performance among females with a masculine sex-role orientation. Conversely, no relationship between these attitudes and performance was found among girls with a traditional sex-role orientation. Houts and Entwisle suggested that the competitiveness and higher achievement attitudes of the masculine-oriented females permitted them to compete openly with males in the classroom while the traditional females may have been inhibited and feared rejection in expressing their competitive feelings.

However, a study by Doherty and Culver (27) found that while masculine-oriented female high school students were higher in intelligence test scores, they were penalized for masculine-oriented behavior by teachers and received significantly lower grades than feminine females. Doherty and Culver correlated scores on the Lorge-Thorndike Intelligence Test (verbal subtest) and academic rank with responses on the Inventory of Female Sex-Role Values (I.F.V.). On the I.F.V. subjects indicated on a five-point scale their agreement or disagreement with certain female role behavior descriptions. High negative scores on the scale indicated a intrafamilial traditional feminine orientation, while high positive scores indicated a nontraditional, personal fulfillment or masculine orientation.

A significant positive correlation was obtained ($p < .01$) between the Lorge-Thorndike Test scores and masculinity on the I.F.V. scale. Thus, females who identified with a personal-fulfillment, masculine orientation had significantly higher scores on the intelligence test than the more

traditionally oriented females. However, Doherty and Culver found that the nontraditional "personal fulfillment" females were significantly lower in overall academic achievement ($p < .01$) and in class rank ($p < .05$) than the traditional females. The authors suggested that the lower achievement and class rank of the nontraditional females may be due to their violation of teachers' expectations of appropriate feminine behavior, resulting in a negative bias by the teachers in evaluating these students.

In summary, generally consistent evidence has been found for males with feminine personality attributes. Feminized males, compared to masculine-oriented males, have been found to have higher intelligence test scores, to be more creative, and to be recipients of higher academic grades, both in high school and college. Masculine-oriented females have consistently scored higher on intelligence and achievement tests than feminine females. However, research investigating the relationship between cross-sex identity and academic achievement or grade-point average for females have produced inconsistent results. Several studies have found feminized females obtaining higher grades in college and high school while other studies have found similar results for masculine-oriented females.

Research on cross-sex personality differences have judged individuals on the extreme ends of a bipolar sex continuum. No consideration was made for androgynous individuals who may possess in varying degrees both female and male personality characteristics. Possibly some of the research on cross-sex differences may actually be defining androgynous individuals and not the bipolar extremes of the sex continuum.

Internal-External Locus of Control

The internal-external locus of control construct is based on the Social Learning Theory of Julian Rotter (71). Rotter's theory differs from other psychological theories on learning by emphasizing the influence of the social environment upon behavior. Man's behavior, according to Rotter, is determined by his goals within his cultural context. An individual learns to respond to those behavioral patterns which will lead to the greatest satisfaction in a given situation. Rotter rejects the assumption that man's behavior and learning are the results of instincts or other physiologically determined drives. Man's motives, learning, and subsequent personality are the results of interaction with his social environment.

Rotter describes how the growing child's awareness of self and others is built by learning in the social environment. At first, the infant's psychological needs and biological drives are satisfied by the mother. The growing child soon learns that many types of behavior invoke responses from the mother, with some behavior bringing satisfaction and reinforcement and other behavior bringing dissatisfaction and avoidance. The child learns to seek mother's approval and attention while avoiding her disapproval, until finally even in the absence of mother, the growing child learns how to act and react to others outside the immediate family and becomes increasingly aware of other individuals' needs and expectations. Gradually, each individual develops a set of differentiated motives or needs based on his own unique social experiences.

The individual learns through past experiences that satisfaction is more likely to occur in one situation than in another. How an individual reacts to a situation depends on his own past experience which

differentiates his goal behavior from others. Each individual then learns behavior or sets of behavior which will lead to a particular goal or satisfaction. Every situation that the individual faces presents him with clues which define his expectancies that his behavior will lead to a desired outcome. In other words, the person's behavior is not only determined by the nature or importance of goals or reinforcement but also by the person's anticipation or expectancy that these goals will occur.

Rotter, however, believes that goals and needs are not the only important index of individual differences. Individuals differ in their attitudes toward similar situations, in how they respond to strong reinforcements, and in how they respond emotionally to anticipated situations and reinforcements. In addition, individuals differ in how they perceive their own behavior in determining goal fulfillment and reinforcement. How a person perceives his own behavior in complex social situations or in solving intellectual tasks is referred to as a "generalized expectancy" in social learning theory.

Central to the individual's "generalized expectancy" is how the individual perceives his sense of control in determining life events and outcomes. Does the event or outcome follow from and is it dependent upon the individual's own actions, or is the event or outcome controlled by forces beyond the individual's control and will it occur independently of his actions? Rotter believes that when an individual comes to perceive a wide range of situations or reinforcements beyond his individual control, then in our culture this behavior is typically perceived as the result of luck, chance, fate, or under the control of powerful others. Rotter labels an individual with this type of "generalized expectancy" as being "externally

controlled." However, when an individual perceives that situations or reinforcements are contingent or follow from his own actions or attributes, this behavior is labeled "internal control."

Thus, depending on the perception of events, the internal-external locus of control forms a "generalized expectancy" to situations and goals for the individual. Rotter hypothesizes that these variables (external-internal) are of major significance in understanding the nature of the learning process. He further believes that individuals are consistent in the degree to which they attribute personal control to events or rewards in the same situation. Thus, behavior and learning are contingent upon whether or not the person perceives a causal relationship between his own behavior and the reward.

An extensive amount of research has been generated from Rotter's locus of control construct. Between 1966 to 1971 over 300 studies were published involving the construct and Rotter's I-E scale (discussed in Chapter III) in relationship to a wide variety of behaviors. In addition, the I-E scale has been translated into at least six other languages, and four children's scales are in use based on the original I-E control scale (72).

One of the first large-scale studies involving the internal-external control dimensions (used a children's version of the I-E scale) was the 1964 Equality of Educational Opportunity study (21). The study, popularly known as the Coleman Report, was a survey of over 645,000 students enrolled in grades 1, 3, 6, 9, and 12 from 4000 schools in all 50 states. The main focus of the study was to determine the various "inputs" and "outputs" of the school system which could influence students' success. Tests and questionnaires were given to students focusing on the extent and causes of

inequality in the public schools. In addition, extensive surveys were conducted with teachers and administrators, and data on the school facilities were obtained. Over 100 variables pertaining to school success were measured in the survey.

From the formidable amount of data that was collected, the single best predictor of academic achievement for disadvantaged students of any race (no sex differences were cited) was their sense of personal control over the environment. As Coleman et al. stated (pp. 320-321):

The special importance of a sense of control of environment for achievement of minority group children and perhaps for disadvantaged whites as well, suggests a different set of predispositional factors operating to create low or high achievement for children from disadvantaged groups than for children from advantaged groups. For children from advantaged groups, achievement or lack of it appears closely related to their self-concept. . . . For children from disadvantaged groups, achievement or lack of achievement appears closely related to what they believe about their environment: whether they believe the environment will respond to reasonable efforts, or whether they believe it is instead merely random or immovable.

The Coleman Report's major conclusion was that such factors as the school educational program, teachers' education or salary, and the amount of money spent on the school facilities had little relationship to the academic success of disadvantaged students. The most important factor related to achievement was what the student brought with him from his family and community environment, including foremost how the student viewed his ability or inability to control his life.

Several studies have investigated the relationship of the internal-external control concept to academic achievement and sex in college populations. Brown and Strickland (17) investigated the relationship of I-E control to involvement in academic activities and to grade-point averages.

Subjects in the experiment were 94 males and 74 female undergraduates enrolled in introductory psychology classes. The results of an analysis of variance for all the subjects suggested that internal students were more likely than external students to participate in academic activities, though the level of significance did not reach conventional levels of significance ($F = 3.06$, $df = 1/164$, $p < .09$). However, in dichotomizing the sexes the authors found a significant relationship between internality in males and higher grades ($r = .47$, $p < .01$). Locus of control was not predictive for female achievement behavior. In their conclusion, Brown and Strickland stated (p. 148):

Further research directed toward an understanding of the development of locus of control and sex-linked behaviors, particularly with reference to academic achievement, is clearly indicated.

Brown and Stricklands' study has been supported by other researchers. Boor (12) investigated the relationships between I-E control, the number of points earned in introductory psychology class (criteria for achievement), and scores on the Wechsler Adult Intelligence Scale. High externality in male subjects was negatively correlated with both course achievement (number of points earned) ($r = -.31$, $p < .05$) and with scores on the intelligence scale ($r = -.36 < .025$). However, for females I-E control scores were not significantly related to either course achievement or intelligence scores ($r = \pm .13$, $ps > .05$). In addition, Boors found that females obtained significantly higher I-E scores than males ($r = .25$, $p < .05$, two tailed).

A study by Nowicki and Roundtree (59) supported Brown and Strickland's and Boors' findings in that internality was correlated with males' achievement, while no relationship was found for females. Nowicki and Roundtree

investigated the relationship between the I-E construct, extracurricular activities, academic achievement, and intelligence among high school seniors. Previous research according to the authors had failed to investigate the relationship between achievement and extracurricular activities. The California Achievement Test was utilized to measure achievement, and the Otis-Lennon Mental Abilities Test was utilized to measure intelligence. Involvement in extracurricular activities was derived from students' self-report and from administrators and teachers.

Internal males were found to have significantly higher performance scores on the California Achievement Test ($r = -.44$, $p < .01$) than external males. There was no significant relationship between the I-E construct and achievement for females. Scores on the Otis-Lennon Mental Test were unrelated to the I-E construct for both sexes. For the extracurricular activities' measures, females were significantly ($p < .01$) more involved in activities than males, while the interaction effect ($p < .10$) suggested that internal females engaged in more activities than external females.

Nowicki and Roundtree believed that the sex differences may, in part, be explained by the fact that American culture rewards males more than females for academic performance and females more than males for involvement in extracurricular activities. The authors, however, didn't mention the cultural emphasis on male-dominated high school sports and whether this was included as extracurricular activities. In addition, as numerous studies have indicated, females consistently outperformed males in academic achievement as measured by high school grades.

Another study which revealed a disparity in how male and female behavior relates to the I-E construct was conducted by Reimanis (67). Subjects

were 327 male and female college students randomly selected from freshman English classes at Corning Community College, New York. The study was designed to test the hypothesis that internal control can be increased by application of behavior modification techniques and by special counseling and achievement motivation training. One hundred fifty-one of the subjects had been defined as high-risk academic students based on a review of their high school records and SAT scores. These students had undergone one week of achievement motivation training during the summer prior to the start of their freshman year. Two remaining "regular" groups of students, 86 who volunteered to undergo motivation training and a control group of 90 with no motivation training, were included in the study.

To test the hypothesis, the I-E scale was administered to the 151 high-risk and the 86 regular students on three occasions: immediately before motivational training and again after one to two months and after seven months of training. The control group was administered the I-E scale during the beginning of the fall semester and then on the same post-test basis as the other students. The mean I-E scores decreased significantly ($p < .01$) for the high-risk and the regular groups immediately after the motivational training. At this point there was no significant difference between males and females.

The post-test results after the one- to two-month period showed a significant ($p < .05$) mean decrease, compared to the pre-motivational training period, in externality for both the high-risk and regular subjects. Again, no significant sex differences were reported. However, after the seven-month period, the initial increase in internal control for the females had

disappeared. For males the significant increase in internality was still present.

Reimanis believed that his hypothesis was partially supported. Achievement motivation had immediate and long-lasting effects in developing internal control in male subjects. However, for females the significant increase immediately after training seemed to dissipate after seven months. Reimanis offers the following explanation for the differences in the male and female behavior responses (p. 125):

. . . because of early social learning the female students perhaps were not as career or competition oriented, and as a result the achievement motivation training procedures were less relevant to them than to the males. The females increased in internal control immediately following the training, but they may have discovered that the role they felt more comfortable with was not career or long-range goal oriented.

However, other studies have found significant relationships between female locus of control scores and achievement. Massari and Rosenblum (54) examined the relationship between locus of control, interpersonal trust, and academic performance of 43 females and 90 males in an introductory psychology class. The expected relationship between trust and achievement was based on the authors' rationale that more trusting persons would accept statements of presumed facts from other sources (e.g., instructors, textbooks) more often than less trusting persons. In order to avoid variability of grading standards, the achievement criteria was the final examination administered to all subjects in the course. The authors first hypothesized that there would be a positive relationship between internal scores on the I-E scale and achievement, the relationship being greater for men than women. Their second hypothesis was that there would be a positive relationship between trust and academic achievement.

The results of hypothesis 1 failed to confirm the prediction. No significant relationship was found between male's I-E scores and achievement. However, women scoring high on the I-E scale (high external) showed significantly better achievement scores ($r = .27$, $p < .05$). The second hypothesis proved to be nonsignificant for males ($r = -.04$), while for women the more trusting attitude was related to lower academic performance ($r = -.37$, $p < .01$). No significant relationship was found for either sex between I-E scores and intelligence tests as measured by the verbal, quantitative, and total SAT entrance raw scores.

In the conclusion to their study, Massari and Rosenblum suggested through the use of "post hoc reasoning" that women may have viewed the final exam as an external or fate control situation and viewed the testing environment as not worthy of trust (p. 359).

In another study, Gozali and Clearly (39) found that internally-oriented females utilized time more appropriately in taking tests of achievement. They investigated the relationship between locus of control and achievement by manipulating learning tasks to create a skilled-controlled and a chance-controlled condition. The particular task behavior of interest for the researchers was time utilization on a test of verbal ability. Specifically, their hypothesis was that internal subjects would use time in a manner more appropriate to the task than would external, that is, they would spend less time on easy items and more time on difficult items while external's time utilization would not be systematically related to item difficulty. Gozali and Clearly's conjecture was that achievement tests measure more than intellectual variables and that since most tests have a time limit good use of time is important to test performance.

Sixty-three volunteer subjects at the University of Wisconsin were administered the I-E scale with the scores divided into three equal groups. The three cell groups were called the internal group (scores 1 through 7), the middle group (scores 7 through 12), and the external group (scores of 12 or more). The instrument chosen to measure the relationship between time utilization and item difficulty was selected from a pool of items made available from the Educational Testing Service. The final instrument consisted of 20 multiple-choice items plus analogies, antonyms, and sentence completion items.

Gozali and Clearly found that the I-E scale was significantly related to predicting time utilization in that the more internal the subject's orientation, the stronger was the linear relationship between time utilization and item difficulty (univariate $F = 4.94$, $df\ 1/60$, $p < .03$). The authors also believed that the trend was stronger for females than males because of the higher number of males, but their lower mean scores, in the internal group lowered the relationship between time utilization and test item difficulty. Had there been an equal number of males and females in each group, the obtained significant relationship between internality and time utilization would have been even stronger.

In summary, the locus of control construct and the I-E scale were generally predictive for males' behavior in that internality was positively related to achievement and intelligence. These relationships were consistent with Rotter's theory on the internally-oriented personality.

However, no such consistent relationships have been found for females. Generally, no significant relationship was found between females' I-E scores and academic achievement. Some evidence has also indicated that

high externality in females was associated with high achievement, the reverse of that for males. Conversely, other evidence indicated that internally-oriented females would be more efficient in taking tests of achievement. Evidence also exists which suggested that externality in males was more readily changed than like behavior in females under behavior modification programs.

Studies investigating the relationship between the I-E construct, achievement-intelligence, and sex often show questionable methodological procedures. The sample sizes have been small with the subjects generally selected from one academic discipline (psychology) and from one or two comparable classes. In addition, research related to the locus of control construct has consistently dichotomized the sexes by physical gender. No consideration has been made of personality differences or similarities and their relationship to the sex-identity disposition of the male and female subjects.

Dogmatism

Dogmatism, learning, and sex

Rokeach (69) developed his conceptualization of the open and closed mind from earlier work by Adorno et al. (1) on the authoritarian personality. Individual openness or closedness to new cognitive beliefs is dependent, according to Rokeach, on how the individual receives, evaluates, and acts upon information. The more open one's belief system, the more evaluating and acting on information should proceed independently on its own merit. In addition, Rokeach theorized that the more open the individual's belief system, the more the individual should be governed in his

actions by internal self-actualizing forces and the more he should be able to resist pressures exerted by external forces.

Persons characterized as having closed systems of belief depend on irrelevant internal drives (e.g., insecurity, fear of rejection) and/or arbitrary reinforcements from external authorities. According to Rokeach, closed-mindedness can be defined as a form of ideological dogmatism. He defined dogmatism as ". . . a closed way of thinking which could be associated with any outlook on life, an intolerance toward those with opposing beliefs and a sufferance of those with similar beliefs" (p. 62).

Rokeach believed that the more closed the system, the more the individual would see the world as threatening. The mechanism employed by the closed-minded individual for screening out threatening knowledge of reality by distorting and narrowing cognitions was a constellation of preconceived beliefs which he called dogma. Thus, Rokeach equated the closed mind with the dogmatic mind.

An important addition to Rokeach's theory has been the work of Landsman (50) who applied the open- and closed-minded concept specifically to education and learning. Landsman believed that researchers in education have proceeded along two major paths: the atomistic path, as in programmed learning, from parts to whole, and the learner or self-concept path in which the learner is viewed as a self-perceiver as he encounters learning tasks. It was to the latter path which Landsman directed his attention, relating self-concept to the open and closed constructs.

All learning, according to Landsman, is internalized more rapidly as it is perceived positively to one's self-concept while learning which is related negatively to one's self-concept is avoided or rejected. Unlike

the open self, the closed self is constricted, rejecting fearful or new experiences. He stated (p. 294):

A series of threatening, frightening school years constricts and closes the self, develops feelings of self-worthlessness and continues the vicious circle of avoidance of learning.

Landsman believed that individuals must come to possess an open mind because people learn only when they have found that learning has personal value for them.

Several studies have found that dogmatism is related to personality disorders which could impede learning. One such study was conducted by Vacchiano et al. (93) in which they examined the personality correlates of dogmatism in a college population. The specific purpose of the research was to determine whether the dogmatic personality could be predicted from commonly-used traits which logically related to the belief structure of closed-minded individuals.

Three widely used personality scales, measuring different approaches and concepts of personality, were used to assess different modes of personality functioning. The three scales were the Edwards Personal Preference Schedule (EPPS), based on a need structure theory; the Sixteen Personality Factor Questionnaire (16 PF), based on a source-trait theory; and the Tennessee Self-Concept Scale (TSCS), based on a multidimensional self-concept theory. In addition, Rokeach's Dogmatism Scale was administered to the 53 male and 29 female college students utilized in the study.

Of the 59 scales contained within the three testing instruments, 20 factors were obtained which accounted for 81 percent of the variance. Each of these 20 personality factors was significantly related ($p < .05$) to Rokeach's closed-minded or dogmatism scale component. From these factors

Vacchiano et al. deduced a personality profile of the high-dogmatic subjects.

On the EPPS, high-dogmatic subjects revealed an intolerance for understanding the feelings and motives of others and an avoidance in changing their environment or daily routines. High dogmatism was significantly related to such TSCS factors as low self-esteem, defensiveness, anxiety, and a lack of confidence in self. Perhaps the 16 PF factors correlated with high dogmatism would be most related to learning in higher education. These subjects who were frustrated by changeable conditions became more submissive and conforming to established ideas. In addition, these high-dogmatic subjects were confident in what they have been taught to believe, accepted the "tried-and-true" despite inconsistencies, and were cautious and compromising in regard to new ideas. The investigation of Vacchiano et al. substantiates Rokeach's and Landsman's theories on the closed-minded individual and how dogmatism could prevent or impede normal learning. As Vacchiano et al. stated (p. 84): "Personality maladjustment and instability appear to underlie dogmatism."

Numerous studies have investigated the relationship between dogmatism and academic achievement. Frumkin (35) investigated the relationship between achievement in sociology courses and subjects' degree of dogmatism among 135 college students. Subjects were administered Rokeach's Dogmatism Scale and Allport, Vernon, and Lindzey's Study of Values Scale. The Values Scale was used to investigate the kinds of values supported by subjects with various degrees of dogmatism. Frumkin used a point-method of grading to establish a more accurate estimation of the students' achievement rather than the "crude grade designations A, B, C, D, and E."

Frumkin contrasted the 17 highest scores on dogmatism with the 17 lowest scores. The mean difference for the high dogmatism scores was significantly different ($p < .01$) than the mean for the low dogmatism scorers. In addition, the low-dogmatic subjects had significantly higher ($p < .01$) mean grade points than the high dogmatics. The author also found from the Study of Values Scale that high dogmatism scores were related to higher economic and religious values and lower theoretical values. Frumkin fails to define these values and their implications for academic achievement nor does he examine the relationship between dogmatism and sex.

Costin's (23) investigation contradicts the study by Frumkin. Costin used a pre-course and post-course multiple-choice psychology test to determine the relationship between dogmatism and achievement. Subjects in the experiment were 67 students enrolled in an introductory psychology class. In addition to the pre- and post-tests, Costin administered the Dogmatism Scale and SCAT verbal reasoning inventory to each subject. No significant ($p > .05$) relationship was found between dogmatism, classroom performance (difference between pre- and post-tests), and SCAT scores. However, Costin did find a significant positive ($p < .01$) relationship between SCAT scores and classroom performance.

Costin concluded by stating (p. 187):

Dogmatism is differentially related to classroom learning, depending on the particular nature of the learner's dogmatism, and its relevance to the kind of learning task he pursues.

Inconsistent evidence has been reported by researchers who have attempted to investigate sex differences in relationship to dogmatism.

Anderson (3) found a significant relationship between dogmatism, intelligence, and sex for 346 eleventh- and twelfth-grade Canadian students.

Females were more dogmatic than males at both grades 11 and 12, but the differences did not reach a level of significance. However, the upper 10 percent of both males and females on intelligence scores (Otis AM-IQ) showed significantly different dogmatism scores. Females in the top 10 percent had significantly ($p < .05$) higher dogmatism scores than males in the top 10 percent.

Anderson suggested that the higher dogmatism scores for females had their locus in restrictive child-rearing practices. Thus, intelligent females may have been significantly more hostile (and supposedly more dogmatic) because of their child-rearing and their perception of a submissive secondary role in a masculine-oriented society.

However, other evidence suggested that high dogmatism in males is positively correlated with academic achievement. Steininger (85) investigated the relationship between dogmatism, grade-point average, and SAT scores for 74 male and 75 female freshman community college students. A significant negative relationship was found between dogmatism and SAT scores for both sexes. However, Steininger found that dogmatism and grade-point averages were positively related for males. Thus, males who were the most dogmatic or closed-minded received the highest grades. No relationship was found between dogmatism and grades for females. Steininger did not offer any statistical data on the levels of significance for any relationships in the study nor did he offer mean scores or the number of subjects who were classified as high or low dogmatic.

Steininger believed that males, as compared to females, were under more pressure to achieve, being concerned about grades for graduate school and a way to avoid the draft. One result of this stress on achievement was

a greater sense of anxiety which, according to the author, often produced a more closed or dogmatic mind. The author suggested that on any given test males will be working harder for grades, and the highest achieving males will be the most anxious about grades and the most dogmatic.

Numerous studies have found a consistent difference in the degree of dogmatism for male and female subjects. In a longitudinal study of college students ($N = 2,350$) from the freshman to the senior year, Plant (63) found that females had significantly lower scores at all grade levels on Rokeach's Dogmatism Scale than did males. However, both male and female subjects had a consistent decrease in mean dogmatism scores over the four-year period, with no significant difference in the decrease between the sexes. Plant suggested that education and particularly the "collegiate experience" seem to facilitate lower dogmatism scores. The author, however, did not offer any explanation for the significant lower dogmatism scores for females.

Alter and White's (2) findings supported Plant's evidence. The authors sampled 1000 male and 1000 female students at the University of Utah and found a significant difference in dogmatism scores between the sexes. Males had significantly higher dogmatism scores than did females. In addition, Alter and White reviewed 37 studies investigating sex differences and dogmatism from a wide variety of populations and found that males showed consistently higher scores than females.

The authors suggested that sex differences may be due in part to what they believe is a sex bias in the Dogmatism Scale. Women may interpret statements in the scale such as "I would like to be a great man like Einstein" entirely different than males. Would women, the authors ask,

like to be a great person or like to be a man? In their own research, Alter and White found that when this particular item was excluded from the scale the difference in dogmatism scores between males and females was reduced by 1.1 mean points.

Dogmatism, religious convictions, and learning

Rokeach, as well as subsequent researchers in the area of dogmatism, has suggested that closed-mindedness or dogmatism and a firm belief in a particular conviction or belief system may be synonymous. Rokeach's view of dogmatism as being a relatively closed system of beliefs and disbeliefs about reality and providing a framework for intolerance and qualified tolerance of others might apply to an adamant, unquestioning belief in Christianity (or any religion). Thus, learning may be reduced by the degree of commitment to a particular belief system. If a dogmatic belief in a religious ideology detracts from learning or a consideration of new ideas, an investigation of this phenomenon might be crucial to understanding the learning process, particularly in educational institutions with a professed religious commitment.

Johnson (48) defined religion as a "firm belief in one true faith." He believed that a firm belief in a religion leads to inflexibility and the incapacity to view alternative beliefs or ideas. As he stated (P. 281):

My premise is that religious belief, so defined, blocks the type of learning that education (theoretically) seeks to achieve. . . . The point I intend to make is that, in a given area, conviction paralyzes the capacity to explore alternatives to that conviction. And to the extent that this is true, no behavioral change (learning) is possible.

Johnson believed that the socialization process indoctrinates, overtly and covertly, the individual into the prevailing cultural reality. The

church indoctrinates overtly with the explicit intention of perpetuating its beliefs, and its efforts are reinforced by the family. Thus indoctrination, Johnson felt, is the core of the individual self-identity with the concomitant fear of disorientation and insecurity resulting from the threat to or loss of this identity. Both the family and church instill feelings of guilt in the individual if he should entertain ideas or facts contrary to the "right" ones. "Every solid belief is a solid wall against the world of alternative ideas that lies beyond" (p. 283).

Johnson defined the difference between the open- and closed-self in the learning process (p. 290):

Very few people hold an image of a changing, evolving, or open Self because their primary institutions guarantee disapproval of such a Self. A person will learn when he is motivated to do so; society offers very few stimuli to actual learning, though there are many stimuli to memorization and skill-polishing. Belief does not motivate one to change of belief, but rather to seek "proof." Belief will not thwart training in the manipulation of a typewriter, nor hamper further indoctrination in the theology and dogma of one's own faith. But learning can occur only in those areas where one's preconditioned beliefs do not stymie the process.

Research in the area of dogmatism, religion, and learning generally supports Rokeach's and Johnson's contentions. Tennison and Snyder (88) investigated the relationships between religiosity and personality characteristics for 132 male and 167 female Protestant students at Ohio State University. The Edwards Personal Preference Schedule was used to measure the psychological needs of the subjects. The authors found a significant relationship ($p < .05$) between high religious beliefs and the subjects' needs for lower achievement and lower autonomy and subjects' needs for self-abasement, affiliation, and submissiveness.

Tennison and Snyder believed that their findings supported the basic psychoanalytic theory of Freud in that the relationship of man to his God has an infantile prototype in the relationship of a child to his parent. According to the authors' interpretation of Freud, not only is the child taught to be obedient, reverent, and submissive, but by man's attempt to win forgiveness from the omnipotent father, the individual emphasizes his own worthlessness and abasement. If a positive self-concept is a factor in academic achievement, then the findings of Tennison and Snyder would seem to cast some doubt on the achievement capabilities or openness to learning of the highly religious individual.

Several other studies supported Tennison and Snyder's findings. Feather (31) investigated the relationship between dogmatism, critical thinking, and intolerance of ambiguity among college students from three religious groups and one atheist group. Subjects were administered several reasoning tests consisting of religious syllogisms with valid and invalid conclusions. In addition, a religious attitude scale constructed by the author, a scale to measure cognitive ambiguity, and Rokeach's Dogmatism Scale were administered to each subject. For the three religious groups, Feather found a significant negative correlation ($p < .01$) between high performance on syllogism evaluation and critical thinking ability and a positive correlation between high syllogism evaluation and intolerance of ambiguity. In addition, the proreligious groups were found to be significantly ($p < .01$) more dogmatic than the atheist group. For the atheistic subjects, a significant positive correlation ($p < .01$) was found between high performance on syllogism evaluation and critical thinking ability.

Feather concluded his article by stating (p. 10):

As one moves from a group or society that tolerates a wide range of beliefs about religious matter to religious groups that requires members to subscribe to a set of basic beliefs about which there can be little argument and which depends upon the authority of church and/or the Scripture, one encounters increased dogmatism and intolerance of ambiguity among members.

Evidence on sex differences in relationship to religiosity and dogmatism has also been reported in the research literature. Glass and Schock (36) investigated the relationship between religious beliefs, dogmatism, and anxiety for 495 females enrolled in the freshman and sophomore classes of a private college for women in the South. The scales employed in the study were the Inventory of Religious Beliefs, Survey of Religious Practice, Self-Analysis Form (measuring anxiety and insecurity), and Rokeach's Dogmatism Scale. The results from these four scales were correlated.

Subjects were divided into three equal groups on the basis of high, intermediate, and low religion belief scores (derived from the Inventory of Religion Beliefs). Both dogmatism and anxiety scores were compared across the three levels of religious beliefs.

Based on Duncan's Multiple Range comparison, the high religious belief group was significantly more dogmatic than both the low and intermediate belief groups. However, no significant relationship was found between dogmatic and religious practice. Negative relationships were found between high anxiety scores and both religious beliefs and practices.

Glass and Schock suggested that while subjects who scored low on the religion scale were more anxious or insecure than the high religious subjects, insecurity may have served as the original basis for adopting a religious orientation for the high religious subjects. The authors

speculated that the subsequent practice of religion by the high religiously-oriented subjects may have been effective in reducing the anxiety associated with their insecurity. The authors, however, gave no evidence for these assertions.

Other evidence which supports the relationship between closed-mindedness or dogmatism and religiosity has been reported by Swindell and L'Abate (87). Subjects in the study were 45 male and 90 female students at Georgia State University enrolled in introductory and applied psychology classes. The Religion Attitude Questionnaire, the Fundamentalist Attitude Inventory, and Rokeach's Dogmatism Scale were administered to each subject. In addition, 127 items were selected from the MMPI to measure cognitive repression (the closing out of threatening stimuli by avoiding or denying them). The purpose was to test the assertions made by various theoretists that fundamentalism represents the religious manifestation of the closed mind and that highly religious individuals are alleged to be more authoritarian, ethnocentric, and inflexible in their thinking.

Swindell and L'Abate found that dogmatism correlated positively and significantly ($p < .05$) with high religiosity scores on both the Religion Attitude Questionnaire and the Fundamentalist Attitude Inventory. High dogmatism was also significantly ($p < .05$) related to high cognitive repression on the MMPI derived scale. In addition, females were found to score significantly higher ($p < .01$) than males on the two religious scales.

Swindell and L'Abate did not offer any discussion or conclusions to their findings. The findings, however, supported the original contentions

that religiosity was related to closed-mindedness and inflexibility in thinking.

In summary, Rokeach and Landsman's theories on closed- and open-minded individuals (Part A) seem to be of major significance in understanding the learning process. Closed-mindedness or dogmatism has been shown to be related to personality maladjustment and instability. However, research findings on the relationship between dogmatism and achievement or intelligence have been inconsistent. While some evidence supported Rokeach and Landsman's theories on the relationship between learning and dogmatism, other evidence failed to support these relationships. Both high and low dogmatism scores from various studies have been associated with achievement and intelligence test scores for groups of subjects when sex differences were not taken into account. In studies investigating sex differences, high and low dogmatism scores for both males and females have been found to be correlated with achievement and intelligence. One generally consistent finding, however, is that females have had lower dogmatism scores than males.

In studies investigating the relationship between dogmatism and religious beliefs (Part B), the research findings have been generally consistent. Evidence indicates that closed-mindedness or dogmatism is positively and significantly related to high religiosity. This evidence seems to support the theories of both Rokeach and Johnson in that a firm belief in a particular ideology will restrict or close the cognitive functioning of individuals if they are presented with new beliefs and ideas. However, none of the research cited investigated the sex-identity dispositions of the subjects in relationship to either dogmatism or religiosity.

Further research on the dogmatism construct is needed. What is the interrelationship between dogmatism, academic achievement, and religious convictions? Would the interrelationship between dogmatism and various behaviors be affected by the sex-identity disposition of individuals? In addition, what is the relationship between Rokeach's dogmatism construct and Rotter's locus of control?

Dogmatism and Locus of Control

Both Rokeach's dogmatism construct and Rotter's internal-external locus of control share similar theoretical views of man. Both theories rest on the assumption that an individual's view of himself and others is a determinant of his behavior.

Rokeach postulated that the more closed the individual's system of belief, the more it can be viewed as a network of cognitive defenses against anxiety. For the closed-minded individual, irrelevant external pressures, particularly the assumed rewards or punishments ensuing from authority or powerful others, interferes with realistic appraisal of information. Information about a situation is acted upon by the closed-minded in accordance with his perceived expectation of an authority figure.

Likewise, Rotter has suggested that externality in individuals is significantly influenced by their perception of power and how powerful others control their lives. For externally-oriented individuals, the low expectations of receiving a reward often lead to defensive and maladaptive behavior. Instead of learning how to achieve his goals, the individual learns how to avoid and defend himself against the anxiety of failure in goal attainment. One defense measure used to reduce anxiety and feelings of

failure is to believe that life is controlled by powerful others. This belief forms a "generalized expectancy" (similar to Rokeach's cognitive belief system) for the individual and determines his view of himself and his relationship to his environment.

Conversely, both the internally-oriented and the open-minded (low dogmatic) individuals are relatively independent of external authority and evaluate information on its own merit and logical consistency. The more open or internally-oriented the individual, the more the individual is governed in his actions by internal self-actualizing forces rather than by irrational internal or external forces. As both Rokeach and Rotter suggested, individuals who believe in their power to control their own destiny are more likely to see the world as friendly rather than threatening.

While there are numerous theoretical similarities between locus of control and open-closed-mindedness, few conscientious investigations have been undertaken to determine the relationship between these constructs. One study (Clouse and Hjelle, 20) which attempted to investigate the relationship between these constructs produced questionable results.

Clouse and Hjelle had two reasons for investigating the relationship between Rotter's locus of control and Rokeach's dogmatism construct. One, they believed that the constructs had some ". . . common theoretical resemblance," and second, they suggested that no previous studies had been undertaken to examine the relationship between the constructs (p. 1006).

Subjects in their investigation were 116 male and 125 female psychology students. Rotter's I-E scale and Rokeach's Dogmatism Scale were administered to each subject, and it was found that external control varied positively and significantly with dogmatism ($r = .24, p < .01$). In

addition, the authors presented a more dramatic confirmation of the proposed relationship by comparing mean dogmatism scores for extreme internals ($N = 25$, range 18-23) and extreme externals ($N = 54$, range 0-9). They found a significant difference between these two extreme groups ($t = 2.14$, $< .05$).

However, the scoring procedure for Rotter's scale is that high scores (above 18) always represent externality while low scores (under 9) always represent internality. While Clouse and Hjelle did find a significant relationship, either their scoring procedure for the I-E scale or their usage of internal and external was reversed leaving the reader with the question that if the correct procedure had been used would there have been a significant and positive relationship between externality and dogmatism?

In conclusion, while both Rotter and Rokeach believed that their respective theories were important in understanding the learning process, no research has attempted to combine these constructs to ascertain their relationship to learning and achievement. The relationship between these constructs, in addition to the effect of sex-identity, was hypothesized in this study as being of major significance in understanding the learning process.

CHAPTER III. METHOD OF PROCEDURE

This chapter describes the methods and procedures that were used to gather and analyze the data required for this study. The chapter has been divided into four sections: (1) Selection of the Sample, (2) Description of the Instruments, (3) Collection of the Data, (4) Treatment of the Data.

Selecting the Sample

Subjects included all entering freshmen students, Fall 1975 and Spring 1976, at Grand View College, Des Moines, Iowa. Through the cooperation of the administration at Grand View, each entering freshman student was instructed, a month before the start of school, to take a battery of tests scheduled during orientation week at the college. The attitudinal scales employed in this study were among the scheduled tests. The scales were administered to 355 subjects during fall orientation and 57 subjects during spring orientation.

Since the dependent variable in this study was the academic achievement of the subjects as measured by their grade-point averages, only those subjects who completed nine or more credit hours their first semester were included in the study. During the fall semester, 31 of the 355 administered the scales either completed less than nine credit hours or withdrew from school before the end of the semester. Of the 57 subjects who were administered the scales the spring semester, 10 either failed to complete the required hours or withdrew. The final number of subjects in the study was 371: 224 females and 147 males.

Description of the Instruments

In the consideration of appropriate instruments to employ in the investigation, a review of pertinent literature was conducted. Three of the four scales employed in the investigation were found to be the only standardized scales available to measure the particular attitudes under consideration. The fourth scale was selected from various scales on the attitude under consideration as most suitable to this investigation (defined in Religious Attitude section, page 74).

There are a number of factors of importance in the selection and use of an instrument to measure personality or attitudinal characteristics.

Best (9) suggests that several qualities are desirable in the selection and use of an instrument for research purposes. The following definitions of these qualities are offered (pp. 193-196).

- 1) Empirical validity refers to the usefulness of a scale in predicting the behavior under consideration and how well the scale measures what it purports to measure.
- 2) Reliability refers to the extent to which the scale measures accurately and consistently from one time period to another and is internally consistent with itself. In scales that have a high coefficient of reliability, the errors of measurement have been reduced to a minimum.
- 3) Objectivity refers to the extent to which the scale yields a clear score value for each behavioral characteristic, the score being independent of the personal judgment of the scorer.
- 4) Economy refers to the concern with the time needed and the expense of administering the scale. An instrument that can be given in a

short period of time is more likely to gain the cooperation of the subjects and to conserve the time of those administering and scoring the scale.

- 5) Simplicity of administration refers to the concern with the ease and effectiveness of administering, scoring, and interpreting the scale results, particularly when expert personnel or an adequate budget is not available.
- 6) Interest refers to the extent that subjects will find the scale interesting and relevant rather than dull or silly. Scales that are interesting and enjoyable are more likely to gain the cooperation of the subjects.

In addition, Best believed that a researcher should select the most appropriate standardized scale available, recognizing, however, that standardized scores are only approximate measures of the behavior under consideration. Also, the researcher should recognize that errors are inherent in any scale or testing instrument and that no instrument is completely valid or reliable.

The four scales chosen to measure the attitude and values under consideration in this investigation were Bem's Sex Role Inventory (6), Rotter's Internal-External (I-E) Scale (73), Rokeach's Dogmatism Scale - Form E (69), and Poppleton and Pinkington's Religion Attitude Scale (65). In addition, English aptitude scores (C.E.T., Educational Testing Service) were available from the institution from which the subjects were sampled. Examples of these scales are found in Appendix A.

Scale I - Bem's Sex-Role Inventory

Bem's Sex Role Inventory (BSRI) is the only available scale which purports to measure a wide range of sex-identity characteristics. While other sex-inventory scales are available which measure masculine and feminine characteristics, Bem's scale also measures individuals who possess in varying degrees the characteristics of both sexes, that is, the degree of androgyny. In addition, Bem's scale has normative and reliability data, and the scale reflects contemporary sexual attitudes and values.

The construction of the scale was based on 400 personality characteristics that were defined as being either masculine, feminine, or neutral. The final items used in the Bem Sex Role Inventory were selected from the pool of 400 by 100 Stanford University undergraduate students (50 males, 50 females) who judged each item on a seven-point scale. A personality characteristic qualified as masculine if it was independently judged by both males and females to be significantly ($.05$) more desirable for a male to possess than for a female. The final feminine characteristics were selected in the same manner. Using this criteria, 20 items were defined as masculine, and 20 items were defined as feminine.

A personality characteristic was defined as neutral if it was judged by both males and females as being no more desirable for one sex to possess than for the other. The purpose of the neutral items in the final Bem Inventory was to provide a neutral context for the masculinity and femininity scale items and to insure that the scale would not simply be tapping a general tendency to endorse socially desirable traits. Twenty items were selected which formed the Social Desirability Scale component of the BSRI.

In the scoring of the BSRI, subjects are asked to score each of the 60 traits on a scale of 1 ("Never or almost never true") to 7 ("Always or almost always true") as descriptions of themselves. The subjects then receive three major scores: a masculinity score, a femininity score, and an androgyny score. A social desirability score can also be computed.

The masculinity score is the mean self-rating of all endorsed masculine traits while the femininity score is the mean of all endorsed feminine traits. The androgyny score is the difference between the femininity and the masculinity scores, normalized with respect to the standard deviation of the subjects' masculinity and femininity scores. The androgynous score is defined by Bem as a Student's *t* ratio for the difference between a person's masculine and feminine self-endorsements. Bem believed that the use of the *t* ratio, rather than a simple difference score, has two conceptual advantages:

- 1) Researchers can determine whether an individual's masculine-endorsements differ significantly from his or her feminine-endorsements, and if they do, to classify that individual as significantly sex-typed.
- 2) Researchers can compare different populations in terms of the percentage of significantly sex-typed individuals present within each population.

A psychometric analysis of the BSRI was conducted by Bem. Included in the analyses were 444 males and 279 female students in introductory psychology classes at Stanford University. In addition, 117 males and 77 female volunteers from Foothill Junior College (California) were used in the analyses. In order to evaluate test-retest reliability, 28 males and

28 females were randomly chosen from the Stanford normative sample. Correlations were computed between the first administering of the BSRI and a retest four weeks later. All four components of the scale proved to be highly reliable over the four-week interval (masculinity $r = .90$; femininity $r = .90$; androgyny $r = .93$; social desirability $r = .89$).

Other normative data were obtained from the total Stanford and Foothill samples. Mean scores for the four components of the BSRI were obtained for males and females separately. Males scored significantly higher ($p < .001$) than females on the masculinity scale, and females scored significantly higher ($p < .001$) than males on the femininity scale for both samples. On the measure of androgyny, males scored on the masculine side of zero while females scored on the feminine side. These differences were both significant ($p < .001$). In addition, the percentage of subjects who were classified as masculine, feminine, and androgynous was derived from this sample. The percentage of male subjects classified as feminine was 11 percent, as masculine 55 percent, and as androgynous 34 percent. The percentage of females in each category was 54 percent feminine, 20 percent masculine, and 27 percent androgynous.

Subjects are classified as androgynous if the absolute values of the t ratio are less than or equal to 1 ($-1 \leq t \leq +1$) and "near" androgynous if the absolute t ratio is between 1 and 2.025. Subjects scoring higher than the absolute t ratio value of 2.025 are classified as sex-typed or sex-reversed. High positive scores ($t \geq 2.025$) indicate femininity and high negative scores ($t \leq -2.025$) indicate masculinity. For purposes of this investigation, the "near" androgynous subjects were defined as androgynous, a procedure suggested by Bem in her studies.

Scale II - Rotter's Internal-External Scale

Rotter based part of his construction of the I-E Scale on studies by Phares (61). Phares was one of the first researchers to attempt to measure individuals' locus of control. He developed a Likert-type scale with 13 items stated as external attitudes and 13 items stated as internal attitudes. In order to measure skill versus chance effects on expectancies of reinforcement, subjects in Phares' investigation were told that success on a task was determined by skill while other subjects were told that success on the same task was a matter of chance. Subjects who thought that success depended on their own skill (internal control) changed expectancies more frequently in regard to appropriate cues and more in the direction of previous experiences on the task. Conversely, subjects who thought that luck or chance determined the outcome or reward showed more erratic behavior and gambled (saw it as a chance situation) in their attempt to gain the reward. Phares concluded his study by stating that "categorizing a situation as skill leads the subjects to use the results of his past performance in formulating expectancies for future performance" (p. 341). Subsequent development of Phares' scale was undertaken by James (47).

The Phares-James scale was broadened by Rotter, and various subscales were initially added to measure achievement, affection, and general social and political attitudes. Item analysis of this 60-item scale by Rotter indicated that the subscales were not generating separate predictions. Some of the subscales were found to correlate with other scales at approximately the same level as their internal consistency. Reduction and purification of the 60-item scale were undertaken. According to Rotter, item validity of the revised scale was available from a study by Seeman and

Evans (80) on tuberculosis patients who had evidenced greater self-effort toward recovery versus those who were more passive. In addition, item validity for the prediction of individual differences was available from a study by Rotter, Liverant, and Crowe (74) in which subjects who perceived a task as externally controlled led to predictable differences in behavior, compared to a task situation in which the subjects perceived themselves as controlling the outcome.

The final version of the I-E Scale (73) was a 29-item forced-choice test, including six filler items. High scores on the scale indicate externality or the belief-expectancy that luck, chance, or powerful others control life rewards. Low scores on the scale indicate internality or the belief-expectancy that life rewards are contingent upon and follow from personal effort.

Reliability data on the I-E scale were reported by Rotter (73). The internal consistency of the scale, as determined by the split-half, Spearman-Brown, and Kuder-Richardson techniques, ranged from .65 for male Ohio State University students to .79 for female elementary psychology students at the same university (p. 13). Test-retest reliability was less stable. With retest intervals of one to two months, the correlation from seven different studies ranged from .49 to .83, with a mean of .67 for the seven studies (p. 13). The low correlation (.49) represented a retest after two months, while the high correlation (.83) represented a retest after one month.

In order to assess the social desirability response set of subjects, the I-E Scale was correlated with the Marlowe-Crowne Social Desirability Scale (73). This scale purports to locate individuals who describe

themselves in favorable, socially desirable terms in order to achieve the approval of others. Rotter reported consistently low and negative correlations between the I-E Scale and the Social Desirability Scale in ten different studies. The correlation reported by Rotter for these studies ranged from $-.12$ to $-.41$, with a mean of $-.29$ (p. 10).

Adequate support seems to attest to the validity of the I-E Scale as a measure of individuals' locus of control.

Scale III - Rokeach's Dogmatism Scale

Rokeach described the procedures used in constructing the Dogmatism Scale as "essentially deductive" (p. 72). The statements used in the Dogmatism Scale were constructed after scrutinizing the various defining characteristics of open and closed systems and from remarks made by individuals who Rokeach defined as closed-minded. In addition, some statements were adapted from works by Hoffer (43), Berger (8), and from the MMPI (42).

The original Dogmatism Scale went through five revisions in order to refine early conceptualization and to increase reliability. The last two forms, D and E, have been used in the majority of studies investigating dogmatism. Form E is composed of 40 items selected from the 66 items of Form D which had the highest discriminatory power.

On the 40-item Dogmatism Scale (Form E), subjects indicate disagreement or agreement with each item on a scale ranging from -3 to $+3$. The scoring of the scale is accomplished by adding a constant of 4 to each item score. The range of possible scores is from 40 to 280. The higher the score, the more the subject is considered closed-minded or dogmatic.

In order to test the reliability of the scale, Rokeach sampled individuals from three geographical areas: the Midwest, New York City, and England. In the Midwest subjects were college students from Michigan State University enrolled in beginning psychology classes. In New York City, the subjects were psychology students from New York University and Brooklyn College. In England 217 students from the University of London and Birkbeck College and 60 industrial workers from Vauxhall Motors were tested. The reported reliability data ranged from .70 to .91 (69, p. 90).

One of Rokeach's first attempts to ascertain the validity of the Dogmatism Scale was by the method of the "known groups." Graduate students in Rokeach's psychology classes were asked to submit names of students who they regarded as most and least dogmatic. Prior to selection, each student judge was given a brief written description of the defining characteristics of open and closed systems. A total of 20 subjects was obtained: 10 judged to be extremely dogmatic and 10 judged to be extremely low in dogmatism. The high dogmatic subjects had a mean score of 157.2 on the Dogmatic Scale while low dogmatic subjects had a mean of 101.1. The difference between these two extreme groups was significant at the .01 level. In addition, a significant difference (.01) between these two groups and scores on Adorno's F Scale was obtained. High dogmatic subjects were significantly more authoritarian as measured by the F scale than the low dogmatic subjects.

In order to test the validity of the Dogmatism Scale as a measure of general authoritarianism, as opposed to the F Scale's concentration on right-wing authoritarianism, Rokeach presented evidence on various religious and political groups in America and England. If general

authoritarianism or dogmatism was to be accepted as an alternative to Adorno's F Scale, it was necessary to demonstrate that dogmatism is a curvilinear phenomenon with individuals at both ends of a distribution being more dogmatic than those at the middle of the distribution.

Rokeach utilized his Opinionation Scale (composed of 20 politically-left and 20 politically-right items) to determine the political orientation of Catholics, Protestants, Jews, and religiously nonbelieving students at various New York colleges (69, p. 112). Catholics were found to be the most conservative politically (Rokeach describes as "right wing") while the nonbelievers were found to be the least conservative, that is, the most politically left. Protestants and Jews were between these two extremes in political orientation.

On the Dogmatism Scale, Rokeach found that Catholics and nonbelievers scored equally high on dogmatism, and both these groups scored higher on this variable than did the Protestants and Jews. The study seemed to support Rokeach's theory that the Dogmatism Scale was measuring general authoritarianism with individuals at the extreme ends of a continuum more dogmatic than those in the middle.

Additional support to this study was offered by Rokeach in an investigation of English college students who described themselves as Conservative, Liberal, Attleeite Labor, Bevanite Labor, and Communist. The Opinionation Scale was utilized to determine the political beliefs of each of the five groups. The extreme scores on both ends of the political continuum (e.g., Conservatives on one end and Communists on the other end) were found to be equally high on dogmatism and more dogmatic than the three political groups in the center.

In a summation of these two studies, Rokeach stated:

These findings provide the strongest evidence we have been able to obtain thus far indicating that the Dogmatism and Opinionation Scales are measuring something relatively independent of ideological content. We infer this "something" to be general authoritarianism and general intolerance (p. 117).

Scale IV - Religious Attitudes

In selecting an appropriate instrument to measure the degree of belief or conviction in the Christian faith, several qualities were deemed necessary for the purposes of this investigation. First, the instrument or scale must measure the degree of belief or conviction in the general Christian faith, rather than measure one extreme dimension of Christianity, such as fundamentalism. Second, the scale must measure the general beliefs of the subjects, rather than measure such aspects as knowledge of the Christian faith, attitude toward a specific religious "object" (e.g., the Bible, God), the effects or consequences of the belief, or the attitude toward the church as an institution. Third, the scale must have proven validity and reliability data to support it based on a population similar to the subjects in the present investigation. Fourth, the scale questions must be current in expression and written in straight-forward language that subjects could relate to in a battery of scales administered during a 60-minute session.

Robinson and Shaver's Measures of Social Psychological Attitude (68) and Shaw and Wright's Scales for the Measurement of Attitude (82) give summaries of scales that measure various dimensions of religious attitudes. These scales, with their strengths and weaknesses, were reviewed which related to the purposes of this investigation.

- 1) "Attitudes toward the Church" by Thurstone and Chave (82, p. 544).

This scale, developed in 1929, has been used extensively in research for several decades. While the scale has impressive validity and reliability data to support it (from the 1930's), the scale was judged to be dated. In addition, the scale does not relate specifically to individual attitudes about Christian belief or doctrine, being directed almost entirely toward attitudes concerning organizational or ritual aspects.

- 2) "Dimensions of Religious Commitment" by Glock and Stark (68, p. 556). This scale, developed in 1966, measures five dimensions of religiosity: belief, ritual, experience, knowledge, and consequences. While the scale was developed from an extensive questionnaire given to over 3,000 randomly selected individuals from 118 churches, the validity of the instrument was based on a population different from the subjects in the present investigation. Also, the major portion of the scale is concerned with aspects, such as Christian knowledge, unrelated to the purposes of this investigation. Because of these limitations and the excessive length (500 items) of the scale, it was rejected for the purposes of this investigation.

- 3) "Dimensions of Religiosity" by King and Hunt (68, p. 570). Items in this scale were based on an extensive review of the literature and covered 11 areas of religious life, such as "assent to credal proposition," "financial support," "loyalty to the church." The validity and reliability data on the scale are questionable, based on a 48 percent return of 575 Methodists from Dallas, Texas.

Because of the various areas covered in the scale unrelated to the present investigation and the questionable validity of the instrument, this scale was rejected.

- 4) "Dimensions of Religious Ideology" by Putney and Middleton (82, p. 337). This scale, developed in 1961, measures four dimensions of religious ideology, orthodoxy, fanaticism, importance, and ambivalence. Validity data on the orthodoxy dimension of the scale, based on responses from 1,126 social science students in 13 colleges, indicates that this particular dimension is highly valid. However, no validity data have been reported on the other three dimensions nor are any reliability measures reported on any of the dimensions. Because of these limitations, this scale was rejected.

The "Religious Attitude Scale" developed by Poppleton and Pinkington (65) was chosen as the most appropriate scale to measure the religious convictions of the subjects in this investigation. This scale, developed in 1963, was designed to measure the religious convictions of British college students.

The development of the scale was based on the responses to a religious questionnaire solicited from the students and faculty at the University of Sheffield. Using the Thurstone method, two parallel forms of a scale were developed each containing 22 items. These two forms were then given to a group of 121 individuals sampled from the original population; half received form A first, half received form B first. Each group received the alternative form three weeks later.

Responses to the forms were based on a five-point Likert scale. From an item analysis suggested by Likert (1932), 23 items were eliminated. The final scale, Form C, consisted of 21 items each with appropriate weights (based on a method suggested by Guilford, 1954) for response categories. These weights gave a possible range of scores from 40 (anti-religious) to 136 (pro-religious).

In order to ascertain the reliability of the final scale, Poppleton and Pinkington split the scale into three parts, and intercorrelations were computed. Based on a stratified random sample ($N = 463$) of the student body at the University of Sheffield, the intercorrelations were as follows: $r_{12} = .95$, $r_{13} = .96$, and $r_{23} = .97$ (p. 23). Using Cronback's (1947) formula for the coefficient alpha, a value of .97 was obtained, indicating "a very high measure of reliability" (65, p. 23).

The validity of the final scale was based on a questionnaire concerning the religious activities and beliefs of the subjects in the above sample. From this information three groups were defined: (1) an anti-religious group, made up of those claiming to be atheists or agnostics; (2) a high participative religious group who attended church three or more times per month, prayed at least once weekly, and were active church members; (3) those subjects who failed to meet either set of criteria. The anti-religion and the high religion groups differed significantly, with the anti-religion group ($N = 109$) obtaining a median score of 60 on the scale and the high religion group ($N = 107$) obtaining a median score of 116. In addition, no overlap was found between scores for these two extreme groups.

The Religion Attitude Scale appeared to be an adequate measure of general religious belief or conviction in the Christian faith and quite

suitable for a college population. The reliability data and the Scale's ability to discriminate between groups were judged as acceptable for this investigation. In addition, the items in the scale were simply worded, and the scale could be completed by subjects in approximately 15 minutes.

Scale V - English Aptitude

The final scale used in this study was the Cooperative English Test-English Expression developed by Educational Testing Service, Princeton, New Jersey (22). This scale has been used at Grand View College during the past five years as the means of determining the placement of entering freshmen students in various levels of English courses.

The English Expression Test is composed of 30 multiple choice items which measure English effectiveness and 60 multiple choice items which measure English mechanics, such as usage, spelling, and punctuation. The Testing Service notes that while the English Expression Test is not a direct measure of writing ability, evidence suggests that ability to do well on this kind of test is related to ability to write well in an essay situation (p. 7).

One study of the predictive validity of the English Expression Test was conducted at the University of Florida (p. 18). The test was administered to 2449 freshmen students, and scores were compared to a composite of all regular English tests given the first semester. The correlation coefficient for this comparison was .67 (p. 18). In addition, the Testing Service study of 713 college freshmen selected from 78 colleges revealed a correlation of .74 between the English Expression Test and SCAT verbal

scores (p. 21). Substantial evidence is available from the Testing Service which supports the validity and reliability of the instrument.

Data Collection

Prior to the collection of data, a conference was held with the Academic Dean at Grand View College. The project was explained, and permission was granted by the Dean to include the attitude scales for this study in the regular testing program scheduled during orientation week at the college. It was decided at this time to call the various attitude scales the Student Inventory Survey for purposes of notifying the students.

A pilot study was undertaken to ascertain any problems of administering the attitude scales. Subjects in the pilot study were two classes of the author's introductory sociology course ($N = 77$) at Grand View College, Spring, 1975. After taking the scales, students were asked for comments on the structuring and administering of the scales. From this discussion, several minor problems were noted, and a revision of the testing procedure was made.

The administration of the Inventory Survey, Fall 1975 and Spring 1976, was begun by asking the subjects for their cooperation and by giving a brief introduction to the purposes of the Inventory. A list of directions was placed on the chalkboard before them and explained, including definitions of some words that were questioned during the pilot study. Subjects were requested to ask for help from the person in charge if there were any questions. The time allotted for the Inventory Survey was 60 minutes.

Treatment of the Data

Based on the hypotheses presented in Chapter I, the data obtained from the subjects in this investigation were analyzed in four ways:

1. Descriptive data were obtained for each subject on the five independent variables and the one dependent variable under investigation. The mean, mode, minimum and maximum scores, and the standard deviation were found for each of the variables in the investigation. In addition, descriptive data on each of the variables were obtained for males and females separately.
2. Male and female subjects were categorized by their degree of femininity, masculinity, and androgyny based on the normative data from Bem's Sex-Role Inventory Scale. Femininity was defined as a score of 1.00 or more, androgyny as a score of 1.00 to -1.00, and masculinity as a score of -1.00 or less. From this categorization, a 2 x 3 ANOVA was derived.

Because there were unequal cell frequencies, the classic experimental approach to ANOVA was not used. The ANOVA subprogram in the computer program--Statistical Package for the Social Sciences (SPSS) (57) provides an option whereby a regression solution can be obtained with factors and interactions processed simultaneously in a multivariate format, with each effect being adjusted for all other effects. "F" values were computed for all of the relationships.

The 2 x 3 ANOVA was utilized to test hypotheses 1 through 5, as stated in Chapter I.

3. In order to quantify the nature of the relationship of the variables in the investigation, correlation techniques were utilized. Pearson's product-moment correlation coefficient was used to determine the magnitude and the direction of the relationship among variables in a bivariate, unadjusted format. Hypothesis 6 was tested in the null form, and the confidence level for determining significance was established at the .05 level. In addition, the .01 level of significance was reported.
4. In order to ascertain which independent variable or combination of variables gave the best prediction of grade-point average (the dependent-criteria variable), regression analysis was performed. Stepwise regression was used to obtain the regression model used for prediction. The stepwise solution selects the independent variable which first correlates most highly with the dependent variable and selects subsequent independent variables in order of the magnitude of their relationship to the dependent variable after controlling for previously entered variables.

Snedecor and Cochran (83) suggest three principle uses of multiple regression analysis (p. 381):

1. Constructing an equation in the X's (independent variables) that give the best prediction of the value of Y (criterion variable).
2. When there are many X's, finding the subset that gives the best linear prediction equation.
3. . . . to discover which variables are related to Y and . . . to rate the variables in order of importance.

The statistical model on which multiple regression is based is as follows:

$$Y_i = a + b_1X_{i1} + b_2X_{i2} + \dots b_6X_{i6} + e_i$$

Where:

Y_i = the criteria variable

X 's = the predictor variables

a = a constant

b 's = the regression coefficient for the predictor variable

e_i = the independent chance quantities

The regression model was utilized to test hypothesis 7. The stepwise regression analysis was derived from the SPSS computer program procedure (pp. 406-407).

CHAPTER IV. FINDINGS

The findings for this study will be divided into two sections. The first section will include descriptive data for the combined male and female subjects for all of the variables measured in the investigation. In the second section, the null hypotheses presented in Chapter I will be reported. After the statement of each hypothesis, descriptive data will be presented on the variables involved in the hypothesis. Each hypothesis will then be analyzed by the designated statistical procedure, and a summary of the findings will be reported.

Descriptive Data

The data in Table 7 show the total number of subjects, the mean, median, mode, minimum and maximum scores, and the standard deviation for each of the variables in the investigation. The number of subjects administered the various scales was consistent with the exception of the C.E.T. - English Expression Test. This test was administered at a later time period than the other scales, a fact which could have attributed to the attrition rate.

The data in Table 8 show the absolute frequency and relative frequency for the total subjects in the investigation, categorized by sex and age at time of testing.

Analysis of Hypotheses

Analysis of the data related to the hypotheses presented in Chapter I will be discussed as follows: First, each hypothesis will be stated, and descriptive data for the variables involved in the hypothesis will be

Table 7. Descriptive data for the combined male and female subjects sampled in the investigation

| | N | Mean | Median | Mode | Range | | St. dev. |
|---------------------|-----|---------|---------|---------|---------|---------|----------|
| | | | | | Minimum | Maximum | |
| Sex-role inventory | 371 | .158 | .124 | -0.120 | -6.730 | 6.270 | 2.085 |
| Internal-external | 371 | 8.313 | 8.024 | 6.000 | .000 | 18.000 | 3.537 |
| Dogmatism | 371 | 134.296 | 132.333 | 140.000 | 48.000 | 240.000 | 32.477 |
| Religion attitude | 371 | 99.712 | 101.688 | 126.000 | 45.000 | 134.000 | 19.484 |
| English aptitude | 309 | 42.502 | 42.375 | 41.000 | 18.000 | 74.000 | 10.638 |
| Grade-point average | 371 | 2.633 | 2.599 | 2.000 | 1.000 | 4.000 | .684 |

Table 8. Total sample dichotomized by sex and age

| | Sex | | Age | |
|---------|--------------------|--------------------|----------|------------|
| | Absolute frequency | Relative frequency | Under 21 | 21 or over |
| Females | 224 | 60.4% | 206 | 18 |
| Males | 147 | 39.6% | 123 | 24 |
| Total | 371 | 100.0% | | |

presented. Second, the statistical technique and data used to test the relationships of the variables for each hypothesis will be presented in table form. Hypotheses 1 through 5 will be tested using analysis of variance with each main effect and interactions adjusted in a multivariate format. Hypothesis 6 will be tested using Pearson correlation in a bivariate format with no adjustments made, and hypothesis 7 will be tested using stepwise regression. Third, a summary of the findings for each hypothesis will be presented.

Hypothesis 1

- a) There is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their performance in college as measured by academic achievement.
- b) There is no significant difference between males and females in their academic performance.
- c) There is no significant interaction between sex-identity endorsement and sex (males and females) in relationship to academic performance.

The following descriptive data presented in Table 9 are based on the 2 x 3 ANOVA defined in Chapter III.

Table 9. Academic grade-point means, standard deviations, and number of subjects categorized by their sex-identity endorsement

| | Feminine | Androgynous | Masculine | Total |
|---------|---|---|--|---|
| Females | $\bar{X} = 2.65$ SD = .72 N = 115 | $\bar{X} = 2.71$ SD = .71 N = 85 | $\bar{X} = 2.86$ SD = .72 N = 24 | $\bar{X} = 2.69$ SD = .71 N = 224 |
| Males | $\bar{X} = 2.39$ SD = .49 N = 14 | $\bar{X} = 2.53$ SD = .73 N = 58 | $\bar{X} = 2.58$ SD = .57 N = 75 | $\bar{X} = 2.54$ SD = .63 N = 147 |
| Total | $\bar{X} = 2.62$ SD = .70 N = 129 | $\bar{X} = 2.64$ SD = .72 N = 143 | $\bar{X} = 2.64$ SD = .62 N = 99 | $\bar{X} = 2.63$ SD = .68 N = 371 |

Table 10. Analysis of variance for sex, sex-identity endorsement (Bem), and grade-point average

| Source | D.F. | Sum of square | Mean square | F | Significance of F |
|-------------|------|---------------|-------------|------|-------------------|
| Main effect | 3 | | | | |
| Sex | 1 | .783 | .783 | 1.69 | .20 |
| Bem | 2 | .958 | .479 | 1.03 | .19 |
| Interaction | 2 | | | | |
| Sex•Bem | 2 | .131 | .065 | .14 | .99 |
| Residual | 365 | 169.66 | .465 | | |

Summary hypothesis 1

There is no significant difference between the categories of sex-identity endorsement and between males and females with regard to academic achievement. In addition, there was no significant interaction between the main effects, sex-identity endorsement, and sex. Therefore, we failed to reject hypothesis 1.

Hypothesis 2

- a) There is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their performance on a standardized English aptitude test.
- b) There is no significant difference between males and females in their performance on an English aptitude test.
- c) There is no significant interaction between sex-identity endorsement and sex (males and females) in relationship to performance on an English aptitude test.

The descriptive data related to the variables in hypothesis 2 are presented in Table 11.

Table 11. English aptitude (C.E.T.) means, standard deviations, and number of subjects categorized by their sex-identity endorsement

| | Feminine | Androgynous | Masculine | Total |
|---------|--|--|---|--|
| Females | $\bar{X} = 43.74$ SD = 10.56 N = 93 | $\bar{X} = 43.61$ SD = 9.97 N = 66 | $\bar{X} = 44.52$ SD = 7.69 N = 21 | $\bar{X} = 43.78$ SD = 10.01 N = 180 |
| Males | $\bar{X} = 42.62$ SD = 9.66 N = 13 | $\bar{X} = 38.04$ SD = 10.77 N = 51 | $\bar{X} = 41.69$ SD = 11.66 N = 65 | $\bar{X} = 40.71$ SD = 11.26 N = 129 |
| Total | $\bar{X} = 43.49$ SD = 10.43 N = 106 | $\bar{X} = 41.18$ SD = 10.65 N = 117 | $\bar{X} = 43.08$ SD = 10.82 N = 86 | $\bar{X} = 42.50$ SD = 10.64 N = 309 |

Table 12. Analysis of variance for sex, sex-identity endorsement (Bem), and English aptitude

| Source | D.F. | Sum of square | Mean square | F | Significance of F |
|-------------|------|---------------|-------------|------|-------------------|
| Main effect | 3 | | | | |
| Sex | 1 | 47.91 | 47.91 | .433 | .99 |
| Bem | 2 | 13.75 | 6.87 | .062 | .99 |
| Interaction | 2 | | | | |
| Sex·Bem | 2 | 181.54 | 90.77 | .820 | .99 |
| Residual | 303 | 33522.31 | 110.64 | | |

Summary hypothesis 2

There is no significant difference between the categories of sex-identity endorsement and between males and females with regard to English aptitude scores. In addition, there was no significant interaction between the main effects, sex-identity endorsement, and sex. Therefore, we failed to reject hypothesis 2.

Hypothesis 3

- a) There is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their cognitive openness or closedness to new beliefs.
- b) There is no significant difference between males and females in their cognitive openness or closedness to new beliefs.
- c) There is no significant interaction between sex-identity endorsement and sex (males and females) in relationship to cognitive openness or closedness.

The descriptive data related to the variables in hypothesis 3 are presented in Table 13.

Table 13. Dogmatism means, standard deviations, and number of subjects categorized by their sex-identity endorsement

| | Feminine | Androgynous | Masculine | Total |
|---------|---|---|--|---|
| Females | $\bar{X} = 135.97$ SD = 29.48 N = 115 | $\bar{X} = 127.73$ SD = 32.08 N = 85 | $\bar{X} = 126.17$ SD = 25.02 N = 24 | $\bar{X} = 131.80$ SD = 30.25 N = 224 |
| Males | $\bar{X} = 145.86$ SD = 30.43 N = 14 | $\bar{X} = 142.36$ SD = 38.56 N = 58 | $\bar{X} = 133.37$ SD = 33.35 N = 75 | $\bar{X} = 138.11$ SD = 35.37 N = 147 |
| Total | $\bar{X} = 137.05$ SD = 29.62 N = 129 | $\bar{X} = 133.66$ SD = 35.46 N = 143 | $\bar{X} = 131.63$ SD = 31.57 N = 99 | $\bar{X} = 134.30$ SD = 32.48 N = 371 |

Table 14. Analysis of variance for sex, sex-identity endorsement (Bem), and dogmatism scores

| Source | D.F. | Sum of square | Mean square | F | Significance of F |
|-------------|------|---------------|-------------|------|-------------------|
| Main effect | 3 | | | | |
| Sex | 1 | 1219.058 | 1219.058 | 1.17 | .28 |
| Bem | 2 | 4173.539 | 2086.770 | 2.01 | .13 |
| Interaction | 2 | | | | |
| Sex·Bem | 2 | 704.625 | 352.312 | .33 | .99 |
| Residual | 365 | 378971.312 | 1038.277 | | |

Summary hypothesis 3

There is no significant difference between the categories of sex-identity endorsement and between males and females with regard to dogmatism scores. In addition, there was no significant interaction between the main effects, sex-identity endorsement, and sex. Therefore, we failed to reject hypothesis 3.

Hypothesis 4

- a) There is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their personal convictions.
- b) There is no significant difference between males and females in their personal convictions.
- c) There is no significant interaction between sex-identity endorsement and sex (males and females) in relationship to personal convictions.

The descriptive data related to the variables in hypothesis 4 are presented in Table 15.

Table 15. Religious attitude means, standard deviations, and number of subjects categorized by their sex-identity endorsement

| | Feminine | Androgynous | Masculine | Total |
|---------|---|---|---|---|
| Females | $\bar{X} = 106.09$ SD = 16.79 N = 115 | $\bar{X} = 102.65$ SD = 17.08 N = 85 | $\bar{X} = 95.75$ SD = 23.47 N = 24 | $\bar{X} = 103.68$ SD = 17.92 N = 224 |
| Males | $\bar{X} = 90.21$ SD = 20.55 N = 14 | $\bar{X} = 96.71$ SD = 20.37 N = 58 | $\bar{X} = 91.96$ SD = 20.11 N = 75 | $\bar{X} = 93.67$ SD = 20.27 N = 147 |
| Total | $\bar{X} = 104.37$ SD = 17.85 N = 129 | $\bar{X} = 100.24$ SD = 18.65 N = 143 | $\bar{X} = 92.88$ SD = 20.91 N = 99 | $\bar{X} = 99.71$ SD = 19.48 N = 371 |

Table 16. Analysis of variance for sex, sex-identity endorsement (Bem), and religious attitude (conviction) scores

| Source | D.F. | Sum of square | Mean square | F | Significance of F |
|-------------|------|---------------|-------------|-------|-------------------|
| Main effect | 3 | | | | |
| Sex | 1 | 3147.896 | 3147.896 | 8.951 | .003** |
| Bem | 2 | 2270.980 | 1135.490 | 3.229 | .039* |
| Interaction | 2 | | | | |
| Sex*Bem | 2 | 1206.666 | 603.333 | 1.715 | .179 |
| Residual | 365 | 128370.187 | 351.699 | | |

*Significant at .05 level (one tailed).

**Significant at .01 level (one tailed).

Summary hypothesis 4

There is a significant difference between categories of sex-identity endorsement and a highly significant difference between males and females with regard to religious conviction scores. As a result, parts a and b of hypothesis 4 can be rejected. The Newman-Keuls method (84, p. 111) was used to test the mean differences for the three Bem categories. It was found that feminine-oriented subjects (male or female) had significantly higher (.01) scores than masculine-oriented subjects. Furthermore, female subjects were found to have significantly higher (.01) religious conviction scores than male subjects.

However, we failed to reject hypothesis 4c because no significant interaction was found between endorsed sex-identity and males and females on religious conviction scores.

Hypothesis 5

- a) There is no significant difference between the perceived sex-identity endorsement of traditional, androgynous, and psychologically cross-sexed students and their perceived ability to control their lives.
- b) There is no significant difference between males and females in their perceived ability to control their lives.
- c) There is no significant interaction between sex-identity endorsement and sex (males and females) and their perceived ability to control their lives.

The descriptive data related to the variables in hypothesis 5 are presented in Table 17.

Table 17. Internal-external locus of control means, standard deviations, and number of subjects categorized by their sex-identity endorsement

| | Feminine | Androgynous | Masculine | Total |
|---------|--|--|---|--|
| Females | $\bar{X} = 8.02$ SD = 3.18 N = 115 | $\bar{X} = 8.59$ SD = 3.86 N = 85 | $\bar{X} = 7.67$ SD = 3.47 N = 24 | $\bar{X} = 8.20$ SD = 3.49 N = 224 |
| Males | $\bar{X} = 7.43$ SD = 3.41 N = 14 | $\bar{X} = 9.48$ SD = 3.70 N = 58 | $\bar{X} = 7.92$ SD = 3.46 N = 75 | $\bar{X} = 8.49$ SD = 3.62 N = 147 |
| Total | $\bar{X} = 7.95$ SD = 3.20 N = 129 | $\bar{X} = 8.95$ SD = 3.81 N = 143 | $\bar{X} = 7.86$ SD = 3.44 N = 99 | $\bar{X} = 8.31$ SD = 3.54 N = 371 |

Table 18. Analysis of variance for sex, sex-identity endorsement (Bem), and internal-external locus of control scores

| Source | D.F. | Sum of square | Mean square | F | Significance of F |
|-------------|------|---------------|-------------|------|-------------------|
| Main effect | 3 | | | | |
| Sex | 1 | 4.327 | 4.327 | .351 | .99 |
| Bem | 2 | 23.471 | 11.735 | .952 | .99 |
| Interaction | 2 | | | | |
| Sex•Bem | 2 | 20.961 | 10.481 | .850 | .99 |
| Residual | 365 | 4499.199 | 12.327 | | |

Summary hypothesis 5

There is no significant difference between the categories of sex-identity endorsement and between males and females with regard to internal-external locus of control. In addition, there was no significant interaction between the main effects, sex-identity endorsement, and sex.

Therefore, we failed to reject hypothesis 5.

Hypothesis 6

There is no significant interrelationship between student's sex, sex-identity endorsement, openness or closedness to new cognitive beliefs, personal convictions, perceived control of one's life, English aptitude scores, and academic achievement.

Hypothesis 6 was tested by comparing the derived Pearson product-moment correlation coefficients with values necessary for statistical significance. Unlike the testing of hypotheses 1 through 5, each variable in hypothesis 6 was tested in a bivariate format with no adjustment made for

main effects or interactions. Both the .01 and the .05 levels of significance were reported. The correlations were reported first by comparing the variables for the combined male and female sample, and then correlations were presented separately for each sex. For computational purposes, females were coded 0 and males were coded 1. The data in Table 19 present the correlations for the combined male and female subjects.

Table 19. Correlation matrix for combined male and female subjects

| | Sex | Bem | I.E. | Rel. | Dog. | C.E.T. |
|--------|----------|---------|---------|--------|----------|---------|
| Sex | | | | | | |
| Bem | -.5467** | | | | | |
| I.E. | .0406 | -.0051 | | | | |
| Rel. | -.2517** | .2873** | -.1066* | | | |
| Dog. | .0952* | .0653 | .0216 | .0865* | | |
| C.E.T. | -.1425* | .0050 | -.0989* | .0057 | -.1234* | |
| G.P.A. | -.1099* | -.0039 | -.0544 | .0094 | -.3719** | .4716** |

*Significant at .05 level (one tailed).

**Significant at .01 level (one tailed).

Summary hypothesis 6

The correlation coefficients for the combined male and female subjects show the following relationships to be highly significant (.01 level): the correlation of $-.2517$ between sex and religion suggests that females tend to have higher religious convictions than males. The correlation of $.2873$ between Bem and religion indicates that femininity (for males or females) is related to higher religious convictions. The correlation of $-.3719$ between dogmatism and G.P.A. suggests that the more dogmatic individuals have lower grade-point averages. The correlation of $.4716$ between C.E.T.

and G.P.A. indicates that higher scores on the English aptitude scale are related to higher grade-point averages.

The following relationships were found to be significant (.05 level): the correlation of .0952 between sex and dogmatism suggests that males are more dogmatic than females. Females tend to have higher C.E.T.-English aptitude scores (-.1425) and higher G.P.A.'s (-.1099). The inverse relationship between I-E scores and both religion (-.1066) and C.E.T. (-.0989) suggests that externally-oriented subjects have lower religious conviction scores and lower English aptitude scores. The correlation of .0865 between religion and dogmatism indicates that higher religious conviction scores are associated with more dogmatic thinking. The inverse correlation of -.1234 between dogmatism and C.E.T. suggests that the more dogmatic subjects scored lower on the English aptitude scale. Thus, hypothesis 6 can be rejected for the pairs of variables identified above.

The data on Table 20 present the correlation of variables for female subjects. Only those correlations which were found to differ from the combined male and female findings were discussed.

Unlike the correlations for the combined subjects, a statistically significant relationship (.1441) was found between Bem and dogmatism. This finding suggests that feminine-oriented females were more dogmatic than other females in the sample. The combined sample also revealed a significant relationship between I-E scores and religion; however, no relationship between these variables was found for female subjects.

The data in Table 21 present the correlation of variables for male subjects. Correlations which differ from the combined sample are reported.

Table 20. Correlation matrix for total female subjects

| | Bem | I.E. | Rel. | Dog. | C.E.T. |
|--------|---------|---------|--------|----------|---------|
| Bem | | | | | |
| I.E. | -.0030 | | | | |
| Rel. | .2184** | -.0627 | | | |
| Dog. | .1441** | -.0074 | .1311* | | |
| C.E.T. | -.0149 | -.1491* | .0668 | -.1240* | |
| G.P.A. | -.0907 | -.0696 | .0748 | -.3553** | .5900** |

*Significant at .05 level (one tailed).

**Significant at .01 level (one tailed).

Table 21. Correlation matrix for total male subjects

| | Bem | I.E. | Rel. | Dog. | C.E.T. |
|--------|--------|---------|--------|----------|---------|
| Bem | | | | | |
| I.E. | .0556 | | | | |
| Rel. | .1394* | -.1480* | | | |
| Dog. | .1376* | .0496 | .0958 | | |
| C.E.T. | .1778* | -.0399 | -.1331 | -.1006 | |
| G.P.A. | .0528 | -.0186 | -.1625 | -.3887** | .2946** |

*Significant at .05 level (one tailed).

**Significant at .01 level (one tailed).

Male subjects differ from the combined sample in that males with a feminine sex endorsement tended to have higher dogmatism (.1376) and C.E.T.-English aptitude (.1778) scores than other males in the sample. Unlike the combined sample, no significant relationship was found between I-E and C.E.T. scores nor between religion and dogmatism. In addition, no significant relationship was found between dogmatism and C.E.T. scores for the male subjects.

Hypothesis 7

There is no significant relationship between grade-point average (G.P.A.) and a linear combination of the variables of student's sex, sex-identity endorsement, openness or closedness to new beliefs, personal convictions, the perceived ability to control their lives, and aptitude scores.

The hypothesis was tested using stepwise regression to determine which independent variables should be included in the regression model and their degree of correlation with the dependent variable. The data in Table 22 indicate the degree to which each of the selected independent variables contributes to the prediction/explanation of grade-point average (G.P.A.).

Summary hypothesis 7

The independent variables, English aptitude, dogmatism, sex-Bem interaction, Bem, and religion, were selected by the stepwise multiple regression procedure as being the best combination of "predictors" of grade-point average, the dependent variable. The overall F-value of 29.545 (with 5 and 303 degrees of freedom) is significant beyond the .01 level indicating that a relationship does appear to exist between the dependent variable, G.P.A., and the linear combination of independent variables selected.

Table 22. Grand-point average (G.P.A.) predicted by means of stepwise regression^a

| Independent variable | R | R ² | R ² change | Regression coefficient | Standardized regression coefficient | Partial F-value |
|--|---------|----------------|-----------------------|------------------------|-------------------------------------|-----------------|
| English aptitude | 0.47160 | 0.22240 | 0.22240 | 0.02802 | 0.43579 | 83.928** |
| Dogmatism | 0.56776 | 0.32235 | 0.09995 | -0.00675 | -0.32029 | 45.070** |
| Sex•Bem (interaction) | 0.57044 | 0.32540 | 0.00305 | 0.05136 | 0.09355 | 1.881 |
| Bem | 0.57159 | 0.32672 | 0.00132 | -0.02044 | -0.06233 | 0.799 |
| Religion | 0.57249 | 0.32775 | 0.00103 | 0.00118 | 0.03359 | 0.464 |
| Final prediction equation: G.P.A. = 2.2589 + 0.02802 Eng. Apt. + (-0.00675) Dog. + 0.05136 SxBem + (-0.02044) Bem + 0.00118 Rel. | | | | | | |
| Overall F-value: 29.545 with 5 and 303 degrees of freedom. | | | | | | |

^aIndependent variables sex and I.E. failed to meet statistical criterion for inclusion in the model.

**Significant at .01 level.

The multiple correlation coefficient, R , is 0.57249, and the coefficient of determination, R^2 , is 0.32775. This can be interpreted to mean that 32.775 percent of the variability in G.P.A. is accounted for or "explained" by the linear combination of independent variables.

Of the independent variables, English aptitude and dogmatism are the two variables most highly related to G.P.A. The most parsimonious final model would include English aptitude and dogmatism since the partial F -values for both the variables are highly significant (83.928 and 45.070, respectively), and the standardized regression coefficients for both variables (0.43579 and -0.32029) are substantially larger than those for the other independent variables. However, a model with additional variables could be selected, depending on the inclusion criteria set by the researcher. The model defined here was determined using the default option for criteria inclusion used by SPSS.

Since the overall F -value is highly significant, hypothesis 7 is rejected. However, it must be noted that a substantial portion of the variability in G.P.A. (over 67 percent) is not accounted for or "explained" by the independent variables selected for inclusion in the model.

CHAPTER V. SUMMARY, DISCUSSION, CONCLUSION,
AND RECOMMENDATIONS

Summary

The primary purpose of this investigation was to determine the differences in the sex-identity disposition of college students and how this sex-identity would affect academic achievement. A second purpose of this investigation was to determine the relationship of sex-identity differences to various beliefs and attitudes of the students. A third purpose was to investigate the relationship of sex-identity and beliefs and attitudes with scores on a standardized English aptitude test. The final purpose of this study was to investigate the interrelationships of sex identity, attitudes, and English aptitude scores and to determine how these variables would affect the prediction of academic achievement. Seven major hypotheses were developed and tested.

Subjects in this investigation were 412 entering freshman students at Grand View College, Des Moines, Iowa, during the 1975-76 academic year. Academic achievement was defined as the subject's grade-point average. Of the original sample of 412 students, 41 either failed to complete their first semester or reduced their course load to less than full-time equivalency. The total usable sample was 371 subjects: 224 females and 147 males.

Data from the survey instrument and academic achievement (G.P.A.) were examined to test the seven hypotheses derived from the research literature. Analysis of variance was used to test hypotheses 1 through 5. Hypothesis 6

was tested by Pearson correlation, and hypothesis 7 was tested by stepwise regression. The following were the major findings of this investigation:

1. For hypotheses 1 through 5, only hypothesis 4 was rejected. It was found that feminine-oriented subjects (male or female) had significantly higher (.01 level) religious conviction scores than masculine-oriented subjects. In addition, female subjects were found to have significantly higher (.01 higher) religious conviction scores than males.
2. For hypothesis 6, the correlation coefficient showed the following relationships to be highly significant (.01 level):
 - a. Sex-identity (Bem) and Religious Conviction ($r = .2873$). Subjects who had higher positive scores on the Bem Scale (more feminine) had higher scores on the religious conviction scale than did other subjects.
 - b. Sex-identity (Bem) and Dogmatism ($r = .1441$). Females who had higher positive scores on the Bem Scale were more dogmatic than other females.
 - c. Sex and Religious Conviction ($r = -.5467$). Female subjects had higher religious conviction scores than did males.
 - d. Dogmatism and Academic Achievement ($r = -.3719$). High dogmatism scores were related to low grade-point averages.
 - e. English Aptitude and Academic Achievement ($r = .4716$). High English aptitude scores were related to high grade-point averages.

The following relationships were found to be significant (.05 level):

- a. Sex and English Aptitude ($r = -.1425$). Females had higher English aptitude scores than did males.
 - b. Sex and Academic Achievement ($r = -.1099$). Females had higher grade-point averages than did males.
 - c. Sex and Dogmatism ($r = .0952$). Male subjects were more dogmatic than females.
 - d. Sex-identity (Bem) and Dogmatism ($r = .1376$). Males who had higher positive scores on the Bem Scale (more feminine) were more dogmatic in their thinking than were other males.
 - e. Sex-identity (Bem) and English Aptitude ($r = .1778$). Males who had higher positive scores on the Bem Scale (more feminine) had higher scores on the English aptitude scale than other males.
 - f. Dogmatism and Religious Conviction ($r = .0865$). High dogmatic scores were related to higher religious conviction scores.
 - g. Dogmatism and English Aptitude ($r = -.1234$). High dogmatism scores were related to lower scores on the English aptitude scale.
 - h. Internal-external Locus of Control and English Aptitude Scores ($r = -.0989$). High externally-controlled subjects had lower English aptitude scores than did internally-controlled subjects.
3. For hypothesis 7, English aptitude scores and dogmatism scores were found to be significant in predicting academic achievement. None of the other variables reached significance. The partial F-values for English aptitude and dogmatism scores were highly

significant (83.928 and 45.070, respectively). However, 67 percent of the variability in G.P.A. was not accounted for by the independent variables selected for inclusion in the model.

Discussion

The findings of this investigation suggest that males and females respond differently to various attitudinal and academic measures. Female subjects tended to have higher English aptitude scores and grade-point averages than did males, which are congruent with numerous research studies (4, 5, 90). Females had significantly higher religious conviction scores which are supported by previous research in which females were generally more supportive of religion and participated to a greater extent than males in religious activities (88, 87). Researchers (2, 63) have also found that males are generally more dogmatic or closed-minded in their thinking than are females which is supported by the evidence of this investigation. However, Alter and White (2) suggest that the Dogmatism Scale may be sex-biased, and when certain items in the scale are reworded, sex differences are reduced.

The findings on the sex-identity disposition of the subjects generally lend support to the limited number of experimental studies which have used sex-identity, and especially androgyny, as an independent variable. Research by Bem (7), in a controlled laboratory situation, suggests that traditional feminine females may be more rigid and conventional in their behavior than other females. The findings of this study indicate that females who scored high on the Bem Scale (more feminine) tended to be more

dogmatic and adhered more closely to conventional religious beliefs than did females who scored low on the Bem Scale.

However, the evidence of this study indicated that males who had higher positive scores on the Bem Scale tended to be more dogmatic than other males. This evidence conflicts with some theoretical speculation (6) which postulates that masculine males would be the most dogmatic. Vacchiano et al. (93) and Plant et al. (64) have found dogmatic individuals to be less secure and to have a greater fear of rejection than open or less dogmatic individuals, which often results in a lower self-esteem. It could be conjectured that the small number of feminine-oriented males in this study may have felt less accepted, especially from other males, which could have attributed to a lower self-esteem. Conversely, since the majority of males was more masculine-oriented, they may have had a greater degree of peer approval.

Males who had high positive scores on the Bem Scale (more feminine) were also found to have higher English aptitude scores than the other male subjects. This evidence is supported by Sexton's study (81) of high school students in which it was found that feminine-oriented males were similar to females in that they performed higher on English and language tests, compared to most males who performed higher on science and mathematic scales.

The findings of this investigation which show various attitudinal variables related to academic achievement and aptitude scores are generally supported by other research. Subjects who were more dogmatic or closed-minded in their thinking tended to have lower grade-point averages and English aptitude scores. These findings are supported by Zagana and Zurcher (97) who found that low dogmatic subjects performed significantly

higher academically and by Steininger (85) who found low dogmatism scores to be significantly related to higher SAT scores for college freshmen. In addition, the finding that high English aptitude scores are related to higher academic achievement is substantiated by previous research (44).

Externally-controlled subjects were found to have lower English aptitude scores and tended to have lower academic achievement. These findings are supported by a study on junior high school students (18) in which it was suggested that externally-oriented students are less likely to accept personal responsibility for low grades and are more prone to blame external forces such as teacher's whims, poor tests, and so forth as the reason for low grades.

One other significant finding of this study with which previous research has been in conflict is that subjects who were the most dogmatic or closed-minded had higher religious conviction scores. While various theorists (48, 50) have postulated that closed-mindedness and strong religious beliefs would be related, few empirical studies have found a significant relationship between these variables among college students. This finding would support both the contentions of Rokeach (69) and Johnson (48) who believed that a strong commitment to a particular belief system closes one's mind to alternative beliefs. These contentions are further supported by the findings of this study in that high dogmatic subjects tended to have lower academic achievement.

Several nonsignificant relationships of this study are in conflict with previous research. Clouse and Hjille (20) found a significant relationship between external locus of control and high dogmatism scores among college students. No such relationship was found in this investigation.

One possible explanation is that Clouse and Hjille sampled subjects from only one academic discipline which could have produced biased results. In support of this conjecture, Frumkin (35) found that students' degree of dogmatism was related to their academic major and readiness to learn. Consequently, a sample of subjects with varied academic interests, such as the subjects in this investigation, may produce different results than studies which sampled from only one academic discipline.

Various theorists (47, 60) have postulated that the internally controlled individual would be more assertive and self-motivated in such areas as academic achievement. However, the findings of this study indicate that the I-E locus of control construct had little relationship to achievement. One possible explanation is that the extreme externally controlled individual may have dropped out of school before the freshman year of college and that college students are basically a homogeneous group in terms of their internal-external control perceptions. The finding of Coleman *et al.* (21) which indicated that low-income or minority group children are more externally controlled may lend support to this thesis: the low-income student more often drops out of high school, compared to the more internally controlled middle-class student.

Finally, although numerous studies have found English aptitude scores to be predictive of academic achievement (4, 5), few empirical studies have found the level of subject's dogmatism to be significant in a predictive model. The present study found both English aptitude and dogmatism scores to be significant predictors of academic achievement. The usefulness of the dogmatism construct in predicting academic achievement adds credence to

various theoretical propositions (50, 35) that subject's degree of dogmatism would be predictive of openness to new cognitive information.

In conclusion, judging from the results of this investigation, it appears that sex-role identity may be a viable concept to use to gain a better understanding of individual behavior. While this investigation found many significant differences between males and females, there were also differences in behavior within each sex group when individuals' sex-role identity was considered. The results of this investigation suggest that rather than dichotomizing individuals solely by physical gender, educators and/or researchers should recognize that individuals' sex-role concepts may differ considerably from the behaviors attributed to the traditional male or female. Failure to consider this phenomenon may prove to be detrimental to what may be an increasing number of individuals who ascribe in varying degrees to the personality characteristics of the opposite sex.

In addition, of the total number of significant relationships found in this study, seven involved the dogmatism construct. Not only was this construct found to be significantly related to sex and to some of the other attitudes measured in the investigation, but it was also found to be significantly related to aptitude scores and achievement. Additional refinement of the Dogmatism Scale or the development of other techniques to measure dogmatism or the open-closed-minded continuum may prove to be beneficial to educators who are concerned with improving the learning process. Seemingly, the use of select attitudinal scales to measure behavior can offer educators additional information to supplement scores on various

intelligence and achievement tests when they are attempting to predict students' behavior or academic performance.

Limitations

The findings of this research are constrained in part by certain assumptions which were made in Chapter I. First, the generalizability of these findings is limited to students attending Grand View College. Second, it was assumed that personality scales could be used to measure the behaviors under consideration in this study. Third, it was assumed that the various personality characteristics could be measured and quantified and could serve as a valid source of predicting behavior. And fourth, it was assumed that the grade-point averages of college students are a valid measure of academic achievement.

Several other possible limitations or questions were generated throughout the course of the study. The use of only one scale to measure each of the personality variables in this investigation can be questioned. Perhaps it would have been more fructuous to use many types of scales, personal interview, and/or controlled experimental techniques to evaluate one personality characteristic in depth, rather than superficially analyzing numerous characteristics.

Another possible limitation is the assumption that because significant relationships were found between various variables that these variables are then linked together in a causal relationship. The presence of a significant correlation between variables does not necessarily mean that one variable causes the other. Conversely, the fact that no significant relationships were found between some of the variables does not necessarily mean

that no causal link exists between them. Other variables not considered in this study could have attributed to the observed relationships.

Last, is the implicit, often subtle, value judgment of this researcher as well as some other authors cited in this study that certain behaviors are more desirable or appropriate than others. Thus, open-mindedness is viewed as more desirable than closed-mindedness, internal control as more desirable than external control, an androgynous sex orientation as more appropriate than either a feminine or masculine sex orientation, and so forth. One limitation of these value judgments is that social scientists, educators, and laypersons come to view certain behaviors as more desirable with little consideration of how these "right" behaviors may only be a function of temporal usefulness to the current socio-economic system. One could equally hold the value judgment that a pluralistic society composed of a wide range of behaviors should be accepted and encouraged rather than a drive for behavioral uniformity. Thus, if an individual chooses to be masculine or feminine, dogmatic or religiously devout, should he or she be permitted to do so, or should labels or other controls be applied to these behaviors in order to change them to some "better" behavior?

Recommendations for Further Research

Based on the findings and insights gained from this investigation, the following recommendations for further research are made:

1. Replication of this study, involving students from other small, denominational colleges might substantiate the findings presented here and provide a broader base for generalization. In addition, students from different types of colleges and universities could

be assessed and compared to the subjects in this investigation. . . . For example, would students attending large state-supported universities differ in their levels of dogmatism or religious conviction compared to subjects from a denominational college?

2. An investigation could be undertaken to determine if students' academic major or specific academic courses would influence their degree of dogmatism, locus of control, or religious convictions in relationship to achievement. For example, would education majors be more dogmatic or have stronger religious convictions than other academic majors, and would this difference be related to achievement?
3. In addition to determining the effects of behavioral attitudes on achievement, a study could utilize personal background data and determine its effects on both attitudes and achievement. Would, for example, social class background or parent's educational level influence a subject's locus of control, dogmatism, or sex-identity disposition?
4. A longitudinal study could be conducted to determine if the attitudes under consideration in this study change from the freshman to the junior or senior year of college. For example, would endorsed sex-identity or religious convictions change over several years of college? Would this change be influenced by the academic major of the subjects? How would this change compare to a similar age group of noncollege subjects studied during the same time span?

5. Further research could employ several standardized personality scales to measure each of the attitudes under consideration in this study. The use of additional scales would add more depth and thoroughness to the analysis of the behavioral attitudes. In addition, the use of projective instruments (such as the completion of incomplete sentences) or a case study approach could tap information different from the personality scales and strengthen an analysis of the variables.

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APPENDIX A: INSTRUMENTS USED IN THE STUDY TO MEASURE
SUBJECTS' ATTITUDES AND BELIEFS

STUDENT INVENTORY SURVEY

Grand View College
Fall, 1975

| | | |
|-----------|----|-----------------------------|
| Scale I | -- | Personality Characteristics |
| Scale II | -- | Attitudinal Characteristics |
| Scale III | -- | Religious Attitudes |
| Scale IV | -- | Personal Convictions |
| Scale V | -- | Educational Values |

Please read the directions carefully for each scale.
When you finish a scale you may begin the next scale.

Please write your name at the top of each scale in
the space provided.

You have ample time to finish all the scales. Do
not rush through them.

You may begin.

SCALE T
120
PERSONALITY CHARACTERISTICS

On the following page, you will be shown a large number of personality characteristics. I would like you to use these characteristics in order to describe yourself. Please indicate, on a scale from 1 to 7, how true of you those various characteristics are. Please do not leave any characteristic unmarked.

EXAMPLE: SLY

Mark a 1 if it is NEVER OR ALMOST NEVER TRUE that you are sly.

Mark a 2 if it is USUALLY NOT TRUE that you are sly.

Mark a 3 if it is SOMETIMES BUT INFREQUENTLY TRUE that you are sly.

Mark a 4 if it is OCCASIONALLY TRUE that you are sly.

Mark a 5 if it is OFTEN TRUE that you are sly.

Mark a 6 if it is USUALLY TRUE that you are sly.

Mark a 7 if it is ALWAYS OR ALMOST ALWAYS TRUE that you are sly.

Thus, if you feel that it is ~~sometimes~~ but infrequently true that you are "sly", never or almost never true that you are "malicious", always or almost always true that you are "irresponsible", and often true that you are "carefree", then you would rate these characteristics as follows:

| | |
|-----------|---|
| Sly | 3 |
| Malicious | 1 |

| | |
|---------------|---|
| Irresponsible | 7 |
| Carefree | 5 |

SCALE I 121

DESCRIBE YOURSELF

1 2 3 4 5 6 7
 NEVER OR USUALLY SOMETIMES BUT OCCASIONALLY OFTEN USUALLY ALWAYS OR
 MOST NEVER NOT INFREQUENTLY TRUE TRUE TRUE TRUE ALMOST
 TRUE TRUE TRUE TRUE TRUE ALWAYS TRUE

| | |
|---------------------|--|
| Self reliant | |
| Yielding | |
| Helpful | |
| Defends own beliefs | |
| Cheerful | |
| Moody | |
| Independent | |
| Shy | |
| Conscientious | |
| Athletic | |
| Affectionate | |
| Theatrical | |
| Assertive | |
| Flatterable | |
| Happy | |
| Strong personality | |
| Loyal | |
| Unpredictable | |
| Forceful | |
| Feminine | |

| | |
|----------------------------------|--|
| Reliable | |
| Analytical | |
| Sympathetic | |
| Jealous | |
| Has leadership abilities | |
| Sensitive to the needs of others | |
| Truthful | |
| Willing to take risks | |
| Understanding | |
| Secretive | |
| Makes decisions easily | |
| Compassionate | |
| Sincere | |
| Self-sufficient | |
| Eager to soothe hurt feelings | |
| Conceited | |
| Dominant | |
| Soft-spoken | |
| Likable | |
| Masculine | |

| | |
|-----------------------------|--|
| Warm | |
| Solemn | |
| Willing to take a stand | |
| Tender | |
| Friendly | |
| Aggressive | |
| Gullible | |
| Inefficient | |
| Acts as a leader | |
| Childlike | |
| Adaptable | |
| Individualistic | |
| Does not use harsh language | |
| Unsystematic | |
| Competitive | |
| Loves children | |
| Tactful | |
| Ambitious | |
| Gentle | |
| Conventional | |

Go on to Scale II

SCALE II

ATTITUDINAL CHARACTERISTICS

Under each number please circle the letter a or b which best describes your attitude or belief. There are no right or wrong answers.

- 1.a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.
- 2.a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's misfortunes result from the mistakes they make.
- 3.a. One of the major reasons why we have wars is because people don't take enough interest in politics.
b. There will always be wars, no matter how hard people try to prevent them.
- 4.a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
- 5.a. The idea that teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
- 6.a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.
- 7.a. No matter how hard you try some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
- 8.a. Heredity plays the major role in determining one's personality.
b. It is one's experiences in life which determine what they're like.
- 9.a. I have often found that what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of actions.
- 10.a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is really useless.
- 11.a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.
- 12.a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.

Scale II Continued:

- 13.a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
- 123
- 14.a. There are certain people who are just no good.
b. There is some good in everybody.
- 15.a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by flipping a coin.
- 16.a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
- 17.a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
b. By taking an active part in political and social affairs the people can control world events.
- 18.a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
b. There really is no such thing as "luck."
- 19.a. One should always be willing to admit mistakes.
b. It is usually best to cover up one's mistakes.
- 20.a. It is hard to know whether or not a person really likes you.
b. How many friends you have depends on how nice a person you are.
- 21.a. In the long run the bad things that happen to us are balanced by the good ones.
b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
- 22.a. With enough effort we can wipe out political corruption.
b. It is difficult for people to have much control over the things politicians do in office.
- 23.a. Sometimes I can't understand how teachers arrive at the grades they give.
b. There is a direct connection between how hard I study and the grades I get.
- 24.a. A good leader expects people to decide for themselves what they should do.
b. A good leader makes it clear to everybody what their jobs are.
- 25.a. Many times I feel that I have little influence over the things that happen to me.
b. It is impossible for me to believe that chance or luck plays an important role in my life.
- 26.a. People are lonely because they don't try to be friendly.
b. There's not much use in trying too hard to please people, if they like you, they like you.
- 27.a. There is too much emphasis on athletics in high school.
b. Team sports are an excellent way to build character.
- 28.a. What happens to me is my own doing.
b. Sometimes I feel that I don't have enough control over the direction my life is taking.
- 29.a. Most of the time I can't understand why politicians behave the way they do.
b. In the long run the people are responsible for bad government on a national as well as on a local level.

124
SCALE III

RELIGIOUS ATTITUDES

Below are 21 statements which concern religious beliefs. Please indicate the extent to which you agree or disagree with each of them. On the right-hand side of the page you will find five alternative answers. Place an X opposite each statement in the column which best represents your opinion. For example:

| Strongly Agree | Agree | Uncertain | Disagree | Strongly Disagree |
|----------------|-------|-----------|----------|-------------------|
|----------------|-------|-----------|----------|-------------------|

More time in broadcasting should be allotted to agnostic speakers.

X

Please do not leave out any statements even if you find it difficult to make up your mind.

1. To lead a good life it is necessary to have some religious belief.
2. Jesus Christ was an important and interesting historical figure, but in no way divine.
3. I genuinely do not know whether or not God exists.
4. People without religious beliefs can lead just as moral and useful lives as people with religious beliefs.
5. Religious faith is merely another name for belief which is contrary to reason.
6. The existence of disease, famine and strife in the world makes one doubt some religious doctrines.
7. The miracles recorded in the Bible really happened.
8. It makes no difference to me whether religious beliefs are true or false.

| Strongly Agree | Agree | Uncertain | Disagree | Strongly Disagree |
|----------------|-------|-----------|----------|-------------------|
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|-------------------|--|
| Strongly Agree | |
| Agree | |
| Uncertain | |
| Disagree | |
| Strongly Disagree | |

- 6 -

126
SCALE IV

PERSONAL CONVICTIONS

Below are 40 statements which concern your personal convictions. Please indicate the extent to which you agree or disagree with each statement. Place an X opposite each statement under the column which best represents your conviction.

| | Strongly Agree | Agree on the Whole | Agree a Little | Uncertain | Disagree a Little | Disagree on the Whole | Strongly Disagree |
|--|----------------|--------------------|----------------|-----------|-------------------|-----------------------|-------------------|
| 1. The United States and Russia have just about nothing in common. | | | | | | | |
| 2. The highest form of government is a democracy and the highest form of democracy is a government run by those who are most intelligent. | | | | | | | |
| 3. Even though freedom of speech for all groups is a worthwhile goal, it is unfortunately necessary to restrict the freedom of certain political groups. | | | | | | | |
| 4. It is only natural that a person would have a much better acquaintance with ideas he believes in than with ideas he opposes. | | | | | | | |
| 5. Man on his own is a helpless and miserable creature. | | | | | | | |
| 6. Fundamentally, the world we live in is a pretty lonesome place. | | | | | | | |
| 7. Most people just don't give a "damn" for others. | | | | | | | |
| 8. I'd like it if I could find someone who would tell me how to solve my personal problems. | | | | | | | |
| 9. It is only natural for a person to be rather fearful of the future. | | | | | | | |
| 10. There is so much to be done and so little time to do it in. | | | | | | | |
| 11. Once I get wound up in a heated discussion I just can't stop. | | | | | | | |

12. In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.
13. In a heated discussion I generally become so absorbed in what I am going to say that I forget to listen to what others are saying.
14. It is better to be a dead hero than a live coward.
15. While I don't like to admit this even to myself, my secret ambition is to become a great man, like Einstein, or Beethoven or Shakespeare.
16. The main thing in life is for a person to want to do something important.
17. If given the chance I would do something of great benefit to the world.
18. In the history of mankind there have probably been just a handful of really great thinkers.
19. There are a number of people I have come to hate because of the things they stand for.
20. A man who does not believe in some great cause has not really lived.
21. It is only when a person devotes himself to an ideal or cause that life becomes meaningful.
22. Of all the different philosophies which exist in this world there probably is only one which is correct.
23. A person who gets enthusiastic about too many causes is likely to be a pretty "wishy-washy" sort of person.
24. To compromise with our political opponents is dangerous because it usually leads to betrayal of our own side.
25. When it comes to differences of opinion in religion we must be careful not to compromise with those who believe differently from the way we do.

| | |
|-----------------------|--|
| Strongly Agree | |
| Agree on the Whole | |
| Agree a Little | |
| Uncertain | |
| Disagree a Little | |
| Disagree on the Whole | |
| Strongly Disagree | |

26. In times like these, a person must be pretty selfish if he considers primarily his own happiness
27. The worst crime a person could commit is to attack publicly the people who believe in the same thing he does.
28. In times like these it is often necessary to be more on guard against ideas put by people or groups in one's own camp than by those in the opposing camp.
29. A group which tolerates too many differences of opinion among its own members cannot exist for long.
30. There are two kinds of people in this world: those who are for the truth and those who are against the truth.
31. My blood boils whenever a person stubbornly refuses to admit he's wrong.
32. A person who thinks primarily of his own happiness is beneath contempt.
33. Most of the ideas which get printed nowadays are aren't worth the paper they are printed on.
34. In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted.
35. It is often desirable to reserve judgment about what's going on until one has had a chance to hear the opinions of those one respects.
36. In the long run the best way to live is to pick friends and associates whose tastes and beliefs are the same as one's own.
37. The present is all too often full of unhappiness. It is only the future that counts.

| | |
|-----------------------|--|
| Strongly Agree | |
| Agree on the Whole | |
| Agree a Little | |
| Uncertain | |
| Disagree a Little | |
| Disagree on the Whole | |
| Strongly Disagree | |

APPENDIX B: THE USE OF PROJECTIVE INSTRUMENTS
TO MEASURE ATTITUDES TOWARD EDUCATION

Purposes

This study had three primary purposes. One purpose was to determine if subjects' attitudes towards the learning process could be analyzed through the use of projective measuring instruments. A second purpose of this study was to determine if there was any relationship between the variables measured in the main study (sex, sex-identity, dogmatism, I-E locus of control, religious convictions, aptitude, and academic achievement) and the results from the variables measured by the projective instruments. The last purpose was to generate hypotheses from the results of the study which could then be tested empirically.

Methodology

Two projective instruments were devised for this study. The first projective instrument (see p. 139) consisted of illustrations of two diverse classroom situations, labeled A and B, in which subjects were asked to choose the classroom which they believed was the most conducive for learning. Their choice was then marked on a line continuum, A being on the left end of the continuum and B on the other end. In order to determine their degree of belief in the classroom learning situation, the line continuum was divided into five equal sections. Thus, the response of subjects who chose Classroom A was given a numerical value of 1 or 2, while the response of the subjects who chose Classroom B was given values of 4 or 5. A value of 3 was judged either as a rejection of both classrooms or as an indication that both classrooms could be equally conducive for learning.

The second projective instrument (see p. 140) consisted of a group of five open-ended sentences which subjects were asked to complete. These

sentences related to the two illustrated classroom situations in the first projective instrument and to other aspects of education.

Analysis

After the administration of the instruments, the results were analyzed in two ways. First, the numerical values assigned to the subjects on the line continuum were correlated with all of the variables used in the main study. The first incomplete question asked the subjects to which classroom, A or B, they would prefer to send their own children. The responses were coded as either 1 (A) or 2 (B) and correlated with all the other variables in the main study.

The four remaining questions were analyzed by dividing the subjects into two groups: those who chose Classroom A and those who chose Classroom B on the line continuum. Answers which were closely related and appeared at least three times were then identified as being significant. Of the 358 subjects who completed the projective instrument, 182 subjects chose Classroom A (1 or 2 on the line continuum) while 67 chose Classroom B (4 or 5).

Findings

A Pearson product-moment correlation was used to test the relationships between the subjects' responses on the line continuum and the seven variables employed in the main study. Subjects who chose classroom A as being the most conducive for learning had significantly higher (.01 level) religion conviction scores but lower (.01 level) English aptitude scores and grade-point averages. However, no relationship was found between the subjects' choice of the best classroom for their children (sentence 1) and the seven dependent variables.

In response to sentence 1, of the 182 subjects who selected classroom A as the most conducive for learning, 163 or 89 percent preferred to send their own children to a similar classroom. The remaining 11 percent either believed that Classroom B was preferred for their children, or they replied that "a little of both classrooms" would be preferred.

Of the 67 subjects who selected Classroom B, 64 or 96 percent preferred to send their own children to the same classroom. Of the other three respondents who selected Classroom B, two chose Classroom A as the better classroom for their children. The remaining subject believed that it would be better to initially enroll his children in Classroom A, but as they matured, to expose them to a Classroom B situation.

In response to sentence 2, "A teacher should _____," endorsers of Classroom A generally tended to view the teacher's role differently from the teacher illustrated in Classroom A. Subjects indicated that a teacher should be "helpful," "care about the students," "be nice," "spend equal time with all students," "be sincere," and so forth. A smaller number of Classroom A endorsers stated that the teacher should be "strict with everyone," "be in control," "do his job," "be firm," "respected," and so forth.

Endorsers of Classroom B in response to "A teacher should _____," were more consistent and somewhat different in their responses than those who selected Classroom A. These students generally believed that a teacher should "be creative," "an inspirer of knowledge," "be innovative," "not lecture," "individualize instruction," "work with the student at his level," "be a friend of the student," and so forth. Unlike supporters of Classroom A, the B endorsers seemed to emphasize that a democratic teacher

who fostered student-teacher equality provided the most conducive atmosphere for learning.

In response to sentence 3, "Education today is _____," endorsers of Classroom A seemed to stress pragmatic functions such as "worth every penny it costs," "not related to a job," "necessary," "important," "needed to make money," "forming future leaders," and so forth. A smaller number of Classroom A endorsers viewed education today as "too lenient," "a joke," "becoming like Classroom B," "too extremist," and "impractical."

Endorsers of Classroom B generally responded to question 3 in terms of the instructional techniques for the students. Answer completions such as "not personal enough," "needs to be individualized," "too strict," "too detailed," "too systematic" were frequent responses. However, a large number of Classroom B supporters seemed to be optimistic about education as evidenced by such statements as "improving," "changing," "better than it was," "more concerned with the individual," "more democratic," and so forth. At least six endorsers of B simply said that education today is "too expensive."

In response to sentence 4, "I learn best when _____," supporters of Classroom A gave seemingly contradictory replies regarding the role of the teacher or classroom depicted in illustration A. Many subjects believed that they learned best when "the classes are small," "I am on my own," "I can explore alternatives," "in discussion groups," and "I'm outside." However, the majority of Classroom A respondents reflected authoritarian views of learning, i.e., they felt they learned best when the teacher directed the learning. Statements that appeared frequently were "when I am made to study," "when the teacher stimulated me," "when the

teacher knows what he's talking about," "when the class is orderly," "when there is lack of noise," "when I am lectured to," and so forth.

Supporters of Classroom B often gave more creative and humorous answers to the fourth item, "I learn best _____. " Such answers as "when the teacher is absent," "when my potential is tapped instead of trampled," "when I can actualize," "when the teacher is uninhibited," "when I can read by myself" were frequent responses. Other replies were "when I am stimulated," "when the classroom is small," "when it's fun," "when the class is interesting," and "when I can discuss."

In response to sentence 5, "Why can't schools be more _____," supporters of A often gave replies which contradicted the learning environment of Classroom A. Most subjects believed that schools should be "more relaxed," "more informal," "discussion-oriented," "aware of personal problems," "independent," "personalized," "alert to all differences," "sensitive to students," "cooperative," "student-oriented," and so forth. A smaller number of Classroom A supporters believed that schools should be more "orderly," "structured," "selective," "relevant," "advanced," "disciplined," "concerned about essentials," and so forth.

The majority of supporters of Classroom B believed that schools should be more "flexible," "offer more choice," "informal," "personalized," "warm and humane," "individualized," "student-oriented," "good for students," "open to different styles," "equal," "more individualized-less bureaucracy," "relaxed," and so forth. None of the supporters of Classroom B believed that schools should be more orderly, disciplined, structured, or concerned with essentials as had supporters of Classroom A.

Conclusions

The results of this study suggested that individuals' attitudes could be differentiated by the use of projective instruments. While the analysis of the results of any projective instrument is subjective in interpretation, the findings often offer insights which may go unnoticed by more objective evaluation techniques.

Consistent differences were observed between supporters of Classrooms A and B. Classroom A supporters consistently gave responses to the incomplete sentences which seemed to contradict the actual classroom scene illustrated in Classroom A. Perhaps the answer of one supporter of Classroom A in which he stated that a teacher should be "democratic but firm" is indicative of the attitudes of these individuals. Classroom A may have been viewed as a democratic or egalitarian structure with the teacher's firmness used to maintain the egalitarian structure. On the other hand, Classroom B with its stress on "doing your own thing" may have appeared too chaotic and was judged by A supporters as a structure unable to maintain order and individual rights.

Classroom B supporters gave consistent answers to the incomplete sentences which reflected the scene illustrated in Classroom B. The B supporters seemed to stress the learning process as a responsibility of the student. Perhaps the answer of one student who replied that he learns best "when left on my own" illustrated this student-centered responsibility for learning.

Recommendations

Based on the results of this study, the following recommendations for future studies are suggested:

1. The projective scales used in this study should be refined and extended to other educational variables. A standardized scoring procedure should be developed which could facilitate a more quantifiable analysis of the variables.
2. A longitudinal study could be conducted to determine if students' attitudes toward the "best" classroom change after their freshman year. If change does occur, is it related to the academic major of the student or to their grade-point averages?
3. A study could investigate how a structured, teacher-oriented classroom would effect students who support a student-oriented learning environment. What percentage of college drop-outs are individuals who were exposed to learning situations which they couldn't accept philosophically?
4. Additional information on the background of students who chose Classrooms A and B could strengthen the results of this study. Would such variables as parents' educational backgrounds, parents' occupations, rural versus urban secondary school experience, political ideology, and so forth be related to students' classroom choices?
5. This study found significant differences in the academic achievement of Classrooms A and B supporters. Further research could be conducted to determine the reasons for this difference.

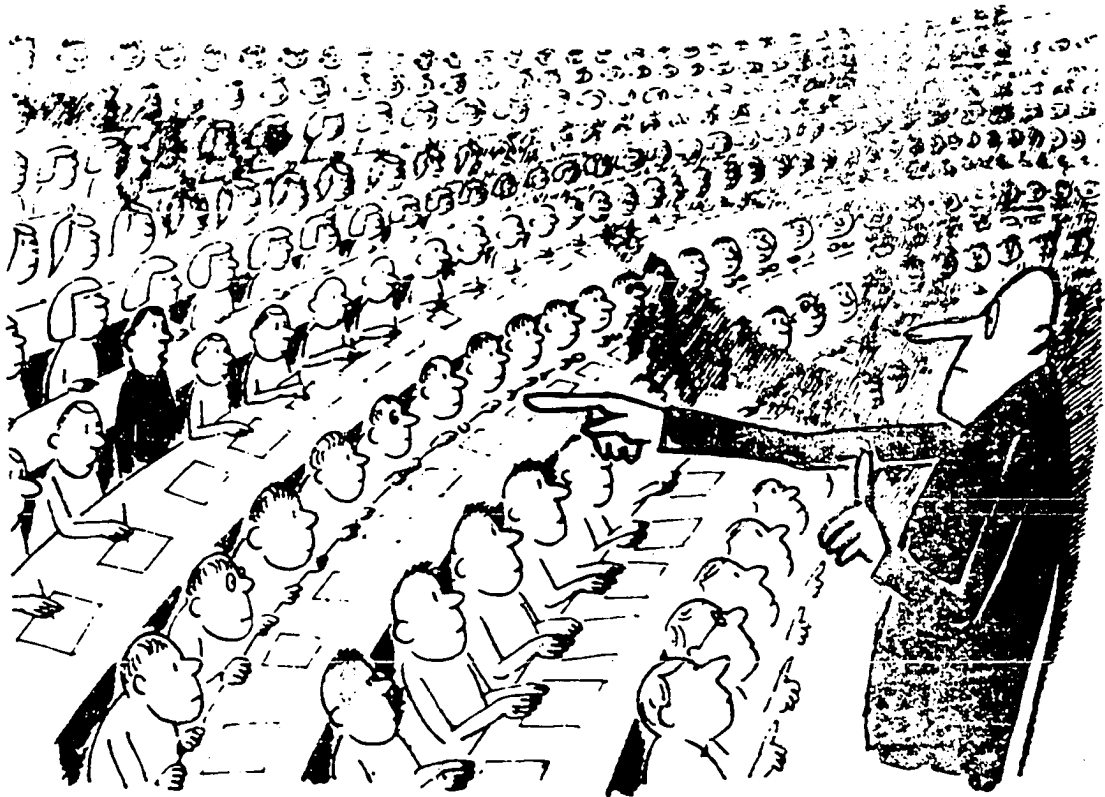
6. A study could investigate if classroom choice is related to students' general conforming versus nonconforming behavior or to their conservative versus liberal views of man. Would a scale which consisted of quotes from such prominent educators as John Dewey and Max Rafferty relating to the "true" purposes of education (presented in a Likert-type answering format) differentiate or relate to the students' choices of Classrooms A or B?

EDUCATIONAL VALUES

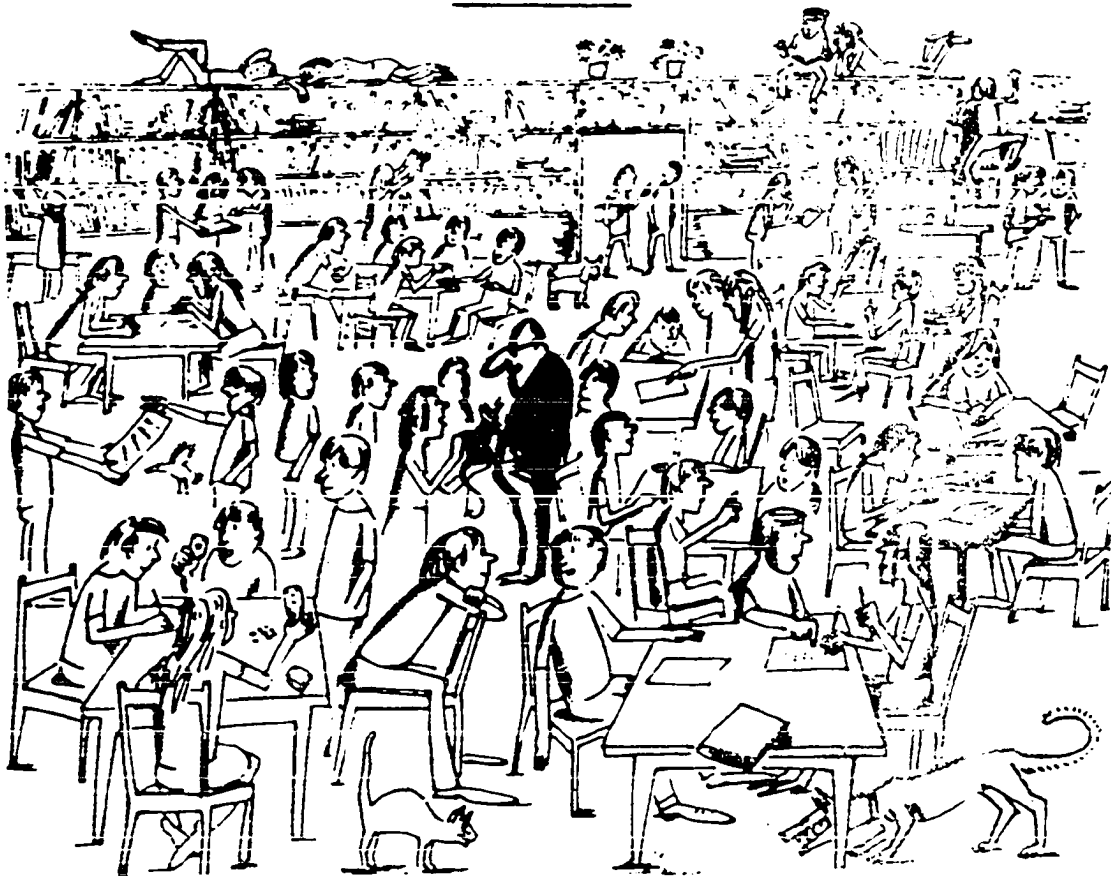
These pictures represent opposite extremes of the educational process in American schools.

139

Classroom A



Classroom B




SCALE V

Which classroom situation do you believe would be the most conducive to learning? Please place an X on the line continuum according to your beliefs:

High Acceptance
Classroom A

High Acceptance
Classroom B



Please complete the following sentences. (There are no right or wrong answers):

1. I would prefer to send my own children (assuming you have some) to classroom _____ (A or B).
2. A teacher should (print) _____.
3. Education today is (print) _____.
4. I learn best when (print) _____.
5. Why can't schools be more (print) _____.