SELECTED FACTORS RELATED TO SEMESTER GRADE POINT AVERAGE OF THIRD YEAR OR LATER STUDENTS IN THE FACULTY OF EDUCATION AT MEMORIAL UNIVERSITY OF NEWFOUNDLAND

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The undersigned certify that they have read, and recommend to the Faculty of Education for acceptance, a thesis entitled "Selected Factors Related to Semester Grade Point Average of Third Year or Later Students in the Faculty of Education at Memorial University of Newfoundland" submitted by Frederick Frank French in partial fulfillment of the requirements for the degree of Master of Education.

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ABSTRACT

The purpose of this study was to determine the effects of living accommodation, distance commuted, age, sex, marital status, religious affiliation, high school graduating average and measured intelligence on the semester grade point average of university students. High school average and measured intelligence served as controls in examining the influence of the other variables.

Subjects of the study were 102 students enrolled in their third year or later in the Faculty of Education at Memorial University of Newfoundland. The fifty-five males and forty-seven females were administered a questionnaire devised by the researcher, to gather background information, and the Lorge-Thorndike Intelligence Test, Form 1, Level H. Further information relevant to academic grades was gathered with the subjects' consent from the Registrar's Office at Memorial University and from records at the Provincial Department of Education.

An analysis of the data revealed that students who lived with their parents scored significantly higher mean semester grade point averages than did students living in university residences, apartments and boarding houses. Living accommodation accounted for approximately nine per cent of the variance in semester grade point average while distance commuted accounted for less than

four per cent of the variance. Age contributed only one per cent to the total amount of variance in semester grade point average. Without controlling for the effects of measured intelligence and high school average, the difference in semester grade point average between males and females was significant, favouring females; however, no significant difference was found when the effects of measured intelligence and high school average were removed. Sex of the subject accounted for little more than six per cent of the variation in grade point average. Marital status and religious affiliation did not significantly affect semester grade point average; their influence was so negligible, in fact, that they were not included in the final regression analysis to determine contributors to the variance in semester grade point average. High school graduating average and measured intelligence accounted for thirty-nine per cent of the variance in semester grade point average (twelve per cent and twenty-seven per cent, respectively). A total of fifty-eight per cent of the variance in grade point average was accounted for by the factors studied.

The significance of the study was threefold and rested on better counselling for students, better understanding of the relationship of certain variables to each other and further understanding of factors affecting university grade point average. Recommendations were made

to make such information available to school and university officials. In addition, a study of boarding houses was recommended since these students scored the lowest mean semester grade point averages. Measured intelligence, high school average and living accommodation, the factors most highly related to semester grade point average, should be of special interest to school and university officials. Distance commuted, age, sex, marital status and religious affiliation contributed little to the variability of semester grade point average; rather than pursuing these factors, further research should examine variables such as motivation, attitudes, values, home study habits, personality and personal concerns of the students.

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CHAPTER I

INTRODUCTION

Research has shown that many factors affect a student's progress through university. For example, such factors as living accommodation, age, sex, marital status, religious affiliation, high school graduating average, and measured intelligence have all been investigated.

In the case of living accommodation, Smallwood (1971) studied the effects of different residential settings on the academic, social and personal lives of students at Memorial University. His results indicated that students living in on-campus residences did significantly better academically than did students living in off-campus boarding houses. A few exceptions were reported, as in the case of Grant (1968), who found that no significant relationship existed between academic achievement and type of living accommodation.

As far as student age is concerned, Sullivan (1966) studied factors that may have contributed to a lack of student academic success at Memorial University in the Fall term, 1966. He found the proportion of failure lower for students fifteen to sixteen years of age than for older students. However, Frerichs (1973) studied differences in the academic achievement of 1,435 female nursing students in Illinois and found that students above the age of twenty-

three achieved grade point averages approximately one grade point higher than did younger students.

The majority of studies have found that females, in general, score higher mean grade point averages than do males. One such study is that of Hosseini (1975) who compared three groups of academically successful, unsuccessful and average students according to sex. Hence, it is important to examine the role of sex in any local study related to achievement in university.

Studies of marital status as a factor affecting university grade point average have produced contradictory results. Aller (1963) found the grade point averages of married students to be higher than the grade point averages of single men and women. Jensen and Clarke (1958), however, found in a study of 72 males (thirty-six married and thirty-six single) that there was no significant difference in academic achievement between married and single subjects.

Because of the continued denominational nature of the school system in Newfoundland and Labrador, it is important, from a descriptive perspective, to determine if religious affiliation is related to grade point average at Memorial University. Astin (1971) studied selectivity data for 2,300 American colleges and reported that while Catholic and non-Catholic girls obtained the same average freshman grade point average, the Catholic girls' grade point averages were lower than was to be expected, given their high school grades and academic ability. Schneider (1965), on the

contrary, found that public high school graduates and Catholic high school graduates were more alike than different on variables such as personality, age and university grade point average.

Lavin (1965), in a review of research dealing with the prediction of university grade point average, found that of all the measures used in prediction batteries, the one that consistently emerged as the best single predictor of college success was the high school grade point average; only two exceptions were found in the literature.

Generally speaking, the research has shown measured general intelligence to be positively correlated to academic success in university. General intelligence was used as a control in some comparative studies (Matson, 1963).

There still appear to be areas of confusion as to how certain factors are related to university grade point average. Even those factors which have shown rather consistent relationships in other universities have not been investigated at Memorial University of Newfoundland. Further clarification of the relationship of such factors to university grade point average in Memorial University seems necessary. Furthermore, many of the preceding studies have examined students at the beginning of their academic career. The present study will examine only those students who have attained a third year or later status; thus, only students who have already achieved some measure of academic success are in the sample.

Purpose of the Study

The purpose of this study was to determine what relationships the following variables have to the grade point averages of third year or later Memorial University of Newfoundland students enrolled in the Faculty of Education:

1. Living accommodation
2. Distance commuted
3. Age
4. Sex
5. Marital status
6. Religious affiliation
7. High school graduating average
8. Measured intelligence

In addition, the variables of high school graduating average and measured intelligence served as controls while comparing the other variables to grade point average.

Significance of the Study

For many years, the Faculty of Education at Memorial University has been attempting to gain additional data on students who enter the Faculty. However, little research on factors affecting academic grade point average in the Faculty has been carried out. Information on the relationship between academic grade point average and factors such as living accommodation, distance commuted, age, sex, marital status, religious affiliation, high school graduating average and measured intelligence should aid university officials in

their selection and advisement of students; in addition, such information would aid secondary school guidance counselors in their advisement of prospective university students.

Dr. Garfield Gizzard, former Chairman of the Selection Committee of the Faculty of Education at Memorial University, stated that the above factors appear to be related to academic grade point average in the Faculty of Education.[1] What is not known is the strength and degree of this relationship. This study should give statistical information on the strength and direction of the relationship between the above variables and academic grade point averages in the Faculty of Education at Memorial University.

Some research into the relationship of the above factors to the academic grade point average has been carried out at Memorial University and at other universities. However, many of the studies have been quite limited in scope, inconclusive, and even contradictory.

Smallwood (1971) compared male residence hall students and male lodging students at Memorial University of Newfoundland in several areas; for example, he compared the students on the basis of their final exam results and found that residence hall students had significantly higher academic results than lodging students. In his recommendations for future study, Smallwood suggested that his study

[1] This statement was made by Dr. Garfield Fizzard, Chairman of the Selection Committee of the Faculty of Education at Memorial University of Newfoundland in a June, 1975 interview with the investigator.

be expanded to include students who are regularly domiciled in the city, where the university is located. In addition, he recommended that other types of residence environments, such as apartments, be included. He further suggested the use of a standardized intelligence test as a control to determine whether the academic differences were due to differences in types of living accommodation or differences in intelligence. These recommendations were incorporated into the present study. In addition, since apartment dwellers, as one example, can live various distances from the university campus, the distance commuted might be a factor impinging on grade point average. This factor was also examined in this study. Females were included in this study as well, thus permitting the results to be more generalizable than the Smallwood study.

Prusok and Walsh (1964) studied the relationship between living accommodation and academic achievement of freshman men at the State University of Iowa. They found that when academic ability was controlled there was no difference in the adjusted grade point averages among freshman men living in fraternities, in residence halls, at home or off-campus. Such a finding, of course, conflicts with the evidence supplied by Smallwood.

In his review of literature dealing with the prediction of university grade point average Lavin (1965) found that no generalization could be made regarding the effect of age on academic achievement since the studies

reviewed were contradictory. Contradictory results were also reported in the effect of marital status on grade point average. Russo (1969) found married students achieved a higher grade point average than unmarried students; however, Jensen and Clarke (1958) found no significant difference between the grade point averages of married and single students.

Schneider (1965) reported no significant differences in the achievement of students who persist beyond the first semester, when he compared public and Catholic high school graduates. However, little research has been done on the influence of religious affiliation. Hence, religious affiliation will also be examined.

Matson (1963) studied five types of living accommodation at Indiana University to determine their effect on academic achievement. He found that while differences existed in the academic achievement of students in their first year, no differences were found in the academic achievement of students by their fourth year. He attributed this to the dropping out of low ability students before the senior year. Many studies of these variables used only first or second year students (Prusok and Walsh, 1964; Russo, 1969; Endler and Steinberg, 1963; and Altus, 1961). This study will use third year or later students in an attempt to examine how the factors under investigation are related to academic performance of students who are at or near the completion of a university education degree. Thus,

any predictive significance evolving from the study would be more applicable to program completion than to completion of first or second year university.

This study can be of significance in three ways:

1. One way is related to the concept of better counselling for students, using the information obtained from this study. This may be called the utilitarian or humanitarian significance. Recommendations to the appropriate school and university officials regarding selection and advisement procedures for students in Education programs at Memorial University will be made.

2. The second significance relates to the gathering of data for the sake of better understanding the relationship of certain variables. This may be called the scientific significance. Such a significance will help broaden the generalizability of the results.

3. A third significance relates to the use of third year or later students to form the sample. This may be called a scientific significance as well since it furthers the understanding of the question of factors affecting grade point average.

Research Questions

This study will deal with the following questions:

1. Does the current type of living accommodation, such as living in an apartment, living with parents, living

in a boarding house or living on campus in a university residence, account for any significant difference in the grade point averages of students, when controlling for differences in high school average and measured intelligence?

2. Does a student's sex account for any significant difference in the grade point average, while controlling for differences in high school average and measured intelligence?

3. Do differences in marital status account for any significant difference in the grade point average of students, while controlling for differences in high school average and measured intelligence?

4. Do differences in religious affiliation account for any significant differences in the grade point averages of students, while controlling for differences in high school average and measured intelligence?

5. What are the individual relationships of living accommodation, distance commuted, age, sex, marital status, religious affiliation, high school average and measured intelligence to semester grade point average?

6. What is the combined relationship of living accommodation, distance commuted, age, sex, marital status, religious affiliation, high school average and measured intelligence to semester grade point averages?

Operational Definitions

Commuter -- a student who resides off-campus and travels daily to and from the university campus; this term includes the city-dwelling student.

City-dwelling student -- a student whose permanent home is in the same town in which the university is located.

Non-commuter -- a student who lives in a campus residence.

University residence -- a place that provides living accommodation to students on the university's main campus in St. John's.

Affiliated church residences -- a place that provides living accommodation to students on the university campus and is owned and/or operated by a church organization.

Regular semester -- a semester of four or more full courses which can be counted as credit towards a degree.

Grade eleven scores -- marks received by a student at the end of his or her eleventh academic year, whether on a Newfoundland Public Exam or on a Shared Evaluation Process between the school and the Newfoundland Public Exam Division.

Intelligence -- that total score obtained on the Lorge-Thorndike Level H - Form 1.

Education student -- a student who is enrolled in the full time study of a program of courses at university that will lead to the conferring of a degree in Education and will entitle that student to enter the teaching profession.

Limitations

1. This research is limited in generalizability to third year or later students enrolled during the third semester of 1975 at Memorial University of Newfoundland, Faculty of Education.

2. The present study is limited to those students enrolled in classes in which the faculty member agreed to the use of his class time for the administration of the questionnaire and the intelligence test. Thus, a random sample was not selected.

3. For those students who moved just prior to the study's being conducted, the time period of one semester may not be sufficient to establish any effect of living accommodation and distance commuted on semester grade point average.

4. Some students maintain the same living accommodation. Other students move from one type of living accommodation to another. It is not known what influence frequent moving may have on the results of the study.

This chapter has dealt with an introduction to the study, its purpose, and its significance to the research in the field. Research questions were posed and definitions and limitations were presented. The following chapter will present a selection of the related research.

CHAPTER II

REVIEW OF LITERATURE

This chapter will present a selected review of the literature relevant to the topic of this study. The chapter is divided into seven sections:

1. Early studies on factors related to university achievement,
2. The relationship between type of living accommodation and grade point average at university,
3. The relationship between distance commuted and grade point average at university,
4. The relationship between personal background factors of age, sex, marital status and religious affiliation and grade point average at university,
5. The relationship between high school graduating average and grade point average at university,
6. The relationship between measured intelligence and grade point average at university,
7. Summary and conclusions.

Early Studies on Factors Related to University Achievement

A vast amount of research has been carried out on the prediction of achievement at university. Wherever possible, this review of literature will limit itself to studies since 1960; exceptions occur where the majority of studies in a particular area were made prior to 1960.

Durflinger (1943) reviewed studies that were made from 1934 to 1943. These studies included some seventy-five coefficients based on the following variables: high school average, intelligence test scores, general achievement test scores and personality factors. Correlations with freshman grades included: high school average, .55; intelligence test scores, .52; and, achievement test scores, .48.

Garrett (1949) provided a comprehensive review of the literature dealing with factors related to scholastic success in Colleges of Arts and Science and Teacher Colleges. He reported on 194 studies between 1919 and 1947. His review led to the following conclusions:

1. The five factors with the greatest predictive value were:

   a) High school scholarship, made up of high school average and rank in graduating class, with correlations of .56 and .55 respectively,
   b) General achievement tests, with a correlation of .49,
   c) Intelligence test scores, with a correlation of .47,
   d) General aptitude test scores, with a correlation of .43,
   e) Special aptitude test scores, with a correlation of .41.

2. No consistent difference was found between men and women in relation to their high school standing or college performance.

3. When intelligence scores were examined, the scores of women were correlated more closely with college success than were the scores of men.

4. Age did not play too important a role. There was a slight tendency for those who entered college younger than the average (seventeen) to receive slightly better than average grades.

5. Finally, Garrett reported that combining high school marks and intelligence scores yielded the best predictive results.

Cosand (1953) reviewed several studies that had been made between 1931 and 1950. In these studies both single and multiple predictors were used. He found rank in class (.58), high school average (.54) and general achievement test scores (.54) correlated highest with college freshman grades. When these three predictors were combined, the resulting correlation (.61) was higher.

The above studies dealt with predictors such as rank in high school, intelligence and various measures of achievement, including high school grades and standardized achievement tests. These predictors were for the most part correlated with first year grade point average in university; as a result, no information was available on the consistency of performance. Many of the studies failed to analyze data

separately for males and females, thus hindering comparability among some investigations. Research was also needed into the relationships between performance and different segments of the range of ability.

The predictors investigated in the above studies accounted for about forty-five per cent of the variation in academic performance. While no single factor accounted for this much variation, more than half of the variance remains unexplained.

The Relationship Between Type of Living Accommodation and Grade Point Average at University

Alfert (1966) investigated the relationship between the housing arrangements of 153 students and the drop-out problem. His results indicated that dropping out was related to the type of living accommodation chosen; the highest number of drop-outs was reported from those students in boarding houses and those students living at home. Men's dormitories, societies and co-operatives had the lowest number of drop-outs.

Prusok and Walsh (1964) studied the relationship between living accommodation and academic achievement of freshmen at the State University of Iowa. They found that when academic ability was controlled, there was no difference in the adjusted grade point averages among freshmen living in fraternities, in residence halls, at home or off-campus. This study is of particular importance to the present investigator because the authors controlled for academic

ability through the use of the American College Testing Program and high school grades. The present investigator will use the Lorge-Thorndike Intelligence Tests and high school grades in an attempt to replicate the findings of Prusok and Walsh. Prusok and Walsh used an analysis of covariance to evaluate their hypotheses and collected data from 1,070 pupils. The present study will not examine data from fraternities but will further divide the off-campus group into apartment dwellers and boarding house dwellers.

Hountras and Brandt (1970), in exploring the relationship between type of student residence and academic achievement, found that the combined group of residence hall students had a higher mean grade point average than did students who resided off-campus. They found no significant differences when they compared the type of college the students attended.

Matson (1963) studied five types of living accommodation at Indiana University to determine their relationship to academic potential, academic achievement and the length of stay at the university. He grouped the thirty fraternities at the university according to high prestige, middle prestige and low prestige; two other types of living accommodation studied were dormitory students and off-campus students. He found high prestige fraternities had students of higher academic potential than did the other four groups; however, by the fourth year no substantial differences existed between the five campus groups. He attributed this

finding to the dropping out of low ability students prior to the senior year. No statistically significant trends were reported between the five types of living accommodation and the academic grade point average. However, the results indicated that fraternities with an average or better reputation and residence halls provided the best atmosphere for academic achievement. Those students living off-campus or in a low prestige fraternity scored lower on academic achievement. Finally, the study reported that students are more likely to drop out of university when living off-campus or in a residence-hall.

Matson's study is important to the present investigation because it attributes the lack of differences between the five types of living accommodation to the dropping-out of low ability students prior to their senior year. If the low risk students have dropped out, then university accommodation is not a factor in determining grade point average. However, if a relatively homogeneous group remains and the grades are still different, then dropping out prior to the fourth year would have to be eliminated as a factor causing homogeneity between such groups. Matson's findings are all the more important because of the controls he used in his study, such as controlling for ability ranges and for consistency in type of living accommodation.

Willingham (1962) compared fraternity members and independent students on freshman attrition, freshman grades and four year grades. The results indicated that freshmen

who pledged a fraternity were less likely to drop out; the academic achievement of fraternity members was as high as, if not higher than, that of independent students, both in the freshman year and over the four year period.

Call (1974) matched two hundred residence students with two hundred commuting students on the basis of sex, college class, marital status and intelligence to determine whether the scholastic averages of resident students at York College, Pennsylvania, were significantly different from those of commuting students. He found that there was no significant difference between resident and commuting students in regard to scholastic average. Without matching the samples he then examined the total resident and commuting populations and found that while commuters scored consistently higher averages than did residence students, there was no significant difference. Unfortunately, Call did not provide information on the nature of the commuting students regarding types of living accommodation they selected and the distances they commuted.

Smallwood (1971) compared 150 male university students living in four different residential settings on five factors: academic success, personality, participation in extra-curricular activities, study habits and attitudes, and involvement in community affairs. Students from the first through the fifth year of university were included in the study. Relevant to the present study, he found that students in residence on campus did significantly better

than those students living off campus in boarding houses, despite the fact that the off-campus pupils had the second highest high school average of the groups studied. He did not control for intelligence, nor did he study female university students. Smallwood's study was limited to only four types of on-campus residence settings and off-campus lodging students.

Grant (1968) studied the relationship between type of university housing and academic achievement. She did not find a significant relationship between academic achievement and type of housing, using the housing groups of fraternity, residence-hall, co-operative and off-campus types.

Contradictory and inconclusive results are evident in the studies of the effects of living accommodation on university grade point average. Many of the studies did not divide off-campus housing, to account for the different types such as living at home, living in an apartment or living in a boarding-house. Furthermore, few studies examined one faculty; differences may exist in the academic expectations of students enrolled in different faculties. The present investigation will attempt to broaden the information in these areas as well as attempt to resolve the comments by Matson regarding non-significant differences in university grade point average due to the living accommodation for senior students.

The Relationship of Distance Commuted and Grade Point Average at University

A review of the literature failed to locate any studies in which distance commuted and its effects on the grade point average of students was investigated; it is hoped that this study will provide information on the relationship between these two factors. It is of particular importance to examine the factor of distance commuted since it may influence not only the type of living accommodation but also the university grade point average. Call's study of residence and commuting students, for example, did not investigate the effects of distance commuted.

The Relationship Between Background Factors and University Grade Point Average

1. Age as factor in university grade point average. At Memorial University, Sodhi and Moore (1970) studied a number of possible correlates of academic adjustment. They found that younger students (18 and below) displayed better curricular adjustment than did students 19 and over.

Sullivan (1966) studied the factors that may have contributed to a lack of success for a group of Memorial University students. He found that the proportion of failures was lower for students fifteen and sixteen years of age; however, he did not find a corresponding high proportion of young students who did well. In 1967, Sullivan found that students in the age bracket above twenty-five did much poorer in 1966-67 than in 1965-66. He attributed this effect

to the fact that in 1966 mature students (those without university entrance requirements but over their twenty-first birthday) were first admitted. The factor of mature students is still relevant to the present study.

Frerichs (1973) related the academic achievement of 1,435 female nursing students to age (younger or older than twenty-three), marital status and nursing experience. She found that students in the older age range achieved grade point averages approximately one grade point higher than the younger students.

Russo (1969) studied the relationship between first semester freshman and first semester sophomore grade point averages. He found that students who were above the median age of the population under study were more successful than students below the median age.

A number of studies disagreed with the use of age as a predictor, since their findings reported a lack of significant differences between different age groups. Lavin (1965), reporting on his review of literature related to the prediction of academic performance, found that no generalization regarding the effect of age on academic achievement could be made, since the studies cited were contradictory.

Jex (1966), in establishing prediction tables for the state of Utah, did not break down the college-bound population by age. He considered this impractical, despite demonstrated differences in performance, because the

resulting increased forecasting efficiency of such breakdowns seemed rather small compared to the increased work involved.

Lafferty (1969) studied the influence of age on the predictability of graduate record examinations and found no significant differences in the means of graduate record exams for any age group.

Grant (1968) reported that age showed no significant relationship to academic achievement.

Thus, the results of studies on the effect of age on university grade point average have been either inconclusive or contradictory. The present study hopes to further examine the factor of age. Many of the previous studies examined age as being in categories. This study will deal with age as a continuous variable.

2. Sex as a factor in university grade point average. Endler and Steinberg (1963) found that while females did not differ appreciably from males on high school performance, females did significantly better than males on first year university grade point average. In addition, males exhibited a significant drop in overall academic performance from high school to college; females did not exhibit such a drop. When Endler and Steinberg examined the different predictors of aptitude and achievement they found that females were more predictable than males, in that the correlations between the different predictor variables and first year university grade point average were higher for females than for males.

Truesdell (1972) studied the records of 1,258 students to determine the predictive accuracy of five American College Test scores on grade point average. He found that while males had significantly higher American College Test scores, females had significantly higher mean grade point averages.

Hewitt and Goldman (1975) found that for a given ability profile college women, on the average, achieved higher grades than did men. They reported that this difference was probably an artifact of the sex differences in major field choice.

Duff and Siegal (1960) studied overachievement in an attempt to determine the relationship between personal history data and academic over-and-under achievement. Their conclusion was that females tended to utilize their ability more effectively than did males.

Sodhi and Moore (1970), in their study of correlates of academic adjustment at Memorial University, found females to be more mature and to hold a higher composite score on the Borow's College Inventory of Academic Adjustment.

Sullivan (1966), in his study of the factors that contributed to a lack of student success during the Christmas examinations at Memorial University, found the percentages of females who failed to be lower than the percentage of males who failed. Furthermore, the percentage of females who did well was higher than the percentage of males who did well.

Michael, et al. (1962) found that when a group of 209 male and 233 female freshman grade point averages were compared, using high school grade point average and Scholastic Aptitude Test scores as predictors, the achievement of females in liberal art colleges could be predicted with greater accuracy than that of men.

Lewis (1962) studied 1,158 men and 840 women to select from a battery of eleven predictor variables those variables which would yield the best prediction of first quarter grade point average. Estimates of the criterion variable were made with a statistically significant greater degree of accuracy for female subjects than for male subjects.

Vick and Hornaday (1962) studied thirteen separate variables, including high school grade point average, in an attempt to predict grade point average at the end of first year university. They found higher correlations on all variables for females than for males.

Hosseini (1975), comparing groups of successful, unsuccessful and average pupils, found that females in general scored higher mean grade point averages than did males, both in high school and in university.

Gross, Faggen and McCarthy (1974) performed separate multiple regression analysis in ten undergraduate colleges of the City of New York University. College freshman grade point average was used as the dependent variable while the scores of six high school courses were the predictor

variables. Their findings showed females to be more predictable than males in academic settings.

Seashore (1962) analyzed data for predicting high school and college grades from the Differential Aptitude Test and reported sex differences favoring females when all subtests were administered.

Using an analysis of variance technique, Stanley (1967) showed that over a six-year period female freshman grades in thirteen coeducational state colleges in Georgia were better predicted by a standardized verbal aptitude test than were the grades of males.

Khan (1973) correlated scores on a predictor battery, including aptitude and achievement tests, for 10,379 males and 8,951 females who were in grade thirteen in Ontario with academic grades over a period of three years in five Ontario universities. His conclusions were that the correlations between predictors and achievement for females were higher than similar correlations for males.

Astin (1971) presented selection data for 2,300 American Colleges. His findings indicated that women tended to get better grades than men during their freshman years. Half of the women, as compared with a third of the men, obtained grade point averages of 2.50 or above. By contrast, twice as many men obtained freshmen grade point averages below 1.50 on a four point scale.

Aller (1963) investigated student marital adjustment and related it to academic achievement. He found that

higher grade point averages were earned by married women than by married men.

Altus (1961) correlated high school average, the Scholastic Aptitude Test and sixty items from a study-habits questionnaire with first semester grades and found females more predictable than males.

Lavin (1965), in a review of research related to the prediction of academic performance, found that the correlation between intelligence and performance was higher for females than for males; that is, the performance of females was more nearly in accord with their measured ability. Females also tended to be more predictable than males in academic performance. Even though the research is not entirely consistent, nowhere do males exceed females; either there was no sex difference, or females had higher correlations with intelligence than did males. Females' performance in university was more nearly in accord with their measured ability.

Contradictory results to Lavin's research has since been found. In addition, the debate as to the influence of the sex factor continues. Jex (1966), as one example, in establishing prediction tables for the state of Utah found women to be more predictable than men. However, he did not develop separate prediction tables for each sex. Women, although they achieved better than men in college, also achieved better than men in high school. Payne, et al. (1973), in the application of biographical data to the

prediction of academic achievement, did not find females to be more predictable than males. Lovett (1969), Mazur (1968) and Worthington (1969), in separate studies, examined the influence of biographical factors on academic achievement and reported a nonsignificant relationship between sex and achievement. Jones (1970) correlated scores on the Short Test of Educational Ability and second-semester grades in various subject areas for 284 male and 263 female students in the seventh grade. He did not find any significant differences between males and females.

Despite the debate over the influence of sex on university grade point average the evidence appears to favor the statement that females are more predictable than males and do perform better in university. Hence, it is important to examine the role of the sex factor in any study related to achievement in university. Given the majority of studies that favor females over males in prediction and actual achievement it is important to examine on a local level the differences in achievement between males and females.

3. Marital status as a factor in university grade point average. Frump (1947) studied a group of married and single veterans at the University of Wisconsin. He found that the married veteran was academically more successful than the single veteran. Furthermore, he found those who were married and had children earned higher grades than those who were married without children.

Frederiksen and Schrader (1951) investigated freshmen and sophomores in sixteen American colleges and found a significant tendency for married veterans to scholastically outperform single veterans.

In a study of a somewhat different type Hamilton (1947) reported that veterans were doing work superior to that done in their years prior to marriage.

Aller (1963) investigated student marital adjustment and related it to academic achievement. She found that the grade point averages of married men and women were higher than the grade point averages of single men and women. Student parents earned slightly higher grade point averages than did nonparents. Higher grade point averages were earned by student wives than by student husbands.

Jenson and Clarke (1958) compared students who had been married all four of their college years to students who were single all four years. The comparisons were in the areas of achievement, scholastic ability and personality. They found that of the 72 males studied (thirty-six married and thirty-six single) both groups were approximately of equal scholastic ability. There was no significant difference in grade point average, although the single students obtained a slightly higher grade point average. This study has significance for the present investigation in that its sample was more comparable with the present sample. However, only a small sample was employed in the study, and all were males, omitting information on females and leaving the

generalizability of the study open to question.

In contrast, Frerichs (1973) studied 1,435 female nursing students in Illinois and found that married women achieved one grade point higher than did their single counterparts.

Russo (1969) studied the relationship between first semester freshman and first semester sophomore grade point averages of a group of students attending Arizona junior colleges. He found that students who were married achieved a higher grade point average than did unmarried students.

As with previous factors, contradictory results exist regarding the influence of marital status on university grade point average. Because of the contradictory results and the use of veterans, nursing students and junior college pupils, a further examination of the effect of marital status on university grade point average is necessary.

4. Religion as a factor in university grade point average. This factor is one of the more difficult to evaluate as many extraneous variables may affect any relationships studied; examples of such extraneous variables include differing value systems and differing commitments to the particular religion. The factor is further complicated because the importance of religion to the present investigation rests more with the denomination of the high school attended than with the particular religious affiliation of the student. Despite these concerns, it is important from a descriptive perspective to know to which

particular religious affiliation a member of the sample belongs because of the continued denominational nature of the school system in Newfoundland and Labrador. What effects this type of system has on university education is unknown. Thus, an analysis will be carried out to determine, within the limitations of this study, if religious affiliation is related to university grade point average. The following studies outline some findings regarding the effects of attendance at a public or parochial school on subsequent grades, as well as some of the problems inherent in research into this topic.

Schneider (1965) studied a number of variables affecting public and Catholic high school graduates at university. Among the variables compared were personality, extra-curricular participation, parental socio-economic status, age at entrance and university grade point average. The significant findings support the statement that public high school graduates and Catholic high school graduates are more alike than different in the variables studied. No significant differences were found in the achievement of those pupils who continued beyond the first semester. However, public high school graduates scores significantly higher at the end of the first semester, when adjusted for entrance examination scores.

Lavin (1965) reviewed research relevant to the prediction of university academic performance. He found that Jewish students outperformed non-Jewish students.

However, he pointed out the effect of socio-economic status on the religious variable; when socio-economic status was controlled, the effects of religion on achievement disappeared. Furthermore, Lavin pointed out the unknown influences of value systems associated with different religions.

Astin (1971) studied selectivity data for 2,300 American colleges and reported that while Catholic and non-Catholic girls obtained similar freshman grade point averages, the Catholic girls' grade point averages were lower than was predicted, given their high school grades and academic ability.

The Relationship Between High School Average and University Grade Point Average

Only two studies were found to contradict the statement that high school average is the best single predictor of university grade point average. Sedlackl and Brooks (1972) studied a number of predictors of first semester freshman grade point average and found that high school grades did not correlate significantly with college grades for either males or females.

Smallwood (1971) investigated four different residential environments to clarify their effects on the academic, personal and social lives of students living in those environments. The four residence environments were composed of boarding-house and three types of on-campus residences with varying operating philosophies. He did

not find a relationship between high school graduating average and university grade point average.

There are many studies that support the position that the high school record is the best single predictor of university grade point average. For example, Wise (1960) demonstrated that as the percentile rank in the high school graduating class increased so did the percentage entering college and the percentage graduating from college.

From a group of nine predictors Conklin and Ogston (1968) found high school average to be the best predictor of first year success at university. Among the other predictors used were the Cooperative Academic Ability Test, the Eysenck Personality Inventory and the Taylor Manifest Anxiety Scale.

Endler and Steinberg (1963) also found the best single predictor of first year final grade averages to be the high school average. This finding was based on a comparison of various aptitude and achievement measures.

McCormick and Asher (1964) studied the Otis Test of Mental Maturity, the Scholastic Aptitude Test, The School and College Ability Test, the high school grade point average and the grades earned in five curriculum areas during the three years of senior high school in order to predict the grade point average of students in several colleges. The best single predictor was found to be the high school average, with a correlation of .59. The best combination of variables was the Otis Test of Mental Maturity, the

Scholastic Aptitude Test (Verbal), the curriculum grade point average in mathematics, social studies and foreign languages and the overall high school grade point average. This combination gave a correlation of .69. The authors suggested a need for the development of prediction equations from each school. It is unfortunate that even a correlation of .59 still leaves approximately sixty-four per cent unaccounted for variance. Combining variables reduced the amount of variance to be accounted for to approximately fifty-one per cent. Prediction with these figures gives no better than a fifty-fifty chance of accuracy.

Scannel (1960) correlated various measures of achievement and attainment with the freshman grade point average and the four-year cumulative college grade point average of 3,202 students at the State University of Iowa. His findings showed that high school grade point average was the best single predictor of college success, yielding a correlation of .67 with freshman grade point average and .59 with fourth year grade point average.

Michael and Jones (1963) studied the entering students at the College of Letters, Arts, and Science of the University of Southern California for the years 1956 through 1961 and found that, consistently, the record of academic achievement in high school had been more predictive of college work than the Scholastic Aptitude Test. This finding was for both males and females. When both the high school scores and the Scholastic Aptitude Test were combined,

the resulting values were more predictive than individual predictors. They concluded that a reduction in the variance in predictors, such as high school grade point averages and scores on scholastic aptitude tests, may be expected where colleges require higher minimum standings for admission.

Haney, Michael and Gershon (1962) studied the predictive value of a number of aptitude and personality measures, as well as the high school course averages, with respect to grades of freshman trainees in student nursing. They found that the chemistry grades in high school were slightly more predictive of grades in four training courses than was the overall high school grade point average. This study suggests that perhaps it is better to examine courses in high school related to later training than to look at total high school graduating average. However, few researchers have undertaken this task; indeed, Jex (1966) has refuted its value. He examined all academic subjects as opposed to all high school subjects but did not correlate specific subjects with subsequent training. Jex studied twenty-two post high school institutions in the State of Utah and developed tables to predict academic performance beyond high school. His study demonstrated that high school average and achievement test scores would predict college success for an entire state with consistency and validity. The high school average consistently emerged as the best single predictor of college success. The

predictive efficiency of high school average was essentially the same whether it was computed from all grades or grades in academic courses only. While combining high school average and the average of achievement test scores improved prediction, the addition of a third factor only slightly raised the multiple correlation and combinations of more than three predictors were statistically indefensible. Furthermore, the inclusion of non-academic factors met with little success. Nearly half of what accounted for academic success as measured by course grades could be accounted for by high school average and achievement test scores. Jex also found that high school grade average more accurately predicted initial college success, while the first quarter college average more accurately predicted graduation from college. Four basic subjects were used to calculate high school average; these were eleventh grade English, mathematics, social studies and natural science.

Michael, et al. (1962) studied 209 male and 233 female freshmen grade point averages to determine the predictive validity of high school grade point average and the Scholastic Aptitude Test. Using correlational and multiple regression analysis they found that for both sexes high school grade point average was more predictive of success in college than either part scores or total scores of the Scholastic Aptitude Test. As with other studies, a combination of high school grade point average and Scholastic Aptitude Test yielded a higher predictive validity.

Sullivan (1966), in a study of the lack of success of students at Memorial University during the Christmas Examinations of 1966, found the Grade XI performance to be significantly associated with success at Memorial University. An extremely high percentage of those who failed the Christmas Examinations had an average mark of seventy or below in Grade XI Newfoundland Public Examinations. Students who passed had an average mark of eighty or above in their Grade XI examinations.

Hosseini (1975) surveyed all university students who had a grade point average of 3.0 or more (successful) as well as those who had a grade point average of less than 2.0 (unsuccessful). A third group was randomly selected from all pupils between the grade point average of 2.0 and 2.99. His analysis showed that the overall mean of the high school grade point average of the successful group was significantly higher than the unsuccessful group or the third group.

Altus (1961) correlated high school average, the Scholastic Aptitude Test and sixty items from a study habit questionnaire with first semester grade point average. He found the best predictor to be high school average.

The American College Testing Program (1965) found that a simple average of the high school student's final course grades in eleventh grade English, mathematics, social studies and natural science proved just as predictive of college success as the usual average comprising all high

school grades. This was confirmed by Jex (1966) in a later study.

Astin (1971), in his study of selectivity data for 2,300 American colleges, reported that the majority of high school students who intended to enroll in college should be prepared to receive average grades below those that they are used to receiving in high school. He reported a correlation coefficient of .50 for the relationship between high school grades and college performance.

Lavin (1965) found that of all the measures used in prediction batteries, the one that consistently emerged as the best single predictor of college success was the high school average.

Fleming (1962) studied the use of various predictive factors for the improvement of university admission requirements at the University of Toronto. His findings showed the best single predictor to be an average of the marks obtained in the grade thirteen Departmental Examinations in Algebra, Geometry, Trigonometry and Statistics, Physics and Chemistry. The predictive value of this average was considerably higher than that of an average of the marks obtained on all papers written. Other variables studied were grade twelve average, Scholastic Aptitude Test, Nelson-Denny Reading Test and teacher ratings.

It appears from the information in the previous studies on the relationship between high school average and university grade point average that approximately fifty

per cent of the variance in predicting college achievement can be accounted for by high school average. This is the highest amount of variance accounted for by any single predictor. With some correlations ranging up to .70, there is a relatively high positive correlation indicating a good relationship between the two factors. Thus, it is possible to use high school average as a control variable while investigating a number of other variables. Unfortunately, some of the higher correlations, such as McCormack's and Asher's (1964), resulted from the use of one high school as predictor, thus increasing the correlation.

However, approximately fifty per cent of the variance is still unaccounted for when only high school average is used to predict university grade point average. Research has been carried out using study habit items and actual questionnaires, various achievement tests, reading tests and numerous other factors without appreciatively reducing the unaccounted for variance. In addition, few studies controlled for the effect of intelligence. This study will attempt to determine the amount of variance accounted for by local high school graduating averages and will investigate other factors such as distance commuted, age and measured intelligence to see if in combination these can reduce even further the amount of variance.

Because the present study will use third year or later students the correlations are not expected to be as high, since previous studies reported a decrease in

correlations between high school average and university achievement for senior students.

The Relationship Between Measured Intelligence and University Grade Point Average

Cronbach (1949) reviewed research dealing with single tests of intelligence used to predict overall academic grade point averages at the college level. He reported correlations of .50 to .55 between measured ability and grade point average. Henry (1950) completed a similar review and arrived at conclusions similar to those of Cronbach. While the range in correlations is not high, part of the variation was probably due to the use of different types of intelligence tests.

Lavin (1965) reported on more recent research and found that correlations average .50, with a range of .30 to .70. He attributed the variation to the use of different types of ability measures and the different sex composition of the samples studied; that is, some studies used both sexes while others differentiated their samples on the basis of sex.

Cronbach (1949) cited studies in which a battery of predictors was used to predict an overall index of college performance. Multiple correlations of such batteries with college grade point average run between .60 and .70. Lavin (1965) confirmed this finding in a more recent review of research, his average correlation being .65.

Cattell and Butcher (1968) summarized research carried out in Britain on the prediction of achievement from general intelligence. They reported that a test of general intelligence given at age eleven was more effective in predicting school attainment than tests in English and arithmetic. They did not investigate how effective intelligence was as a predictor when compared to other factors, such as overall high school average.

Wise (1960) studied the effect of measured intelligence, among other variables, on grade point average. His findings indicated that as measured intelligence increased the percentage of youths graduating from college increased.

Gowan (1957) studied two measures of scholastic achievement, namely the American College Entrance Exam and the Iowa Reading Test, plus the Kuder Preference Record. He found the least useful to be the interest areas of the pupil. The highest correlation was between reading ability and scholastic achievement.

In a related study, Kinkelman (1955) examined the marks of fifteen boys and fifteen girls in grades two through seven. He found that the pupils' progress in all school subjects, except art, were positively related to intellectual ability.

Sinha (1966) studied the responses of 185 high achievers and 190 low achievers to a study-habits form, an intelligence test and an anxiety scale. He found that low

achievers at university had a lower intellectual level than did high achievers.

Elliott (1971) used intellectual, motivational and personality factors to predict academic achievement. These items made up his College Academic Achievement Scale. His results, using 502 college students and a validation of 166 college students, indicated that academic achievement was related to intelligence, with higher achievers having higher intelligence scores on the intellectual items in his scale.

McBee and Duke (1960) studied the effects of intelligence and scholastic motivation and their possible interrelationships upon academic achievement. Tests of intelligence, scholastic motivation and academic achievement were administered to 180 seventh grade pupils. The results demonstrated a high positive correlation between intelligence and achievement.

Sex, type of program, residence chosen and intelligence were some of the factors Redford (1968) investigated to determine their effect on grade point average in junior college. She found that the composite of predictor variables showed a greater degree of relationship with academic success than did any one single predictor. The best single predictor was found to be intelligence.

Sullivan (1966) found above average ability (IQ of 110 or above) to be a necessary qualification for success in college. This finding became evident in her study of

the collegiate achievement of 673 graduates of a large city public school system.

Stone (1957) found that a weighted combination of certain intellectual, interest and personality variables contributed significantly to academic achievement in a physical science and mathematics curriculum. The addition of the non-intellectual factors more than doubled the efficiency in predicting criterion scores.

Astin (1971) studied the selectivity data for 2,300 American colleges and found correlations of .35 for men and .45 for women between ability and achievement.

In a contradictory study, Grant (1968) examined the relationship of age, housing and intelligence to academic achievement. She found no significant relationship between the variables of intelligence and academic achievement. Since many studies indicate a relationship between intelligence and academic achievement, Grant's study may be a chance happening. Another explanation which appears to be more definitive is that Grant accepted a higher correlation as indicating a relationship between intelligence and university achievement. Astin (1971), for example, accepted a correlation of .35 as indicating a significant relationship between the two variables for males.

Correlations of intelligence with university grade point average ranged from .30 to .70, with most being above .50. This does not account for approximately seventy-five per cent of the variance in university grade point average.

Hence, other factors need to be examined to account for the unexplained variance. As previously noted, the present study will attempt to do this by examining variables such as distance commuted, age and high school average.

Many of the studies did not occur in settings comparable to the setting of the present study. For example, junior colleges, elementary grade schools and nursing schools are some of the settings for the previous research. The present study will investigate the influence of intelligence on third year or later university students in an education faculty.

Since only one study did not demonstrate a relationship between intelligence and university grade point average, it is accepted, for the purpose of this study, that intelligence is positively correlated with university grade point average. Furthermore, most of the studies cited did report correlations above .50, with fluctuations above and below possibly attributed to differences in the instruments used to measure intelligence. Hence, for part of the analysis of this study intelligence will be used as a control while determining the effects of other variables such as marital status and sex.

Summary and Conclusions

The present study will be dealing with a relatively homogeneous group of students in their third year or later. Douglass (1967) reported that the more homogeneous the group

the less will be the coefficient of correlation between two variables. Hence, as a group of students progresses through university the group becomes more homogeneous and lower than usual correlations are to be expected. Douglass also pointed out that only rarely does the use of more than three predictive variables add materially to the correlation between the predictors and the predicted criterion of success. This study will test Douglass' contention.

Durflinger (1943), in his summary of findings related to the prediction of college success, concluded by stating that:

> The findings from one institution cannot be transferred unaltered to another college without considerable loss in validity but they can and do indicate the general trend of thinking and a few of the conclusions which may be specific or general. (P. 259).

This study will attempt to replicate on a local level many of the findings regarding the predictor variables reviewed in this chapter.

The first section of this chapter dealt with early studies or factors related to university achievement. Very little improvement in the correlations achieved in these early studies has been achieved in later studies. Predictor variables have been expanded. Yet, not all types of living accommodation have been investigated and none of the researchers surveyed have commented on the effects of distance commuted. The effect of sex on grade point average continues to yield contradictory results. It is, however, reasonable to conclude that generally females will be more predictable

in level of achievement and will achieve better. Therefore, it is necessary to continue to examine the role of sex in predictive studies, since different predictive equations may be necessary for males and females. Marital status is an area of few, yet contradictory, studies. Furthermore, many studies of the role of marital status in university achievement dealt with unrelated settings such as junior colleges, nursing students and veterans. Further local investigation is necessary. The effects of religious affiliation on university grade point average are open to question, especially since few studies dealt with such extraneous factors as the related value systems that are involved in religious affiliation. Hence, the present study will examine this variable more from a descriptive aspect than from a manipulative aspect. The influence of religious affiliation on university grade point average will be analyzed primarily because of the denominational nature of the province's school system. Any conclusions drawn from this analysis will be held as very tentative, pending more detailed investigation. High school average and measured intelligence are two areas where the available research is voluminous. In both cases, it is generally agreed that these two factors are positively correlated with university grade point average. Garrett (1949) reviewed the literature dealing with prediction of college success from 1919 through 1947 and found high school average and measured intelligence to be the best predictors of university

achievement. Hence, both variables will be used as controls in the analysis of other predictor variables in the present study. Furthermore, both high school average and measured intelligence will be the subject of analysis to determine the amount of variance accounted for by each in university grade point average.

Given the continually changing context of universities as pointed out by Lavin (1965) and the call for local research, this study will attempt to replicate the findings of previous investigators and will attempt to broaden the knowledge of factors relevant to the prediction of college achievement.

CHAPTER III

METHODOLOGY

This chapter describes the procedures followed in conducting the study. Specific sections include: description of the sample and the sampling procedure; background to the data collection; method of data collection; description of the instruments used; and scoring and analysis of data.

Description of the Sample and Sampling Procedure

A list containing the names of all third semester undergraduate students was obtained from the Registrar's Office at Memorial University of Newfoundland. From this list, a list of all the names of the third year or later undergraduate students registered in the Faculty of Education at Memorial University was compiled.

The original proposal had called for random selection of classes of pupils in each Department of the Faculty of Education. While initial permission to enter classes was granted in principle by the respective Department Heads, actual admission to a particular class depended on the individual faculty member responsible for that class. Since the study required two class periods for each class, a few of the faculty were unable to accommodate the study. Thus, classes in which permission for entry was obtained from the faculty member composed the sample. Students in these

classes were given the option of participating in the research or using the period to work on a course-related matter. The Registrar's Office agreed to permit access to the files of those students who have given their consent to be a part of the study. This approach eliminated those who were not agreeable to participate and thus would contribute to the validity of the results.

The population studied contained 411 students. Of this number 192 students, representing 46.7 per cent, were contacted in their classes. Only 8 students refused to participate in the study. Given incomplete data, as well as spoiled forms, the number of students who made up the sample was 102; this represented 24.8 per cent of the total population.

Of the 102 students studied, fifty-five were males and forty-seven were females, representing 53.9 per cent and 46.1 per cent of the sample, respectively. While nineteen reported being married the majority of the students, 83 or 81.4 per cent, reported being single. None of the students listed themselves as divorced or separated.

Table 1 presents data on the number of students in the various living accommodations selected for study. Those living in apartments made up the largest part of the sample, composing 52 per cent of the group, or 53 pupils. The university residences, which included Paton College and the church residences of Coughlan College (United Church), Queen's College (Anglican), and St. John's College

(Roman Catholic), had 15 students or 14.7 per cent of the sample. Boarding house students were close to university residence students in number, having 14 or 13.7 per cent. Those students still living at home numbered 20 and made up the remaining 19.6 per cent.

TABLE I

Description of Living Accommodations

Type	Number in Sample	Per cent of Sample
Apartment (includes single and shared)	53	52.0
Living with Parents	20	19.6
Boarding House (includes living with other relatives)	14	13.7
University Residence (includes Church residences on campus)	15	14.7
Totals	N = 102	100%

Table II shows the religious affiliation of the group studied. The three largest groups were Roman Catholic (32), Anglican (31), and United Church (22). Salvation

Army students numbered eight while those listing themselves as other numbered nine.

TABLE II

Description of Religious Affiliation

Type	Number in Sample	Per cent of Sample
Anglican	31	30.4
United Church	22	21.6
Salvation Army	8	7.8
Roman Catholic	32	31.4
Other	9	8.8

Twenty-six students were in their third year at the time of the study, sixty students were in their fourth year and sixteen students were in their fifth year.

The number and percentage of students completing various degree programs are given in Table III. As can be seen, most of the students were enrolled in the four year B.A. (Ed.) program. Conjoint degree programs of B.Ed. with the B.A., B.Sc., or B.P.E. totaled 39 cases or 38.3 per cent of the sample. Only a few students, four, were enrolled in the straight B.Ed. program.

TABLE III

Type of Degrees being Pursued

Type of Degree	Number in Sample	Per cent of Sample
B.A. (Ed.)	59	57.8
B.Ed.	4	3.9
B.A., B.Ed.	26	25.6
B.Sc., B.Ed.	10	9.8
B.Ed., B.P.E.	3	2.9

Background to the Data Collection

Before beginning the data collection verbal consent from three sources was necessary. In June 1975, this consent was gained from the Department of Education of the Province of Newfoundland and Labrador. This consent entitled the writer to assess the files of the students who composed the sample, provided they gave their written agreement to the investigator. The writer also gained permission to assess the files of students involved in the study from the Registrar's Office at the Memorial University of Newfoundland. Lastly, permission was sought from the Department Heads and certain faculty members of the Faculty of Education of Memorial University of Newfoundland for entry into classes.

After the data collection began, the Registrar's Office informed the writer that written student consent was required. This stipulation was met by requesting students to sign their name next to their student number on the Questionnaire (see Appendix B).

The data collection began in July, 1975 and was completed in August, 1975. The month of July was used as a starting point so that the last day for undergraduate students to drop courses without academic prejudice, June 28, had passed. In addition to leaving the sample relatively intact for the remainder of the semester, the use of the month of July as the starting point permitted students two months to settle into their living accommodation.

Data Collection

In the beginning of July the writer began visiting classes to administer the Questionnaire and the Lorge-Thorndike Intelligence Test, Form 1 - Level H.

Each class received two visits. During the first visit the purpose of the research was outlined, the Questionnaire was administered and the Verbal Scale of the intelligence test was administered. The second visit was used to administer the Non-Verbal Scale of the intelligence test.

In late July and early August the investigator collected the high school graduating averages from the Department of Education.

In late August, 1975, the grades of the students for the Third Semester were released. At this point files of the Registrar's Office were assessed and student grades were recorded.

Attempts through class professors were made in early August to contact students with incomplete or spoiled forms. Only four students completed the required information in this way.

Description of the Instruments Used

The instruments used in procuring the information for this study were: The Lorge-Thorndike Intelligence Tests, College Edition - Level H, and a questionnaire devised by the writer (see Appendix B). Each of these instruments will be described in detail in this section.

1. The Lorge-Thorndike Intelligence Tests, College Edition - Level H: This test, which consists of a verbal battery and a nonverbal battery, is designed for students in grade twelve and those beginning college. The verbal battery, which has a working time of thirty-five minutes, is composed of five subtests: Vocabulary, Sentence Completion, Arithmetic, Reasoning, Verbal Classification and Verbal Analogies. Figure Classification, Number Series and Figure Analogies composed the nonverbal section, requiring twenty-seven minutes working time.

In Buros' Mental Measurements Yearbook (7th Edition) William B. Michael, Professor of Educational Psychology and Psychology, University of Southern California, stated that:

> ...the Lorge-Thorndike Intelligence Test compares favorably with other tests of general intelligence that are available from commercial publishers. The College Edition (Level H) should continue to make an important contribution to the counselling and placement of superior high school students who are seeking admission to college.

Another writer in Buros, Eric F. Gardner, Professor of Education and Psychology and Chairman, Department of Psychology; and Director, Psychological Services and Research Centre, Syracuse University, wrote of the Lorge-Thorndike:

> In general, the favorable comments made by reviewers of the earlier Lorge-Thorndike are warranted. In fact, these are superior test batteries with superior ancillary materials and should have great value for the purposes defined by their authors. The major weakness is that the College Edition, which obviously is being recommended for college students, has minimum data on college students compared with the kinds supplied at the lower levels.

A third writer in Buros, John H. Rosenback, Professor of Educational Psychology and Head of the Department, State University of New York at Albany, stated that in the case of the Lorge-Thorndike:

> An overall assessment of Level H leads one to mixed conclusions. The lack of appropriate norms and validity data is offset, in part, by the acknowledged overall quality of the items (content validity), satisfactory levels of reliability, and good performance characteristics of the lower level forms. ...The test user should be wary of making any other than the most general interpretations unless local norms and, hopefully, locally derived validity data are at his disposal.

Thus, it would appear that as a general screening device to determine whether or not students fall within the

average intellectual range (85-115), the Lorge-Thorndike Intelligence Tests, College Edition - Level H, are satisfactory.

A reasonable administration time, the fact that a group test was necessary, and the presence of both verbal and performance type items were also important considerations which the Lorge-Thorndike Intelligence Tests, College Edition - Level H, met. No other tests were found to suit the purposes and scope of this study. Newfoundland and Labrador students enter university from Grade XI at an age of about sixteen years. By the time they are in their third year they are about eighteen or nineteen years old. While the Lorge-Thorndike does not consider age levels, it is a College Level Test for American students entering college from grade twelve. This would make them seventeen and eighteen years of age. Thus, the two groups are roughly comparable in age.

2. The Questionnaire: The questionnaire was developed by the writer to collect data on the students' hometown, place of birth, educational background, marital status, age, sex, living accommodation, distance commuted, religious affiliation and parental occupation. More data than required such as hometown, type of school from which the student graduated and parental occupation were gathered, should further description of the sample become necessary.

Since the questionnaire was of the writer's own design it was necessary to pre-test it. The first draft

was administered to 56 students during March, 1974. These 56 students were made up of volunteers from different types of living accommodation. While all were third or later year students, none were involved in the study. Students were asked to complete the questionnaire, pointing out problems after completion. This questionnaire is found in Appendix A. Based on the pre-testing, the following changes were made:

Question 1 - grade XI records was mistakenly left off the first questionnaire, but added to the second questionnaire.

Question 4 - this became question 5 on the second questionnaire. Since place of birth and hometown may be different, question 4 on the second questionnaire asked for their place of birth.

Question 5 - dropped since only Education students were involved.

Question 6 - "including this semester" was placed at the beginning to give more clarity.

Question 7 - became question 13 on the second form. The word "present" was added to give more clarity.

Question 9 - became question 16.

Question 10 - made more specific by the addition of "At the time of your graduation".

Question 11 - use of the past tense on the second form since some schools were closed since the students graduated.

Thirteen questions were added to the second form of the questionnaire to gain additional information. The

second form of the questionnaire carried a cover letter outlining the general purposes of the research which is found in Appendix C.

The revised questionnaire was administered to ten more students not involved in the study. These students were from other faculties. In addition, two members of the writer's committee examined the questionnaire. No changes were made as a result of these examinations. The questionnaire was also shown to officials of the Registrar's Office.

After the first class of students had been administered the questionnaire, the Registrar's Office informed the writer that written permission showing the student's signature was necessary for access to their files. While no space had been allocated for this permission on the questionnaire, the request was met by asking the students to sign their name opposite their student number. Some of the sample failed to sign their name, although they gave complete information on the questionnaire. Some attempts to contact these students were successful and their questionnaires were usable.

Scoring and Analysis of Data

The scoring of the intelligence test and the questionnaire were clerical tasks carried out by the researcher. The Lorge-Thorndike Intelligence Tests were hand-scored with an MRC scoring mask for Level H, obtained from the test distributors, Thomas Nelson and Sons (Canada) Limited.

Data from the Department of Education and Registrar's Office were read from their records and tabulated on the researcher's sheets.

The total score on the Lorge-Thorndike, the high school graduating averages, the mean grade point averages for third semester, 1975, the total grade point average while at Memorial University, and the information from the questionnaire were transferred to coding sheets and from there punched on I.B.M. cards to be stored on disc in the computer. An outline of this arrangement is found in Appendix D. Frequencies were calculated for each category of each of the discrete variables of living accommodation, sex, marital status and religious affiliation. Means, standard deviations and ranges were calculated for each of the continuous variables of distance commuted, age, high school average, measured intelligence, grade point averages for third semester and for total grade point average. Pearson Correlational Coefficients were calculated for each of the continuous variables with the dependent variable of grade point average. A one-way analysis of variance was performed on the discrete variables to determine which categories of the variables significantly affected grade point average. The correlational matrix thus derived was for later use in the regression analysis.

The computer program Analysis of Covariance from the Statistical Package for the Social Sciences (Revised) was used to analyze the data. The object of this analysis

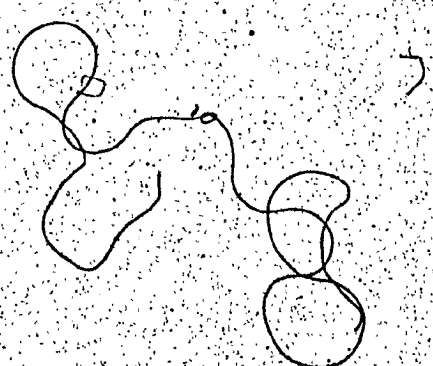
was to ensure that the results observed may be attributed within limits of error to the variable under consideration and not to an extraneous variable of high school average or measured intelligence. This is a statistical method for controlling or adjusting for the effects of experimentally uncontrolled variables, thus permitting a more valid evaluation of the outcome of the study. This analysis would help answer the research questions numbered one through four.

In addition to the preceding analysis the computer program Multiple Regression Analysis from the Statistical Package for the Social Sciences (Revised) was used to process the data and help answer research questions five and six. Hence a study of the linear relationship between the independent variables (type of living accommodation, distance commuted, measured intelligence, high school graduating average and the personal background factors) and the dependent variable (third semester grade point average) could be undertaken. This analysis could be used while taking into account the interrelationships among the independent variables.

The basic concept of this analysis is to produce a linear combination of independent variables which will correlate as highly as possible with the dependent variable. It is the resulting linear combination which is used to predict values of the dependent variable. The difference between the predicted value and the actual value

of the dependent variable is known as the residual.

Chapter IV contains the results obtained from this analysis.



CHAPTER IV

ANALYSIS OF DATA

This chapter presents the statistical analysis of the results of this study with respect to the six research questions presented in Chapter I. Descriptive statistics, analysis of variance, analysis of covariance and the Scheffé method of multiple comparisons were used for research questions one through four. Multiple regression analysis was used to determine the individual and total influence of the selected variables on semester grade point average.

Research Question I

Does the current type of living accommodation, such as living in an apartment, living with parents, living in a boarding house or living on campus in a university residence, account for any significant difference in the grade point average of students, when controlling for differences in high school average and measured intelligence?

In examining this question a comparison of the mean semester grade point average of students enrolled in each of the four types of living accommodation was carried out; the effects of measured intelligence and high school graduating average were controlled. An analysis of covariance was then applied.

Table IV presents the mean semester grade point averages, along with their standard deviations, for the students in each of the four types of living accommodation.

TABLE IV

Mean Grade Point Averages of Students in Four Different Types of Living Accommodation

Type of Living Accommodation	Number in Sample	Mean Grade Point Average (3 point scale)*	Standard Deviation
University Residence (includes church residences on campus)	15	1.75	.54
Boarding House (includes living with other relatives)	14	1.50	.55
Living with Parents	20	2.00	.58
Apartment (includes single and shared)	53	1.64	.51
	T = 102	1.71	.55
		Mean Grade Point Average	Mean Standard Deviation

*Memorial University of Newfoundland has its grading system placed on a 4 point scale. A represents 3 points, B represents 2 points, C represents 1 point and D or F represent 0 points.

Table IV shows that pupils who were living with their parents scored higher mean semester grade point averages that did students who were living in apartments, university residences or boarding houses.

When these results were analyzed, using the analysis of covariance and removing the effects of measured intelligence and high school graduating average, it was found that living accommodation significantly (.001) affected the mean semester grade point average of the students. A summary of this information is presented in Table V.

Scheffé's method was then performed on the semester grade point averages to determine the better discriminator among the types of living accommodation.[2] Table VI presents the results of this analysis.

An examination of Table VI reveals that there was no significant difference in student semester grade point average between students living in university residence and those living in boarding houses and apartments.

When the semester grade point average of students living in university residence were compared with those of students living with parents, a significant difference at the .05 level was found; this showed that those living with their parents obtained significantly higher semester grade point averages. The same result was found when students

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[2]Scheffe's method of multiple comparison used the F test and employs the criterion that the probability of rejecting the null hypothesis, when it is true, should not exceed .01 or .05.

living in boarding houses and in apartments were compared to those living with parents.

TABLE V

Summary of Analysis of Covariance of Semester Grade Point Average by Type of Living Accommodation (Controlling for Measured Intelligence and High School Average)

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance of F
Covariates	13.59	2	6.796	45.843	.001
a. Measured Intelligence	3.66	1	3.660	24.692	.001
b. High School Average	4.77	1	4.773	32.195	.001
Main Effects of Living Accommodations*	2.68	3	.895	6.036	.001
Explained Covariates and Main Effects**	16.28	5	3.255	21.959	.001

*"Main Effects" refers to the influence of living accommodation on semester grade point average.

**"Explained Covariates and Main Effects" refer to the combined influence of measured intelligence, high school average and living accommodation.

TABLE VI

Comparison of Different Types of Living Accommodation, as to their Relationship to Semester Grade Point Averages

Types Compared	Resulting F*
University Residence with Boarding House	.96
University Residence with Parents	7.51**
University Residence with Apartment	.03
Boarding House with Parents	13.88**
Boarding House with Apartment	1.07
Parents with Apartment	14.16**
University Residence, Boarding House and Apartment with Parents	856.02**
University Residence and Apartment with Boarding House and Parents	12.74**

*Required F for significance at .05 level is 7.10
**Significant at .05 level

Two further comparisons were made. The first involved a comparison of the semester grade point average of students who lived with parents with a combined mean semester grade point average of students living in the remaining three types of living accommodation (apartment, boarding house and university residence). Again, the results showed those living with parents demonstrating significantly higher

semester grade point averages. A second comparison involved combining those students who were living with parents and those living in a boarding house and comparing their semester grade point average to the semester grade point average of students living in apartments and university residences. This was done because several of the students studied lived with relatives in a boarding house situation. A significant difference was obtained between these two groups. However, boarding house students obtained the lowest semester grade point average of students in the four types of living accommodations. Hence, the significant difference was due to the much higher semester grade point average of students who lived with their parents.

Thus, the answer to research question number one was that the type of living accommodation does significantly affect semester grade point average, when measured intelligence and high school graduating average are controlled. Those students who lived with parents obtained significantly higher semester grade point averages than did any of the other students.

Research Question II

Does a student's sex account for any significant difference in the grade point average, while controlling for differences in high school average and measured intelligence?

Table VII presents the mean semester grade point average for males and females in the study.

TABLE VII

Mean Semester Grade Point Average for Males and Females in the Study

Sex	Mean Grade Point Average (3 point scale)	Standard Deviation
Male	1.58	.61
Female	1.85	.44

Table VII shows males to have a slightly lower mean semester grade point average (1.58) than females (1.85). The difference was found to be significant at the .05 level.

However, when the factors of measured intelligence and high school graduating average were controlled a positive but nonsignificant difference between males and females was found. A summary of this analysis is presented in Table VIII..

Research Question III

Do differences in marital status account for any significant difference in the grade point average of students, while controlling for differences in high school average and measured intelligence?

TABLE VIII

Summary of Analysis of Covariance of Semester Grade Point Average by Sex (Controlling for Measured Intelligence and High School Average)

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance of F
Covariates	13.59	2	6.80	40.72	.001
a. Measured Intelligence	3.66	1	3.66	21.93	.001
b. High School Average	4.77	1	4.77	28.60	.001
Main Effects of Sex*	.56	1	.56	3.67	.066
Explained Covariates and Main Effects**	14.15	3	4.72	28.71	.001

*"Main Effects" refers to the influence of sex on semester grade point average.

**"Explained Covariates and Main Effects" refer to the combined influence of measured intelligence, high school average and sex on semester grade point average.

Table IX presents the mean semester grade point averages for the single and the married students in the sample.

TABLE IX.

A Comparison of the Mean Semester Grade Point Average of Single and Married Students in the Sample

Marital Status	Number	Mean Grade Point Average (3 point scale)	Standard Deviation
Single	83	1.70	.55
Married	19	1.72	.58
N =	102	1.71	.55
		Total Mean Grade Point Average (3 point scale)	Mean Standard Deviation

An examination of this table shows that marital status did not significantly affect the mean semester grade point average of those in the sample; controlling for the effects of measured intelligence and high school graduating average did not point out any change in this relationship. A summary of this analysis is presented in Table X.

Research Question IV

Do differences in religious affiliation account for any significant differences in the grade point averages of

students, while controlling for differences in high school average and measured intelligence?

TABLE X

Summary of Analysis of Covariance of Semester Grade Point Average by Marital Status (Controlling for Measured Intelligence and High School Average)

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance of F
Covariates	13.59	2	6.80	40.17	.001
a. Measured Intelligence	3.66	1	3.66	21.63	.001
b. High School Average	4.77	1	4.77	28.21	.001
Main Effects of Marital Status*	.33	1	.33	1.98	.159
Explained Covariates and Main Effects**	13.93	3	4.64	27.44	.001

*"Main Effects" refers to the influence of marital status on semester grade point average.

**"Explained Covariates and Main Effects" refers to the combined influence of measured intelligence, high school average and marital status on semester grade point average.

Table XI presents the mean semester grade point averages and the standard deviations for students in the various religious denominations.

TABLE XI

Mean Semester Grade Point Averages and Standard Deviations of Students in the Various Religious Denominations

Type of Religious Denomination	Number of Students	Mean Grade Point Average (3 point scale)	Standard Deviation
Anglican	31	1.60	.66
United Church	22	1.65	.54
Salvation Army	8	1.77	.28
Roman Catholic	32	1.79	.49
Other	9	1.88	.52
T =	102	1.71	.55
		Mean Grade Point Average of all Groups (3 point scale)	Mean Standard Deviation

An examination of this table reveals that there was some degree of variation in the semester grade point averages. Those students in the "other" category scored higher than any of the students who were in the remaining denominational

categories; those of the Anglican faith were the lowest. However, no significant differences were found by an analysis of variance. In addition, when the effects of measured intelligence and high school average were held under control no significant differences were found in the semester grade point averages. A summary of this covariate analysis is presented in Table XII.

Research Question V

What are the individual relationships of living accommodation, distance commuted, age, sex, marital status, religious affiliation, high school average and measured intelligence to semester grade point average?

Because marital status and religious affiliation were not found to be statistically significant in terms of semester grade point average by an analysis of variance or by an analysis of covariance, the investigator decided to drop these from further analysis. Sex, because it was significant according to the analysis of variance, was retained. It is important to note that when the effects of measured intelligence and high school average were removed sex did not significantly affect semester grade point average.

A stepwise multiple regression program was used to perform the statistical analysis on the data to answer research question five. A summary of this information can be found in Table XIII.

TABLE XII

Summary of Analysis of Covariance of Semester Grade Point Average by Religious Affiliation (Controlling for Measured Intelligence and High School Average)

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance of F
Covariates	13.592	2	6.80	40.81	.001
a. Measured Intelligence	3.660	1	3.66	21.98	.001
b. High School Average	4.773	1	4.77	28.66	.001
Main Effects of Religious Affiliation*	1.094	4	.27	1.64	.169
Explained Covariates and Main Effects**	14.686	6	2.45	14.70	.001

*"Main Effects" refers to the influence of religious affiliation on semester grade point average.

**"Explained Covariates and Main Effects" refer to the combined influence of measured intelligence, high school average and religious affiliation on semester grade point average.

TABLE XIII

Multiple Regression Analysis of Semester Grade Point Average with Selected Variables

	Selected Variables	Multiple R	R Square	RSQ Change	Single R
D2	Living Accommodation (Parents)	.266	.071	.071	.266
D1	Living Accommodation (Boarding House)	.283	.080	.010	-.148
D3	Living Accommodation (Apartments)	.292	.085	.005	-.132
D4	Sex	.384	.148	.063	-.248
	Distance Commuted	.428	.183	.035	-.159
	Age	.428	.183	.0001	-.100
	Measured Intelligence	.672	.451	.268	.538
	High School Average	.758	.575	.123	.571
D5	Living Accommodation (Boarding House) X Sex (Males)	.759	.576	.0008	.039
D6	Living Accommodation (Parents) X Sex (Males)	.759	.577	.001	-.273
D7	Living Accommodation (Apartments) X Sex (Males)	.761	.578	.002	-.165

An examination of this table reveals that the influence of living accommodation on semester grade point average totaled approximately 8.5 per cent. The larger portion of this was taken up by those students who lived with their parents, 7.1 per cent.

Sex accounted for approximately 6.3 per cent of the variance contributing to semester grade point average. Distance commuted accounted for approximately 3.5 per cent of the variance contributing to semester grade point average. By far the largest amounts of variance contributed by any of the variables came from grade eleven average and measured intelligence, the two control variables. Grade eleven average accounted for approximately 12.3 per cent of the variance in semester grade point average. Even though this was the second largest value contributing to semester grade point average, the overall effect is still less than a fifth of the total variance. Measured intelligence accounted for the largest amount of variance in semester grade point average, that of 26.8 per cent.

Research Question VI

What is the combined relationship of living accommodation, distance commuted, age, sex, marital status, religious affiliation, high school average and measured intelligence to semester grade point averages?

The R square column of Table XIII presents the additive influence of the variables, type of living accom-

modation, sex, measured intelligence, distance commuted, age and grade eleven average. Marital status and religious affiliation were omitted because of their lack of significance to the study, according to both an analysis of variance and an analysis of covariance, using measured intelligence and grade eleven average as covariates. The variance shown totals approximately 57.5 per cent of all variance in semester grade point average. In other words, approximately 42.5 per cent of what contributes to the variability in semester grade point average is still left unaccounted for. These values are approximates, since marital status and religious affiliation were dropped; however, it is doubtful, given their lack of significance, if they would have accounted for much more of the variance.

In summary then, the total influence of the variables studied, on semester grade point average was approximately 57.5 per cent.

This chapter has presented an analysis of the data pertaining to the six research questions posed in the study. Chapter V will present a discussion of this analysis and make recommendations pertinent to the use of this information and to areas for future study.

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

The purpose of this study was to determine the effects of the following variables on semester grade point average of third year or later Education students at Memorial University.

1. Living accommodation
2. Distance commuted
3. Age
4. Sex
5. Marital status
6. Religious affiliation
7. High school graduating average (also a control variable)
8. Measured intelligence (also a control variable)

Such information would not only be of research interest, but would also be of use to those who advise prospective and current students at Memorial. The study involved 102 students enrolled during the third semester in the Faculty of Education.

This chapter is organized into two parts. Part one deals with the discussion of the results of the study, while part two outlines the recommendations. The discussion of the results follows the order of the research questions posed in Chapter I.

Discussion

1. The type of living accommodation was significantly related to the semester grade point average, when measured intelligence and high school graduating average were controlled. Pupils who lived with their parents obtained significantly higher semester grade point averages than did those who lived in an apartment, in a boarding house or in a university residence on campus. This information can be presented to current and prospective students at Memorial University. Unfortunately, it does little to help a student whose parents' home is beyond commuting distance. It does, however, raise questions for officials at Memorial University, such as:

a. Should university residence settings be more like a student's home?

b. Should students continue to live in boarding houses while attending university?

These findings expand upon those of Smallwood (1971). His study, which involved first year through fifth year students, indicated that students living in on-campus residences did significantly better academically than did students living off-campus. However, he did not study females or students living at home; nor did he control for the effects of intelligence. The present findings are in agreement with his general conclusion that pupils living in a boarding house do obtain the lowest semester grade point averages of the types studied; the findings differ

from those of Smallwood since those subjects living with their parents were found to have the highest semester grade point averages. Distance from university was found, in this study, to be unrelated to semester grade point average, but the type and degree of parental supervision and assistance were not investigated. Further study may determine the effect of such factors.

When students living with their parents were compared with a combined group of students living in the remaining three types of living accommodation (apartment, boarding house and university residence) the results still showed that those living with parents earned significantly higher semester grade point averages. With the exception of those living with their parents, all other types of living accommodation involved some degree of parental independence.

It may be logical to assume that different personality types choose to live at home than in a more independent setting. This question was not investigated by the writer. However, any study in this area would have to be limited to those pupils who have a choice since some students are forced to leave home to attend university.

Matson (1963) attributed the lack of differences between types of living accommodation and academic grade point averages to the fact that his sample was relatively homogeneous, given the dropping out of low ability students. Since the present sample studied was relatively homogeneous in terms of Faculty attended and measured intelligence, and

since the semester grade point averages still significantly favoured students living at home, it may be all the more indicative that living accommodation does indeed influence semester grade point average.

This study was limited to the investigation of one semester and information on the duration of each student's stay in a particular type of living accommodation could not be determined. Hence, the long term effect of living accommodation on grade point average was not assessed; this too could be an area for further study.

2. Previous research reported that females are more predictable than males and perform better in university. The present investigation, without controlling for the effects of measured intelligence and high school graduating average, also found that the subject's sex had a significant effect, favouring females. This finding was consistent with the majority of the previous research. In fact, Lavin (1965) in his review of studies previous to that date, reported no studies where males exceeded females in these factors.

Many of the previous studies (Ender and Steinberg, 1963, Truesdell, 1972, Sodhi and Moore, 1970, and Sullivan, 1966) examined only first year students and did not control for the effects of measured intelligence or high school average. In a number of studies where the effects of either high school average or measured intelligence was controlled, both factors were not used as control; Hewitt and Goldman (1975), Duff and Seigal (1960), Vick and Howaday (1962) and

Hossein (1975) were among the researchers who fell into this category. The present investigation then examined the effect of the sex factor by removing the effects of the covariates of measured intelligence and high school average. When this was done, sex no longer had a significant effect on semester grade point average. This is important because it provides an insight into the sex factor previously unaccounted for, namely that the intelligence of a pupil and his high school graduating average are more important than his sex.

3. Much of the previous research into the effects of marital status on university grade point average used veterans, nursing students and junior college pupils as subjects. Thus, contradictory results exist regarding the influence of marital status on university grade point average. The current investigation found that marital status had no significant effect on subsequent semester grade point average. However, no controls for the length of the marriage or the number of dependents were made. It is possible that these and other variables, such as financial status and whether the couple lived together or were separated while attending university, could influence subsequent grades.

The present findings concur with the findings of Jensen and Clarke (1958) who found no significant differences in grade point average between married and single males. The two samples are comparable in that the Jensen and Clarke study examined students over a four year period, giving third

year or later results as well as first and second year. The present study involved only nineteen married pupils. Thus, some caution should be exercised in applying the results of this aspect of the study.

4. Students in the present sample did not show a relationship between religious affiliation and semester grade point average. It is important to note that this study did not examine students immediately upon entry to university; hence, the influences of religious affiliation may be somewhat decreased by the time students are in their third year. Furthermore, as noted in Chapter II, religious affiliation and its influences on university grade point average is further confused by the effects of the particular high school one graduates from in Newfoundland. How strongly one accepts and follows the particular value system of his denomination, and indeed, how different the value systems really are, should be the subject of another type of study. In effect, a whole multitude of variables can influence the factor of religious affiliation. The previous research examined the effects of attendance at a public or parochial school on subsequent grades. Knowledge of religious affiliation as an aid to advising students as to their expected grade levels at university would thus appear limited. A suggestion for future research could be to examine the influence of various specific parochial schools on university grade point average.

5. Since a discussion of several of the factors relevant to research question five preceded this section,

the following discussion will relate to the factors of distance commuted, age, high school average and measured intelligence.

As was shown in Chapter IV, the effect of distance commuted on semester grade point average accounted for only 3.5 per cent of the variability in those scores. Thus, in partial answer to research question five, distance commuted had no significant effect on semester grade point average for most students. However, there may be an effect on factors other than grade point average; distance commuted could be found to be related, for example, to study habits. Thus, as far as furthering information on the influence of distance commuted on semester grade point average is concerned, this study has, for the first known time, provided some factual information. Despite the limitation of the time of one semester, it appears logical, given the low level of variability accounted for, to conclude that further investigation of the effects of distance commuted on semester grade point average would be of limited use; a long term investigation might prove more valuable. As far as counselling individual pupils is concerned, the effect of distance commuted on semester grade point average need not be a particular concern.

Contrary to many of the previous studies, age was examined as a continuous variable in the present investigation. This change in approach was made in an attempt to resolve the contradictory nature of previous findings. It was found

that age contributed the least of all the factors to the variability of semester grade point averages; less than one per cent of the variability in semester grade point averages could be attributed to the effects of age. While contradicting the work of local researchers such as Sullivan (1966) and Sodhi and Moore (1970), who studied first year pupils, the present findings support the evidence offered by Lafferty (1969) and Grant (1968). This finding could help allay fears, particularly of more mature students, that age affects grade point average.

Contrary to the majority of past research findings, high school average was not the best single predictor of semester grade point average. High school average accounted for 12.3 per cent of the variance in semester grade point average. This lower than usual influence of high school average may be attributable to two factors. One factor concerns the use of third year or later students in the study. As previously noted (Jex, 1966), the prediction of college performance by high school average decreases in accuracy as students' time away from high school increases. Another factor contributing to the lower than usual influence of high school average concerns the use of a sample of pupils from a large number of high schools. Studies by McCormack and Asher (1964) demonstrated that higher correlations resulted from the use of one high school as a predictor. High school average had the second highest amount of influence; thus, the factor of high school average remains

an important consideration for prospective and current students as well as for university officials involved in selection procedures.

The highest amount of variability in semester grade point average, that of 26.8 per cent, was accounted for by measured intelligence. This contradicts the majority of previous research which found high school average to account for the greatest variability. The results of this study may suggest that high school average is a useful short-term predictor for university performance, but that measured intellectual skills are a better long-range predictor. Few of the previous studies examined, as their subjects, students in an education faculty at the third year or later of their university career; thus, few direct comparisons can be made. However, it is important to note that the amount of variability accounted for in previous studies ranged from fifteen per cent to thirty-five per cent, with an average of about twenty-five per cent; this average figure compared with the findings of the present research. It is important for students to know that measured intelligence is an important factor in accounting for the variability in semester grade point average. It is also important for university and school officials to be aware of, and use, information of this type in the advisement of pupils.

The amount of variability accounted for by the factors of marital status and religious affiliation were

not included in this research question because of their lack of significance.

Approximately nine per cent of the known variability in university grade point average was attributable to living accommodation, with the majority of that variability being attributed to those students who live with their parents. In other words, while living in a boarding house is related to lower semester grade point averages, it does not account for a significant amount of variation in grade point average.

Sex of the student was found to account for about six per cent of the variability in semester grade point average.

The effects of the factors of sex and living accommodation are important to a precise, scientific understanding of what helps determine semester grade point average in university. It should be noted, of course, that other factors contributed more to the variation in grade point average.

6. Research question six dealt with the combined relationship of the variables under study to semester grade point average. Marital status and religious affiliation were omitted because of their lack of statistical significance in the earlier analysis. The remaining variables of living accommodation, distance commuted, age, sex, high school average and measured intelligence were found to account for 57.5 per cent of all the variance in semester grade point average. This leaves 42.5 per cent of the variance not accounted for.

The remaining 42.5 per cent of the variance may come from a variety of sources.

1. The sample was composed of a basically homogeneous group, as pointed out in Chapter II. Douglass (1967) reported that the more homogeneous the group the less will be the resulting correlation between the variables. The premise that third year or later students form a relatively homogeneous group might be an explanation for part of the variance left unaccounted for. Douglass also went on to show that more than three predictive variables, chosen to be not highly interrelated, do not usually add materially to the correlation between the predictors and the predicted criterion of success.

2. Numerical grades, although mathematically exact, include in their attainment a complete set of circumstances related to motivation, teaching style, type of evaluation and many other factors. It is possible that part of the unaccounted for variation resulted from such factors.

3. Complete randomization cannot be claimed since permission for entry into the classes had to be obtained from the instructors (see Chapter I).

4. The time period of only one semester has been previously commented on, as was the lack of knowledge as to which students moved from one type of living accommodation to another on a frequent basis.

Despite these limitations, it is the author's contention that further refinements, even if possible, would not appreciably improve the amount of variability accounted for. Unknown or unmeasureable qualities may always exist. More likely, the variance is due to a combination of the factors studied and the yet unknown qualities. Large samples studied on a long-term basis may account for greater amounts of variance.

A final comment relates to the value of these findings to prospective university students. Certainly, prospective students have a right to know what factors are most likely to contribute to variation in their grade point average. Knowing the source of some of the variation can be helpful to a prospective student as long as he is made aware that a significant part of the variation is still unaccounted for.

Recommendations

1. Within the framework of the limitations of this and similar studies all information pertinent to the counselling of prospective and current students should be made available to school and university officials. Care should be exercised in the interpretation of this information.

2. The university should undertake a study of the boarding house type of accommodation to determine the reasons for its relationship to lower semester grade point averages.

3. The university should undertake a study of the residences to determine the degree of student independence

and its relationship to the motivational and academic functioning of the students.

4. Larger samples studied on a more longitudinal basis may account for greater amounts of variance.

5. School officials involved in the counselling of prospective university students should utilize information on the students' intelligence and high school averages to help in their advisement.

6. Further research into the religious affiliation variable should focus attention on the schools from which students graduate rather than on the pupil's religious denomination.

7. Attempts should be made to explain what composes a university grade.

8. Cooperation from university instructors should be such that complete random sampling can take place. Free access to pupil records, when necessary student permission has been obtained, by duly appointed researchers should be continued. These factors would contribute to more meaningful findings.

9. Further research into the effects of values, home study habits, personality and personal concerns of the students on student grade point averages should be conducted.

10. Further research should be conducted into why students who were living with their parents did significantly better academically. Such factors as parental encouragement,

relations with parents and study conditions may be worthwhile to investigate.

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APPENDICES

APPENDIX A

GENERAL INFORMATION QUESTIONNAIRE

The following questions relate to research being carried out on the development of predictive indices for success at M.U.N. While your participation is totally voluntary, your cooperation is needed to properly complete the research.

1. Do you consent to your university grade records being used on an anonymous basis for statistical analysis in determining predictive indices of success at Memorial?

   Yes _____ No _____

2. Your IBM Number is _____

3. Your sex is: M _____ F _____

4. Your home town is _____

5. Your present faculty is _____

6. How long have you been at Memorial (include this semester)?

   _____ semesters

7. Your type of living accommodation is: (check one of the following)

   _____ apartment (single)

   _____ apartment (shared)

   _____ live with parents

   _____ boarding house (single)

   _____ boarding house (shared)

   _____ live with relatives other than parents

_____ church residence

_____ university residence

_____ other (please specify)

8. If you live off-campus, approximately how far do you commute each day?

_____ miles (one way)

9. What is the name of the school from which you graduated?

_____

10. What was the approximate enrollment of this school?

_____

11. What community is the school located in?

_____

12. Was this school a: (check one of the following)

_____ regional high school

_____ central high school

_____ junior high-high school combination

_____ all grade

_____ other (specify)

APPENDIX B

1. Do you consent to your grade XI and University records being used on an anonymous basis for statistical analysis in determining factors related to success at Memorial?

   Yes _____ No _____

2. Your IBM number is _____

3. Your sex is: M_____ F _____

4. Your place of birth was _____

5. Your hometown is _____

6. Including this semester, how long have you been at Memorial?

   _____ semesters

7. Including this semester, how long have you been in the Education Faculty?

   _____ semesters

8. Have you attended an educational institution other than Memorial since leaving high school?

   Yes _____ No _____

   If yes, please specify _____

9. What is your date of birth. Day ___ Month ___ Year ___

10. What is your marital status? _____

11. How far is your hometown from the university?

    _____ miles (one way)

12. How large is your hometown?

    _____ (estimated population)

13. What is your present type of living accommodation? (Check one)

_____ apartment (single)
_____ apartment (shared
_____ live with parents
_____ boarding house (single)
_____ boarding house (shared)
_____ live with relatives other than parents
_____ church residence
_____ university residence
_____ other (please specify) _____

14. Was your type of living accommodation different during your first year?

Yes _____ No _____

15. If you live off-campus, approximately how far do you commute each day?

_____ miles (one way)

16. From what school did you receive your grade XI?

_____

17. At the time of your graduation, what was the approximate enrollment of this school?

_____ pupils

18. Was the school a: (check one)

_____ regional high school
_____ central high school
_____ junior high-high school combination
_____ all grade school
_____ other (please specify) _____

19. In what community was the school located? _____

20. What denomination was your school? _____

21. While you were attending school
a) What was your father's occupation? _____
b) What was your mother's occupation? _____

22. At present
a) What is your father's occupation? _____
b) What is your mother's occupation? _____

23. What is your denomination? _____

24. Do you want to know the results of any or all of this study?

Yes _____ No _____

25. If yes, how can you be contacted? _____

ONCE AGAIN

THANK YOU FOR YOUR HELP IN THIS PART OF THE STUDY

APPENDIX C

GENERAL INFORMATION QUESTIONNAIRE

The following questions relate to research being carried out at Memorial University towards the completion of a M.Ed. in Guidance and Counselling. Answers to these questions should help describe more concretely the factors that contribute to a student being successful at Memorial.

Research has shown that the type of living accommodation, the terminal high school average, the type and size of high school attended, the parent's occupation, the distance commuted and the intelligence of the student are related to academic success. Unfortunately, the type or degree of the relationship is often unclear or variable. In terms of the programs at Memorial University projections from research done elsewhere must be used since little research has been done within this university.

You have been selected because you have been successful in reaching the fourth or later year at Memorial. Please help by giving your permission to use your grade XI and University records on an anonymous basis. Also, please answer the following questions.

Thank you for your help and attention.

Fred French
Graduate Student

Dr. L. Klas
Thesis Supervisor

APPENDIX D

Arrangement of Data on Computer Cards

Student Code Number	Grade Point Average Third Semester	Grade Point Average Accumulated	Living Accommodation	Distance Commuted in Miles	Total IQ	Grade Eleven Average	Age in Years	Sex	Marital Status	Religious Affiliation
001	200	220	1000	20	135	657	21	10	100	10000

GPA 3rd Sem. would read 2.00 as for GPA Accumulated

Living Accommodation has four categories
Apartment represented by a 1 if used or 0 if not
Living with parents - 1 or 0
Boarding house - 1 or 0
University residence - 1 or 0

Actual distance commuted would read 20 miles

Total IQ would read 135

Grade eleven average is the high school graduating average and would read 65.7

Age would read 21 years

Sex had two categories
Male represented by 1 for a male or 0 if not
Female represented by 1 or 0

Marital status had three categories
Married represented by a 1 if the student was, 0 representing not married
Single represented by 1 or 0
Other represented by 1 or 0

Religion had five categories
Anglican represented by a 1 if the student was, or 0 if he was not Anglican
United Church represented by 1 or 0
Salvation Army represented by 1 or 0
Roman Catholic represented by 1 or 0
Other represented by 1 or 0