AN ANALYSIS OF THE ACADEMIC ACHIEVEMENT
OF ADULT UNDERGRADUATE STUDENTS IN THE
LIBERAL ARTS PROGRAM AT MACOMB COUNTY
COMMUNITY COLLEGE DURING THE ACADEMIC YEAR,
1968 - 1969

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
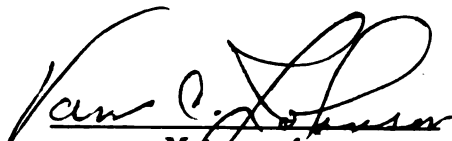ORVA LEE ICE, JR.
1971

This is to certify that the

thesis entitled

AN ANALYSIS OF THE ACADEMIC ACHEIVEMENT OF ADULT
UNDERGRADUATE STUDENTS IN THE LIBERAL ARTS PROGRAM
AT MACOMB COUNTY COMMUNITY COLLEGE DURING THE
ACADEMIC YEAR, 1968-1969.

presented by

ORVA LEE ICE, JR.

has been accepted towards fulfillment
of the requirements for

__Ph.D.___ degree in _Education_

_____
Major professor

Date _January 27, 1971_

O-169

Purpose of the Study

The purpose of this study was to investigate the
academic achievement of adult undergraduate students
attending M.C.C.C. full-time in a liberal arts program.
It determined: (1) if the adult student earned a higher
G.P.A. than his younger counterparts; and (2) what, for the
student, predicts M.C.C.C. grade point average better the
high school G.P.A. or the A.C.T. predictive score.

Procedures

The population of this study included 707 full
time students enrolled in a liberal arts program at
M.C.C.C. All students were enrolled for the first time in
any college, and attended one complete academic year from
September, 1968 to June, 1969.

The population was divided into four groups as
follows. Group 1 consisted of 448 students who graduated

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ABSTRACT

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from high school within one year prior to entering
M.C.C.C.; Group 2 consisted of 99 students who had
graduated from high school within three years, but with
an absence of at least one year; Group 3 consisted of 57
students who had graduated from high school within five
years, but with an absence of at least three years; and
Group 4 consisted of 105 students who had graduated from
high school five years or more before entering M.C.C.C.

Group 4 represents the Adult Undergraduate Student
and Group 1 is his Younger counterpart. Each group was
subdivided into a male and female group. This was a true
sample since the total population was used for the
analysis.

The data consisted of a total mean G.P.A. for all
groups taken from the actual high school record, the
A.C.T. predictive scores, and the actual M.C.C.C. record.
It also included a sub-total mean G.P.A. in each of the
four academic subjects, English, Mathematics, Social
Science, and Natural Science, the high school records,
A.C.T. predictive scores, and M.C.C.C. records.

A multivariate analysis of variance was used to
test the statistical hypotheses: (1) There is no sig-
nificant group effect for the multivariate case, (2) There
is no significant sex effect in the multivariate case,
and (3) There is no significant interaction between groups
and sexes in the multivariate case. This analysis was
applied to the data for all four groups of the population,

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to test the group effect. This same analysis of variance
model was applied to the data for all groups for a sex
effect and the interaction of sex and group effect. The
.05 level of confidence was chosen as the level at which
differences were considered resulting from factors other
than chance.

A simple correlation study was utilized to ascer-
tain the best possible predictor of M.C.C.C. grade point
average. A step-wise regression method was also utilized
to yield the variable with the most significant ratio in
predicting the grade point average at M.C.C.C.

Major Findings of the Study

The findings of this study justified the following
conclusions:

1. The hypothesized superiority on academic
    achievement of the Adult Undergraduate Student
    over his Younger Counterpart, as measured by
    higher grade point averages, is affirmed. For
    the year 1968-1969 at M.C.C.C., the Adult
    Student (Group 4) earned a higher G.P.A. than
    his Younger Student Counterpart (Group 1). The
    differences between the two groups were sub-
    stantial.

2. Almost all students, in this sample, in the
    Liberal Arts program at M.C.C.C., had similar
    grade averages in high school.

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3. Academic achievement was greater for almost all
    females in all groups.

4. The difference in academic achievement between
    the adult student and the younger student
    group was not affected by a comparison between
    groups on the basis of sex.

5. For the Adult Undergraduate Student, the best
    predictors of M.C.C.C. grade point average, in
    order of significance, are: A.C.T. Social
    Science mean Predictive grade point average
    taken from converted scores; A.C.T. Total mean
    Predictive G.P.A.; and High School Total mean
    G.P.A.

Implications for Practice

1. There is no academic reason for a special role
    being assigned to the adult undergraduate
    student.

2. No academic standards have to be compromised
    and no special academic limits, except for
    appropriateness, need be imposed due to the
    presence of the adult student.

3. There is little reason for older persons in
    good health to hesitate to pursue their
    undergraduate education.

4. Correlation of high school and A.C.T. records,
    with M.C.C.C., are not sufficiently high to

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Orva Lee Ice, Jr.

warrant their use as exclusive criteria for
admission or prediction of success.

5. The significance of the adult population in
college should be recognized as an encouragement
for colleges to provide more mature programs.

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DURING THE ACADEMIC YEAR, 1968-1969

By

Orva Lee Ice, Jr.

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Administration and Higher Education

1971

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ACKNOWLEDGMENTS

A written expression of gratitude cannot do justice to my feelings for the efforts of the committee which made this study possible. The guidance and encouragement each gave me was an indispensable contribution to the completion of this study.

Dr. Van C. Johnson as chairman gave me invaluable direction throughout the several phases of the study which was augmented by his constant encouragement from the very beginning.

Professor Russell J. Kleis patiently helped clarify many points of research throughout the study which served to crystallize much of the thought incorporated in the study.

Acknowledgment is made to Dr. George R. Myers and Dr. Grafton Trout for their guidance and encouragement during the progress of the study.

I wish to acknowledge with all my love the indebtedness to my wife, Jean Ellen Ice, for her support, constant encouragement, and statistical help during the preparation of the study.

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CHAPTER I

THE PROBLEM

This chapter contains a general introduction to the study and includes need, purpose, theory, research hypotheses, definitions, delimitations, assumptions and an overview of the dissertation.

Need

The mass media, with its articles, commentaries, analyses and reports, along with scholarly research, have emphasized the vastness of adult interest in higher education. Most educators today recognize the necessity of increasing society's commitment to the further training of adults and adult education. Many institutions of higher learning are sponsoring research and development of programs specifically designed for adults. However, most colleges and universities are geared for the younger student and offer courses and degree programs for which adults may register, but which are not designed specifically for them. Newgarten states succinctly that: "We are operating with expectations of adolescence in an

institution that has been geared to adolescence" (18:8).
She seems to indicate a barrier for adults interested in a
college degree.

Erickson asserts that:

Universities and colleges need to recognize many
changing patterns in education. More people want and
need more education. Greater numbers of adults have
educational needs . . . adults, looking for degrees,
are knocking at the door (51:190).

This barrier is a comprehensive one encompassing
the general structure of the institutions of higher edu-
cation. It includes the specific hurdle of an admissions
process that makes no distinction between a person of
thirty-five and one who is eighteen. Is it a reasonable
admissions practice that demands that the adult student
present his high school record as a mean of judgment? Is
it also reasonable to demand that he score a certain level
on a test for proper admission status? This study attempts
to scrutinize the high school record and one of the
national tests, (American College Test), and its scoring,
as a predictor of college success.

This barrier also includes the more subtle hurdle
of college press that makes the adult student fit into the
age old patterns of terms, credits, and course work.

Cohen reports this:

If a mature man or woman overcomes the hurdles of the
admissions office and can schedule his life to include
college attendance, he confronts the same set of
departmentalized courses and the routine requirements
designed for middle-class young people and for the
most part unchanged for a generation or more (5:68).

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Much of the research in adult education indicates that these procedural "hurdles" are currently in effect (Giusti 35; DeCrow 8; Casand 31; Segal 47). Most adult students have been relegated to the part-time or non-credit status, rather than as part of the regular program status. Adults have been categorized into "those evening, night-school, adult-continuing education students."

With this comprehensive barrier in mind there is a need to analyze performance of those adult students enrolled in a full-time undergraduate program. It is pertinent to analyze the situation as to their success or lack of it--for discouragement or encouragement.

To make the barrier a particular one, this study was concerned with the adult undergraduate student enrolled full-time on a degree program at a public supported community college. The policies, expectations, and procedures of the community college are not as stringent or geared so strongly to the adolescent as those of a four year institution. Although everyone is accepted under the "open door" policy, admissions to a degree program still require the high school credentials, and a placement test used to evaluate the students' background and knowledge. Poor high school records and fear of tests continue to be an integral part of the adult discouragement. This may lead to misplacement, but the adult student does have more access to a degree program than he would at most four year institutions.

Since the community college has the aspect of encouraging the adult student to enroll, research on the aspect of adult student academic success, or lack of it, may stimulate some inspection of the adult undergraduate situation in all institutions of higher education.

Purpose

This study has investigated the Adult Undergraduate Students who attended Macomb County Community College, (Warren, Michigan), full-time during the academic year 1968-1969. It asked: (1) Does the adult student perform academically as well as, better than, or worse than his younger counterpart, as indicated by the academic records; and (2) What predicts Macomb County Community College G.P.A. better--the high school G.P.A. measure, or the American College Test score, and how does this compare with the better predictor for his younger counterpart; and (3) Is the adult's academic success at M.C.C.C. better than his high school or A.C.T. test indicate?

Theory

With such a statement as "society now has as great a stake in the continued learning of adults as it ever had in the education of children" (54), on the one hand, and college admissions officers rejecting, or at least dis-couraging, adult applicants on the other, confusion is in order for an adult aspirant. These admissions officers

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are simply adhering to assumptions that the adult student
is less able than the younger student. (Much of this
assumption, as well as hearsay, is transmitted by society
in general, and by college administrators, faculty and
students.)

The fact that adults can learn has been adequately
revealed, through the years, in research, by Thorndike
(26) and Sorensen (22). Research of adult learning indi-
cates that while there are differences between the learning
processes of adults and youths, adults are capable learners,
has been reported by de S. Brunner (9), Havighurst (11),
Ulmer (55).

Other researchers, including Lorge (16) and Gibson
(52), emphasize time limitations, but indicate that adults
learn more readily in terms of power ability, i.e.,
learning without stringent time limits. In spite of this
more recent research, the basic Thorndike theory of a
declining rate of learning seems to keep alive the belief
that the ability to learn begins to decline at a relatively
early age. A closer look at this theory seems to be
modified by Thorndike himself: "In general nobody under
forty-five should restrain himself from trying to learn
anything because of a belief or fear that he is too old to
be able to learn it" (26:177). However, on the negative
side there remains considerable question among educators
concerning achievement, professional standards, and

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motivation of adult students. Differences in age, maturity, prior learnings, economic responsibilities, and motivation tend to accentuate the differences between adults and younger students. Where differences are not fully understood by administrators, faculty, and students, there often develops the attitude that adults do not or cannot learn as well as younger students.

Some research classified the adult capacity to learn as a slow learner. Wechsler stated that:

> Every human capacity (mental) after attaining a maximum begins an immediate decline. This decline is at first very slow but after awhile increases perceptibly. The age at which the maximum is attained varies from ability to ability, but seldom occurs beyond 30 and in most cases somewhere in the earlier 20's. Once the decline begins it progresses continually (27:55).

At the same time he defined general intelligence as a multivariate construct:

> General intelligence as evaluated by pragmatic criteria appears to maintain itself unimpaired over a much greater portion of adult life and to decline at a much slower rate than do the mental abilities by which it is inevitably measured. What we are proposing then is that general intelligence is a multivariate construct, the differentia of which may and do alter with successive periods in the individual's life (27:142).

These passages might have been read and studied by school administrators and faculty in their study and research. A bias may have developed regarding the capabilities of the adult student. Knowledge of certain atypical examples drawn from school records showing adult lack of achievement and drop-out, or personal

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acquaintances, might have added to a negative attitude.
Myths have arisen from such fragmentary opinions as: "You
can't teach an old dogs new tricks." "Unless you have a
high I.Q., all hope is abandoned." "The mental age of the
average adult is thirteen years."*

On the positive side Stern (23) titled his account
"Never Too Late For College." Research does describe the
adult student capacity for achievement, but at a slower
pace than younger students (Ulmer 56) and (Gibson 52), as
evidenced in special testing situations. There is evidence
that despite poor preparation and extended period of non-
academic activities, adults in general will produce far
better than their former records would indicate (Wientge
49) and (Gibson 52).

Most academic success is recorded under certain
special situations, with certain groups and special age
groups, such as in Schlossberg's (45) study of older men
(age thirty-five) attending college full time.

In the press of regular college programs the
assumptions still persist, on the one hand, that the adult
student cannot "cut it," while the theory on the other
hand, indicates that he has latent potential. A cleavage
also exists in recognizing this potential by discouraging

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*Address by Dr. J. R. Kidd, Director, Candian
Association for Adult Education Before College and Uni-
versity Section, Adult Education Association of Michigan,
Detroit, 1961.

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admissions procedures and judgments used for adolescent students.

With the irrelation of assumptions and theory, this study has been designed to (1) investigate the academic achievement of adult undergraduate students at Macomb County Community College; (2) to examine the relationship of college performance to high school grades and the current American College Test scores; and (3) to compare the adult student record with the younger student record at Macomb County Community College.

Hypotheses

Two hypotheses are to be answered:

1. Do Adult Undergraduate Students at Macomb County Community College have higher scores in academic grade variables than the Younger Undergraduate Students? Specifically:

   a. Is there any significant difference between groups as to high school grades, A.C.T. scores, and Macomb County Community College grades?

   b. Is there any significant difference between male and female groups in high school grades, A.C.T. predicted grade and Macomb County Community College grades?

   c. Is there significant interaction between groups and sexes in high school, G.P.A. measures, A.C.T. measures, and Macomb County Community College G.P.A. measures?

2. For the Adult Undergraduate Students, what predicts Macomb County Community College G.P.A. better the high school G.P.A. measure or the A.C.T. score measure?

Definition of Terms

__M.C.C.C.__ refers to Macomb County Community College.

__A.C.T.__ refers to American College Test.

__G.P.A.__ refers to Grade Point Average. The grade point average is determined by dividing the total grade points earned by the total number of semester hours, whether passed or failed. The numerical equivalents of letter grades for determining the G.P.A. are: A = 4, B = 3, C = 2, D = 1, and E = 0.

__M.C.C.C. Student__ refers only to Liberal Arts students attending Macomb County Community College full time.

__Adult Student__ refers to a student who graduated from high school at least five years prior to his college entrance, or who is at least twenty-five years of age.

__Younger Student__ refers to a student who is not older than twenty years of age, and who graduated from high school within one year prior to his college entrance.

__College Achievement__ refers to academic achievement over a period of two eighteen-week semesters of Liberal Arts courses. These courses include: freshman English, Mathematics, Social Science, and Natural Science. The grades range from A to E. A is excellent; B is good; C is fair; D is poor; and E is failure.

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<u>High School Records</u> refer to the official transcript of grades sent by the high school to the college.

<u>High School Achievement</u> is determined by grades in academic course work. One unit is one year of study. Only English, Mathematics, Social Studies and Natural Science are considered. The grades range from A to E or F. If grades are indicated in numerical form, the following evaluation has been made: A = 95 through 100; B = 85 through 94; C = 75 through 84; D = 65 through 74; and E or F = 64 and under. The numerical equivalents of letter grades for determining G.P.A. are the same as those specified above for College Achievement.

<u>A.C.T. Scores</u> refer to the American College Test predicted grades computed from the raw scores according to A.C.T. formula without the mix of reported high school grades (see Appendix A).

<div align="center"><u>Delimitations</u></div>

This study is limited to 707 cases, or 100 per cent of the undergraduates who have completed the freshman year of college in a Liberal Arts program at Macomb County Community College, September, 1968 to June, 1969.

The study is limited to the analysis and comparisons of college academic achievement levels. The study is not intended to account for the extent to which motivation and

maturity affect the attitudes and achievement of the population tested.

This study is limited to an analysis of grades and predictive grade point averages.

Assumptions

For the purpose of this study, it is assumed that differences in high school grades due to differential grading practices in high schools represented in this study, would not systematically influence the findings.

For the purpose of this study, it is assumed that the A.C.T. test is a reliable instrument in the comparison of scores of all students.

It is recognized that the statement of assumptions, definitions, and delimitations gives rise to further limitations inherent in the study itself and others like it. For example, the basic use of grades raises the serious challenge of the meaning of grades. Barzun sums up much of the opinion and research: "Marks are a convention, a language agreed upon and therefore to be respected" (1:217). Wolk states that ". . . grading seems to be unanimously disapproved and universally used" (50:5).

Overview

Chapter II presents a few of the categories of the literature of higher education for adults. Such topics as

the adult student himself, the need for higher education
for adults, the specific programs in higher education for
adults, adult achievement in higher education, and the
comparison of adult student achievement with other student
achievement are outlined. This includes the junior com-
munity college programs. Except for a brief review of
basic studies of adult learning capacity, this review did
not attempt to survey the many studies of adult intelli-
gence and mental abilities. Chapter III contains a
description of the sample, the methodology, and the
procedures used in the collection and analysis of the data.
Chapter IV contains the analysis of the results through
statements of hypothesis testing, and a discussion of
findings. Chapter V presents a summary, with conclusions,
implications, and recommendations for future research.

CHAPTER II

A REVIEW OF THE LITERATURE

This section concerns itself with pertinent liter-
ature of higher education for adults. Other than a review
of basic studies of adult learning capacity, it does not
attempt to survey the many studies of adult intelligence
and mental abilities. Neither does it more than view the
broader "adult" or "continuing" education. An effort was
made to locate and report studies where an objective
comparison of achievement between adult students and
younger students was made. Few studies were found which
met this criterion.

Among the many categories to be chosen in the
literature of higher education for adults, three areas
include pertinent related literature for this study. They
include studies that attempt to measure adult student
learning and learning opportunities. The first category
explores literature about the adult himself, his learning
capacity, needs, attitudes, interests, and achievements.
Secondly there is the literature which studies the need
for education of adults on all levels. The third category

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includes specific studies of <u>college and university</u>
<u>programs for adults</u>, including the junior community college
programs.

<div align="center">Literature Regarding the Adult
Student Himself</div>

Interest in adult abilities and achievements has
not been merely a recent development. As long ago as
1928, E. L. Thorndike's experiments in adult learning
provided the pyschological basis for adult education. In
his book, <u>Adult Learning</u>, Thorndike concluded that adults
can learn, but at a declining rate. This decline begins
at approximately age twenty-five (26:177).

As basic as the experiments of Thorndike were, they
tend to keep alive the belief that the ability to learn
begins to decline at a relatively early age. Roger DeCrow
cites the experiment of Lewis Terman:

> In 1921, Lewis Terman tested 1,000 highly intelligent
> children at the ages of ten and eleven. . . . The same
> subjects were retested at an average age of 29, and
> again in 1951, when most had reached 40. The studies
> show that these subjects improved in vocabulary and
> general information at each stage of the study (8:5).

These and many other experimental findings lend support to
a theory covered in this study that adult capacity to
learn in college will exceed the same population's
achievement in high school.

Sorenson was one of the first to compare the college
achievement of adults in extension classes with those in
resident classes on a large scale (22). His study matched

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fifty classes, extension and campus, by instructor, subject matter and examination. Sorenson found that students in extension classes achieved slightly better than those in resident classes. Twenty-six of the extension classes were found to be superior, fourteen inferior, and ten equal to the resident classes. Where differences were found, Sorenson considered them small and insignificant. Perhaps the most significant statement made regarding this experiment was that there were more differences in college achievement within groups than between them. He said, further, that in the long run the classroom achievement of adults is determined primarily, not by their years of formal education, but by their mental ability.

Wientge and Dubois in their study measured academic success of students as part of a large scale study involving 2,953 pre-tests and 2,252 post-tests of evening college students. Academic success was measured in two ways, through a "residual gain" score in classroom learning, and as final class grade (49:31).

Wientge and Dubois suggested that age-related variables reflected more than the passage of time:

> When interests, abilities and opportunities are appropriate, time is a dimension in college credits earned. Even though the correlations of these variables with academic achievement are lowered when age is partialed out, it seems likely that the basic variable is something which might be described as maturity. . . . In the context of this project, at least, age, social maturity and scholarship co-vary (49:27).

This was a large scale, well planned experiment with an objective measure of evening college achievement being only one facet of the overall design. This study was designed only to test the achievement of the evening college students.

A. M. Anikeeff of Oklahoma State University administered identical pre-tests and post-tests to an extension off campus class and to a day university class which were both taught by him (30:171). A correlation of the pre-test mean for day students with the post-test mean of the extension students showed no significant difference. In view of this result, Anikeeff questioned the advisability of granting college credit for work done in evening off-campus extension courses. He qualified his conclusion, however, by questioning the motivation of that particular evening group. He stated that the evening class was entirely composed of veteran students drawing subsistence allowance from the Veteran's Administration for attending class.

Two other studies regarding evening, off-campus, extension students were conducted by A. A. Lacognata. One compared the learning situations of residential and non-residential adult groups. Under the auspices of the Center for the Study of Liberal Education for Adults, Lacognata's experimental groups consisted of sixty students who were brought to the campus at Michigan State University. The control group consisted of seventy-four students who were

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given the same course at a non-residential program in Detroit. Examinations were administered to both groups. The examinations were designed to measure dimensions of knowledge acquisition, application, and ability to communicate new knowledge. He concluded that residential instruction was superior to non-residential learning situations.

The analysis of the data in the above study shows a higher performance on the examination by the resident students, when compared to the non-residents (42). Many more adults attend non-resident and extension classes.

In 1961-62 Lacognata conducted an investigation at Michigan State University similar to the one by Sorenson cited previously (41). Thirty-two matched classes, comprising over 2,100 residential and non-residential extension students, were compared on the basis of course grades earned. In the area of physical sciences, humanities and arts, the author found no significant difference in performance in the area of applied sciences and social sciences was found, with non-residential extension students demonstrating superior performance. The resident students performed better than non-residential extension students in professional education courses. The analysis of data in this study implied that the residential program was superior to the non-residential program.

With much of the literature concluding that adult students have the learning ability and do achieve well in

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certain areas tested, there must be some reason for the adult student being suspect for poor achievement. The research, which has been done regarding the adult student himself, indicates that dropping out of college provides one reason for continued negative attitudes with which adult college students are viewed. One of the most important drop out factors is the lack of academic achievement. In three studies it has been shown that adults are less likely to graduate than younger students. However, John Summerskill cautions not to view these facts in a cause-and-effect relationship; and he cites a study by Feder which showed a number of students, who were delayed in matriculating, had a higher withdrawal rate although their college grades were better than predicted (24:631). There are reasons other than a poor grade point average which make it difficult for the adult to continue in college without interruption. Lawrence A. Pervin makes the point that interruption, or dropping out of school for several years and being readmitted, may be inefficient; but it is a more successful way of completing an education (19:66).

There is evidence that more subjective factors are the chief cause of the uneasiness with which a college views the adult or mature student. Bernard Stern in his Never Too Late For College describes many of the problems of the adult in a college environment:

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> Adults are frequently overzealous . . . more aloof and
> restrained than youngsters . . . fearful and anxiety-
> ridden in connection with examinations and term papers
> . . . and insulted if they get a C instead of a B.
> They will sometimes complain, argue, appeal, write
> letters, stay after class, play off one professor
> against another, cite irrelevant authorities, and
> occasionally make a nuisance of themselves if in these
> ways they can obtain more credits, higher grades, the
> envy of their peers, and most importantly, the approval
> of spouses, children, and children-in-law (23:33).

Many psychologists have studied "interests" and
their relationship to active participation and vocational
choice. Among the well-known writers in this field are
E. L. Thorndike, E. K. Strong, Alvin Zander, and L. L.
Thurstone. Thus far the findings seem to indicate that for
practical purposes the adult educator would do well to
emphasize the learning capacity of the adult in almost every
program (9:88).

In his study of <u>Psychological Needs of Adults</u>,
Gardner Murphy is very explicit in his descriptions of the
needs of the adult learner. The motives of "gaining
prestige through learning," and "gaining power through new
acquisitions of fact or skill" are the central forces which
push the adult into further schooling (17A:10). He explains
that certain classroom situations arouse fear, rage, and
guilt, and these feelings may be quite irrelevant to the
specific classroom in which they are felt. In comparing
the younger student with the adult student, "the adult has
not <u>fewer</u> but <u>more</u> emotional associations with factual
material, although it is assumed that he has less, because

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the devices of control are more elaborate and better covered in the adult" (17A:8).

If it is true that the adult has more emotional associations with factual material, it would seem logical that he would have more emotional associations with any aspect of going back to college.

<div align="center">

Literature and the Need for
Education of Adults

</div>

The need for the education of adults seems to be a pertinent part of discussions in much of the literature dealing with adults. The Commission of the Professors of Adult Education state this succinctly: "Society now has as great a stake in the continued learning of adults as it ever had in the education of children" (41:6). A review of such books as Hollinshead, Who Should Go to College? (12); Stern, Never Too Late For College (12); Taylor, Blackwell, Mead, Today and Tomorrow (22); or Havighurst and Orr, Adult Education and Adult Needs (11); and Knowles, Handbook of Adult Education (14) gives the vastness of the need of education for adults.

A digest of educational statistics (57) and pertinent data drawn from such studies as Aspirations, Enrollments, and Resources: The Challenge to Higher Education in the Seventies (58) indicated that less than 10 per cent of the population attends college. It was stated that there are more than 58 million people in the United States who have no high school diploma. About

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2 per cent of these people are going back to school. In 1960 there were 24 million persons over 25 years of age, and by 1968, the estimate shows nearly 28 million. Although many of this group may be involved in some type of short term training, schooling and/or single courses, only about 7 per cent are enrolled in a degree-credit program (57:60-68). The percentage enrolled in the liberal arts program at M.C.C.C. (1968-1969) was about 13.4 per cent.

Further descriptions of the need for education of adults become part of a philosophical plea for new goals, approaches, and meaning that conceptualizes an education from the cradle to the grave. New concepts attempt to break the mold of the elementary, secondary, college and graduate steps to ultimate success. Mead suggests this:

> We have somehow to break the mold of thinking that education begins in childhood and then, at some specific point, ends and that anything following on this ending is somehow of a different character. To accomplish this, we need to sort out all the courses in high school and college that are not prerequisites to becoming a functioning human being in a complex society and to treat such courses as elective not for 'sophomores' (to make up a proper number of credits) but for people--seventh graders or middle-aged people, fathers or grandmothers--who want to learn whatever the course offers. Young mothers who missed out on science, for example, might take a special natural history course with their third grade children; parents and children might begin to learn Russian together. Each then might continue at a pace consistent with his own ability and maturational stage (25:35).

Although this concept of learning may be exciting, it is presently not in our purview. It does show the

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concern for not only an individual's total learning, but for a totally new concept in education. Other accounts, such as Liveright (15); Erickson (51); and Wolk (50), pose questions as to what efforts have been tried or should be tried in approaching a more complete adult education.

<div align="center">

Literature on College and University
Programs for Adults
</div>

In spite of the literature frequently presenting a rather bleak outlook on the undergraduate education for adults, there have been some programs concerned with these students. Except for Rutgers University undergraduate degree program in Business Administration, the great books curriculum at the University of Chicago, which may or may not grant a degree, and the Baccalaureate Degree Program for Adults at Brooklyn College--the literature emphasizes the status of the adult student in evening, part time, extension programs that may or may not involve credits or degrees. Although this evening college concept gives an adult the long term opportunity to earn his degree, there is some question as to whether the course of study is particularly devoted to the learning processes of adults. It may be simply a reflection of the conventional day college class, differing only in the time of day at which classes are held, or it may be characterized as a "watered down" course. As previously cited, there are studies that seem to question whether the evening courses or extension courses are of the same quality (Clark 4:3) and (Barzun

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1:232). The extension courses appear to be of poorer
quality. This is not so with the program for adults at
Brooklyn College. This well established program has three
basic methods of building academically on adult experience
(23:6). This adult experience is equated with specific
credit courses and credit is granted. Special accelerated
tutorial services are available to adults who can make
more rapid progress in certain areas than would be possible
in the formal course work. Finally, a curriculum in the
form of four basic seminars and three advanced elective
seminars was designed by the regular faculty committees.
As to admissions Stern plays down previous credentials:
"Our study also shows that there should be less stress on
achievement or knowledge gained before admission and more
on intellectual capacity and current achievement" (23:8).

One of the greatest boons to higher education for
all and especially for adults, according to the more recent
literature, has been the recent development and change in
the junior colleges. Even the name has changed in many
instances to "Community College" or "Junior-Community
College" to denote wider concerns in higher education for
societal needs. The characteristics of the junior-
community college, and especially of its students, is
described in An Introduction to Junior Colleges by E. J.
Gleazer. He points out that the philosophy:

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. . . has evolved over the little more than half
century that the junior college has existed in this
country. Some of its early supporters . . . saw the
role of the junior college as limited to providing the
first two years of a baccalaureate program, thus
relieving the universities of the responsibility of
offering the freshman and sophomore years. Many things
have happened, however, to alter the nature and aims of
a majority of the country's junior colleges. The
population has grown rapidly, and the demand for
college opportunity has increased in the face of new
social and economic needs. Aspirations of Americans
have risen as society has become more complex, and as
the advantages of education in terms of employment
and advancement on the job have become more evident.
While the conventional liberal arts and general edu-
cation programs leading to transfer are still a vital
part of the two-year college endeavor, most of the
institutions now also emphasize courses of study that
will prepare men and women to fill positions immedi-
ately in business and industry, government, social
service, and other areas essential to the development
of the nation. The importance of education to the
fulfillment of the individual has also been recognized
in the changing pattern of junior college education
(35:360).

By implication, the philosophy stated above would

appeal to the adult in his search for continuing his edu-

cation at any and all levels. His desire for additional

training, or change of training, or beginning a new

experience of an undergraduate program is more easily

satisfied than attempting traditional undergraduate

beginning at a residential college or university.

K. P. Cross in describing the junior college

student takes note that:

Another category of student, new to higher education,
and for whom we also have few adequate tests of abili-
ties and learning capacities is the older student.
Whereas only about 15 per cent of the entering full-
time students at four-year institutions are nineteen
or older, almost one-third of the junior college full-
time students are in this older age group (Astin,

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et al., 1967), and if part-time students were con-
sidered, the difference would be even greater. The
need for research and for development of appropriate
measuring instruments for this age group is urgent
(6:14).

Cross continues the call for research on adult students:

> Past research has given us little information about
> important sub-groups of junior college students. We
> know very little about the adult student who consti-
> tutes an extremely important segment of those enrolled
> in institutions of higher education. The majority of
> the studies . . . have either sampled (all) full-time
> students enrolled in junior college or followed recent
> high school graduates into junior college. Typically,
> the adult student falls into neither of these groups.
> . . . We need to know more . . . (5:52).

Much of the literature regarding the junior-

community colleges describes the college of the "Open Door

Policy." Open to all is the implication here. For the

adult student and other groups it may be a revolving door.

As Cross states: "We know little about those who go in,

only to go out again soon after" (6:52). In some instances

the "revolving door" admits the student, only to exclude

him from certain desired programs within the college, due

to the lack of "proper" credentials for admission to a

program. In many cases these credentials are the same as

those needed for programs of the four-year institution.

Summary

After reviewing the literature, the author feels

that the findings of the study being reported have the

potential of adding significantly to the body of knowledge

concerning the achievement of the adult undergraduate

student. This conclusion is based on paucity of research

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specifically dealing with adults in the traditional
undergraduate degree programs.

A survey of significant literature regarding the
Adult undergraduate student achievement indicates the
following:

1. Although older undergraduates may encounter
   more obstacles than their younger counterparts,
   age per se does not affect college achievement.

2. Adult students, in general, will earn far
   better grades than their former records indi-
   cate.

3. Certain problematic factors are the cause of
   adult students being suspect in regard to poor
   achievement, such as dropping out, family
   crises, and emotional involvement in "making
   the grade."

4. The adult route for an undergraduate education
   has seemed rather narrow. A full compliment
   of programs and courses for adults other than
   the traditional degree program, are offered.
   However, most of them are part of "Adult Edu-
   cation," "Continuing Education," "Community
   Services," or "Extension and Evening" programs
   of the junior colleges and senior colleges and
   universities.

Secondly, almost all of the literature reviewed
discusses the general need for education for adults. At

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least philosophically the various accounts subscribe to a general change in education itself, such as a "cradle to the grave" never-ending educational opportunity. Most of the specific studies deal with special programs or pilot programs, rather than study an integrated educational opportunity for all students. Almost all literature of undergraduate education is geared to the younger student and traditional degrees.

In the third place, studies show that more and more institutions of higher education are currently offering more evening, non-resident, extension type programs for undergraduate degrees. This is not only in answer to increased general interest and enrollment, but due to the many studies showing success of evening programs and success of evening student achievement.

Last, but not least, the literature regarding junior community college indicates that its programs offer one of the greatest opportunities for adult students to achieve an undergraduate degree under its "Open Door" policy. It permits all students to enter the college. However, this "Open Door" policy can be a revolving one which generally admits students, but may exclude certain students from certain programs within the institution. Again there is emphasis on proper credentials and background. In spite of this hurdle, the adult student has easier access to the undergraduate program at the junior community college than at senior institutions.

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The literature supports the conclusion that there is a need for more disciplined and particularized research in the area of academic performance of the adult under-graduate student as compared with his younger counterpart in a full time academic degree program. It indicates generally a need to know more about the adult student's achievement in the college or university. It indicates specifically a need to know more about the adult student in the junior-community college.

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CHAPTER III

DESIGN

This chapter contains a description of the sample, the methodology, and the procedures for analysis of the data.

Population

In the fall of 1968 Macomb County Community College had a total population of 12,572 students on two campuses. This is a study of only those students who attended the South Campus; and from these only the full time students in the liberal arts program. From this sub-population a sample consisting of 707 students based on the following criteria were chosen:

1. All students enrolled for the first time in any college.

2. All students graduated from high school in a college preparatory course of sixteen units.

3. All students having scored on the A.C.T. test prior to enrolling.

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4. All students having completed a minimum of
    twenty-four credit hours at Macomb County Com-
    munity College which included: College
    English, Mathematics, Social Science, and
    Natural Science.

It represents a true sample since it represents the total
population of students who meet the above criteria.

Sample

In order to delineate the categories of the Adult
Student and the Younger Student at M.C.C.C. presented in
Chapter I, the sample was divided into four sub-groups as
follows:

Group 1--Includes all students who enrolled at
M.C.C.C. within one year of completing
high school, and who are twenty years of
age or younger at the time of enrolling.

Group 2--Includes all students who enrolled at
M.C.C.C. after one year, but within three
years after completing high school.

Group 3--Includes all students who enrolled at
M.C.C.C. after at least three years, but
within five years after completing high
school.

Note: For the general information of the reader,
the author of this study was the Registrar at M.C.C.C.
during the time the M.C.C.C. students, who became the
sample, were enrolled.

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Group 4--Includes all students who enrolled at

M.C.C.C. at least five years after

completing high school.

This study compares the college achievement of

Group 4 (Adult Student) with Group 1 (Younger Student),

specifically, but generally shows the comparison of all

groups. In summary, the adult student selected had

completed high school five years or more prior to college

enrollment, while his younger student counterpart had

enrolled at M.C.C.C. almost immediately after completing

his high school studies.

The validity of the study was improved by de-

limiting the groups of students who were full time (twenty-

four hours of credit), and who had completed the matched

liberal arts program at the college: English, Mathematics,

Social Science, and Natural Science. This program is also

known as the Junior-Community College Basic Education and

equates to the Freshman program in General Studies courses

at a senior college. This may facilitate a general com-

parison of other adult undergraduate students, and their

younger counterparts, enrolled full time in a liberal arts

college or General Studies program for the first time in

other institutions of higher learning.

The pertinent data were obtained from the student's

record located in the M.C.C.C. Records and Admissions

offices. The names of the students were listed

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alphabetically with a number assigned to each name. They were then divided into male and female. On the basis of the number of years since high school completion, all students were assigned to one of the four groups. In addition, the place of residence and the marital status of each student were considered. Further, the Adult Student (Group 4) was grouped according to the number of years since high school completion.

In summary, a true sample includes 707 full time students sub-divided into four groups according to the number of years out of high school. Group 1 (Younger Student) consists of 446 students and Group 4 (Adult Student) consists of 105 students.

Table 3.1 is a summary of all groups of students, including sex, and marital status. The table in Appendix D shows the profile of Group 4 as to the number of years each of the students has been away from high school.

Methodology

The basic statistical treatments employed on this study consisted of (1) an analysis of variance between groups and between measures utilizing the student mean grade point average (G.P.A.) taken from the M.C.C.C. records, and high school records, and predictive G.P.A. of A.C.T.; (2) a correlation of high school G.P.A. with M.C.C.C. grade point average; and (3) the A.C.T. predictive G.P.A. correlation with M.C.C.C. grade point average to

TABLE 3.1--A

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TABLE 3.1--A Summary of Macomb County Community College
Student Group Samples.

	Group 1	Group 2	Group 3	Group 4	Total
Male	267	65	43	51	426
Female	179	34	14	54	281
Married	1	2	18	87	108
Single	445	97	39	18	599
Total N	446	99	57	105	707

Note: For definitions of Group 1 through 4 see pages 30-31.

measure which is the better predictor of college grade achievement. All grade computations were based on the 4.0 scale.

The G.P.A. for each student in the four groups were computed for the high school English, Mathematics, Social Science, and Natural Science, the A.C.T. predictive G.P.A., and M.C.C.C. courses. The mean and standard deviation were computed for each group. The high school G.P.A. was based on units of credit attempted and the grades earned. The mean and standard deviation were computed for each group. On the A.C.T. test the G.P.A. was based on a predicted grade computed from the test raw scores and according to the A.C.T. computational table for each of the subjects of English, Mathematics, Social Science, and Natural Science, without the A.C.T. factor of

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reported high school grades. The means and standard
deviation were computed for each group (see Appendix A for
the A.C.T. computational table). The M.C.C.C. grade point
average was based on hours attempted, grades earned and
honor points received during the two semesters of work
only in the area of English, Mathematics, Social Science,
and Natural Science. The means and standard deviation
were computed for all groups.

A mean G.P.A. for each student group at M.C.C.C.
was computed for significant grade differences between
groups. A total mean G.P.A. for each student group in each
academic area was computed for correlation of significant
differences between groups and measures.

A mean G.P.A. for each student group of high
school records was computed for significant grade differ-
ences between groups and as a predictor of M.C.C.C.
achievement. A total mean G.P.A. for each student group
in each subject area of high school records was computed
for a correlation of significant grade differences, and as
a predictor of M.C.C.C. total G.P.A. and specific subject
G.P.A.

A mean G.P.A. taken from the A.C.T. raw score was
computed for significant grade differences between groups
and as a predictor of M.C.C.C. achievement. A total mean
predictive G.P.A. taken from the A.C.T. raw scores in each
subject area was computed for showing significant grade
differences and as a predictor of M.C.C.C. total G.P.A.,

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and G.P.A. for specific subjects. Table 3.2 is a matrix of all groups and measures. As noted in Table 3.2, all four groups were sub-divided into a total of eight groups showing male and female for each group. Table 3.3 shows the method of correlating all eight groups within one measure (high school English).

Procedure

To answer the first of two questions pertinent to the thesis hypothesis in comparing the adult undergraduate student to his younger counterpart, an analysis of variance of twelve dependent variables--English, Mathematics, Social Science, and Natural Science of high school, A.C.T. scores, and M.C.C. courses was used according to a three way analysis of variance for different effects: (1) the group effect; (2) the sex effect; and (3) the interaction of group, sexes and measures. The research hypotheses for this study were stated in Chapter I. To facilitate testing the question and statements statistically, they were transformed into operational form. Three null hypotheses were formulated for statistical tests to give evidence to the first research question:

1. There will be no statistical significant differences among students on the basis of age.
2. There will be no statistical significant differences among students on the basis of sex.

TABLE 3.2.--Table of Total Mean G.P.A. for Each Student Group in Each Subject and

TABLE 3.2.--Table of Total Mean G.P.A. for Each Student Group in Each Subject and in Each Measure.

		E	M	SS	NS	E	M	SS	NS	E	M	SS	NS
Group 1	M	1.99	1.53	2.08	1.82	1.91	1.96	2.96	2.11	1.96	1.86	2.17	2.00
	F	2.41	1.82	2.43	2.07	2.04	1.80	2.18	1.98	2.32	1.99	2.46	2.28
Group 2	M	2.01	1.52	2.10	1.76	1.90	1.92	2.32	2.22	1.85	1.68	2.25	1.86
	F	2.48	1.81	2.55	2.14	2.00	1.79	2.25	2.01	2.48	2.32	2.74	2.51
Group 3	M	1.92	1.85	2.12	1.91	1.90	2.05	2.37	2.32	2.18	2.11	2.64	2.30
	F	2.22	1.89	2.19	1.89	1.86	1.74	2.19	1.97	2.21	1.86	2.59	2.55
Group 4	M	1.78	1.62	1.99	1.71	1.93	1.79	2.20	2.11	2.60	2.40	2.86	2.72
	F	2.50	1.97	2.44	1.96	2.07	1.40	2.23	1.88	3.06	2.46	3.37	3.12

TABLE 3.3.

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Male	N
Female	N
Total	N

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TABLE 3.3.--Table of Means of All Four Groups for High
School English.

	Group 1	Group 2	Group 3	Group 4	Total
Male	N = 267 1.99	N = 65 2.01	N = 43 1.92	N = 51 1.78	N = 426 1.73
Female	N = 179 2.41	N = 34 2.49	N = 14 2.23	N = 54 2.50	N = 281 2.43
Total	N = 446 2.16	N = 99 2.17	N = 57 2.00	N = 105 2.15	N = 707 2.01

3. There will be no statistical significant

interaction among students on the basis of age

and sex in the multivariate case.

The second research question of ascertaining the

best predictor of M.C.C.C. grades was used via simple

correlation of (1) high school G.P.A. for all four age

groups with M.C.C.C. grades on the five variables of

English, Mathematics, Social Science, Natural Science, and

total G.P.A.; and (2) A.C.T. converted scores with the

M.C.C.C. G.P.A. on the five variables of English, Mathe-

matics, Social Science, Natural Science, and total G.P.A.

(refer to Table 3.2 for this basic comparison).

Analysis

Two programs were utilized in the analysis of the

data: (1) The Multivariate Analysis of Variances as

programmed by Finn (39), and (2) The Step-Wise Regression

version of the Bio-Medical program, Health Sciences

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Division of U.C.L.A. The .05 level of confidence was selected as the criterion for testing the hypotheses. With both programs giving almost identical results each program complemented the other.

The Multivariate Analysis of Variance program was completed at the Michigan State University Control Data while the step-wise regression was completed at the Control Data, Incorporated of Detroit. Post hoc comparison of the two program tests was not utilized since there were no significant differences in the over-all results.

The description of Strata with Histograms of the Bio-Medical program of U.C.L.A. was utilized to draw a profile of the four groups as to sex, marital status, location, and their G.P.A. in high school, A.C.T. converted raw scores, and M.C.C.C. (see Appendix B).

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CHAPTER IV

ANALYSIS OF RESULTS

In this chapter an introduction to the data, a report of the analysis of data, and discussion of the results are presented. For an analysis of each question and subsequent hypothesized statements of the measures posed in the study (Chapter I), statistical hypotheses were formulated in null form and operational terms.

Introduction

For a more accurate assessment of the data it is pertinent to profile all groups and measures within the sample. This figuratively shows the summary bases of correlations drawn in regard to the original hypotheses.

Utilizing the mean G.P.A. of all students' records in high school all four groups are within the same range in a normal distribution. Table 4.1 shows this range and distribution including the summary mean and standard deviation.

Although Group 4 has the highest mean G.P.A. it is no more than .01 difference. Further specific profiles of the mean G.P.A. in the subject areas of English,

TABLE 4.1. Total Mean G.P.A. Profile for All Student Groups in High School. [Tabulations and Computations which follow exclude interval.]
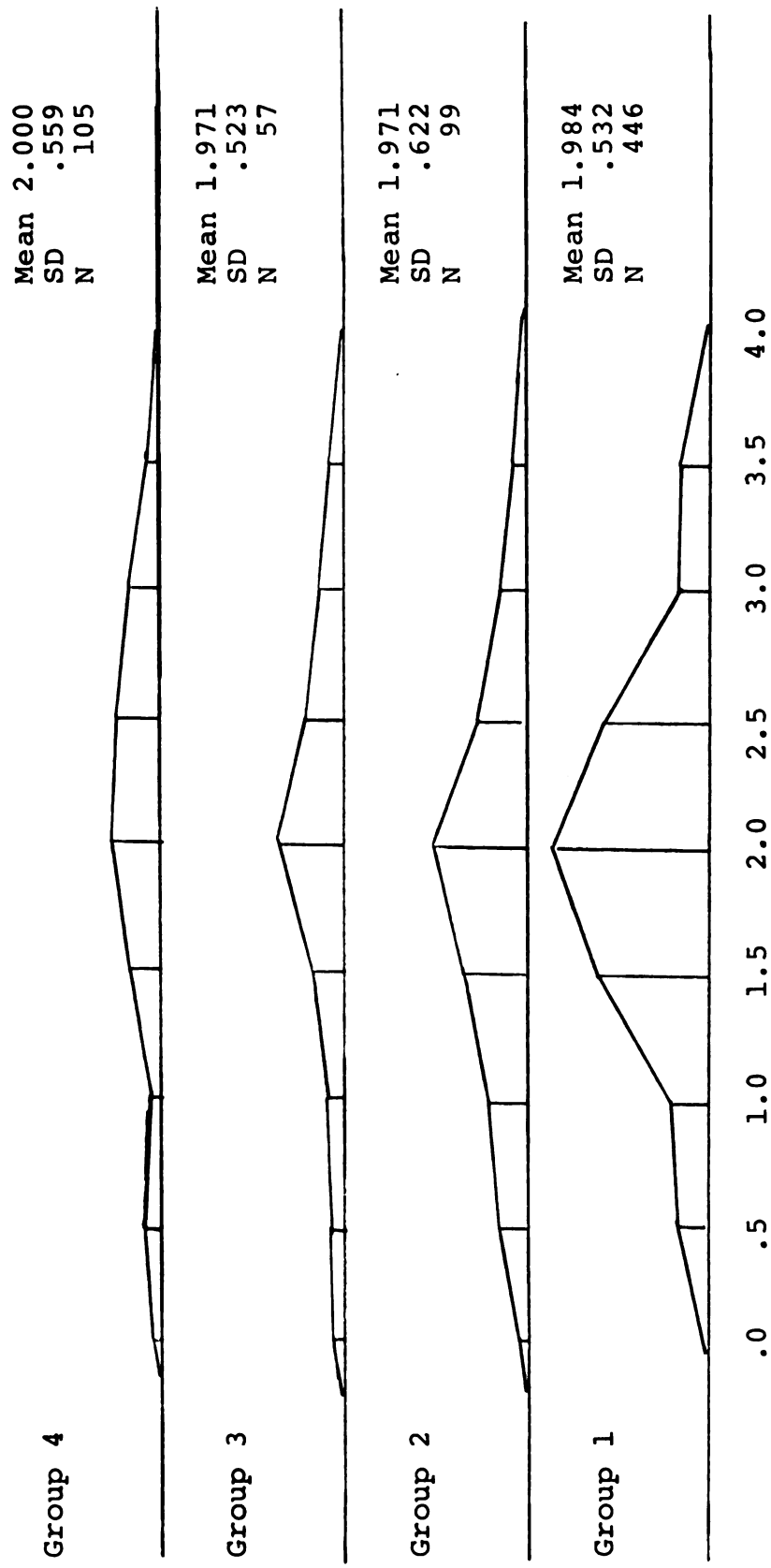
Group 4   Mean 2.000   SD .559   N 105

Group 3   Mean 1.971   SD .523   N 57

Group 2   Mean 1.971   SD .622   N 99

Group 1   Mean 1.984   SD .532   N 446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0

Mathematics, Social Science, and Natural Science affirms this normal distribution (refer to Appendix C).

Utilizing the mean G.P.A. of all students taken from the converted scores of the A.C.T. test records all four groups are within the same range in a normal distribution. Table 4.2 shows this range and distribution including the summary mean and standard deviation.

Although Group 3 has the highest mean G.P.A. it is no more than .05 difference. Further specific profiles of the mean G.P.A. in the subject areas of English, Mathematics, Social Sciences, Natural Science affirms this normal distribution (refer to Appendix C).

Utilizing the mean G.P.A. of all student record at M.C.C.C. all four groups are within the same range but not in the normal distribution previously noted in Tables 4.1 and 4.2. Table 4.3 shows a negatively skewed distribution with Group 4 having the highest mean grade level. The difference is more marked than the match in high school records and A.C.T. scores.

This profile Table 4.3 shows Group 4 with the highest mean G.P.A. and a progressively lower score in Group 3, Group 2, and Group 1. This difference in the total G.P.A. is more pronounced in the specific subject areas as indicated in Table 4.4. through 4.7.

The profile tables (also see Appendix B) offer a clarification for the analysis of data that follows:

TABLE 4.2.--Total Mean Predictive G.P.A. Profile for All Student Groups on A.C.T. [Tabulations and Computations which follow exclude interval.]

Group 4   Mean 1.950
           SD   .489
           N   105

Group 3   Mean 2.099
           SD   .414
           N   57

Group 2   Mean 2.063
           SD   .434
           N   99

Group 1   Mean 2.033
           SD   .425
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
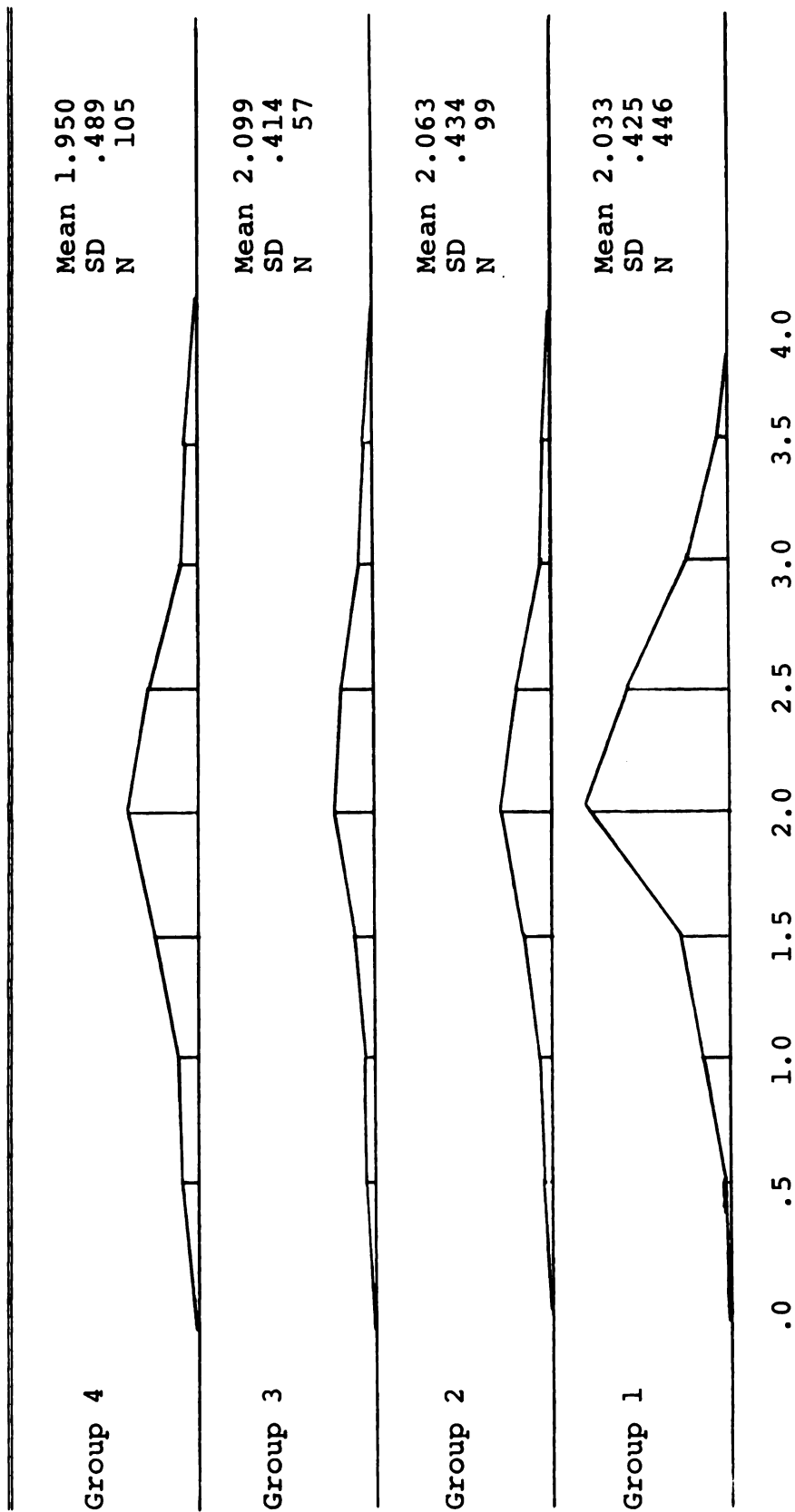
TABLE 4.3.--Total Mean G.P.A. Profile for All Student Groups at M.C.C.C.
[Tabulations and Computations which follow exclude interval.]

Group 4   Mean 2.820
           SD   .622
           N   105

Group 3   Mean 2.307
           SD   .748
           N   57

Group 2   Mean 2.104
           SD   .768
           N   99

Group 1   Mean 2.103
           SD   .741
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
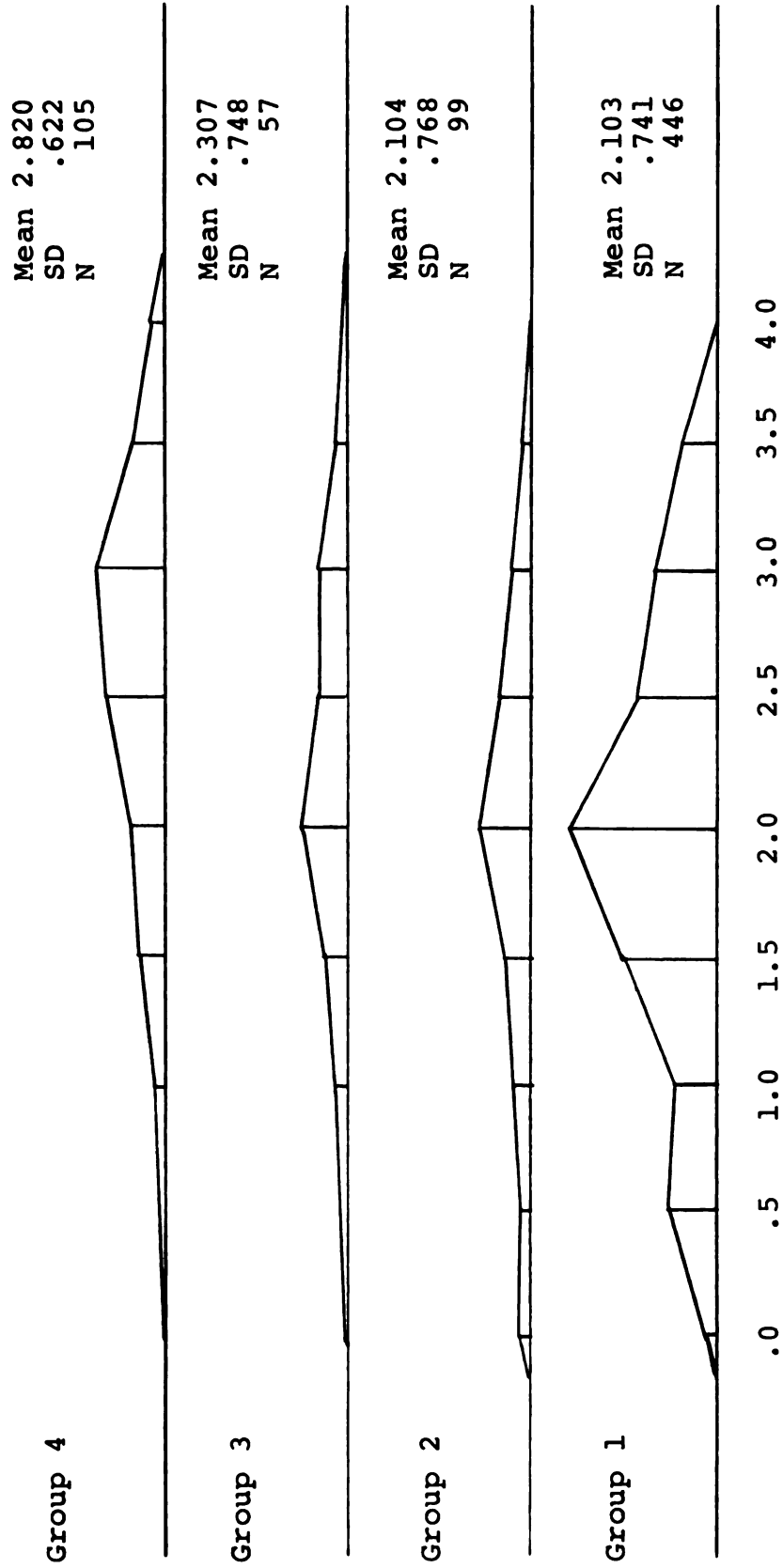
TABLE 4.4.--Total G.P.A. Profile for All Student Groups in M.C.C.C. English. [Tabulations and Computations which follow exclude interval.]

Group 4

Mean 2.836
SD   .747
N   105

Group 3

Mean 2.187
SD   .920
N   57

Group 2

Mean 2.065
SD   .881
N   99

Group 1

Mean 2.104
SD   .905
N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
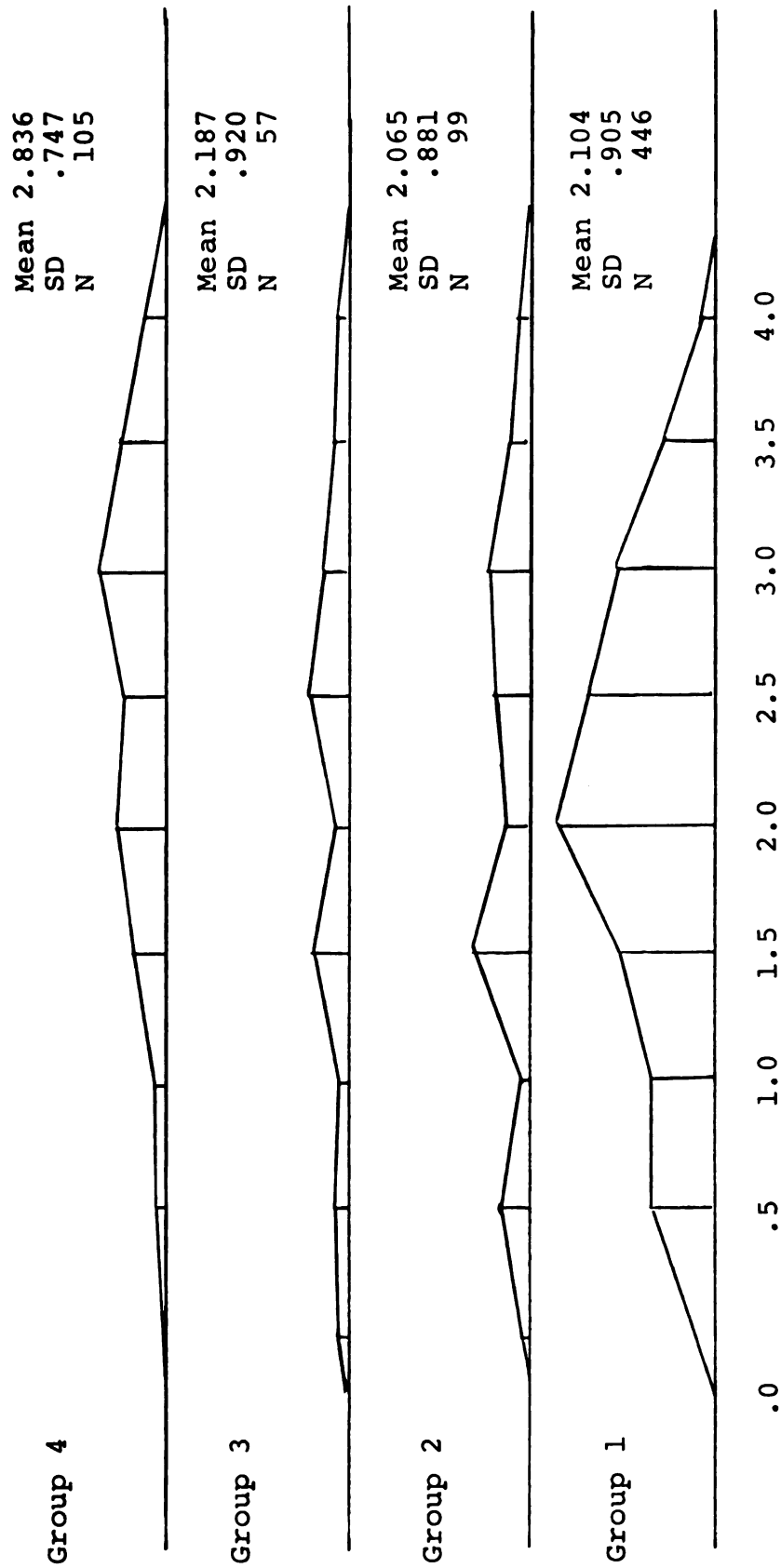
TABLE 4.5.--Total G.P.A. Profile for All Student Groups in M.C.C.C. Math.
[Tabulations and Computations which follow exclude interval.]

Group 4   Mean 2.434
           SD   .838
           N   105

Group 3   Mean 2.055
           SD   .805
           N   57

Group 2   Mean 1.901
           SD   .973
           N   99

Group 1   Mean 1.912
           SD   .947
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0

TABLE 4.6.--Total G.P.A. Profile for All Student Groups in M.C.C.C. Social Science. [Tabulations and Computations which follow exclude interval.]

Group 4

Mean 3.122
SD   .674
N   105

Group 3

Mean 2.630
SD   .762
N   99

Group 2

Mean 2.422
SD   .841
N   99

Group 1

Mean 2.287
SD   .821
N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0

TABLE 4.7.--Total G.P.A. Profile for All Student Groups in M.C.C.C. Natural Science. [Tabulations and Computations which follow exclude interval.]

Group 4 — Mean 2.930, SD .735, N 105

Group 3 — Mean 2.368, SD .962, N 57

Group 2 — Mean 2.083, SD 1.017, N 99

Group 1 — Mean 2.118, SD .960, N 446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
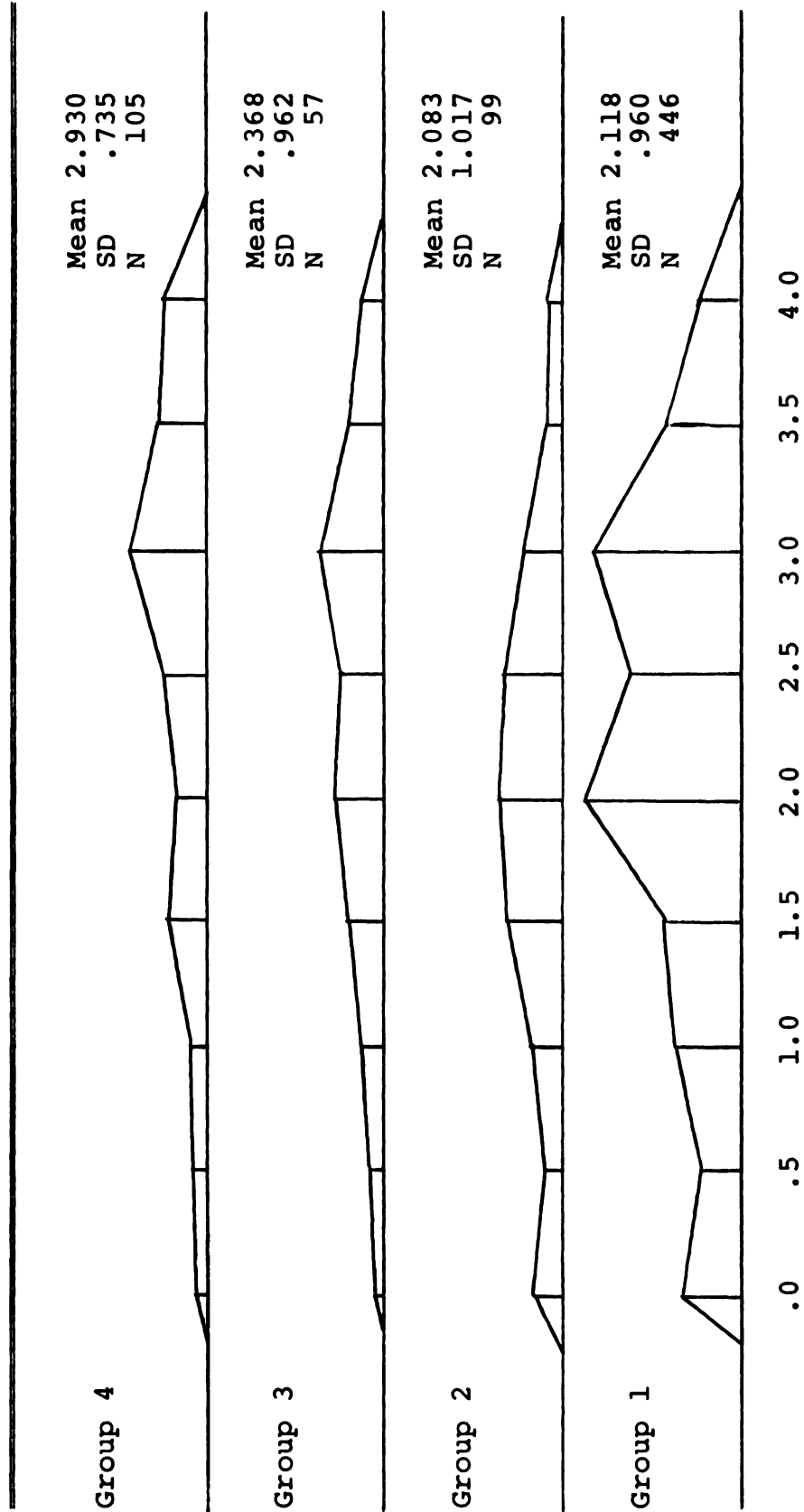
Analysis of Data

The following statistical hypotheses were formulated to obtain evidence in answering the first research question. The subsequent hypothesized statements of measure answers of whether the adult student achieves a higher G.P.A. then his younger counterpart at M.C.C.C. Further, that there is no significant difference between adult and younger students and the G.P.A. measures in high school, on the A.C.T. test, or at M.C.C.C. In this multivariate case the first null hypothesis tested here is:

1. There is no significant group effect for the multivariate case.

The means and standard deviation were computed for all groups as introduced in the profile tables. A weighted mean G.P.A. dependent on the group population was computed for all group correlations. The results of this computation are presented in Table 4.8.

An analysis of variance indicated significant differences at the .05 level of confidence in the following measures:

Measures	Univariate F Ratio	P less than .05
High School Math	2.8452	.0369
A.C.T. Math	7.2347	.0001
M.C.C.C. English	18.8096	.0001
M.C.C.C. Soc. Sci.	31.0592	.0001
M.C.C.C. Math	8.9322	.0001
M.C.C.C. Nat. Sci.	21.2365	.0001

TABLE 4.8.--Weighted Means for Student Groups and Group
Measures.

		High School Grades		A.C.T. Scores		M.C.C.C. Grades	
		Total G.P.A.	Total Gr.	Total G.P.A.	Total Gr.	Total G.P.A.	Total Gr.
Group 1	M	1.86		2.05		2.00	
			2.02		2.03		2.13
	F	2.18		2.00		2.26	
Group 2	M	1.85		2.09		1.91	
			2.05		2.06		2.21
	F	2.25		2.02		2.51	
Group 3	M	1.95		2.16		2.31	
			2.00		1.94		2.31
	F	2.05		1.94		2.30	
Group 4	M	1.78		2.01		2.65	
			2.00		1.96		2.83
	F	2.22		1.90		3.00	
Sample Total							2.34

A more specific analysis of each of these measures is
pertinent to indicate the exact differences in each group
case, especially the difference between Group 1 and
Group 4. The weighted mean G.P.A. for the above measures
is presented in the following tables.

TABLE 4.9.--Means for High School Math of All Student
Groups.

Group 1	Group 2	Group 3	Group 4	Total
N = 446	N = 99	N = 57	N = 105	N = 707
1.65	1.62	1.86	1.80	1.68

Significant differences exist between Group 1 and
Group 4 in Total mean G.P.A. with Group 4 having the
higher score. The highest score rests with Group 3.

The significant differences between groups on the
A.C.T. Math test is presented in Table 4.10. In this case
Group 4 has the lowest score.

TABLE 4.10.--Means for A.C.T. Math Test of All Student
Groups.

Group 1	Group 2	Group 3	Group 4	Total
N = 446	N = 99	N = 57	N = 105	N = 707
1.90	1.88	1.97	1.59	1.86

The significant differences between groups in English at M.C.C.C. is presented in Table 4.11. In this case Group 4 has the highest G.P.A.

TABLE 4.11.--Means for M.C.C.C. English of All Student Groups.

Group 1	Group 2	Group 3	Group 4	Total
N = 446	N = 99	N = 57	N = 105	N = 707
2.10	2.07	2.19	2.84	2.21

The significant differences between groups in Math at M.C.C.C. is presented in Table 4.12. As in English Group 4 scores the highest G.P.A.

TABLE 4.12.--Means for M.C.C.C. Math of All Student Groups.

Group 1	Group 2	Group 3	Group 4	Total
N = 446	N = 99	N = 57	N = 105	N = 707
1.91	1.90	2.06	2.43	2.00

The significant differences between groups in Social Science at M.C.C.C. is presented in Table 4.13. Group 4 in this case had a .83 differential range in the group G.P.A.

The significant differences between groups in Natural Science at M.C.C.C. is presented in Table 4.14. Group 4 maintains the highest G.P.A.

TABLE 4.13.—Means for M.C.C.C. Social Science of All Student Groups.

Group 1	Group 2	Group 3	Group 4	Total
N = 446	N = 99	N = 57	N = 105	N = 707
2.29	2.42	2.63	3.12	2.46

TABLE 4.14.—Means for M.C.C.C. Natural Science of All Student Groups.

Group 1	Group 2	Group 3	Group 4	Total
N = 446	N = 99	N = 57	N = 105	N = 707
2.12	2.08	2.37	2.93	2.25

A comparison of Group 4 with Group 1 in overall G.P.A. including high school record, A.C.T. record and M.C.C.C. record is presented in Table 4.15. Group 4 shows a marked difference of almost a full grade point in comparison with Group 1.

TABLE 4.15.—Overall Mean G.P.A. of Group 1 and Group 4 in High School, A.C.T. Test Record, and M.C.C.C.

Group	High School	A.C.T.	M.C.C.C.
1	2.02	2.03	2.13
4	2.00	1.96	2.83

The analysis of variance summary for the testing of the first null hypothesis as presented earlier show the F-values for the hypothesis were significant at the .05 level of confidence in only those measures discussed in the above Tables 4.9 through 4.15. The F-ratio for the total multivariate test was significant at the .05 level of confidence. In other words there was a difference between the four groups of students with a marked difference between Group 1 and Group 4 in more than 50 per cent of all measures (refer to Appendix D for complete weighted tables).

Statistical Hypothesis 2.--The mean grade point average of male students within groups was compared with those of female students within groups to determine if there was any significant difference. The null hypothesis tested to obtain evidence relative to this hypothesis was:

2. There is no significant sex effect in the multivariate case.

The significant differences between sexes in all groups and in all measures is shown in Table 4.16. In general the females score higher in high school and M.C.C.C. while the males score higher on the A.C.T. record.

Even the higher scores of the males on the A.C.T. record is not total. The female scores on the A.C.T. English record is presented in Table 4.17.

TABLE 4.16.--Total Mean G.P.A. on All Measures for Male and Female Students in Each Group.

		H.S.	A.C.T.	M.C.C.C.
Group 1	M	1.86	2.05	2.00
	F	2.18	2.00	2.26
Group 2	M	1.85	2.09	1.91
	F	2.25	2.02	2.51
Group 3	M	1.95	2.16	2.31
	F	2.05	1.94	2.30
Group 4	M	1.78	2.01	2.65
	F	2.22	1.90	3.00

TABLE 4.17.--Predictive Mean G.P.A. for Male and Female Students in All Groups on the A.C.T. English Test.

	Group 1	Group 2	Group 3	Group 4	Total
Male	N = 267	N = 65	N = 43	N = 51	N = 426
	1.91	1.90	1.90	1.93	1.91
Female	N = 179	N = 34	N = 14	N = 54	N = 281
	2.04	2.00	1.86	2.07	2.03
Total	N = 446	N = 99	N = 57	N = 105	N = 707
	1.96	1.93	1.89	2.00	1.96

From this comparison the female group scored higher than the male group in all but three measures out of a total of fifteen.

An analysis of variance summary for the testing Hypothesis 2 is presented in Table 4.18. The F-values for Hypothesis 2 is significant at the .05 level of confidence.

TABLE 4.18.--Analysis of Variance Summary of Academic
Difference Between Male and Female for All Student Groups.

Variable	F-Value	Significant Level
High School		P less than .05
English	113.4930	.0000
Math	26.2531	.0001
Social Science	46.9406	.0001
Natural Science	17.6745	.0001
A.C.T.		
English	19.2891	.0001
Math	24.2888	.0001
Social Science	.4787	.4893 NS*
Natural Science	12.4610	.0005
M.C.C.C.		
English	42.5571	.0001
Math	7.4467	.0066
Social Science	36.2500	.0001
Natural Science	29.2866	.0001

*Not significant.

The F-value of each variable is significant at the .05 level of confidence with the exception of the A.C.T. Social Science variable.

The null Hypothesis 2, relative to the sex effect in the multivariate case, was rejected.

Statistical Hypothesis 3.--Differences as to sex between groups when considered an integral part of each group have no significant effect on group achievement records. The null hypothesis was:

3. There is no significant interaction between groups and sexes in the multivariate case.

Utilizing the multivariate analysis of variance as shown in Table 4.18 for groups and sexes resulted in the failure to reject the hypothesis. In other words, Hypothesis 3 was not significant at the .05 level of confidence as shown in Table 4.19.

Utilizing the same mean G.P.A. of all student groups in the multivariate case an intercorrelational matrix of group G.P.A. was drawn to answer the second research question: For the Adult Student, what predicts M.C.C.C., G.P.A. better, the high school grades or the A.C.T. scores? A summary correlation of all students, groups, and measures is given in Table 4.20. Group 4 represents the Adult Student and Group 1 is the Younger Student counterpart. The intermediate Group 2 and Group 3 are part of the over-all correlation included in the total population.

TABLE 4.19.--Analysis of Variance "Summary of Interaction" Between Groups and Sexes for All Student Groups.

Variable	Univariate F	P Less Than .05
High School		
English	2.201	.086
Math	0.475	.699
Social Science	0.927	.427
Natural Science	0.689	.558
A.C.T.		
English	0.734	.531
Math	1.278	.280
Social Science	0.378	.768
Natural Science	0.478	.697
M.C.C.C.		
English	1.317	.267
Math	2.936	.032
Social Science	1.754	.154
Natural Science	1.133	.334

TABLE 4.20--Mean G.P.A. and Correlations of High School and A.C.T. Scores With M.C.C.C. Scores.

Variable	G.P.A. and Correlation of High School With M.C.C.C. Scores on Five Variables			G.P.A. and Correlation of A.C.T. With M.C.C.C. Scores on Five Variables	
	M.C.C.C. G.P.A.	High School G.P.A.	Cor.	A.C.T. G.P.A.	Cor.
Group 1					
English	2.10	2.16	.352	1.96	.158
Math	1.91	1.65	.328	1.90	.271
Social Science	2.29	2.22	.386	2.19	.309
Natural Science	2.12	1.92	.335	2.06	.238
Total	2.13	2.02	.490	2.00	.323
Group 2					
English	2.07	2.17	.40	1.93	.20
Math	1.90	1.62	.20	1.88	.12
Social Science	2.42	2.25	.40	2.30	.18
Natural Science	2.08	1.89	.25	2.15	.13
Total	2.21	2.05	.41	2.06	.19
Group 3					
English	2.19	2.00	.41	1.89	.29
Math	2.06	1.86	.37	1.97	.42
Social Science	2.63	2.14	.43	2.33	.43
Natural Science	2.37	1.91	.48	2.23	.28
Total	2.31	2.00	.57	2.05	.45
Group 4					
English	2.84	2.15	.37	2.00	.36
Math	2.43	1.80	.29	1.59	.23
Social Science	3.12	2.22	.33	2.22	.50
Natural Science	2.93	1.84	.26	1.99	.33
Total	2.83	2.00	.41	1.96	.45

Note: Correlation tables in appendix.

(For more complete correlation tables for each group and all variables refer to Appendix E.)

There is a higher correlation of high school grades with M.C.C.C. grades in the case of Group 1. The correlation is not as robust in the case of Group 4. The correlation of total A.C.T. G.P.A. scores with M.C.C.C. is higher than the high school correlation. The highest correlation is the A.C.T. Social Science with M.C.C.C. total G.P.A. and Natural Science. Except for Group 4 the High School G.P.A. correlates higher than the A.C.T. scores on most variables. Even with Group 4, the High School G.P.A. in English is a higher correlation than the A.C.T. English.

In a step-wise regression test all variables were tested as to predictors of M.C.C.C.--G.P.A. In addition to the five variables shown in Table 4.20 the additional variables of sex, marital status, location, and group were included. The most robust ratios for all groups are shown in Table 4.21, Table 4.22, and Table 4.23. Since the marital status variable indicates a strong influence on the entire population further consideration was given to its strength in the individual groups. It is noted that marital status is less significant in Group 4. This was as expected due to the high frequency of married students in Group 4 as compared to Group 1. Group 1 showed only one married student out of 446 students while more than 82 per cent of Group 4 were married. The figure for all groups was less than 15 per cent. The high school total remains

TABLE 4.21.--Step-Wise Regression Summary of All Significant Variables for G.P.A. Prediction at M.C.C.C. All Four Groups (707 Students).

Step No.	Variable Entered	F-Value (.05 Level)	P Less Than
1	High School Total	176.944	.0001
2	Marital Status	103.981	.0001
3	A.C.T. Social Science	27.679	.0001
4	Female Sex	8.022	.0001
5	A.C.T. Total	4.136	.0001

TABLE 4.22.--Step-Wise Regression Summary of All Significant Variables for G.P.A. Prediction at M.C.C.C. for Group 1 (446 Students).

Step No.	Variable Entered	F-Value (.05 Level)	P Less Than
1	High School Total	178.781	.0001
2	A.C.T. Social Science	16.620	.0001
3	Marital Status	7.359	.0001
4	Sex	4.583	.0001
5	A.C.T. English	3.302	.0001
6	A.C.T. Total	1.760	.3506

TABLE 4.23.--Step-Wise Regression Summary of All Signifi-
cant Variables for G.P.A. Prediction at M.C.C.C. for
Group 4 (105 Students).

Step No.	Variable Entered	F-Value (.05 Level)	P Less Than
1	A.C.T. Social Science	33.574	.0001
2	High School Total	17.697	.0001
3	Marital Status	5.913	.0001
4	Sex	3.581	.0001
5	A.C.T. Natural Science	1.631	.0308
6	A.C.T. Total	.057	N.S.

as most significant but marital status becomes less sig-

nificant and the A.C.T. test variables become more

significant.

It is indicated that marital status is less sig-

nificant for Group 4 than with Group 1 and much less

significant than with the entire population. It is also

noted that the high school total is less significant than

with Group 1 and the Social Science part of the A.C.T.

test becomes the most significant variable in the pre-

diction of M.C.C.C. G.P.A. As in the multivariate

analysis of variance the Step-wise regression shows a

robust ratio for the high school total, A.C.T. Social

Science, and sex for all groups. The marital status vari-

able was not exploited in this study since it was not one

of the academic variables for measures of achievement.
The interaction is plotted in Figure 1.

The specific results of testing statistical
Hypothesis 1 indicated that there was a significant
academic difference between Group 1 and Group 4. Group 4
definitely received higher grade average than Group 1. It
indicated that both groups received about the same G.P.A.
in high school. The analysis of data showed that Group 1
received a better average than Group 4 on the A.C.T.
record.

The analysis of data pertaining to null Hypothe-
sis 2 with respect to the sex effect showed significant
difference. Females of all groups received a better
G.P.A. than the males. An exception is indicated on the
A.C.T. record. The male students in Group 1 received
higher G.P.A. and in Group 4 the male student received a
higher G.P.A. However, as the differences were so small,
the amount of difference was not as significant as the
higher G.P.A. of the female students in all other cases.
The sex effect is plotted in Figure 2.

The results of testing null Hypothesis 3 indicated
that the academic difference between all groups and sexes
in the multivariate case was not significant. There were
differences within groups as to sex, with the females
having the higher G.P.A., but in the context of between
groups there was no significant difference.
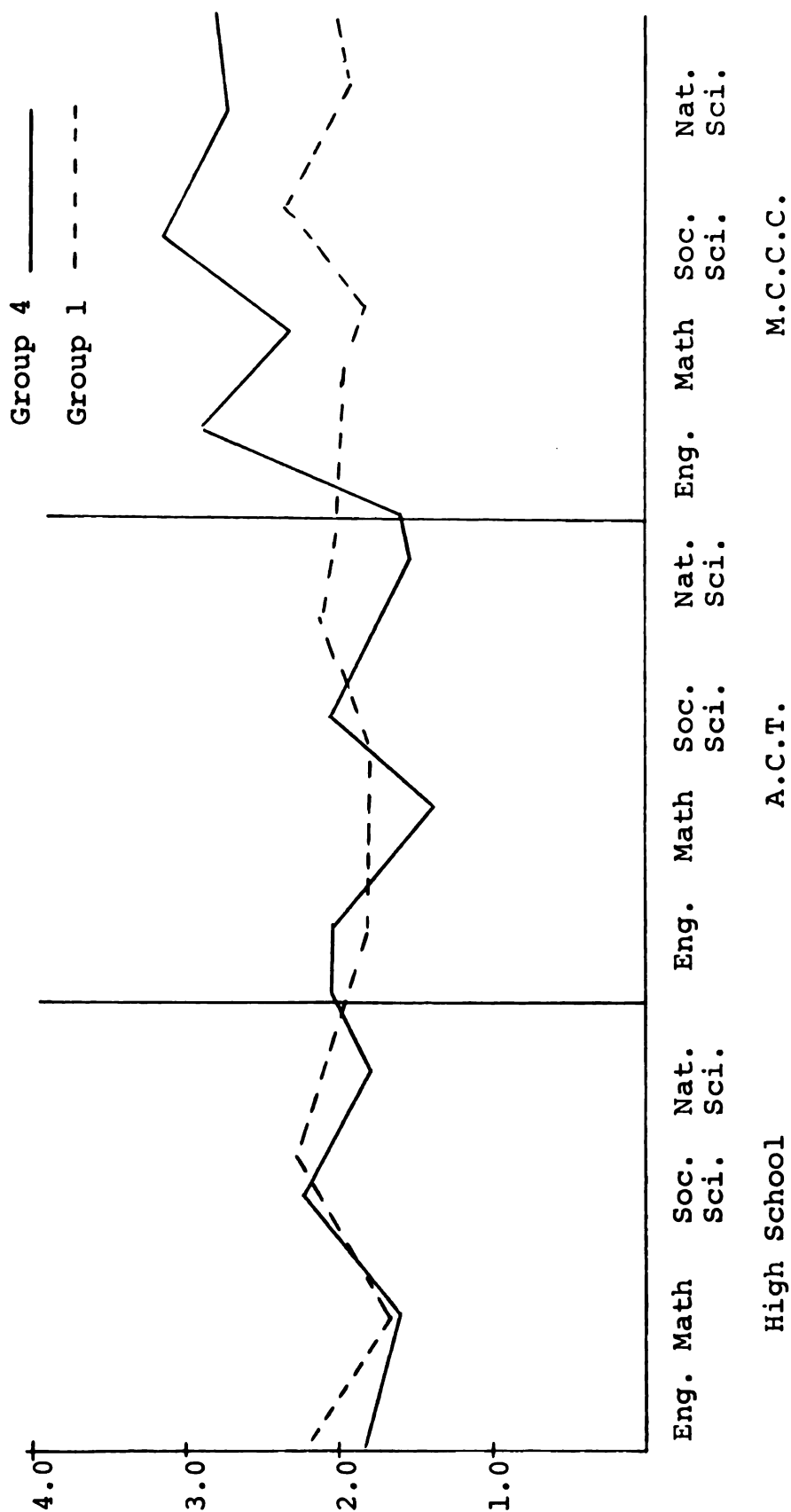
Figure 1.--Plot of means for Group 1 and Group 4 in all academic measures.
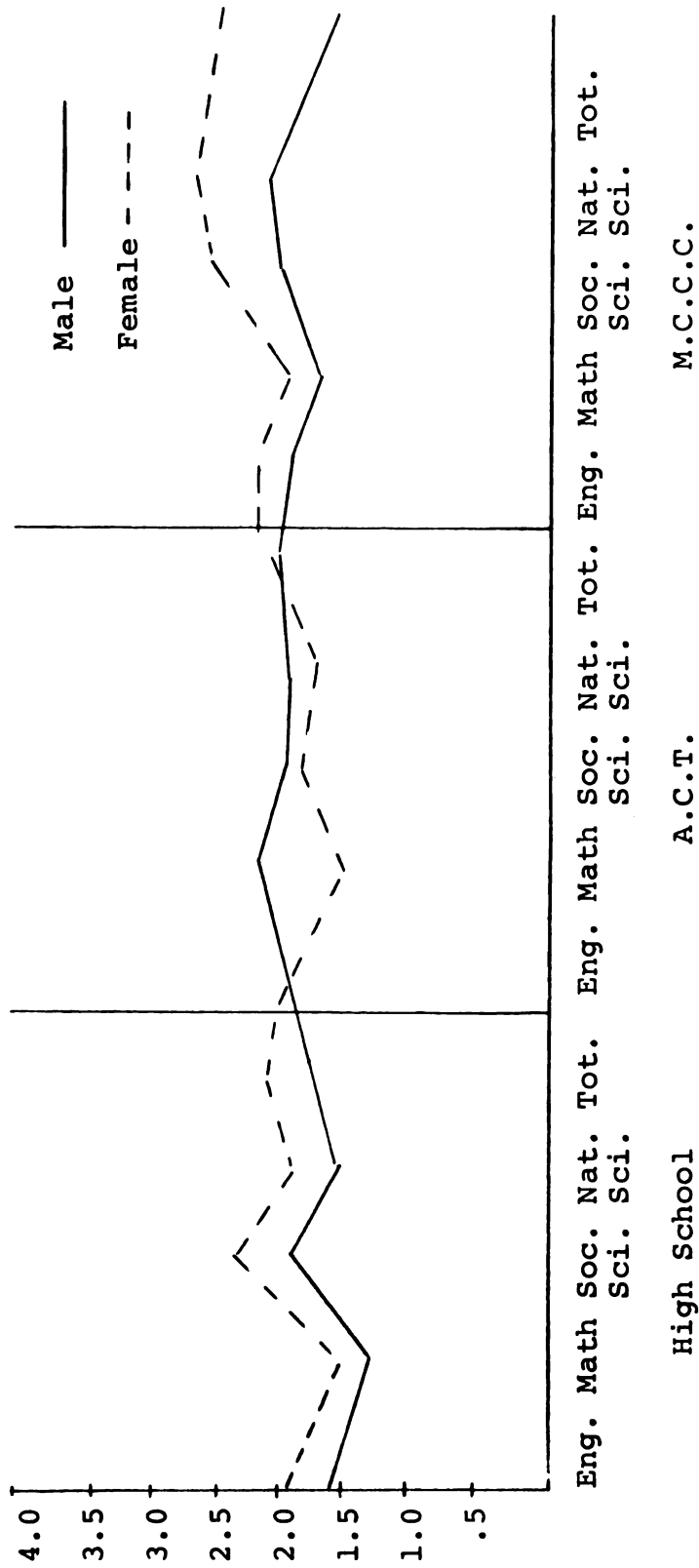
Figure 2.--Plot of means for male and female groups in all academic measures.

The interaction of groups and sexes is plotted in Figure 3.
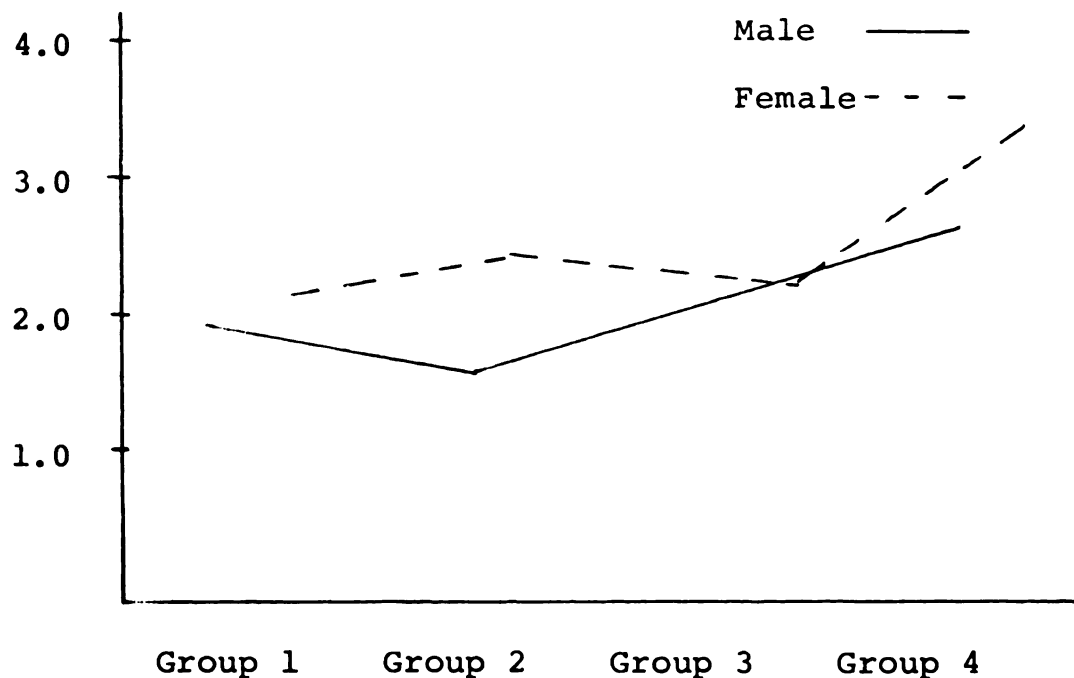
Figure 3.--Plot of means for all groups interaction in all measures.

The answer to the second research question, what predicts M.C.C.C. G.P.A. better, the high school record or the A.C.T. record, indicated the overall high school record had a higher correlation.

In the case of Group 1 (Younger Student) both the high school and the A.C.T. showed significant correlations with M.C.C.C. G.P.A. The total G.P.A. of the high school record showed the higher correlation than the A.C.T. total G.P.A. with .49 to .32. The following variables show the highest correlations:

G.P.A. Variable	F-Value (.05 Level)	Correlations With M.C.C.C. G.P.A. Total
High School Total G.P.A.	178.781	.49
High School Social Science	16.623	.41
A.C.T. Total G.P.A.	4.432	.32

In the case of Group 4 (Adult Student) the correlations were not as clearly defined as in the case of Group 1. The high school total G.P.A. indicates a correlation of .41 with M.C.C.C. total G.P.A. The A.C.T. total G.P.A. indicates a stronger correlation of .45 with M.C.C.C. total G.P.A. The strongest correlation is the A.C.T. Social Science G.P.A. of .50. Correlational differences between high school and A.C.T. in regard to M.C.C.C. G.P.A. are not as significant as in the case of Group 1. The G.P.A. correlations are as follows:

G.P.A. Variable	F-Value (.05 Level)	Correlations With M.C.C.C. G.P.A. Total
A.C.T. Social Science G.P.A.	33.574	.50
A.C.T. Total G.P.A.	27.681	.45
High School Total G.P.A.	17.697	.41

(Refer to Appendix E for complete tables on group correlations.)

Summary

The following table (Table 4.24) is presented as a summary analysis of results. The research question is included with the null hypotheses, an F-value, the significance level and a statement of rejection or non-rejection. In Chapter V the results obtained in the analysis of statistical hypotheses will be related to the research questions.

TABLE 4.24.--Summary of Results.

Research Questions and Null Hypotheses	F-Value	Significant Level	Statement of Rejection or Non-Rejection
I. Do Adult Undergraduate Students at M.C.C.C. have higher scores in academic grade variables than the Younger Undergraduate Students?			
a. There is no significant difference between groups in the multivarate case	5.654	.05	Rejection
b. There is no significant difference between male and female in the multivariate case	9.021	.05	Rejection
c. There is no significant interaction between groups and sexes in the multivariate case	.678	NS	Non-rejection
II. For the Adult Undergraduate Students what predicts M.C.C.C. G.P.A. better, the high school G.P.A. measure of the A.C.T. score measure?			
a. High School G.P.A.	17.697	.05	Correlation .41
b. A.C.T. total G.P.A.	27.681	.05	Correlation .45
c. A.C.T. Social Science G.P.A.	33.574	.05	Correlation .50

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

FOR FUTURE RESEARCH

This chapter contains a summary of the study, presentation of the conclusions, a discussion of the findings, and implications for future research.

Summary of the Problem and Method of Investigation

The purpose of this study was to investigate the academic achievement of the Adult Undergraduate Student enrolled in a liberal arts program full time at M.C.C.C. to determine: (1) If the Adult Student achieved higher grades than his younger counterpart, and (2) For the Adult Student what predicts G.P.A. at M.C.C.C. better, the high school G.P.A. record or the A.C.T. record?

Previous research has indicated that the adult student had achieved academic success, but at a slower pace than his younger counterpart (27 and 56). It also indicated that the Adult Student achievement has been measured mostly within special courses and special programs (46 and 52).

Previous research has shown that the high school

G.P.A. and various admissions tests, such as the A.C.T.,

which combines high school grades with a special battery of

tests, are good predictors of academic success for students

entering college, but not for the adult student (51 and 6).

It has also been indicated that special programs

and special admissions processes should be instituted for

the growing Adult Student Group because of its interest

in general education, and its desire for a college degree

in particular (51 and 6). The special program approach has

not been inclusive enough to cover the rising need for

adults seeking degrees. Adults are ever edging into the

regular college programs geared for younger students.

Limited research has indicated that some adult students in

isolated programs are successful (49 and 23). In many

cases adults are discouraged from entering regular degree

programs because of a general impression that adults should

have special programs to overcome the press of terms,

hours, credits, exams and other credentials.

Recent research has attempted to point up the need

for a new and more complete concept in higher education for

the adult student. This research evolved around explora-

tory and comparative studies of extension, part-time and

evening programs (51 and 50). The junior-community college

concept was heralded as an answer to a higher education for

all. It stood for "open door" admissions. The junior-

community college concept was to be a boon to adult higher

education. There is a great deal of research needed on

the adult situation. Little attention, generally, has

been given to important adult sub-groups at the junior-

community college; less, specifically, in regard to the

achievement of adult students in the regular full time

program (7). Recent studies call attention to special

groups and special programs in junior and senior college,

and indicate definitive differences to be researched

between these groups and programs. Research results,

however, have not been found to check the achievement of

adult undergraduates enrolled full time at either the

senior institution or the junior institution.

In spite of less stringent admission and regis-

tration barriers at the junior-community college, no

research results have been found to check adult student

achievement as one of the most important accounts of

success in the evolution of the junior-community college.

It is a definite part of the junior-community college

philosophy to "meet the needs" of the community for higher

education. No research results have been found to check

the relative achievement of adult students in comparison

with other age groups in the regular college setting

(freshman, first year at a senior college or first year in

a transfer program at the junior college).

The population of this study was taken from the

liberal arts program of M.C.C.C. during the academic year

of 1968-1969. It consisted of 707 students who were

enrolled full time during that year. In order to describe

the adult undergraduate student and the younger under-

graduate student, the population was divided into four

groups. Group 1 included students who graduated from high

school within one year prior to enrollment at M.C.C.C.

Group 2 included students who had graduated from high

school at least one year but not more than three years

before enrolling at M.C.C.C. Group 3 included students

who had graduated from high school at least three years

but not more than five years before enrolling at M.C.C.C.

Group 4 included all students who had been out of high

school five years or more. Group 4 represented the adult

undergraduate student at M.C.C.C. and Group 1 represented

his younger counterpart.

A true sample was used with Group 1, numbering 446,

Group 2 with 99, Group 3 with 57, and Group 4, numbering

105. Each of these groups was also divided into male and

female for the sex and group effect.

A mean G.P.A. was computed for all academic areas

taken from high school records, A.C.T. records, and

M.C.C.C. records of 1968-1969 (two semesters). A multi-

variate analysis of variance as presented in Finn (39) was

used to test the statistical hypotheses. This analysis of

variance was applied to all four groups in the multi-

variate case. The same analysis of variance model was

applied to the data with sex being the independent vari-

able in the multivariate case. The .05 level of confidence

was chosen as the level at which differences were con-

sidered resulting from factors other than chance.

A simple correlation of all mean G.P.A. from high

school records, A.C.T. records, and M.C.C.C. records were

utilized to ascertain the best predictor of M.C.C.C.

grades. Augmenting the multivariate correlations, a step-

wise regression table was utilized to check which of the

variables in the multivariate case was a better predictor

of grades at M.C.C.C.--those of high school G.P.A. or those

of the A.C.T. predicted G.P.A.

Findings and Conclusions

Reasonably clear-cut answers were obtained for the

two major questions which were defined:

Question 1.--Do adult undergraduate students at

M.C.C.C. have higher academic grades

than the younger undergraduate

students at M.C.C.C.?

1. The academic achievement of adult students as

indicated by higher grades in M.C.C.C. courses was affirmed.

The evidence for this conclusion was obtained when the

related null hypothesis concerning the group effect was

rejected. Group 4 (Adult Student) achieved higher grades

than the Group 1 (Younger Student) in every case at

M.C.C.C.

With reference to the achievement of all groups as
indicated by a total mean G.P.A. in courses taken, Group 1
had the lowest score; Group 2 was a per cent higher,
Group 3 was still higher, and Group 4 was the highest. In
this analysis of variance, the time away from high school
seemed to make a difference in the academic achievement at
M.C.C.C.

With regard to the predicted achievement of all
groups in a total mean G.P.A. on the A.C.T., this was a
significant difference. Group 1 (Younger Student) scored
higher than Group 4 (Adult Student). In this case the
Adult Student was not predicted to achieve higher grades.
Armed with the prediction that the adult student would not
achieve higher grades than his younger counterpart, it was
established that the prediction was not fulfilled, but
that at M.C.C.C. the adult student did achieve higher
grades than the younger student.

Noting the high school achievement record of all
groups, as indicated by the total mean G.P.A., the total
population appears to have been on an academic par.

2. There was no difference in academic
achievement within and among four groups on the basis of
sex. This was the conclusion from the third research
hypothesis of this study. There was no evidence on which
to reject the related null hypothesis concerning the effect
of sex on the differences between the G.P.A. of groups and

each group separately. It was concluded that there was no significant interaction between groups and sexes in the multivariate case (Chapter I). However, there was a significant difference for the overall main effect of sex (null Hypothesis 2) as the female group received higher grades than the male group. Only on the A.C.T. predictive G.P.A. did the male group score higher than the female. The null Hypothesis 2 was rejected.

Question 2.--For the adult undergraduate student what predicts M.C.C.C. G.P.A. better-- the high school G.P.A. or the A.C.T. predicted G.P.A.?

1. Utilizing a simple correlation, the A.C.T. predicted G.P.A. measure seems to be the slightly better predictor for the adult undergraduate G.P.A. at M.C.C.C. with a coefficient of .45. An even better predictor on this basis seems to be the A.C.T. predicted social science G.P.A., yielding a correlation coefficient of .50. The high school G.P.A. is also a good predictor with a corre- lation coefficient of .41. With the range of .41 to .50, all three measures would seem to be valid predictors of M.C.C.C. G.P.A. A step-wise regression also was utilized to indicate which of the variables was the best predictor. At a .05 level of confidence the A.C.T. predicted social science G.P.A. was the best predictor with an F-value of 33.574; the A.C.T. predicted total G.P.A. was a good

predictor with an F-value of 27.681; the high school total
G.P.A. was also a good predictor with an F-value of 17.697.

2. Utilizing the simple correlation in the multi-
variate case to compare measures for Group 1 (Younger
Student) predictors, the high school total G.P.A. yielded
a coefficient of .49. The high school Social Science
G.P.A. yielded a coefficient of .41, while the A.C.T.
predicted total G.P.A. yielded only a coefficient of .32.
With the step-wise regression the high school total G.P.A.
showed an F-value of 178.781 in comparison with the high
school Social Science F-value of 16.623 and the A.C.T.
total G.P.A. as 4.432 at the .05 level of confidence. The
high school total becomes a robust ratio in comparison
with all other variables and between all research groups.
None of the correlations in the multivariate case are as
robust predictors as the high school total seems to show.
Although the high school total does not yield as high a
correlation in Group 4 (Adult Student), it remains sig-
nificant with a .41 coefficient.

Previous research regarding the relationship of
high school performance and college achievement, indicated
that correlations between these two variables have yielded
significant correlation coefficients of between .35 and
.69. In this study the overall group results show a
coefficient of .41.

The ranking of predictors for Group 4 (Adult Student) G.P.A. at M.C.C.C., according to the correlation coefficient sequences, are: A.C.T. predicted Social Science G.P.A.; A.C.T. predicted total G.P.A.; and the high school total G.P.A.

For Group 1 (Younger Student) and the total research population of all four groups, the high school total G.P.A. remains the best predictor of M.C.C.C. G.P.A. However, Group 4 (Adult Student) total mean G.P.A. at M.C.C.C. of 2.83 is significantly higher than the total mean G.P.A. on the high school record of 2.00, or the A.C.T. predicted G.P.A. Perhaps it is an indication that neither the high school G.P.A. nor the A.C.T. predicted G.P.A. is a good predictor of the adult students' G.P.A. at M.C.C.C. Utilizing this same comparison with Group 1 (Younger Student), both the high school G.P.A. of 2.02 and the A.C.T. predicted G.P.A. of 2.00 seem to be good predictors of the younger students G.P.A. of 2.13.

Conclusions and Implications

It is reasonably clear that the Adult Student can achieve as well as, if not better than, his Younger Student counterpart, where achievement is measured by M.C.C.C. G.P.A. in a liberal arts program. There seems to be little educational basis for the belief of some writers, administrators, and teachers that a full time Adult Student cannot achieve as well as his younger counterpart under the

same duress of terms, hours, credits, and examinations. This is significant since the majority of adult students have the concern of a wife and family, economic sacrifice, and less hours for formal education. There is the added concern of being "too old," having an insufficient I.Q., and being absent too long from academic work.

There appears to be no academic reason for a marginal role being assigned to the adult undergraduate student. No academic standards have to be compromised in such programs; and at the same time no special academic limits, except those of appropriateness, need be imposed. Adult educators and junior-community college administrators have the opportunity to provide sequential programs, with well defined educational objectives, which include all students, not just the "college age" students.

The correlations of high school and A.C.T. predicted grades with M.C.C.C. grades found in this study are not sufficiently high to warrant their exclusive use as criteria for admission, or to predict ultimate success of the adult student in college. More important, there is little reason for older persons, in good health, to hesitate to pursue their undergraduate education. Previous research indicates the adult's ability (26 and 22). Experimental programs designed for adults have found no dearth of successful students. At M.C.C.C. the average age is twenty-two, and the feeling that older students earn higher grades is confirmed in this study.

Once the significance of the adult population in college is recognized, faculties and administrators can create imaginative courses, curricula, and programs with the adult in mind. A move toward more adults being admitted to degree programs and total adult education, and away from "operating with expectations of adolescence in an institution that has been geared to adolescence" (18) is in order.

Implications for Practice

The following research needs became apparent during this study:

1. Replicated research should be conducted at other junior-community colleges. Such studies would indicate if these findings were peculiar only to M.C.C.C.

2. Replicated research should be conducted at the four-year institutions. Such studies would indicate if the results of these findings were peculiar only to a junior-community college.

3. Research should be conducted showing adult performance of those enrolled in the technical programs at M.C.C.C.

4. Research is needed that includes the performance of the adult attending M.C.C.C. part-time, pursuing an academic degree.

5. The findings in this study, that the adult students' college achievement exceeds their high school achievement, indicates a need for research as to the motivation of adult students. Little is known of the factors which contribute to both success and failure.

6. There is a need for research in the junior-community college, as to the goals of all adult students other than degree or academic considerations.

7. Further research is needed in a follow-up to this study. It should include the number of students who finish at M.C.C.C. and the number who transfer and obtain their undergraduate degree.

8. Research is needed to find out the disposition of those adults who drop-out with no apparent academic reason.

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APPENDICES

APPENDIX A

COMPUTATIONAL TABLES FOR PREDICTING ENGLISH 110,
MATHEMATICS, SOCIAL SCIENCE, NATURAL SCIENCE,
AND OVERALL

TABLE A.1.--Computational Table for Predicting English 110.

M.C.C.C. G.P.A. Range	A.C.T. Score	(Score)		X	(Regr. Coef.)	
		Eng.	Math.		Soc. Sci	N. Sci.
	36	23	2		7	-8
	35	22	2		6	-8
	34	21	2		6	-7
	33	21	2		6	-7
	32	20	2		6	-7
	31	19	2		6	-7
	30	19	2		5	-6
	29	18	2		5	-6
2.7	28	18	1		5	-6
2.6	27	17	1		5	-6
2.5	26	16	1		5	-6
2.6	25	16	1		5	-5
2.4	24	15	1		4	-5
2.3	23	14	1		4	-5
2.3	22	14	1		4	-5
2.2	21	13	1		4	-5
2.3	20	13	1		4	-4
2.1	19	12	1		3	-4
2.0	18	11	1		3	-4
2.0	17	11	1		3	-4
2.0	16	10	1		3	-3
1.9	15	9	1		3	-3
1.9	14	9	1		3	-3
1.7	13	8	1		2	-3
1.7	12	8	1		2	-3
1.7	11	7	1		2	-2
1.6	10	6	1		2	-2
1.5	9	6	0		2	-2
1.3	8	5	0		1	-2
1.2	7	4	0		1	-2
1.3	6	4	0		1	-1
1.2	5	3	0		1	-1

Note: To predict G.P.A. from A.C.T. scores, add the appropriate digits from Figure 1 to the A.C.T. constant (9), then mark off one decimal position.

TABLE A.2.--Computational Table for Predicting Mathematics.

M.C.C.C. G.P.A. Range	A.C.T. Score	(Score)		X (Regr. Coef.)	
		Eng.	Math.	Soc. Sci	N. Sci.
	36	11	25	-2	-3
	35	10	24	-2	-3
	34	10	23	-2	-3
	33	10	23	-2	-3
	32	9	22	-2	-3
	31	9	21	-2	-2
3.2	30	9	21	-2	-2
3.0	29	8	20	-2	-2
2.9	28	8	19	-2	-2
3.0	27	8	19	-1	-2
2.9	26	8	18	-1	-2
2.7	25	7	17	-1	-2
2.7	24	7	17	-1	-2
2.6	23	7	16	-1	-2
2.4	22	6	15	-1	-2
2.2	21	6	15	-1	-2
2.3	20	6	14	-1	-2
2.2	19	6	13	-1	-2
2.1	18	5	12	-1	-1
2.1	17	5	12	-1	-1
2.0	16	5	11	-1	-1
1.8	15	4	10	-1	-1
1.8	14	4	10	-1	-1
1.7	13	4	9	-1	-1
1.6	12	4	8	-1	-1
1.5	11	3	8	-1	-1
1.4	10	3	7	-1	-1
1.4	9	3	6	0	-1
1.3	8	2	6	0	-1
1.2	7	2	5	0	-1
1.2	6	2	4	0	0
1.0	5	1	3	0	0

Note: To predict G.P.A. from A.C.T. scores, add the appropriate digits from Figure 1 to the A.C.T. constant (6), then mark off one decimal position.

TABLE A.3.--Computational Table for Predicting Any Social
Science.

M.C.C.C. G.P.A. Range	A.C.T. Score	(Score)		X (Regr. Coef.)	
		Eng.	Math.	Soc. Sci	N. Sci.
	36	20	6	10	-3
	35	19	6	10	-3
	34	19	5	9	-3
	33	18	5	9	-3
3.7	32	18	5	9	-3
3.4	31	17	5	9	-3
3.2	30	16	5	8	-3
3.3	29	16	5	8	-2
3.1	28	15	4	8	-2
3.1	27	15	4	8	-2
2.9	26	14	4	7	-2
2.9	25	14	4	7	-2
2.8	24	13	4	7	-2
2.7	23	13	4	6	-2
2.6	22	12	4	6	-2
2.5	21	12	3	6	-2
2.4	20	11	3	6	-2
2.2	19	10	3	5	-2
2.2	18	10	3	5	-2
2.2	17	9	3	5	-1
2.1	16	9	3	4	-1
1.9	15	8	2	4	-1
1.9	14	8	2	4	-1
1.8	13	7	2	4	-1
1.7	12	7	2	3	-1
1.6	11	6	2	3	-1
1.5	10	5	2	3	-1
1.4	9	5	1	3	-1
13.	8	4	1	2	-1
1.2	7	4	1	2	-1
1.1	6	3	1	2	-1
1.1	5	3	1	1	0

Note: To predict G.P.A. from A.C.T. scores, add
the appropriate digits from Figure 1 to the A.C.T. constant
(6), then mark off one decimal position.

TABLE A.4.--Computational Table for Predicting Natural Science.

M.C.C.C. G.P.A Range	A.C.T. Score	(Score)		X (Regr. Coef.)	
		Eng.	Math.	Soc. Sci	N. Sci.
	36	23	14	3	0
	35	22	14	3	0
	34	22	13	3	0
3.8	33	21	13	3	0
3.6	32	20	12	3	0
3.6	31	20	12	3	0
3.5	30	19	12	3	0
3.4	29	18	11	3	0
3.3	28	18	11	3	0
3.2	27	17	11	3	0
3.1	26	17	10	3	0
2.9	25	16	10	2	0
2.7	24	15	9	2	0
2.7	23	15	9	2	0
2.6	22	14	9	2	0
2.4	21	13	8	2	0
2.4	20	13	8	2	0
2.2	19	12	7	2	0
2.1	18	11	7	2	0
2.1	17	11	7	2	0
1.9	16	10	6	2	0
1.8	15	10	6	1	0
1.6	14	9	5	1	0
1.5	13	8	5	1	0
1.5	12	8	5	1	0
1.3	11	7	4	1	0
1.1	10	6	4	1	0
1.2	9	6	4	1	0
1.0	8	5	3	1	0
.90	7	4	3	1	0
.80	6	4	2	1	0
.60	5	3	2	0	0

Note: To predict G.P.A. from A.C.T. scores, add the appropriate digits from Figure 1 to the A.C.T. constant (1), then mark off one decimal position.

TABLE A.5.--Computational Table for Predicting Overall.

M.C.C.C. G.P.A. Range	A.C.T. Score	(Score)		X (Regr. Coef.)	
		Eng.	Math.	Soc. Sci	N. Sci.
3.5	36	28	3	3	-6
3.6	35	28	3	3	-5
3.5	34	27	3	3	-5
3.4	33	26	3	3	-5
3.2	32	25	2	3	-5
3.0	31	24	2	2	-5
3.0	30	24	2	2	-5
3.0	29	23	2	2	-4
2.9	28	22	2	2	-4
2.8	27	21	2	2	-4
2.7	26	20	2	2	-4
2.7	25	20	2	2	-4
2.6	24	19	2	2	-4
2.5	23	18	2	2	-4
2.5	22	17	2	2	-3
2.5	21	17	2	2	-3
2.4	20	16	2	2	-3
2.2	19	15	1	2	-3
2.0	18	14	1	1	-3
1.9	17	13	1	1	-3
2.0	16	13	1	1	-2
1.9	15	12	1	1	-2
1.8	14	11	1	1	-2
1.7	13	10	1	1	-2
1.6	12	9	1	1	-2
1.6	11	9	1	1	-2
1.5	10	8	1	1	-2
1.5	9	7	1	1	-1
1.4	8	6	1	1	-1
1.4	7	6	1	1	-1
1.1	6	5	0	0	-1
1.0	5	4	0	0	-1
.50	4	4	0	0	-1
.50	3	4	0	0	-1
.25	2	4	0	0	-1
.25	1	4	0	0	-1

Note: To predict G.P.A. from A.C.T. scores, add the appropriate digits from Figure 1 to the A.C.T. constant (7), then mark off one decimal position.

APPENDIX B

A SUMMARY CORRELATION OF DATA
FOR ALL GROUPS

(N = 707) (Within Groups)

TABLE B.1.--Summary Correlation of Data for All Groups (N = 707) (Within Groups).

		1 HS-ENG	2 HS-MTH	3 HS-SS	4 HS-NS	5 AC-ENG	6 AC-MTH	7 AC-SS	8 AC-NS	9 MC-ENG	10 MC-MTH	11 MC-SS	12 MC-NS
1	HS-ENG	1.00											
2	HS-MTH	0.47	1.00										
3	HS-SS	0.55	0.40	1.00									
4	HS-NS	0.46	0.41	0.42	1.00								
5	AC-ENG	0.32	0.22	0.24	0.25	1.00							
6	AC-MTH	0.24	0.35	0.23	0.32	0.35	1.00						
7	AC-SS	0.25	0.17	0.32	0.23	0.51	0.42	1.00					
8	AC-NS	0.20	0.25	0.23	0.29	0.40	0.51	0.58	1.00				
9	MC-ENG	0.31	0.21	0.31	0.26	0.16	0.14	0.27	0.15	1.00			
10	MC-MTH	0.27	0.30	0.26	0.25	0.10	0.29	0.22	0.22	0.56	1.00		
11	MC-SS	0.29	0.22	0.34	0.27	0.21	0.16	0.32	0.25	0.58	0.49	1.00	
12	MC-NS	0.28	0.24	0.33	0.29	0.14	0.23	0.29	0.26	0.55	0.58	0.59	1.00

APPENDIX C

TOTAL MEAN G.P.A. PROFILE FOR ALL STUDENT GROUPS
IN HIGH SCHOOL AND A.C.T. ENGLISH, MATH, SOCIAL
SCIENCE AND NATURAL SCIENCE

TABLE C.1.--Total Mean G.P.A. Profile for All Student Groups in High School English. [Tabulations and Computations which follow exclude special values interval.]

Group 4   Mean 2.151
           SD   .676
           N   105

Group 3   Mean 1.999
           SD   .657
           N   57

Group 2   Mean 2.176
           SD   .677
           N   99

Group 1   Mean 2.159
           SD   .586
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
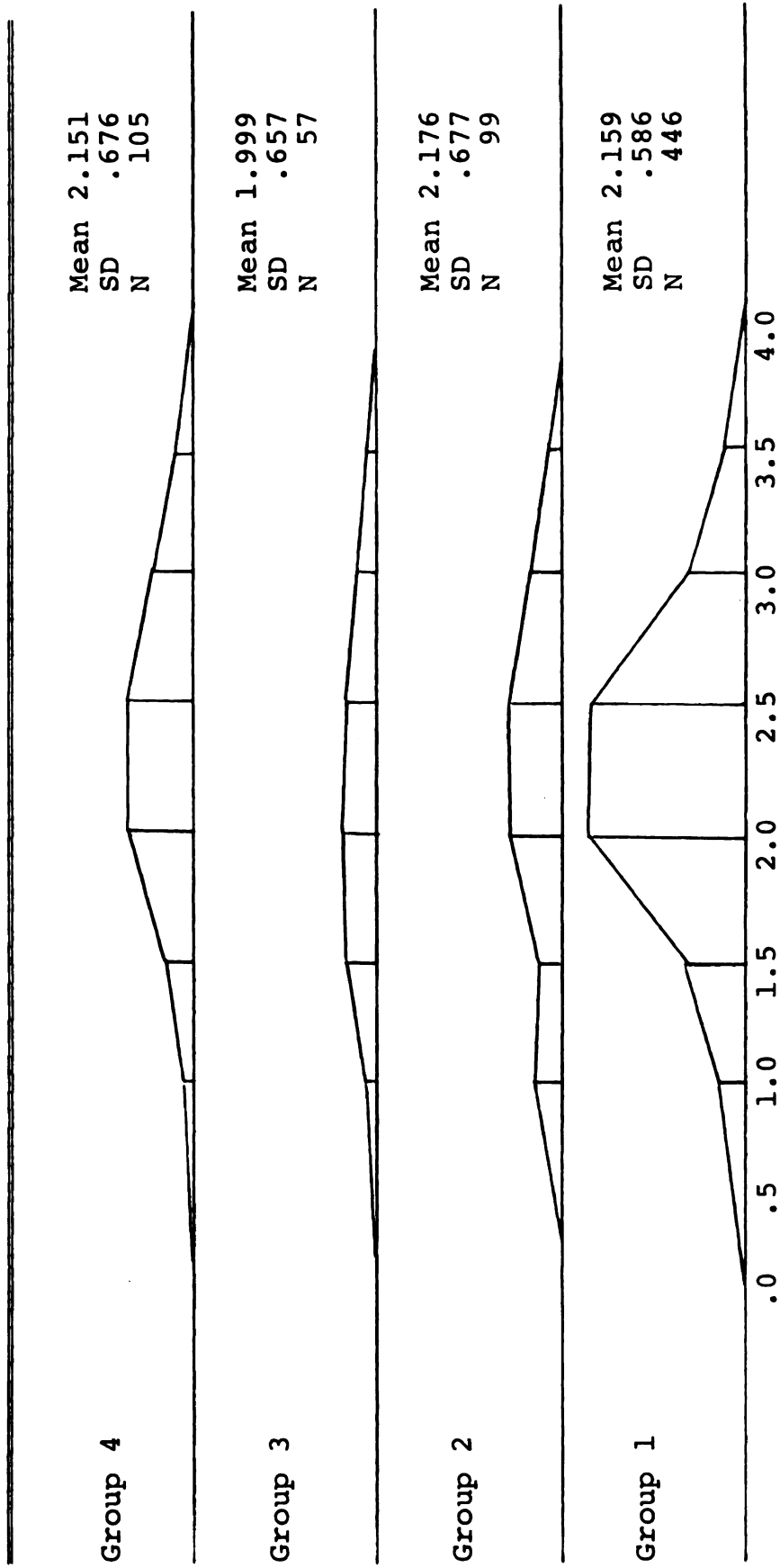
TABLE C.2.--Total Mean G.P.A. Profile for All Student Groups in High School Math.
[Tabulations and Computations which follow exclude special values interval.]

Group 4   Mean 1.798
           SD   .746
           N   105

Group 3   Mean 1.856
           SD   .779
           N   57

Group 2   Mean 1.617
           SD   .744
           N   99

Group 1   Mean 1.643
           SD   .714
           N   446
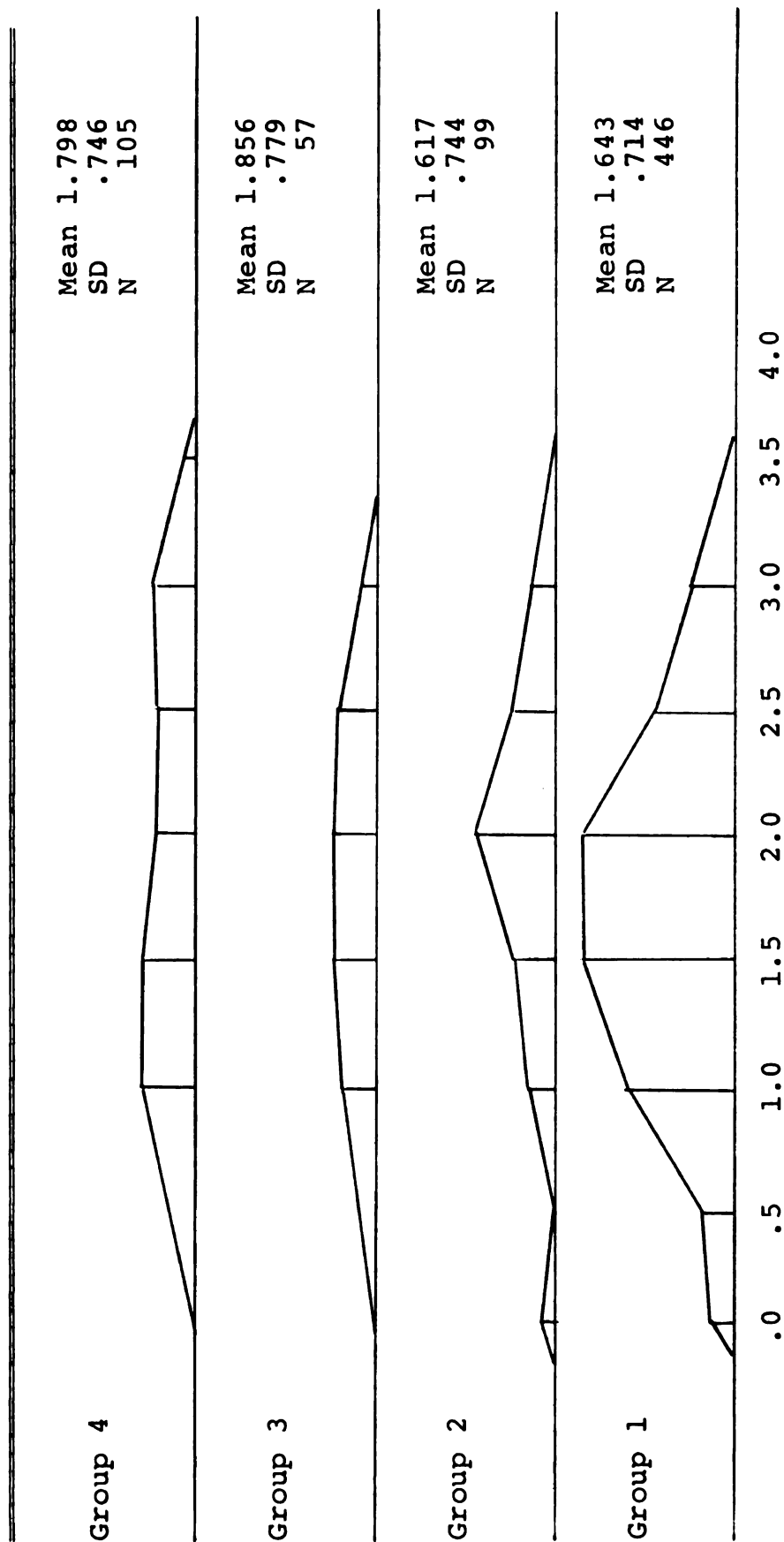
TABLE C.3.--Total Mean G.P.A. Profile for All Student Groups in High School Social Science.

[Tabulations and Computations which follow exclude special values interval.]

Group 4   Mean 2.220
           SD   .711
           N   105

Group 3   Mean 2.133
           SD   .657
           N   57

Group 2   Mean 2.254
           SD   .763
           N   99

Group 1   Mean 2.225
           SD   .692
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0

TABLE C.4.--Total Mean G.P.A. Profile for All Student Groups in High School Natural Science.

[Tabulations and Computations which follow exclude special values interval.]

Group 4   Mean 1.839
           SD   .810
           N   105

Group 3   Mean 1.909
           SD   .709
           N   57

Group 2   Mean 1.893
           SD   .790
           N   99

Group 1   Mean 1.922
           SD   .727
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
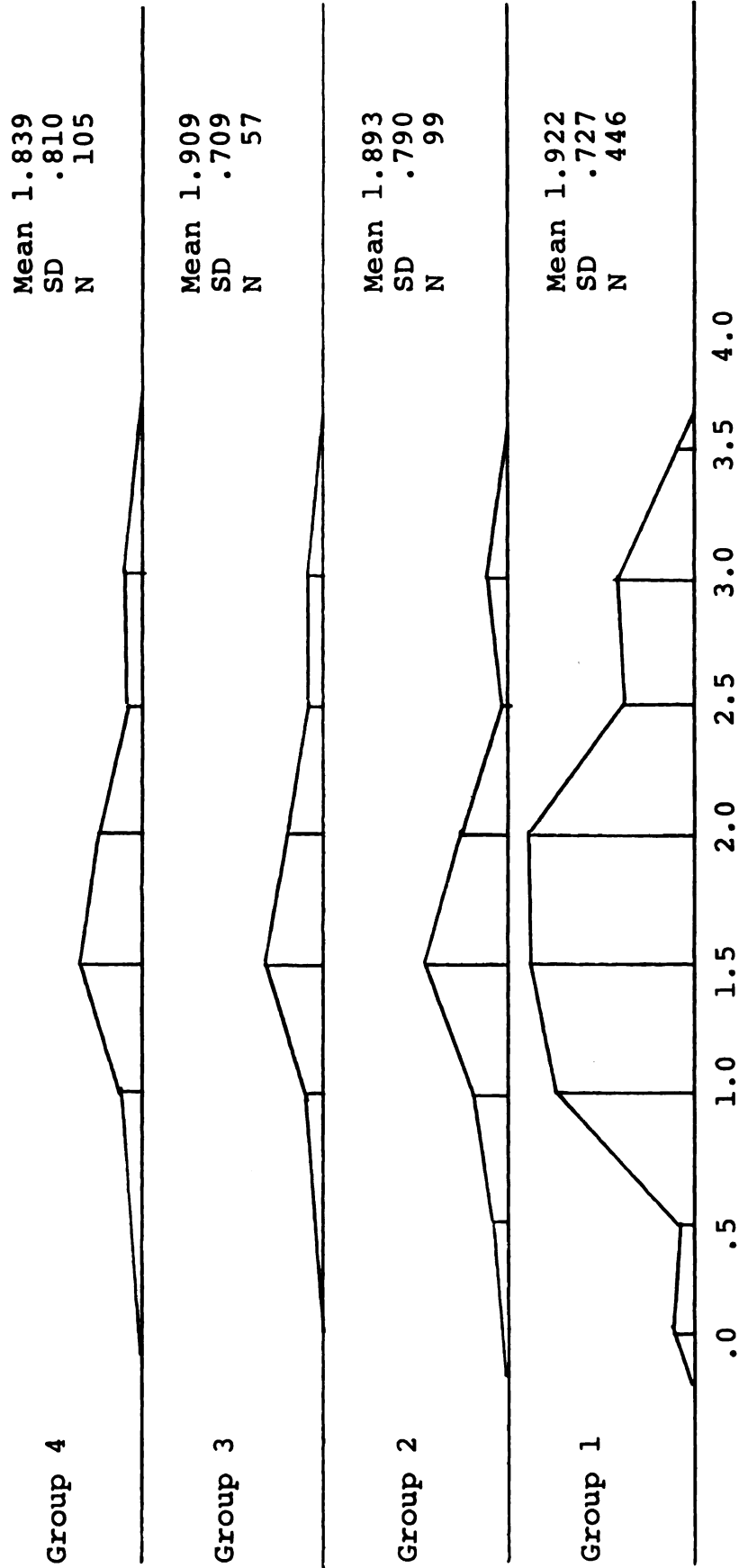
TABLE C.5.--Total Mean Predictive G.P.A. for All Student Groups in A.C.T. English. [Tabulations and Computations which follow exclude special value interval.]

Group 4   Mean 1.999
           SD   .357
           N   105

Group 3   Mean 1.891
           SD   .342
           N   57

Group 2   Mean 1.935
           SD   .333
           N   99

Group 1   Mean 1.962
           SD   .364
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
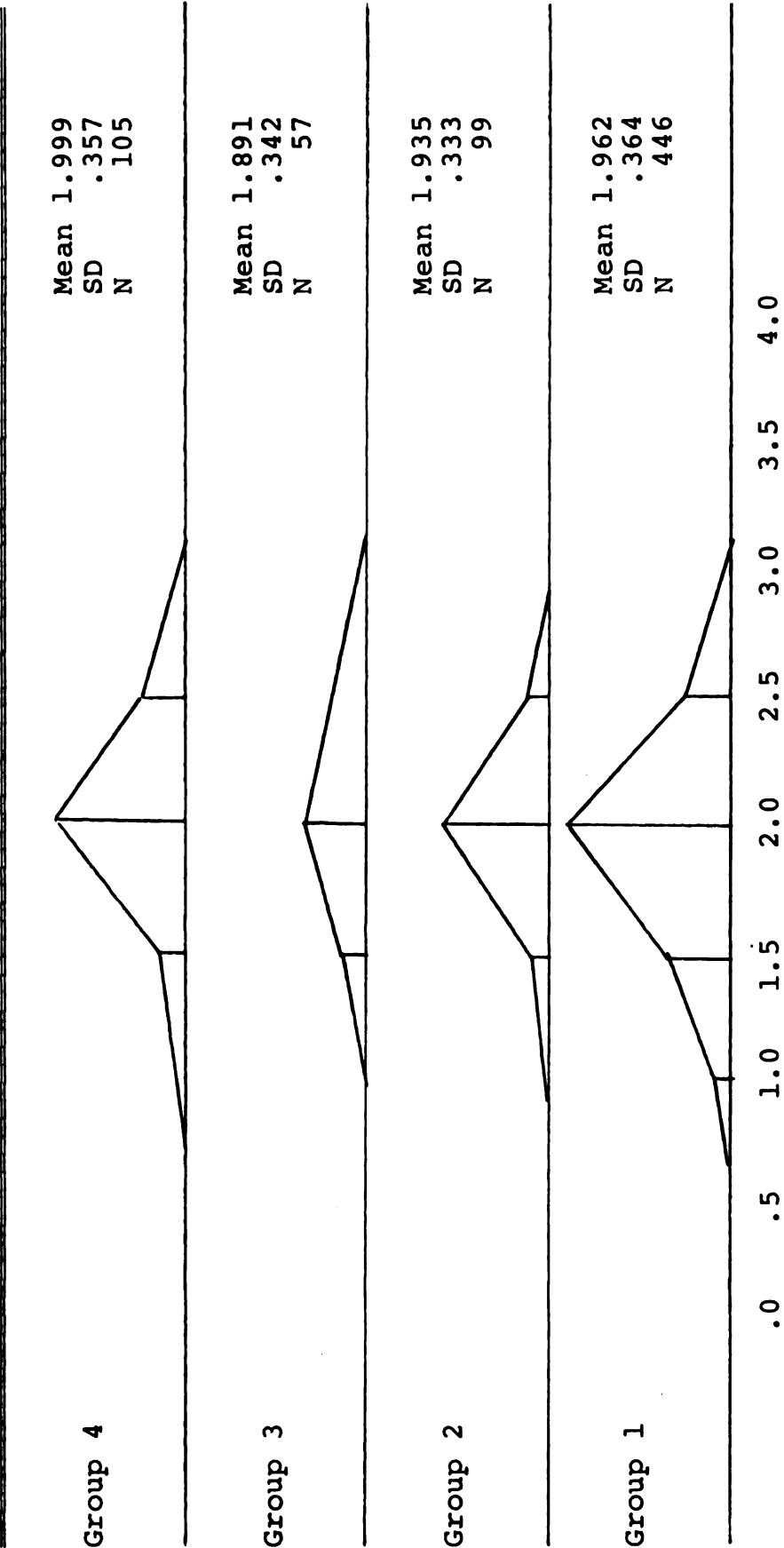
TABLE C.6.--Total Mean Predictive G.P.A. for All Student Groups in A.C.T. Math. [Tabulations and Computations which follow exclude special value interval.]

Group 4   Mean 1.593
           SD   .739
           N   105

Group 3   Mean 1.971
           SD   .524
           N   57

Group 2   Mean 1.880
           SD   .644
           N   99

Group 1   Mean 1.901
           SD   .544
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
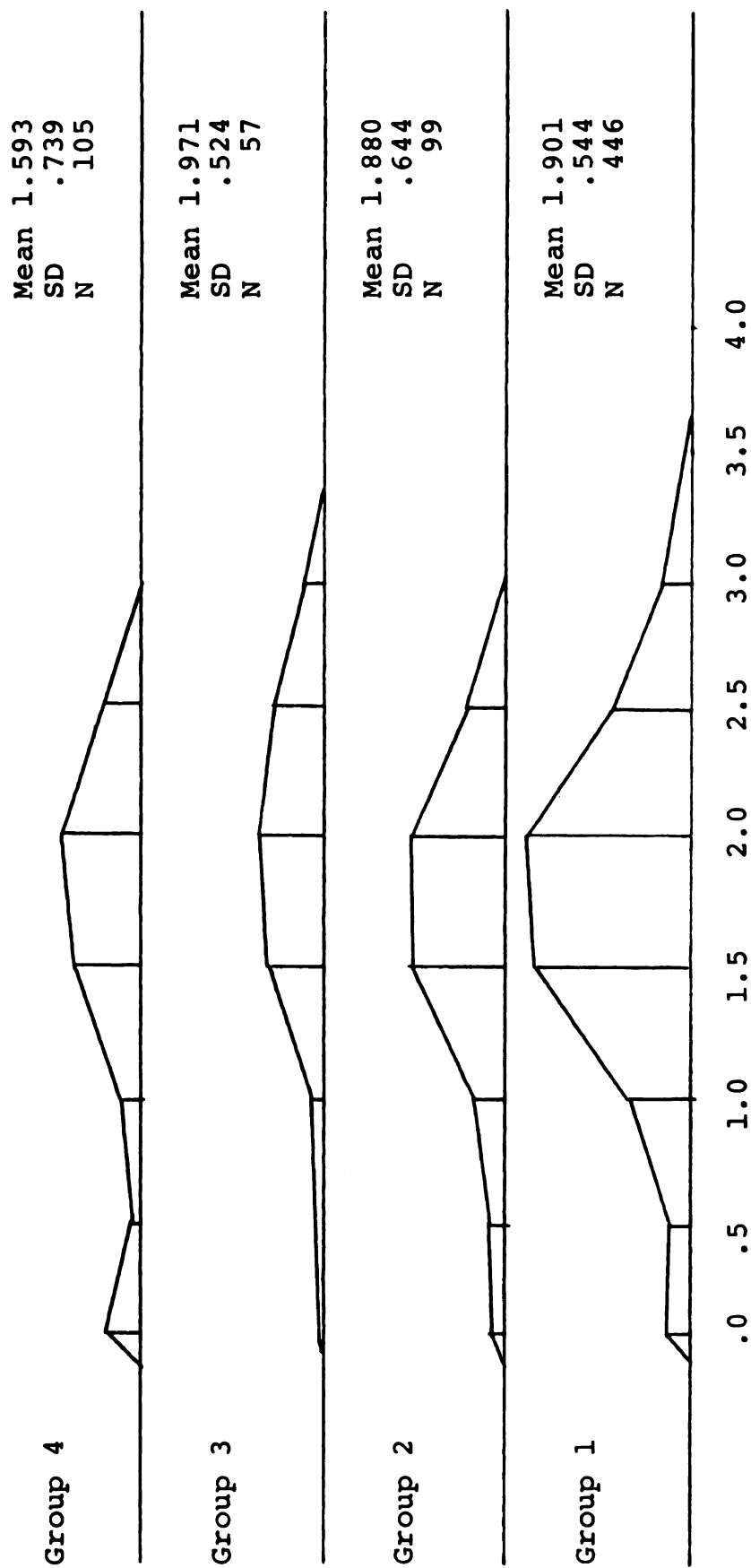
TABLE C.7.—Total Mean Predictive G.P.A. for All Student Groups in A.C.T. Social Science.

[Tabulations and Computations which follow exclude special value interval.]

Group 4   Mean 2.218
           SD   .686
           N   105

Group 3   Mean 2.32
           SD   .528
           N   57

Group 2   Mean 2.299
           SD   .509
           N   99

Group 1   Mean 2.190
           SD   .583
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
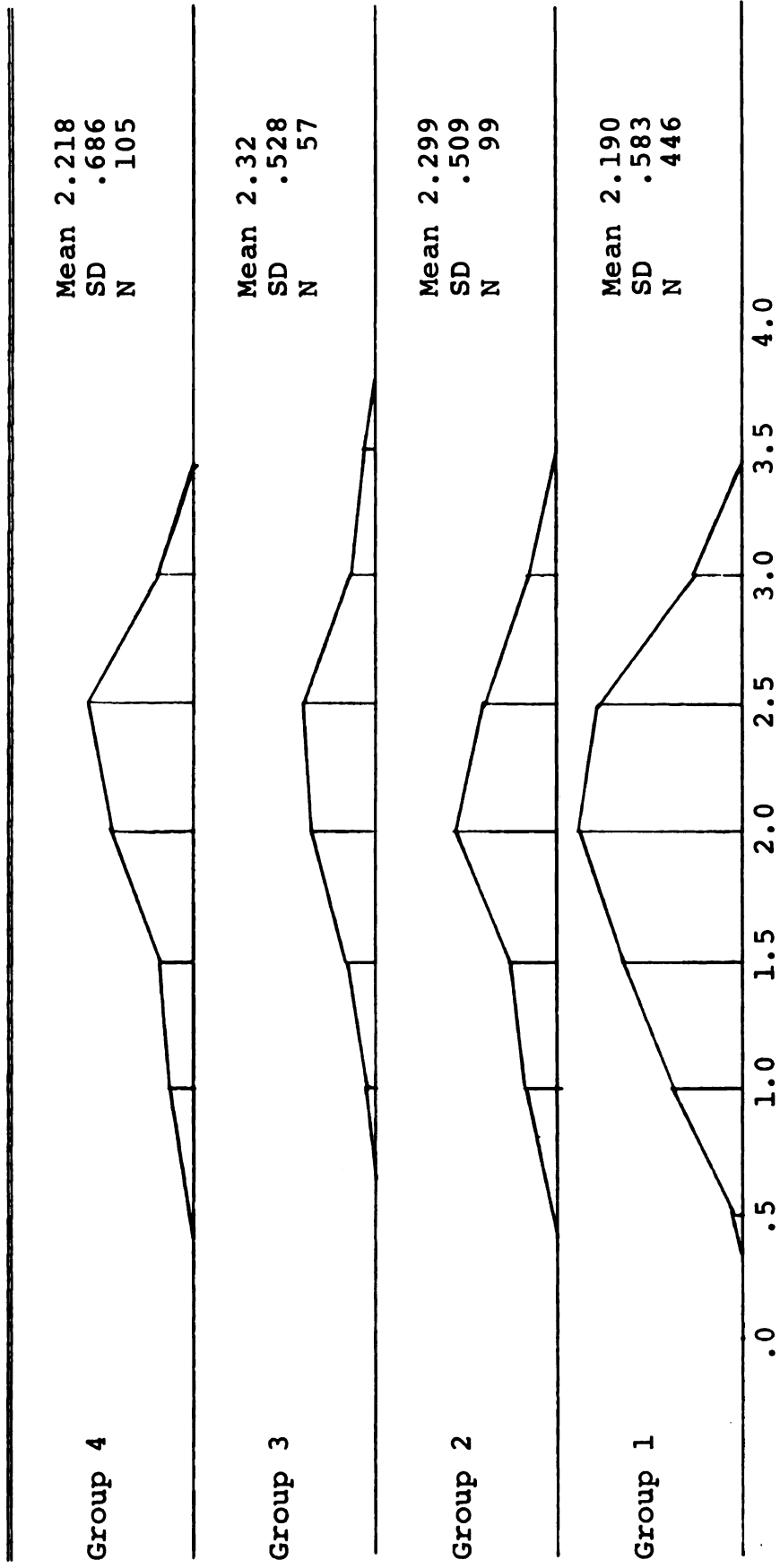
TABLE C.8.--Total Mean Predictive G.P.A. for All Student Groups in A.C.T. Natural Science.

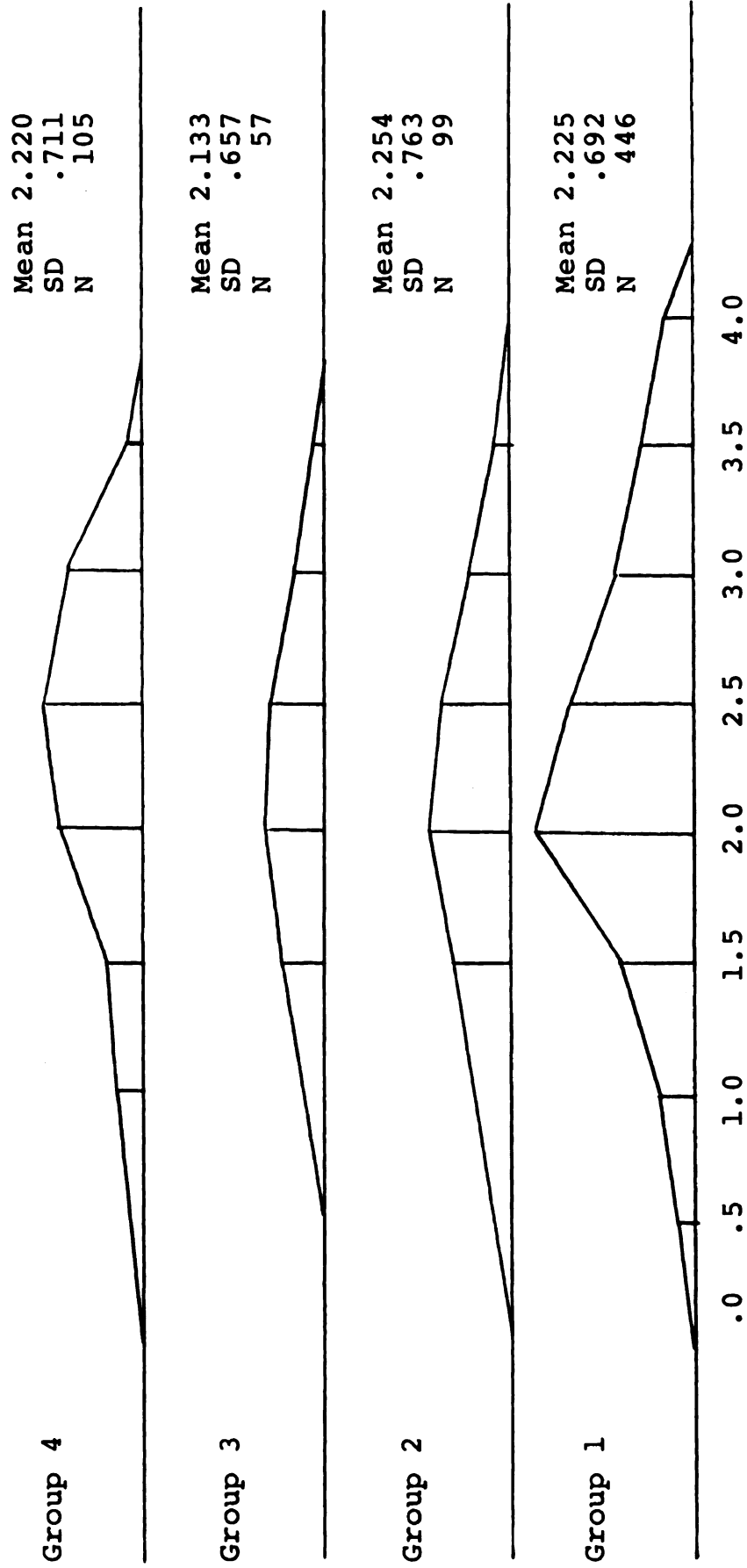[Tabulations and Computations which follow exclude special value interval.]

Group 4   Mean 1.996
           SD   .681
           N   105

Group 3   Mean 2.234
           SD   .640
           N   57

Group 2   Mean 2.147
           SD   .662
           N   99

Group 1   Mean 2.054
           SD   .678
           N   446

.0   .5   1.0   1.5   2.0   2.5   3.0   3.5   4.0
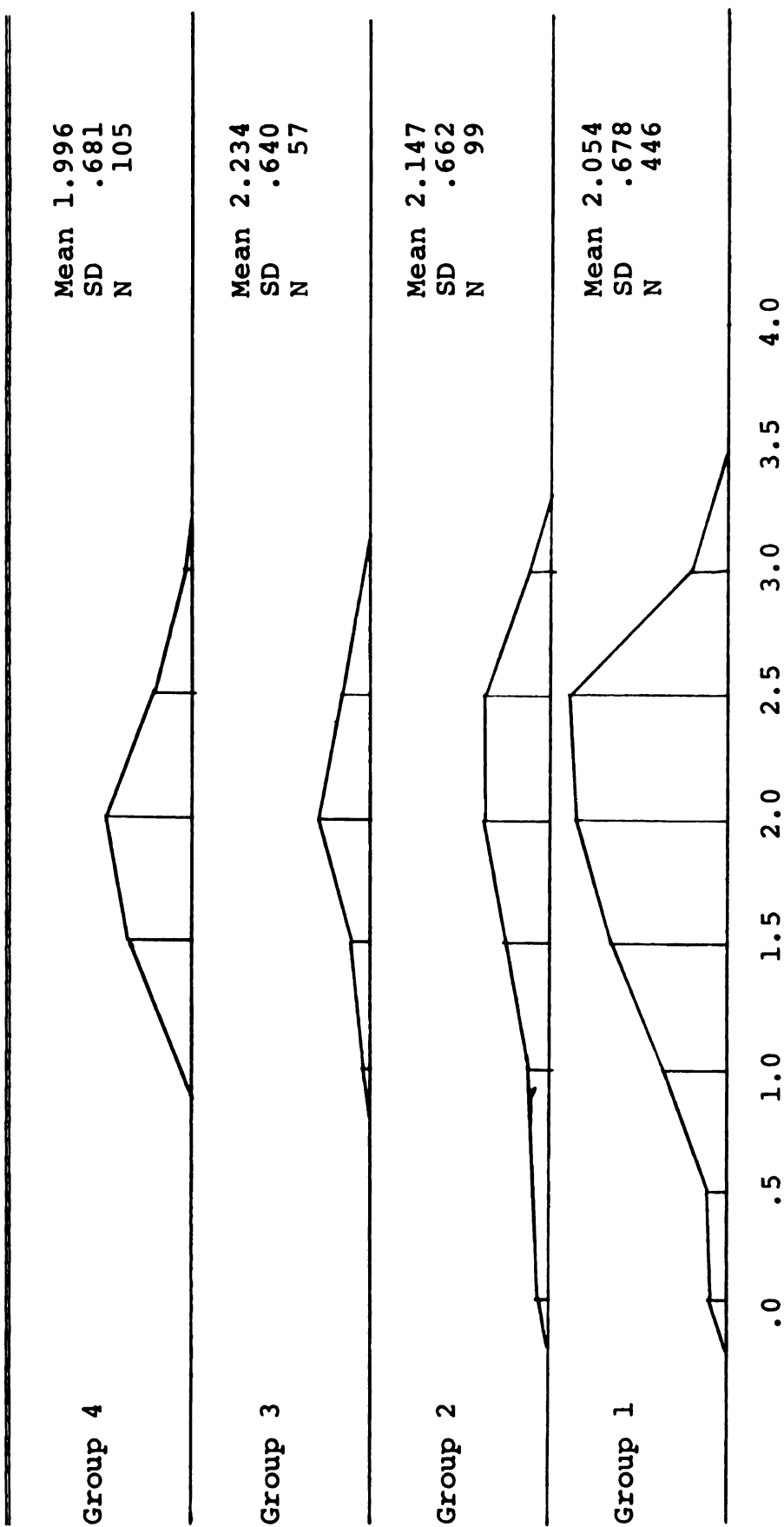
APPENDIX D

ANALYSIS OF GROUP 4

TABLE D.1.--Analysis of Group 4.

Number	Number of Years Out of High School
27	5
12	6
9	7
6	8
5	9
3	10
8	11
5	12
3	13
4	14
2	15
4	16
3	17
3	18
2	20
1	21
1	22
4	24
1	25
1	30
1	32

APPENDIX E

SIMPLE CORRELATIONS--PREDICTION OF
M.C.C.C. GRADES BY GROUPS

TABLE E.1.--Simple Correlations--Prediction of M.C.C.C. Grades Group 1.

	1 HS-ENG	2 HS-MTH	3 HS-SS	4 HS-NS	5 HS-TOT	6 AC-ENG	7 AC-MTH	8 AC-SS	9 AC-NS	10 AC-TPT	11 MC-ENG	12 MC-MTH	13 MC-SS	14 MC-NS	15 MC-TOT
AC-ENG	0.37	0.26	0.27	0.28	0.38										
AC-MTH	0.16	0.30	0.16	0.26	0.28										
AC-SS	0.24	0.16	0.30	0.29	0.32										
AC-NS	0.17	0.24	0.20	0.28	0.28										
AC-TOT	0.27	0.30	0.28	0.35	0.39										
MC-ENG	0.35	0.23	0.37	0.30	0.40	0.16	0.11	0.22	0.12	0.20	1.00				
MC-MTH	0.29	0.33	0.28	0.29	0.38	0.08	0.27	0.19	0.18	0.26	0.57	1.00			
MC-SS	0.34	0.27	0.39	0.33	0.42	0.21	0.10	0.31	0.23	0.29	0.60	0.47	1.00		
MC-NS	0.31	0.26	0.34	0.34	0.40	0.13	0.20	0.24	0.24	0.30	0.53	0.56	0.58	1.00	
MC-TOT	0.40	0.34	0.42	0.39	0.49	0.17	0.21	0.30	0.24	0.32	0.82	0.80	0.80	0.82	1.00

Note: N = 446

TABLE E.2.--Simple Correlations--Prediction of M.C.C.C. Grades Group 2.

	1 HS-ENG	2 HS-MTH	3 HS-SS	4 HS-NS	5 HS-TOT	6 AC-ENG	7 AC-MTH	8 AC-SS	9 AC-NS	10 AC-TOT	11 MC-ENG	12 MC-MTH	13 MC-SS	14 MC-NS	15 MC-TOT
AC-ENG	0.25	0.19	0.36	0.28	0.32										
AC-MTH	0.27	0.50	0.39	0.38	0.46										
AC-SS	0.26	0.24	0.35	0.17	0.31										
AC-NS	0.19	0.29	0.31	0.25	0.32										
AC-TOT	0.31	0.42	0.46	0.35	0.47										
MC-ENG	0.40	0.25	0.33	0.25	0.38	0.18	0.02	0.21	0.03	0.12	1.00				
MC-MTH	0.29	0.27	0.29	0.18	0.31	0.09	0.16	0.11	0.15	0.15	0.57	1.00			
MC-SS	0.38	0.25	0.44	0.27	0.40	0.32	0.13	0.27	0.25	0.30	0.56	0.57	1.00		
MC-NS	0.35	0.26	0.39	0.21	0.37	0.14	0.12	0.15	0.97	0.13	0.66	0.73	0.63	1.00	
MC-TOT	0.41	0.29	0.40	0.25	0.41	0.20	0.12	0.19	0.13	0.19	0.81	0.86	0.79	0.89	1.00

Note: N = 99

TABLE E.3.--Simple Correlations--Prediction of M.C.C.C. Grades Group 3.

	1 HS-ENG	2 HS-MTH	3 HS-SS	4 HS-NS	5 HS-TOT	6 AC-ENG	7 AC-MTH	8 AC-SS	9 AC-NS	10 AC-TOT	11 MC-ENG	12 MC-MTH	13 MC-SS	14 MC-NS	15 MC-TOT
AC-ENG	0.54	0.31	0.30	0.22	0.46										
AC-MTH	0.18	0.49	0.15	0.32	0.40										
AC-SS	0.32	0.34	0.39	0.20	0.42										
AC-NS	0.20	0.33	0.25	0.26	0.35										
AC-TOT	0.36	0.47	0.33	0.32	0.50										
MC-ENG	0.32	0.29	0.29	0.39	0.43	0.36	0.33	0.39	0.18	0.39	1.00				
MC-MTH	0.29	0.37	0.38	0.32	0.46	0.17	0.56	0.35	0.37	0.48	0.65	1.00			
MC-SS	0.35	0.30	0.36	0.41	0.47	0.23	0.36	0.38	0.21	0.38	0.76	0.56	1.00		
MC-NS	0.45	0.32	0.49	0.54	0.60	0.24	0.25	0.36	0.23	0.34	0.75	0.56	0.71	1.00	
MC-TOT	0.41	0.37	0.44	0.48	0.57	0.29	0.42	0.43	0.28	0.45	0.91	0.79	0.87	0.88	1.00

Note N = 57

TABLE E.4.--Simple Correlations--Prediction of M.C.C.C. Grades Group 4.

	1 HS-ENG	2 HS-MTH	3 HS-SS	4 HS-NS	5 HS-TOT	6 AC-ENG	7 AC-MTH	8 AC-SS	9 AC-NS	10 AC-TOT	11 MC-ENG	12 MC-MTH	13 MC-SS	14 MC-NS	15 MC-TOT
AC-ENG	0.31	0.22	0.16	0.24	0.31										
AC-MTH	0.02	0.13	0.07	0.27	0.17										
AC-SS	0.14	0.07	0.28	0.02	0.16										
AC-NS	0.03	0.05	0.01	0.22	0.09										
AC-TOT	0.09	0.13	0.15	0.22	0.20										
MC-ENG	0.40	0.26	0.33	0.22	0.39	0.28	0.06	0.41	0.16	0.28	1.00				
MC-MTH	0.24	0.25	0.22	0.23	0.31	0.25	0.32	0.38	0.33	0.41	0.49	1.00			
MC-SS	0.29	0.11	0.24	0.08	0.23	0.26	0.07	0.35	0.14	0.25	0.60	0.49	1.00		
MC-NS	0.28	0.27	0.31	0.24	0.36	0.40	0.20	0.54	0.44	0.50	0.56	0.51	0.71	1.00	
MC-TOT	0.37	0.29	0.33	0.26	0.41	0.37	0.23	0.50	0.33	0.45	0.79	0.77	0.83	0.84	1.00

Note: N = 105

APPENDIX F

M.C.C.C. TOTAL PREDICTORS

TABLE F.1.--M.C.C.C. Total Predictors.

Variable	Multiple		Increase	F-Value
	Group 1			
HS-TOT 9	.479	.229	.229	178.781
ACT-SS 12	.500	.250	.020	16.620
MARITL 3	.509	.259	.009	7.358
	Groups 2 and 3			
HS-TOT 9	.448	.201	.201	176.944
ACT SS 12	.574	.330	.026	27.679
MARITL 3	.551	.304	.103	103.981
	Group 4			
HS-TOT 9	.598	.357	.112	17.697
ACT-SS 12	.496	.246	.246	33.574
MARITL 3	.627	.393	.036	5.913