A STUDY OF NEGRO MATHEMATICS FACULTIES IN PREDOMINANTLY NEGRO INSTITUTIONS

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CHAPTER I

INTRODUCTION

This chapter contains sections relative to the problem that motivated this investigation, the background and need for this investigation, and a review of the literature and the basic assumptions that emanated from the review of the literature. The hypotheses that were tested, the limitations of this study and the operational definitions of major terms and concepts are also presented in this chapter.

The Problem

This dissertation reports a survey study which sought to determine whether there were significant relationships between levels of academic preparation of mathematics teachers in predominantly Negro colleges and universities and a number of demographic variables. The mathematics teachers in this study served on faculties of accredited institutions during the 1967-68 school year.

This investigation sought to determine whether there were significant relationships between levels of academic preparation of the mathematics teachers and such selected demographic variables as: the educational levels of the subjects' mothers; the educational levels of the subjects' fathers; the types of undergraduate majors; the types of undergraduate institutions attended by the subjects; the types of employment institutions of the subjects; and, the professional

experiences of the subjects. Other demographic variables considered in combination with the above included: age, sex, marital status, number of children, age of youngest child, and age of oldest child.

Background and Need for the Study

The study herein reported was instituted for several reasons. Among them was the fact that Negro mathematics faculty members are beginning to play an increasing role in meeting the demands placed upon their discipline. Their students are being vigorously recruited by governmental agencies, technological industries and businesses. Educational institutions are also recruiting these students for the purposes of graduate training and research.

Fichter (20, p. 157) gives an indication of the governmental recruiting campaign by reporting that the federal government has set an example in the hiring of Negroes who in 1962 constituted 13 per cent of the government's total employees. He stated that the federal government has increased its recruiting campaign and now visits predominantly Negro colleges and universities annually.

"The occupational outlook for Negroes is proceeding at an accelerating pace," according to Perry (38, p. 116). He also contends that the most promising fields are the professions, science and mathematics.

The role of the Negro mathematics faculty members is further magnified by the rapid increase in the numbers of mathematics majors who will be striving to meet the nation's varied demands. The Committee on the Undergraduate Program in Mathematics reports:

> The number of mathematics majors graduating in 1955 was 4,034 compared with a total of 11,202 in all physical sciences and 22,358 in engineering. In 1963-64, the number of mathematics majors passed all physical sciences

> combined, and ... should reach 39,000 by 1970 compared with 29,000 in all physical sciences and 46,000 in engineering. (9, p. 5).

McGrath (35, p. 81) reported that bachelor's degrees awarded by 85 predominantly Negro colleges and universities in 1962-63 reflected an increase. Only four other disciplines of the 25 offered by these institutions that year had a higher percentage of graduates than mathematics.

The permanence of the institutions is another factor to be considered in determining if significant relationships exist between degree levels of the Negro mathematics teachers and major demographic variables. McGrath (35, p. 4) reports:

> Eventually both Negro and whites of the requisite ability from all sectional parts of the country will be able to get their higher education at the institutions of their choice. Despite this prospect, it is likely that for an unpredictable number of years many of the colleges and universities originally intended for Negroes will be attended by them. Strong psychological and social factors as well as those of finance and geography will cause many students to gravitate toward these institutions.... It may also be true that being closer to the problems of Negroes and more experienced in dealing with them they may have already established patterns that give them a kind of advantage, psychologically and organizationally.

Statistics citing the growth in the numbers of mathematics majors have already been given. This growth can be attributed to wider use of the computer, to the increasing usage of mathematics in other disciplines such as the biological and social sciences, emphasis on special topics within mathematics, and to the need for more people to teach the new mathematics.

Added perspective for this study can be gained by citing Maul's summary of the new teacher:

1. Almost half of the new teachers, those entering services in 1964-65, were principally engaged in graduate studies the previous year.

2. Of this group, 48.4 per cent were teachers in institutions of higher education.

3. Of the new teachers of mathematics, 28.2 per cent had doctorates.

4. Only 22 per cent of the graduates in mathematics were fully employed during the year their degrees were conferred, compared to 52.4 percent of the graduates in English.

5. New teachers employed by state colleges from the high school classroom comprised a total of 21.3 per cent. (34, pp. 262-65).

One large problem confronting higher education involves securing sufficient qualified personnel in this national movement. While adequate facilities, appropriate adjustment of curricula, and the removal of barriers to educational opportunity for every citizen are all essential to a realization of the American democratic ideal, these cannot guarantee an effective system of higher education. No program can be better than the people who operate it.

The problem of identifying, attracting, recruiting and training new college and university teachers and retraining qualified faculty members is a challenging one. The present study is rooted in this premise. In summary, the need for this study can be attributed to the fact that: (1) though the general level of college faculty preparation in predominantly Negro colleges and universities is known, that of the mathematics faculty is not; (2) differing levels of preparation are a reasonable assumption--the correlates of these differences are not known; and, (3) before recommendations for improving faculties can be made, factual information is required. This study will provide an indication of status from which recommendations can be made by others for in-service training, financial support, and the recruitment of new personnel.

Review of the Literature and Basic Assumptions

Parental Education and Occupations

Several studies have investigated the selection of college teaching as a career and the relationship of parental education to college teaching.

One major result of a study by Espy (18, p. 217) indicates that college teaching came late for a high percentage of the teachers in question. The result is not inconsistent, however, with the overall picture of choosing college teaching as a career. Eckert and Stecklein (16, p. 82) in their study, report:

> College teachers seem to have entered this field more by accident than by deliberate design. By and large, they did not look forward during their undergraduate years as young people entering other professions do, to working in the field in which they are currently engaged.

Similar results are reported by Gustad (24, p. 6) who indicates that entry into college teaching "is the end product of drift...." He contends that the majority do not engage in the kind of career planning that is typical of the aspiring physician or attorney.

Additional insight into the time of a career decision has been given by Stecklein (46, p. 17) who reports that his subjects did not select college teaching until well after graduation from college. "Generally, larger proportions of humanities and social science teachers than of natural science teachers considered college teaching as a career before they received the B. A. degree." Gustad (24, p. 6) reported that English teachers were much more prone to decide to enter college teaching prior to college graduation than were either the chemistry or psychology teachers.

Although there is some agreement among the studies made by Espy,

Eckert and Stecklein, and Gustad, consideration should be given factors undergirding such findings. Stecklein (46, p. 14), in his report, points out that, in consideration of parental school and occupations, the general low level of formal education of parents suggested that college students had few intellectual or occupational role models to influence their careers. In contrast, Gustad, (24, p. 15) pointed out that a higher proportion of college faculty members had fathers with professional or managerial positions.

Griggs (22, p. 37) considers level of parental educational attainment one of the most important non-academic factors affecting the plans of students for further education. His study showed no significant relationship between family income and occupation of the parents to that of achievement of plans for graduate study.

Influence of Type of Undergraduate Institutions

Espy (18, p. 180) and Eckert and Stecklein (46, p. 12) reported that the public and private colleges had contributed almost equally to the undergraduate preparation of college faculty members included in their studies. Yet, one finds that these subjects tended to return in later professional careers to institutions of the same general type that they attended as undergraduates.

Sawyer (43, p. 87) studied the baccalaureate origin of 1,230 persons teaching in predominantly Negro colleges and universities and found differential institutional rates in the production of college teachers. His results showed that private colleges rank high in the production of college teachers.

For the many others who might have gone into college teaching,

Stecklein (46, p. 10) has reported:

> A number of potentially able college teachers are lost between undergraduate and graduate school because of the kind of academic life they witnessed in the institution did not offer enough for them to go into graduate work.

With reference to undergraduate majors and their relationship to types of undergraduate institutions, mathematics majors are associated more with public colleges than private colleges. This observation is supported by research done by Eckert and Stecklein (16, p. 13) and other investigators: Berelson (4, p. 131) and Knapp and Greenbaum (31, p. 27).

Conditions of Service at Employment Institutions

Few Negro institutions have been in a position to help train Negro college faculties on the graduate level. Davie (12, p. 162) reports that only twelve Negro colleges and universities were offering graduate instruction twenty years ago, and only one of these institutions went beyond the master's degree. According to McGrath, (35, p. 88) in 1963, Negro colleges and universities granted only one and four-tenths per cent of the nation's master's degrees and less than one-twentieth of one per cent of the nation's doctorates.

It is highly conceivable that finances could be a deterrent to graduate offerings at these institutions. Some indication of the general financial structure of these institutions can be gained by an examination of the endowments they possess. Davie (13, p. 160) reports that in 1947 more than 70 private Negro colleges had combined total endowments less than one-third the endowment of Harvard University at that time.

Little change can be reported regarding the financial status of

these institutions today, for in another aspect of the study, McGrath (35, p. 28) reports that while private Negro colleges constituted 4.96 per cent of all such colleges in the nation by 1959, their endowment earnings comprised only 2.37 per cent.

Another deterrent to advanced academic preparation for Negro college teachers has been the lack of established policies for providing financial assistance for graduate work. McGrath (35, p. 112) reports that only a third of the more than 120 Negro colleges and universities he studied had an established sabbatical leave policy or funds to put it into effect.

On the contrary, Miller and Wilson (36, pp. 52-53), in a study of 228 small colleges (mostly white) of 2,000 students or less, found that almost two-thirds of these colleges provided some financial assistance for graduate study of faculty members. More than 90 per cent of the colleges that provided such assistance reported that it was of considerable value for faculty development. The study also disclosed that 42 per cent of the public institutions reported provisions for sabbatical leaves while only 28 per cent of the private institutions had such provisions.

Jencks and Riesman (28, p. 458), discussing the Negro colleges and universities, point out a dichotomy between public and private institutions:

> The need for Ph.D.'s has also made the impoverished private Negro colleges heavily dependent upon refugee and emigre faculty whose foreign credentials look good on paper even when their English is bad and their pedagogy is worse.... The public institutions to which these students would turn are not always better staffed.... However, the public colleges' academic advantages may increase in years ahead.

Robert P. Daniel (11, p. 388) has indicated that until the

mid-forties the Negro private colleges provided an education for the majority of Negroes in higher education. He added that the result of the predominance of this type of institution in Negro higher education was a highly qualified faculty which found the private colleges more attractive than the public institutions. He also pointed out that since that time, the transition has been toward public colleges.

Weaver (54, p. 118) supports the latter contention in his appraisal of the Negro private colleges and universities. He also reports that the public institutions have been attempting to out-bid the private institutions for staff members in order to satisfy their regional accreditation requirements.

Sex Characteristics of College Faculties

There are some personal factors to be considered in attempting to determine relationships between academic preparation and demographic variables. One may immediately raise the question as to the significance of sex in establishing distinctions in academic preparation. Jencks and Riesman (28, p. 28) report that 54 per cent of the college enrollment in Negro colleges was female in 1966 in comparison to 38 per cent female enrollment in predominantly white college campuses.

Fichter (20, p. 101) reported in his Study of Negro College Students, that "teaching is the most attractive occupation to the largest number of women, and the proportions who chose this career are remarkably similar between the races."

With reference to college teaching, McGrath (35, p. 115) reports results showing Negro women teachers being in excess of 40 per cent. Wright and Huyck (57, p. 20) indicate that on the average predominantly

Negro college campus, the percentage of Negro women teachers is twice that of the national average which is about 17 per cent.

Such a significant percentage of women college teachers may be considered for several reasons. One reason is that most women are no doubt married after becoming actively engaged in their chosen profession and the status they accord their marital roles at least restricts progression as far as the doctoral level. Berelson (4, p. 135) reports that in 1910, women constituted only 10 per cent of those who earned the doctorate, and in 1959, the percentage was merely 11 per cent. As late as 1964, the proportion was still 11 per cent, according to the U. S. Office of Education, (50, p. 3).

Marriage and Children as Factors in Graduate Education

Bryan and Boring (7, p. 221) summarized their findings regarding the effects of marriage and children on graduate men and women as following:

> If we compare marriage and children as professional assets and liabilities, we find that marriage and children are about equal as assets for women and as liabilities for men. Marriage (72 per cent) is a greater asset for men than children (29 per cent). Children (60 per cent) are a greater liability for women than is marriage (34 per cent). The men are helped professionally by the social status of marriage and in that respect a wife is more important than children.... It is clear that the careers of women are balked to a considerable degree by the responsibilities of childless marriage and even more by motherhood.

Bernard (5, p. 223) draws much the same conclusion:

> It is, understandably, more difficult for the academic woman to brush aside her obligations to her family than it is for the academic man. The enormous preoccupation which academic work requires is hard enough for the family to bear when the husband and father is absorbed in it.... It can be catastrophic when it is the wife and mother. If a man resigns from the world to carry on in the field of his profession, his wife can keep him anchored. It takes two to make a career....

> But the academic woman cannot expect the same support. However much understanding her husband may show of the demands on her time and energy, her children, at least when they are small can hardly be expected to do the same.

Berelson (4, p. 113) cites the above factors (marital status and children) as major ones which contribute in part to the time lapse between the baccalaureate degree and the doctorate. Additional research on the general topic of time lapse between the baccalaureate degree and the doctorate was conducted by Wilson (56, p. 21) who reported that the mean B. A. - Ph.D. time lapse was about seven years in physical science and 15 years in education, according to results of the National Academy Science-National Research Council in 1963.

Conclusions

Several general assumptions may be stated with regard to previous empirical investigations related to college teachers:

1. Most investigations have been oriented toward an empirical description of college teachers that have been general in nature. The factors commonly explored in these empirical investigations have included: (a) the education of mothers and fathers of the teachers; (b) the graduate training of the teachers; (c) the undergraduate training of the teachers, including their undergraduate institutions and their majors; (d) the places of employment of the teachers; and, (e) the professional experiences of the teachers.

2. Relatively few studies have dealt with an empirical investigation of mathematics teachers relative to the above factors.

3. No exclusive studies have been conducted relative to the Negro mathematics teachers who are serving in predominantly Negro colleges and universities.

4. Few studies have provided additional clarification of relationships between the academic preparation of college teachers and the factors of Item 1. This can be accomplished by inter-group and intra-group analyses of the commonly studied demographic variables.

These assumptions establish a theoretical basis for studying Negro mathematics faculty members on the college and university level.

The Hypotheses

Several hypotheses were generated from the review of literature and the rationale for this study. They were tested at the .05 level of probability, using the Chi-Square procedure of non-parametric statistics. These hypotheses were:

Null Hypothesis: 1. There is no significant relationship between degree levels of mathematics teachers and the educational levels of their fathers, according to a review of the literature. References: Espy, Eckert and Stecklein, Gustad, and Grigg.

Variables considered in testing the hypothesis were: (a) age; (b) sex; (c) marital status; (d) number of children-youngest and oldest; (f) undergraduate institution attended; (g) undergraduate major; (h) employment institution; and, (i) professional experiences.

Null Hypothesis: 2. There is no significant relationship between the degree levels of mathematics teachers and the educational levels of their mothers, according to a review of the literature. References: Espy, Eckert and Stecklein, and Gustad.

Variables considered in testing the hypothesis were: (a) age; (b) sex; (c) marital status; (d) number of children; (e) age of children-youngest and oldest; (f) undergraduate institution attended; (g) undergraduate major; (h) employment institution; and, (i) professional experiences.

Null Hypothesis: 3. There is no significant relationship between the degree levels of mathematics teachers and the types of undergraduate major (mathematics versus

non-mathematical), according to a review of the literature. References: Berelson, Knapp and Greenbaum, McGrath, and Eckert and Stecklein.

Variables considered in testing the hypothesis were: (a) age; (b) sex; (c) marital status; (d) number of children; (e) age of children-youngest and oldest; (f) undergraduate institution attended; (g) employment institution; and, (h) professional experiences.

Null Hypothesis: 4. There is no significant relationship between degree levels of mathematics teachers and types of undergraduate institutions attended (public versus private), according to a review of the literature. References: Sawyer, Espy, Eckert and Stecklein, and Weaver.

Variables considered in testing the hypothesis were: (a) age; (b) sex; (c) marital status; (d) age of children-youngest and oldest; (e) number of children; (f) undergraduate major; (g) employment institution; (h) professional experiences.

Null Hypothesis: 5. There is no significant relationship between the degree levels of mathematicl teachers and types of employment institutions (public versus private), according to a review of the literature. References: McGrath, Miller and Wilson, Davie, Weaver, and Jencks and Riesman.

Variables considered in testing the hypothesis were: (a) age; (b) sex; (c) marital status; (d) number of children; (e) age of children-youngest and oldest; (f) undergraduate institution; (g) undergraduate major; (h) professional experiences.

Null Hypothesis: 6. There is no significant relationship between degree levels of mathematics teachers and types of professional experiences (college teaching versus non-college teaching experiences), according to a review of literature. References: Espy, Stecklein, Eckert and Stecklein, and Maul.

Variables considered in testing the hypothesis were: (a) age; (b) sex; (c) marital status; (d) number of children; (e) age of children-youngest and oldest; (f) undergraduate major; (g) undergraduate institution attended; (h) employment institution.

Limitations

Obviously, a study of this kind would be limited on the number of factors which could be explored. The present study has sought to gather and interpret responses of Negro mathematics faculty members in predominantly Negro colleges and universities in the following areas: personal and family background; educational preparation; and, their current working status.

A criterion for this study was that only faculty members who spent at least 25 per cent of their time as mathematics teachers during the 1967-68 calendar year were included. The institutions were restricted to senior colleges and universities that held membership in their regional accrediting agencies since such membership indicates some status of acceptance as institutions of higher learning.

Certain other limitations were placed on the study and should be recognized. One of these concerned the number of institutions that had lists returned stating the names of their Negro mathematics faculty members. Only one of the institutions refused to send a roster because of the nature of the study. The omission of this institution from the study was not considered significant because of the small number of subjects that it might have contributed to the study. The study was also limited by the respondents' ability to recall from previous years information deemed pertinent to the study.

Definition of Terms and Concepts

For the purposes of this study it will be necessary to define certain terms and concepts as they are to be used:

General Terms and Concepts

1. Mathematics teachers -- refers to the Negro members of the mathematics faculty.

2. Institutions -- refers to predominantly Negro colleges and universities as indicated by the Directory of Negro Colleges and Universities, 1967. (39, pp. 1-103).

3. Academic preparation -- refers to the degree levels of the subjects.

4. Doctoral level -- refers to the earned doctoral degree and also to a level indicated by more than 30 hours beyond the master's toward an approved doctoral program.

5. Subsequent degree levels -- refers to degree levels beyond the bachelor's degree level.

Definitions of the Terms used as Independent Variables

6. Categories -- refers to the units of the population which are classified according to: educational attainment of parents, academic major, type of employing institution, type of undergraduate institution attended, and initial professional experience.

Definition of Terms used as Dependent Variables

7. Number of children -- refers to the number of children in the mathematics teachers' immediate family.

8. Age of children -- refers to the age of the youngest child, and the oldest child in the mathematics teachers' immediate family.

9. Father's educational attainment -- refers to the mathematics teachers' report of the highest educational level completed by the father.

10. Mother's educational attainment -- refers to the mathematics teachers' report of the highest educational level completed by the mother.

11. Professional experience -- refers to the first job held by the mathematics teachers following their graduation from college.

This chapter contains an overview of the study under question. The factors that might possibly be associated with the academic preparation of the mathematics teachers are enumerated. These factors emanated from the review of the literature and the basic assumptions of this study. The hypotheses of the study, the limitations and operation definitions are also given.

Chapter II presents the procedures of the study. Such topics as population sampling, instrumentation, collection of the data and treatment of the data are delineated. Chapters III and IV contain the results accompanied by a discussion, and Chapter V deals with the summary, conclusions and implications of the study.

CHAPTER II

PROCEDURE

The description of the sample population and the instrument used are presented in this chapter. Procedures for collecting and treating the data are also presented.

Nature of the Sample

The geographical scope of the present study includes seventeen states and the District of Columbia. Within this area, there are 67 accredited senior colleges and universities. Seven of these institutions offer a master's degree in mathematics; however, none offer a doctorate in mathematics (Jones, p. 75). The accreditation status of these institutions was verified by reviewing the Accredited Institutions of Higher Education (19, pp. 105-118).

The names of the 67 institutions which serve a predominantly Negro student enrollment were obtained from the Directory of Negro Colleges and Universities (39, pp. 1-103).

The sample includes results from mathematics faculty members in 58 of the 67 accredited institutions. The selection of the 58 institutions was based on the successful responses to requests made by this writer for participation in this study. This number of participating institutions comprises 86.6 per cent of the desired population. For the purposes of this investigation, the institutions were divided into

two groups: public and private. This classification was deemed appropriate because of the nature of the major function of these institutions. According to Wright and Huyck (57, p. 19), the primary concern of more than 95 per cent of the faculties in these institutions is that of teaching undergraduate students.

Findings of this study should be interpreted to be somewhat more representative of the South than of the United States in total. With the exception of the location of seven institutions in the Border states--Maryland, Pennsylvania, Virginia, and West Virginia,--most of the replies were received from institutions located in the South. This characteristic of the sample should be kept in mind in interpreting the results.

Instrumentation

After an extensive review of the literature related to academic preparation of college and university faculties, certain factors were suggested repeatedly. These factors were considered by this author to be significant variables in the patterns and trends of academic preparation of the sample population.

A questionnaire was developed from the information gathered from the review of literature. Among the demographic characteristics included in the instrument were: age, sex, marital status, number of subject's children, age of subject's youngest child, age of subject's oldest child, and the educational attainment of the subject's parents.

With regard to academic preparation per se, attention was focused on the subject's academic area, the degrees and credits earned, tenure of study, and financial resources utilized in becoming academically

prepared for the teaching profession.

A third section of the instrument, entitled "Present Position," focused attention on the subject's current occupational status, academic rank and length of service. Other information sought included: courses taught during the 1967-68 school year, and the distribution of time in terms of teaching and other functions such as academic counseling and administrative work.

Assisting in the development and revisions of the instrument were members of the investigator's advisory committee. Five men enrolled in doctoral programs at Oklahoma State University also made suggestions concerning the instrument's clarity and appropriateness.

The final form of the instrument was a single paged, 11½" x 14" questionnaire with requested information printed on both sides. The color 'green' was chosen to enhance the attractiveness of the commercially printed questionnaire (See Appendix C).

Collection of Data

From December 31, 1967 to February 15, 1968, inquiries were mailed to 67 chairmen of mathematics department, requesting a list of their 1967-68 Negro mathematics faculty members. The addresses of the 67 Negro colleges and universities were obtained from the Directory of Negro Colleges and Universities (39, pp. 1-103). Replies from this mailing were received from 51 chairmen representing a 75.8 per cent return (See Appendix A). One hundred and seventy-eight names of mathematics instructors were obtained through this effort. A basic assumption of the investigator was that these instructors represent a cross section of the mathematics instructors in the nation's

predominantly Negro colleges and universities.

Questionnaires and a cover letter explaining the purpose of the investigation were mailed to the 178 potential subjects during the month of January, 1968. A total of 110 replies were received. Nine of the replies were considered unuseable because of lack of sufficient information. Eight other letters were returned, marked "address unknown." As a result, of the 178 questionnaires mailed, it was assumed 170 reached the potential subjects. The 101 useable questionnaires represents 56.6 per cent of the 178 mailed.

In February and March, 60 follow-up letters were sent the potential subjects who had not replied to the writer's initial correspondence. As a result, 14 useable questionnaires were received.

The sample for this study was increased by conducting personal interviews with some of the faculty members. A total of 17 colleges and universities were visited by the investigator during the 1967-68 semester and spring vacations, and during weekends of the spring semester, 1968. More than 103 interviews were conducted. Seventy-nine of these interviews were "first-time responses" to a request for participation in the investigation. Fifty-nine or 74.6 per cent of the 79 persons interviewed, completed the questionnaires during the interview. They took from five to 15 minutes to complete the questionnaire, and most were highly receptive toward cooperating with the writer in his investigation. Some had indicated the advantage of personal contact. This points out a possible difference in response modes: personal interviews provided the interviewees with some guidance from the investigator wherein such assistance was not available for those interviewed by mail.

Twenty of the interviewees were unable to take the time to complete the questionnaire during the investigator's visit. Provisions were made for responses to be mailed to the university, and from this group, seven did reply by mail.

The 24 other interviewees were those who had already replied by mail. The instrument was reviewed to assure both the interviewee and the investigator that all items were properly answered, thereby increasing the validity of the instrument.

The combined results of the personal interviews and the mailing procedures resulted in 181 useable questionnaires or a sampling of 70.72 per cent of the desired population. The adequacy of the sampling can be attributed to both the instrument and the interview procedures. The instrument was brief and concise in comparison with similar instruments, and careful attention was given to the objectivity of the instrument. With the exception of coding for follow-up procedures, no attempt was made to identify individuals or institutions. The interview procedures re-inforced the results of the mailing procedure and enhanced the percentage of returns.

The process of gathering the data required more than four months. The cut-off date for receiving responses was set at May 15, 1968. After this date, the data gathered from mail and personal interviews was coded and computations were made by the IBM 1640 Computer located at Oklahoma State University, Stillwater, Oklahoma.

Treatment of the Data

Some information regarding the general characteristics of the sample will be presented in terms of percentages. Much of this

information will focus on data for which percentages provide an appropriate analysis and presentation.

Based on Siegel's (44, p. 3) assumptions regarding the nature of data in the behavioral sciences, a non-parametric technique was chosen to test the six hypotheses that developed from the review of literature and the resultant theoretical assumptions. A technique of inference was chosen which did not make as numerous or stringent assumptions about the sample. Such a technique results in conclusions which require fewer qualifications. Consequently, the Chi-Square test was used to determine relationships between levels of academic preparation and a number of demographic variables: educational levels of the subjects' mothers and fathers; the types of undergraduate institutions attended by subjects; types of undergraduate majors of the subjects; types of employment institutions of the subjects; and, types of professional experiences of the subjects. Other variables considered in combination with the above were: age of subjects, the number of their children, age of their youngest and oldest child, and marital status.

The Chi-Square test, in addition to being a non-parametric test, was suitable for this investigation because the data of this research constituted frequencies which were placed in distinct categories. Runyon and Haber (42, p. 205) state that the Chi-Square test:

> ...is a test that permits us to determine whether or not a significant difference exists between the observed number of cases falling in each category, and the expected number of cases, based on the null hypothesis. In other words, it permits us to answer the question, how well does our observed distribution fit the theoretical distribution?

The Chi-Square test requires that the expected frequencies in each cell should not be too small. This does not mean that the observed or actual frequencies should not be small, reference is made only to

expected frequencies. When this requirement is not met the results of the test are meaningless. However, an adequate definition of the term 'small' has not been uniformly defined. Walker and Lev (53, p. 107) suggest that if there are two or more degrees of freedom and roughly approximate probabilities are acceptable for the test of significance, an expectation of only two in a cell is sufficient. Snedecor and Cochran (45, p. 235) state that "the Chi-Square test is accurate enough for single classifications if the smallest expectation is at least 1." More recent findings attributed to Lewontin and Felsenstein (33, p. 234) state:

> The rule requiring an expectation of 5 or greater in a 2 x n table is far too conservative and that nearly any 2 x n table which is non-degenerate can be safely tested by the conventional Chi-Square criterion. If one wished to make a safely conservative rule it would be that: the 2 x n table can be tested by the conventional Chi-Square criterion if all the expectations are one or greater. Even this rule is extremely conservative and in general the Chi-Square criterion can be used for any non-degenerate case with expectations in excess of 1.5 successes in the smallest cells.

One other suggestion may be noted in effecting changes to improve requirements for the use of the Chi-Square test. Siegel (44, p. 178) has recommended that adjacent categories should be combined in order to increase the expectations in the various cells of the frequency table.

Following the consideration and implementations of the techniques reviewed above, the hypotheses were treated in the manner recommended by Siegel (44, p. 6):

1. The null hypothesis was stated for each general hypothesis.

2. The statistical tests were selected and the results were presented in tabular form.

3. The level of significance was selected in advance at the .05 level.

4. The sampling distribution was dependent upon and interpreted from the statistical tables presented in the Appendix of Siegel's Non-Parametric Statistics, Table C.

5. The region of rejection was predicted in advance and lay at either end of the distribution and thus implied a two-tailed region of rejection.

6. The decision or disposition of the hypotheses in the study was stated during a discussion of the results of the investigation.

CHAPTER III

RESULTS AND DISCUSSION

The major purpose of this research has been to determine if important relationships do exist between degree levels of mathematics teachers and selected demographic variables. It is hoped that some insight will be gained regarding the nature of the academic preparation of the mathematics teachers. It is also hoped that this increased insight will provide some understanding of the mathematics teachers' pursuit of their training on the part of those groups that plan and administer training programs that may be of especial interest to the teachers. Another desirable outcome would be that these findings might stimulate further research in this area, as well as encourage a re-examination of the assumptions regarding the specific nature of the variables that academic preparation is related to.

An analysis of the data gathered for this study will be conducted in two ways. First, the data will be discussed in terms of percentages. The areas to be discussed are: personal characteristics of the subjects, their academic preparation, and their present position. Secondly, the six hypotheses that were developed from the review of literature and the resultant theoretical assumptions were tested by means of the Chi-Square, non-parametric technique. These tests and their results will be presented in Chapter IV.

Personal Characteristics

In this section, such personal characteristics as age, sex, marital status and educational attainment of the subjects' parents will be discussed.

Age

One observes from Table I that the median age of the subjects was 37.5, a result which varies from the median age of 43 years for most teachers (16, p. 78). The youthfulness of the staff members is indicated by the fact that 37.1 per cent of the subjects were between 18-34; 46.9 per cent were 35-49; and, only 16 per cent were 50 years old or more.

With reference to types of institutions, one-third of the subjects in public institutions were between 18-34 years old; approximately two-thirds were between 35-49 years old; and less than one-fifth of the subjects were 50 or more years old. The percentages for the subjects teaching in private institutions were: 18-34 years old - 46.29 per cent; 35-49 years old - 37.03 per cent; and, 50 and above - 16.68 per cent.

Sex

The distribution by sex in this study varies from the national average for college teachers. As reported in Table I, the study included 119 men and 62 women, representing 65.75 and 34.25 percent, respectively, of the total sample. Such percentages vary from results reported by Eckert and Stecklein (16, p. 78) in which more of their subjects (73 per cent) were men. Wright and Huyck (57, p. 44) report results similar to the present study when they reviewed the ages of

TABLE I

AGE, SEX AND MARITAL STATUS OF MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS, BY NUMBER AND PER CENT

	Public		Private		Total	
	N	%	N	%	N	%
Age						
1. 18 - 34	42	33.07	24	46.29	67	37.1
2. 34 - 49	65	51.18	20	37.03	85	46.9
3. 50 - Above	20	15.75	9	16.68	29	16.0
Total	127	100.00	54	100.00	181	100.00
Median Age: 37.5 years						
Sex						
1. Men	84	66.15	35	64.81	119	65.75
2. Women	43	33.85	19	35.19	62	34.25
Total	127	100.00	54	100.00	181	100.00
Marital Status						
1. Married	98	77.16	44	81.48	142	78.45
2. Not Married	29	22.84	10	18.52	39	21.55
Total	127	100.00	54	100.00	181	100.00

Negro college teachers. They also indicated that the percentage of Negro women in the college teaching profession was twice that of the national average. When determining the sex characteristics of the two types of institutions, the percentages were approximately the same for

the public and private institutions as they were for the total sample.

Marital Status

Referring once again to Table I, the results show that almost four-fifths of the subjects were married. The proportion of married subjects was higher (approximately four-fifths) among teachers at private institutions, than for those at public institutions (approximately three-fourths).

Educational Attainment of Parents

Table II presents the results of the subjects' responses relative to the educational attainment of their parents. Among subjects in private institutions, 44 per cent of the subjects had fathers with some elementary education, 37 per cent reported their fathers had some secondary education, and approximately 20 per cent of the subjects reported that their fathers had attended college.

The percentages presented for the subjects in private institutions differ from those for subjects in public institutions. Fewer subjects of the latter group reported that their fathers had only elementary education (40.4 per cent). It was also noted that a smaller percentage was reported for the fathers who had some secondary education (32.3 per cent versus 37 per cent). However, more of the fathers (27.3 per cent) of subjects in public institutions had attended college than the fathers of the subjects in private institutions (20 per cent).

Of the major differences noted in the education of the mothers of subjects in public and private institutions, the subjects in public institutions had mothers with higher levels of education than the

TABLE II

EDUCATIONAL ATTAINMENT OF PARENTS OF MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS, BY NUMBER AND PER CENT

Educational Level	Fathers				Mothers			
	Public		Private		Public		Private	
	N	%	N	%	N	%	N	%
Grades:								
1 - 8	51	40.4	24	44.5	40	31.5	22	40.7
9 - 12	41	32.3	20	37.0	50	39.4	20	37.0
13 - Above	35	27.3	10	18.5	37	29.1	12	22.3
Total	127	100.0	54	100.0	127	100.0	54	100.0

subjects in private institutions. In the former group, 39.4 per cent of the mothers had some secondary education and 29.1 per cent of the mothers had attended college in comparison to the percentages of 37.0 and 22.3 reported for the educational levels of the subjects in private institutions.

Academic Preparation

In this section, the various levels of academic preparation of the 181 subjects will be discussed in relation to degrees earned, years degrees were earned, and time lapse between degrees. The nature of graduate work, and financial sources will also be discussed.

Highest Degree Earned

As reported in Table III, all subjects in this study had earned the bachelor's degree and only 26 or 14.4 per cent had progressed no further than the bachelor's degree.

Those having no more than the master's degree comprised 62.4 per cent of the subjects, and an additional 23.2 per cent either had earned the doctorate or indicated they were engaged in doctoral studies.

TABLE III

HIGHEST DEGREE EARNED BY MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS, BY NUMBER AND PER CENT

Degree Level	Public		Private		Total	
	N	%	N	%	N	%
Bachelor's	16	12.6	10	18.5	26	14.4
Master's	79	62.2	34	63.0	113	62.4
Doctoral Level:						
Earned Doctorate	15	11.8	9	16.7	24	13.3
Candidates	17	13.4	1	1.8	18	9.9
Total	127	100.0	54	100.0	181	100.0

Comparing the subjects in public institutions with the subjects in private institutions, one observes that the former group had a lower percentage of bachelor's degree holders (12.6 per cent) than did the

latter group (18.5 per cent). There was very little difference in the percentages of master's degree holders for both groups as 62.2 per cent of the subjects employed in the public institutions had master's degrees and 63.0 per cent of the subjects employed in private institutions also had master's degrees.

Years Degrees Were Earned

Table IV summarizes the data related to period during which the various degrees were earned by the mathematics teachers. One observes that the degrees held by these faculty members had been awarded over more than a 40 year period. However, most of the doctorates (21) and most of the master's degrees (137) had been earned since World War II. These results differ from those of Eckert and Stecklein (16, p. 14) and Berelson (4, p. 32). These two researchers report results considerably less than those reported in this study.

Master's Level Work

Further analysis of the subjects' responses pertaining to the master's degree resulted in the data presented in Table V. The data describes the institutions commonly attended by the subjects, and the annual production of master's degrees, derived mostly from these institutions, is also presented.

Of the ten public institutions listed in Table V, the University of Illinois was one of the most popular ones, having awarded master's degrees to 12 of the subjects in this study. The University of Michigan was also one of the more frequently attended institutions, having awarded master's degrees to 8 subjects. North Carolina College

TABLE IV

YEAR HIGHEST DEGREE WAS EARNED BY MATHEMATICS TEACHERS, BY NUMBER AND PER CENT

Year degree was earned	Types of Degrees: Bachelor's N	Bachelor's %	Master's N	Master's %	Doctorate N	Doctorate %
No degree	0	0.0	26	14.4	157	86.6
Before 1931	10	5.5	10	5.5	1	0.6
1931-1935	12	6.7	2	1.1	1	0.6
1936-1940	11	6.1	3	1.7	0	0.0
1941-1945	21	11.6	3	1.7	1	0.6
1946-1950	29	16.0	21	11.6	0	0.0
1951-1955	27	14.9	14	7.7	2	1.1
1956-1960	40	22.1	34	18.7	5	2.7
1961-1965	25	13.8	42	23.3	7	3.9
1966-1967	6	3.3	26	14.3	7	3.9
Total	181	100.0	181	100.0	181	100.0

College at Durham, a predominantly Negro institution, has awarded master's degrees to 5 of the subjects.

The most frequently attended private institution was Atlanta University, a predominantly Negro institution. As noted in Table V, this particular institution has awarded master's degrees to more than a fourth of the subjects, and most of these subjects received their master's degree during the current decade. Columbia University was the

TABLE V

MOST FREQUENTLY ATTENDED INSTITUTIONS BY MATHEMATICS TEACHERS AND YEARLY PRODUCTION OF MASTER'S FOR 1960-67, BY NUMBER

Public Institutions			
*University of Illinois	12	*Pennsylvania State University	4
University of Michigan	8	Oklahoma State University	3
North Carolina College	5	Agricultural and Technical University	3
Texas Southern University	4	University of Arkansas	3
University of Colorado	4	Louisiana State University	3
	33		16
Private Institutions			
Atlanta University	39	Howard University	4
*Columbia University	12	Fisk University	4
*New York University	5	University of Pittsburgh	3
	56		11

Yearly Production of Master's Degrees			
1960	15	1964	7
1961	8	1965	10
1962	6	1966	8
1963	11	1967	18
	40		43

*Doctorates were also awarded

second most popular institution, having awarded master's degrees to 12 subjects.

The 16 institutions listed in Table V and an additional 14 others contributed to the awarding of 83 master's degrees during the current decade. This total of degrees awarded represented almost half of the master's degrees given to the entire group of subjects.

Time Lapse in Years between Degrees

According to Table VI, approximately one-third of the subjects earned the master's degree one year after receiving the bachelor's degree.

The data in Table VI also shows that an additional 28.6 per cent of the subjects earned the master's degree two years after receiving the bachelor's degree. These percentages were somewhat similar to those reported for subjects in public institutions. Over one-third of the subjects in private institutions earned their master's degree one year following the receipt of the bachelor's however, less than one-fourth of the subjects had a two year period between the bachelor's and master's degrees. Overall, approximately 10 per cent of the subjects had a time lapse period between bachelor's and master's degrees of 4 years or more.

Reviewing the time-lapse period for doctoral degree subjects, the data in Table VII shows the group with a BA-Doctorate time lapse period of 13.5 mean years.

Course Work

The data in Table VII indicates that teachers at public and

TABLE VI

TIME LAPSE IN YEARS BETWEEN DEGREES EARNED BY MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS, BY NUMBER AND PER CENT

Number of Years	Public		Private		Total	
	N	%	N	%	N	%
B.S. - M.S.						
1	41	36.7	17	37.9	58	38.9
2	34	30.4	11	24.4	45	28.6
3	20	17.8	6	13.3	26	16.6
4	4	3.6	4	8.9	8	5.1
5 - 10	7	6.2	1	2.2	8	5.1
Over 10	1	.9	1	2.2	2	1.3
No response	4	4.4	4	11.1	8	6.4
Total	111	100.0	44	100.0	155	100.0
B.S. - Doctorate						
1 - 5	1	6.6	0	0.0	1	4.2
6 - 10	2	13.3	4	44.4	6	25.0
11 - 15	5	33.3	2	22.2	7	29.2
16 - 20	7	46.8	1	11.2	8	33.3
21 - 25	0	0.0	2	22.2	2	8.3
Total	15	100.0	9	100.0	24	100.0
Mean Years - 13.5						

TABLE VII

AVERAGE NUMBER OF GRADUATE MATHEMATICS COURSES STUDIED BY MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS

Courses	Public	Private
Analysis	3.14	2.96
Algebra	2.11	1.77
Topology	1.55	1.66
Probability and Statistics	1.30	1.22
Computer Science	1.19	.81
Methods Courses - Math	.99	.87
Geometry	.86	.85
Foundations - Math	.58	.42

private institutions were somewhat similar in the average number of graduate mathematics courses studied. The 127 public institution faculty members averaged 3.14 courses in analysis in comparison to the 2.96 average for faculty members at private institutions. Algebra, another of the more frequently studies courses was studied more by subjects in public institutions than by subjects in private institutions.

Courses in geometry and foundations of mathematics were those that both groups of subjects had the least contact with. The public institution subjects averaged less than 1 full course in geometry, and less than half a course in foundations, and similar results can be reported for subjects in private institutions.

Sources of Financial Support

Faculty members in public institutions were large users of federal funds in financing their advanced academic training as indicated by figures in Table VIII. One type of federal source, the National Science Foundation, with its several types of programs, assisted 48.8 per cent of the subjects in public institutions to earn the master's degree. Faculty members in private colleges and universities using the same type of support comprised 33.3 per cent.

The National Science Foundation also enabled 13.3 per cent of the faculty members in public institutions to pursue doctoral studies, while 7.4 per cent of the faculty members in private institutions used the same sources for doctoral work.

As reported in Table VIII, support from private fellowships was limited, yet more public institution subjects (12.5 per cent) used this source to assist them in earning the master's, than the private institution subjects, (3.7 per cent).

Personal savings accounted for most of the assistance derived from "other sources." Approximately two-fifths of the subjects who taught at public institutions used personal savings to finance the master's degree program, while only 3.1 per cent used their personal savings to study for the doctorate. The percentages for teachers at private institutions were less, as only a third used personal savings to earn the master's and none indicated they used personal savings to study for a doctorate.

Parental assistance figured prominently, with subjects in public and private institutions getting similar assistance for master's level work. Parents also provided significant financial assistance for

TABLE VIII

SOURCES OF FINANCIAL SUPPORT USED DURING GRADUATE STUDY BY MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS, BY NUMBER AND PER CENT

Source	Master's				Doctorate			
	Public		Private		Public		Private	
	N	%	N	%	N	%	N	%
Federal								
N.S.F.	62	48.8	18	33.3	17	13.4	4	7.4
NDEA	5	3.9	5	9.3	1	.8	0	0.0
G.I. Bill	19	15.0	5	9.3	2	1.6	2	3.7
Other	8	6.3	2	3.7	2	1.6	1	1.8
None	33	26.0	24	44.4	105	82.6	47	87.1
Total	127	100.0	54	100.0	127	100.0	54	100.0
Private Fellowships								
Southern Regional	1	.8	0	0.0	1	.8	0	0.0
Southern Grants	0	0.0	0	0.0	1	.8	0	0.0
Carnegie	0	0.0	0	0.0	0	0.0	0	0.0
Danforth	0	0.0	1	1.8	2	1.6	2	3.7
Ford	3	2.3	0	0.0	0	0.0	1	1.8
Other	12	9.4	1	1.8	4	3.1	3	5.5
None	101	87.5	52	96.4	119	93.7	48	89.0
Total	127	100.0	54	100.0	127	100.0	54	100.0
Other Sources								
Personal Savings	54	42.5	21	38.8	4	3.1	0	0.0
Parents	21	16.5	9	16.6	11	8.6	0	0.0

TABLE VIII (Continued)

Source	Master's				Doctorate			
	Public		Private		Public		Private	
	N	%	N	%	N	%	N	%
Other Sources (continued)								
Assistantship	14	11.0	8	14.8	6	4.7	0	0.0
Sabbatical Leave	3	2.3	1	1.8	2	1.5	1	1.8
Instructorship	4	3.1	3	5.5	2	1.5	2	3.7
Loan	15	11.8	6	11.1	9	7.1	0	0.0
Spouse's Earnings	9	7.1	5	9.2	6	4.7	1	1.8
Other	5	3.9	3	5.5	0	0.0	1	1.8
Total	125	98.2	56	103.3*	40	31.2	5	9.1

* Indicates that more than one response was checked by an individual.

11 doctoral subjects who were teaching in public institutions.

The combined sources of assistantships and instructorships were utilized by 14.1 per cent of the subjects in public institutions and 20.3 per cent of the subjects in private institutions while earning the master's degree.

Financial assistance in terms of sabbatical leaves from public and private institutions was negligible as only 3 persons in the public institutions indicated they received sabbatical leaves for master's detree work, and 2 for doctoral work. Among the private institution

subjects, only one person received a sabbatical leave for the master's level work, and one for doctoral level work.

Present Position

Recognizing that certain factors emanating from the subjects' present positions might impinge on their academic preparation, the writer sought to explore such factors as college and non-college teaching positions, years of college teaching experience, and tenure in present positions. Additional information sought included current academic ranking, time spent in various professional functions, and specific courses taught. This section includes a discussion of these factors.

Work Experiences

In exploring college teacher's backgrounds, this study sought information on the kinds of positions held by subjects after they received the bachelor's degree. Beyond possible personal enrichment such experiences may be potential factors in decision making since college teaching as a career has been called the end-product of a "drift with the choice itself rather late" (16, p. 82; 24, pp. 26, 47).

Information concerning the first full-time job following college graduation shows that most of the subjects had no other type of position other than college teaching. According to Table IX, 51.4 per cent of the subjects had no other job than college teaching, an additional one-third of the subjects had served as teachers in elementary and secondary schools prior to entering the college teaching profession, and 14.9 per cent had non-teaching jobs.

TABLE IX

WORK EXPERIENCES OF MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS, BY NUMBER AND PER CENT

Experience	Public		Private		Total	
	N	%	N	%	N	%
College Teaching	65	51.2	28	51.8	93	51.4
Elementary-Secondary Teaching	43	33.9	18	33.3	61	33.7
Non-Teaching Jobs	19	14.9	8	14.9	27	14.9
Total	127	100.0	54	100.0	181	100.0

Public and private institutions percentages were similar in terms of the sources from which they drew personnel. Each type of institution had about half of its mathematics faculty members with college teaching experience only. An additional one-third of the faculty members for both types of institutions was recruited from elementary or secondary schools. Less than one-fifth entered college teaching from non-teaching jobs which included jobs in industry, governmental service, and business.

Age and Work Experience

As reported in Table X, the subjects with college teaching and elementary-secondary teaching as initial careers were similar in age with the exception of those subjects who were 50 years old or more. Approximately two-fifths of the subjects 18-34 years old had college teaching experience only, and as many 18-34 year old subjects entered

college teaching with elementary or secondary teaching as an intervening work experience. Among the small group of subjects with non-teaching jobs immediately after graduation from college, approximately two-thirds were 35-49 years old.

TABLE X

AGE AND WORK EXPERIENCES OF MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS, BY NUMBER AND PER CENT

By Age:	College Teaching		Elementary-Secondary Teaching		Non-Teaching Jobs		Total Subjects	
	N	%	N	%	N	%	N	%
18 - 34	40	43.1	24	39.3	3	11.1	67	37.1
35 - 49	42	45.1	26	42.6	17	62.9	85	46.9
50-Above	11	11.8	11	18.1	7	20.0	29	16.0
Total	93	100.0	61	100.0	27	100.0	181	100.0

Years of College Teaching Experience

While three of the subjects had been employed in higher institutions as long as 40 years, the median length of employment as college teachers was 8.2 years as shown in Table XI. Nearly 20 per cent of the subjects reported having from one to two years of college teaching experience. The subjects having from three to five years of experience

TABLE XI

YEARS OF COLLEGE TEACHING EXPERIENCE AND YEARS IN CURRENT POSITION OF MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS, BY NUMBER AND PER CENT

Years as Faculty Member	Public		Private		Total	
	N	%	N	%	N	%
1 - 2	24	18.8	11	20.4	35	19.3
3 - 5	20	15.7	14	25.9	34	18.7
6 - 10	39	30.7	11	20.4	50	27.6
11 - 15	9	7.3	4	7.4	13	7.3
21 - 25	8	6.3	4	7.4	12	6.6
26 - 30	3	2.3	1	1.8	4	2.2
31 - 35	2	1.6	1	1.8	3	1.7
36 - 40	1	.8	2	3.7	3	1.7
Total	127	100.0	54	100.0	181	100.0
Median Years: 8.21						
Years in Present Position:						
1 - 2	49	38.7	22	40.8	71	39.2
3 - 5	29	22.8	12	22.3	41	22.6
6 - 10	20	15.7	10	18.53	30	16.5
11 - 15	15	11.8	4	7.4	19	10.4
16 - 20	6	4.7	1	1.8	7	3.9
21 - 25	5	3.9	2	3.7	7	3.9
26 - 30	1	.8	3	5.5	4	2.2
31 - 40	2	1.6	0	0.0	2	1.2
Total	127	100.0	54	100.0	181	100.0
Median Years: 5.1						

were approximately 20 per cent of the sample.

Table XI also shows that more than half of the subjects had served in their present position five years or less, and that nearly two-fifths (39.2 per cent) had served two years or less. The median number of years the subjects have been in their present position is 5.1. Both public and private institutions had somewhat similar percentages for the first two categories of years in present positions with the subjects in public institutions reporting 38.7 per cent for 1-2 years of service and 22.8 per cent for 3-5 years of service as compared to the private institutions' percentages of 40.8 and 22.3, respectively.

Academic Rank

Subjects having the academic rank of instructor comprised 32.1 per cent. Those with the rank of assistant professor comprised 33.7 per cent of the subjects, while full professors were one-fifth of the subjects.

In private institutions, 40.7 per cent of the mathematics faculty members had the rank of instructor, more than one-fifth were assistant professors, while approximately one-third were full professors.

In public institutions, 38.5 per cent of the subjects had achieved the rank of assistant professor, 16.5 per cent were full professors, and less than one-third (28.3 per cent) were instructors.

Teaching, Research and Scholarship

Both public and private institutions had subjects that reported a high percentage of their time was devoted to teaching services. The median percentage for teaching in public institutions exceeded 80

TABLE XII

ACADEMIC RANK OF MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS, BY NUMBER AND PER CENT

Academic Rank	Public		Private		Total	
	N	%	N	%	N	%
Professor	21	16.5	16	29.6	37	20.5
Assoc. Professor	18	14.2	2	3.7	20	11.0
Asst. Professor	49	38.5	12	22.3	61	33.7
Instructor	36	28.5	22	40.7	58	32.0
No Response	3	2.3	2	3.7	5	2.8
Total	127	100.0	54	100.0	181	100.0

per cent, while subjects in private institutions reported the median percentage of time spent in teaching was 71.9 per cent (See Table XIII).

These percentages are not inconsistent with findings reported by McGrath (35, 108) who reported that the "...purposes and programs show that with few exceptions, their [Negro institutions] primary services are related to the teaching of undergraduates."

Administrative and other duties required approximately a fourth of the time of the subjects teaching in private institutions. Subjects in public institutions reported that the median percentage of time spent in administrative and other duties was 15.0 per cent.

It should be recognized that in undergraduate schools the absence of large and vigorous research programs will not in the immediate

TABLE XIII

MEDIAN PERCENTAGES OF CURRENT TIME SPENT IN VARIOUS PROFESSIONAL FUNCTIONS BY MATHEMATICS TEACHERS IN PUBLIC AND PRIVATE INSTITUTIONS

Function	Public %	Private %
Teaching	81.8	71.9
Research and Scholarly Writing	3.2	4.1
Administrative Duties	8.2	9.9
Other	6.8	14.1
Total	100.0	100.0

future create their most pressing problem. However, the participation in investigative research activities among the faculties of these institutions unquestionably affects their general intellectual vitality and their status in the academic world.

Summary

Among the distinctions to be noted about the subjects in this study is their youthfulness. They are on the average about six years younger than most college teachers. Another distinction is that the percentage of women in this study is twice that of the national average for women college teachers, but similar to the percentage of women teachers at predominantly Negro college campuses.

In reference to academic preparation, all mathematics teachers in this study had earned the bachelor's degree, only 14 per cent had not yet earned the master's while another 86 per cent had. Of those that had earned the master's degree, 13.3 per cent also had earned the doctorate degree. It was also observed that more than half of the subjects earned the master's degree since 1959. Major sources for earning this degree were the National Science Foundation and personal savings.

Reviewing the work experiences of the subjects, it was noted that most of the mathematics teachers began their professional careers as college teachers. Overall, the median years of experience as a college teacher is 8.21 years and the median years the subjects have been in their present position is 5.1 years. Four-fifths of the subjects' professional time is spent in teaching with very little time devoted to such other activities as research and scholarly writing.

CHAPTER IV

RESULTS AND DISCUSSION RELATIVE TO THE HYPOTHESES

Six general hypotheses which were developed from a review of the literature and the theoretical assumptions were tested in an effort to determine relationships between the degree levels of the mathematics faculty members and selected demographic variables. This section sets forth the results of the analysis of the data and the implications of these findings as tested by the hypotheses.

Hypothesis I

Hypothesis I states that there is no significant relationship between the degree levels of mathematics teachers and their fathers' educational attainment. The degree levels of the subjects was categorized according to the following levels: (1) bachelor's degree; (2) master's degree; and, (3) doctoral degree. The educational attainment of the mathematics teachers' fathers was categorized according to the levels: (1) grades 1-8; (2) grades 9-12; and (3) grades 13 and above.

A more detailed analysis of the data was executed to provide further insight into possible relationships between the two previously mentioned variables and other selected demographic variables such as: age, sex, marital status, number of children, age of youngest child, age of oldest child, undergraduate institution attended, institution

of employment, undergraduate major, and professional experiences.

Table XIV gives the frequency distribution from which a valid Chi-Square was computed for the total population, considering a relationship between the mathematics teachers' degree levels and their fathers' education. Typically, many of the fathers of mathematics teachers had received less than a high school education with approximately two-fifths of the fathers reportedly having gone no further than the eighth grade. A third of the subjects reported fathers as having attended senior high school, and approximately 25 per cent of the subjects' fathers had some college education. Such findings are consistent with other studies: Espy (18, p. 10), and Eckert and Stecklein (16, p. 7).

TABLE XIV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL AND FATHERS' EDUCATION

Results of Inter-educational Level Comparisons

Degree Level	Fathers' Education by Grades			
	1 - 8	9 - 12	13 and above	Totals
B.S.	14	6	6	26
M.S.	48	43	22	113
Doctorate	13	12	17	42
	75	61	45	181

$X^2 = 9.41$, df=4, p.>.05

No significant relationship was determined between the mathematics teachers' degree levels and their fathers' educational level even though there were apparent differences in proportions.

Age

The statistical treatment of the data was expanded from a two-way classification to that of a three-way classification in order to include a series of personal variables. These variables were combined with fathers' education in an effort to determine if such a combination would clarify relationships between the degree levels of mathematics teachers and their fathers' education. The first variable considered in relation to degree levels of the mathematics teachers and their fathers' education was the age of mathematics teachers. Table XV lists the frequencies for ages of mathematics teachers, their degree levels, and their fathers' education.

As shown in Table XV, separate analyses were made to discern whether, within each age group, there is a significant relationship between the degree levels of the mathematics teachers and their fathers' education. Valid Chi-Squares were computed for the age levels, 18-34 and 35-49. The results of these Chi-Square computations led to the conclusion that at neither of these age levels is there a significant relationship between fathers' education and the academic preparation of the mathematics teachers. No conclusions could be drawn from the computed Chi-Square for the mathematics teachers 50 years and older due to the small number of subjects classified in that age group.

TABLE XV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE, AND FATHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Age Group

	Subjects' Age and Fathers' Education								
Degree Level	18 - 34			35 - 49			50 - Above		
	1-8	9-12	13-	1-8	9-12	13-	1-8	9-12	13-
B.S.	1	1	0	10	4	5	4	1	1
M.S.	20	22	9	20	20	9	8	1	4
Doctorate	6	4	5	3	6	8	4	2	4
	26	27	14	33	30	22	16	4	9
	$X^2 = 3.6509$, df=4 p.>.05			$X^2 = 8.4781$, df=4 p.>.05			Not Valid		

Sex

Results of the analyses of relationships between the degree levels of the mathematics teachers and their fathers' education with the teachers divided according to sex, are shown in Table XVI. For the men teachers, a significant relationship exists between their earned degrees and their fathers' education. In studying the nature of the relationship between degree levels of men and their fathers' education, the frequencies indicated very little relationship between degree levels of subjects whose fathers had only an elementary education and the degree levels of subjects whose fathers attended high school.

However, more subjects whose fathers had attended college were on the doctoral level, thus contributing to the significant relationship between subjects' degree levels and fathers' education. An analysis of women subjects did not reveal a significant relationship between their academic preparation and their fathers' educational attainment.

TABLE XVI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, SEX, AND FATHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Sex

	Subjects' Sex and Fathers' Education					
Degree Level	Men			Women		
	1-8	9-12	13-	1-8	19-12	13-
B.S.	13	6	4	1	0	2
M.S.	37	20	7	11	23	15
Doctorate	10	9	13	3	3	4
	60	35	24	15	26	21
	$X^2 = 12.8055$, df=4 $p.<.01$			$X^2 = 3.4120$, df=4 $p.>.05$		

Marital Status

According to Table XVII, a majority of the subjects are married.

However, such a result of this study is no different from the findings of Eckert and Stecklein's (16, p. 9) study on teacher education.

TABLE XVII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, MARITAL STATUS, AND FATHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Marital Status

	Subjects' Marital Status and Fathers' Education					
Degree Level	Married			Not Married		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	11	5	4	3	1	2
M.S.	40	34	16	8	9	6
Doctorate	10	9	13	3	3	4
	61	48	33	14	13	12
	$X^2 = 8.3334$, df=4 p.>.05			Not Valid		

Since 142 of the subjects were married, a valid Chi-Square test was conducted, the results of which indicated that no significant relationwhip exists between the degree levels and fathers' education when the responses of the married teachers were analyzed. The small sampling of non-married mathematics teachers prohibited the use of the results of the Chi-Square test. Hence, no conclusions could be drawn regarding

the relationship between degree levels of the unmarried teachers and their fathers' education.

Number of Children

Neither of the groups of teachers, those with three children or fewer, and those with at least four children, have degree levels that are significantly related to their fathers' education. The proportions by which individual analyses were conducted for each of the two groups of teachers are presented in Table XVIII.

TABLE XVIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, NUMBER OF CHILDREN, AND FATHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Group of Teachers with Children

	Subjects' Number of Children and Fathers' Education					
Degree Level	Three or less			Four or more		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	6	2	2	8	4	4
M.S.	21	31	14	27	12	8
Doctorate	5	9	10	8	5	17
	32	42	26	43	21	29
	$X^2 = 8.0281$, df=4 p.>.05			$X^2 = 4.7541$, df=4 p.>.05		

Age of Children

Two other variables pertaining to the children of the mathematics teachers, age of oldest child and age of youngest child, were analyzed. The results of the analysis which provided for the computation of four Chi-Squares, did not reveal any relationship between the degree levels of the mathematics teachers and their fathers' education. Tables XIX and XX present the analysis in tabular form.

TABLE XIX

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF OLDEST CHILD, AND FATHERS' EDUCATION

	Age of Subjects' Oldest Child and Fathers' Education					
Degree Level	Nine years or younger			Ten years or older		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	6	3	2	8	3	4
M.S.	27	28	16	21	15	6
Doctorate	5	5	11	8	7	6
	38	36	29	37	25	16
	$X^2 = 8.8308$, df=4 $p.>.05$			$X^2 = 3.1564$, df=4 $p > .05$		

TABLE XX

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF YOUNGEST CHILD, AND FATHERS' EDUCATION

	Age of Subjects' Youngest Child and Fathers' Education					
Degree Level	Nine years or younger			Ten years or older		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	5	3	2	8	3	4
M.S.	29	26	16	19	17	6
Doctorate	7	9	9	6	3	8
	42	38	27	33	23	28
	$X^2 = 3.3143$, df=4 $p > .05$			$X^2 = 7.1240$, df=4 $p > .05$		

Undergraduate Institutions

Table XXI presents the data relating to the degree levels of the mathematics teachers and their fathers' education for each of the types of undergraduate institutions.

Among mathematics teachers who earned their undergraduate degrees from public institutions, there is no significant relationship between their degree levels and fathers' education.

The findings proved otherwise, however, for the mathematics teachers who earned undergraduate degrees from private institutions. A significant relation does exist between their subsequent degree levels and their fathers' education.

TABLE XXI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE INSTITUTION ATTENDED, AND FATHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Type of Institution

	Subjects' Type of Undergraduate Institution and Fathers' Education					
Degree Level	Public			Private		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	8	4	3	6	2	3
M.S.	27	23	11	21	20	11
Doctorate	6	10	6	7	2	11
	41	37	20	34	24	25
	$X^2 = 3.1869$, df=4 $p.>.05$			$X^2 = 10.7528$, df=4 $p.>.05$		

Further examination of this significant relationship showed very little relationship between the degree levels of subjects with fathers having lowest and highest levels of education. However, among the subjects whose fathers attended high school, far more had master's degrees while the numbers of bachelor's and doctoral level subjects were the same.

Employing Institution

Table XXII gives the frequencies by which the degree levels of

mathematics teachers and their fathers' education were analyzed.

TABLE XXII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF EMPLOYMENT INSTITUTION, AND FATHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Type of Institution

	Subjects' Type of Employing Institution and Fathers' Education					
Degree Level	Public			Private		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	8	2	6	6	4	0
M.S.	35	31	13	13	12	9
Doctorate	8	8	16	5	4	1
	51	41	35	24	20	10
	$X^2 = 16.1602$, df=4 $p. < .01$			Not Valid		

When the responses of the mathematics teachers working for public institutions were analyzed, differences in proportions of their degree levels and their fathers' educational grade levels were noted. This difference in relative proportions is highly significant at the .01 level. Further analysis of the results suggest that there is little relationship between degree levels of subjects whose fathers

attended high school and degree levels of subjects whose fathers attended college. However, it was also observed that subjects of fathers with elementary education differed principally in having more master's degrees.

A small sample of mathematics teachers working for private institutions precluded an objective analysis of the data. As a result, no conclusions could be drawn regarding the relationship of the degree levels of these mathematics teachers working for private institutions and their fathers' education.

Undergraduate Major

The questions resulting in frequencies presented in Table XXIII asked the mathematics teachers to list their degrees on the questionnaire and their undergraduate major, along with their fathers' education.

Among the mathematics teachers who reported that their undergraduate major was mathematics, a significant relationship exists between the mathematics majors' degree levels and their fathers' levels of education. The small sampling of mathematics teachers with "other" undergraduate majors precluded the possibility of drawing a valid conclusion regarding any relationship between their earned degrees and their fathers' education.

Professional Experiences

Responses concerning the first full-time job of the mathematics faculty members indicates that 54.1 per cent reported college teaching as their first full-time job. A scrutiny of changes in frequencies

TABLE XXIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE MAJOR AND FATHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Type of Major

	Subjects' Type of Undergraduate Major and Fathers' Education					
Degree Level	Mathematics			Other		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	12	5	4	2	1	2
M.S.	34	36	16	14	7	6
Doctorate	12	8	13	1	4	4
	58	49	33	17	12	12
	$X^2 = 9.5168$, df=4 $p.<.05$			Not Valid		

as shown in Table XXIV reflected contrasts that were rather conspicuous between master's and doctoral level subjects in relation to the levels of their fathers' education.

A Chi-Square test of the changes in frequencies was computed (at the .05 level). As a result, the degree levels of the mathematics teachers with exclusive college teaching experience are significantly related (at the .05 level) to their fathers' education.

A similar analysis of responses given by the mathematics teachers who reported "other" professional experiences prior to college teaching, did not present as significant a contrast in observed and expected

frequencies. As a result, the levels of academic preparation for these mathematics teachers are not related to their fathers' education.

TABLE XXIV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF PROFESSIONAL EXPERIENCE, AND FATHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Type of Professional Experience

	Subjects' Type of Professional Experiences and Fathers' Education					
Degree Level	College Teaching			Other		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	7	4	3	7	2	3
M.S.	28	21	7	20	22	15
Doctorate	17	7	9	6	5	8
	42	32	19	33	29	26
	$X^2 = 10.69$, df=4 $p.<.05$			$X^2 = 4.6901$, df=4 $p.>.05$		

Summary

A general analysis of the mathematics teachers' responses relating their degree levels to their fathers' education revealed that more mathematics teachers had fathers with no more than an elementary education as compared to the subjects who reported fathers with one or more

years of college education. Although such apparent differences were sufficient enough to reflect a relationship between the mathematics teachers' degree levels and the educational levels of their fathers, the relationship is not significant at the .05 level.

A more detailed analysis of the data did serve to clarify some statistically significant relationships between the degree levels of the mathematics teachers and their fathers' education. A significant relationship between degree levels and the education of fathers was detected among the mathematics teachers who are employed in public institutions.

Of several other analyses made between the mathematics teachers' degree levels and their fathers' education, a significant relationship exists between the two variables when analysis was made of responses from teachers who received their undergraduate degrees from private institutions. The mathematics teachers whose undergraduate major was mathematics have degree levels related to their fathers' education. This is also true for the mathematics teachers whose only professional experience has been that of college teaching.

Hypothesis II

Hypothesis II states that there is no significant relationship between the mathematics teachers' degree levels and their mothers' educational attainment. The categorization of subjects' degree levels and their mothers' educational attainment is similar to the procedure used in testing Hypothesis I. The general hypothesis was tested at the .05 level and so were the sub-hypotheses that developed from the same selected variables used to test Hypothesis I.

When testing the general hypothesis of degree levels of the mathematics teachers versus their mothers' educational attainment, the proportions as indicated in Table XXV were not divergent enough from expected proportions to show any relationship at the .05 level. In answer to the likely question of which variable, fathers' education or mothers' education, had the greater influence on the mathematics teachers' academic preparation, it appears that the former had the greater influence.

TABLE XXV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL AND MOTHERS' EDUCATION

Results of Inter-educational Level Comparisons

Degree Level	Mothers' Education by Grades			
	1 - 8	9 - 12	13 and Above	Totals
B.S.	12	7	7	26
M.S.	38	49	26	113
Doctorate	12	14	16	42
	62	70	49	181

$X^2 = 5.9386$, df=4, p.>.05

Age

Separate analyses were again made to discern if, within each age group, there is a significant relationship between the mathematics teachers' degree levels and their mothers' education. Valid Chi-Squares were computed for the teachers 18-34, and for those 35-49. The results indicated that at neither age level is there a significant relationship between mothers' education and the mathematics teachers' degree levels. The small number of teachers (29) classified on the age level, 50 years or older, was not sufficient for a Chi-Square analysis. It can be noted that, in comparison with a test of Hypothesis I, using the same variable "age", a trend of dependence between subjects' degree levels and parents' education is more discernible among the mathematics teachers, 35-49, under Hypothesis I than under the present hypothesis. Frequencies used in analyzing the relationship between age, mathematics teachers' degree levels and their mothers' education are given in Table XXVI.

Sex

Table XXVII presents the results of an analysis of the variables, "mothers' education," and the degree levels of the mathematics teachers by sex.

The relationship between the degree levels of men teachers and their mothers' academic training proved to be highly significant at the .01 level. However, no significant relationship exists between the degree levels of women teachers and their mothers' education. One can conclude from the results of this analysis and a similar one for Hypothesis I that parental education is a factor in the academic

accomplishments of the men teachers.

TABLE XXVI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE, AND MOTHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Age Group

	Subjects' Age and Mothers' Education								
Degree Level	18 - 34			35 - 49			50 - Above		
	1-8	9-12	13-	1-8	9-12	13-	1-8	9-12	13-
B.S.	1	0	1	6	7	6	5	0	1
M.S.	14	25	12	17	22	10	7	2	4
Doctorate	4	6	5	2	7	8	6	1	3
	19	31	17	25	36	24	18	3	8
	$X^2 = 3.2100$, df=4 p.>.05			$X^2 = 5.7364$, df=4 p.>.05			Not Valid		

Marital Status

The proportions on the marital status of mathematics teachers for this particular analysis are presented in Table XXVIII. A Chi-Square test of these proportions for married subjects resulted in the conclusion that the married subjects' degree levels are not related to their mothers' educational levels.

TABLE XXVII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, SEX, AND MOTHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Sex

	Subjects' Sex and Mothers' Education					
Degree Level	Men			Women		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	12	6	5	0	1	2
M.S.	27	28	9	11	21	17
Doctorate	8	10	14	4	4	2
	47	44	28	15	26	21
	$X^2 = 12.6012$, df=4 $p.<.05$			$X^2 = 3.4224$, df=2 $p.>.05$		

TABLE XXVIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, MARITAL STATUS, AND MOTHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Marital Status

	Subjects' Marital Status and Mothers' Education					
Degree Level	Married			Not Married		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	9	6	5	3	1	2
M.S.	32	37	21	6	12	5
Doctorate	9	12	11	3	2	5
	50	55	37	12	15	12
	$X^2 = 2.6559$, df=4 p.>.05			$X^2 = 5.4628$, df=4 p.>.05		

An apparent relationship between degree levels of the unmarried mathematics teachers and their mothers' education does exist. However, the Chi-Square test did not indicate a significant enough relationship between the unmarried mathematics teachers' earned degrees and their mothers' education.

Number of Children

The proportions of mathematics teachers with numbers of children ranging from three or fewer, and four or more, are presented in Table XXIX with the usual classification of mathematics teachers' degree

levels and their mothers' education. For each of the groups of mathematics teachers classified according to the number of children they had, no significant relationship exists between their degree levels and their mothers' education.

TABLE XXIX

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, NUMBER OF CHILDREN, AND MOTHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Group of Teachers with Children

	Subjects' Number of Children and Mothers' Education					
Degree Level	Three or less			Four or more		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	6	2	3	6	5	5
M.S.	17	33	16	27	16	10
Doctorate	5	10	9	7	4	7
	28	45	27	34	25	22
	$X^2 = 7.3781$, df=4 p.>.05			$X^2 = 5.3178$, df=4 p.>.05		

Age of Children

Very little fluctuation from the expected frequencies was recorded for the mathematics teachers on the variable "age of children."

Consequently, this factor does not enter into a relationship between the mathematics teachers' degree levels and their mothers' education. This conclusion is correct for each of the age groups - "age of youngest child" and "age of oldest child," based on a test of the frequencies listed in Tables XXX and XXXI.

TABLE XXX

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF OLDEST CHILD, AND MOTHERS' EDUCATION

	Age of Subjects' Oldest Child and Mothers' Education					
Degree Level	Nine years or younger			Ten years or older		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	5	2	3	7	4	4
M.S.	21	30	20	17	19	6
Doctorate	4	10	8	8	5	8
	30	42	31	32	28	18
	$X^2 = 2.8597$, df=4 p.>.05			$X^2 = 5.9379$, df=4 p.>.05		

Such results as reported above, although generally consistent with the findings of Hypothesis I, differed from the latter as a trend of association is more noticeable between the degree levels of the mathematics teacher with oldest children nine years or younger, and

their fathers' education. A rather large Chi-Square also resulted in a similar assumption of association between the degree levels of mathematics teachers with the oldest child being ten years old or more, and their fathers' education.

TABLE XXXI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF YOUNGEST CHILD, AND MOTHERS' EDUCATION

	Age of Subjects' Youngest Child and Mothers' Education					
Degree Level	Nine years or younger			Ten years or older		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	5	3	3	7	4	4
M.S.	21	33	17	17	16	9
Doctorate	6	10	9	6	4	7
	32	46	29	30	24	20
	$X^2 = 3.0602$, df=4 p.>.05			$X^2 = 3.0180$, df=4 p.>.05		

Undergraduate Institution

A study of the data shown in Table XXXII reveals that no significant relationship exists between degree levels of the mathematics teachers in public institutions and their mothers' education. Similarly, among the subjects in private institutions, there is no

significant relationship between degree levels and mothers' education.

However, the substitution of the variable, "fathers' education," did not produce the same results according to a test of the proportions listed in Table XXI.

TABLE XXXII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE INSTITUTION, AND MOTHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Type of Institution

Degree Level	Subjects' Type of Undergraduate Institution and Mothers' Education					
	Public			Private		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	7	4	4	5	3	3
M.S.	23	25	13	15	24	13
Doctorate	7	6	9	5	8	7
	37	35	26	25	35	23
	$X^2 = 4.1187$, df=4 p.<.05			$X^2 = 2.3799$, df=4 p.<.05		

Employing Institution

It was hypothesized that an analysis of the kinds of institutions in which subjects are teaching might provide an insight into the

relationship between the mathematics teachers' degree levels and their mothers' education. The frequencies cited in Table XXXIII do not deviate significantly from the expected frequencies. As a result, for each group of subjects, those in public institutions and those in private institutions, their degree levels are not significantly related to their mothers' education. The above findings among public institution mathematics teachers differed from the findings of the previous hypothesis when fathers' education was tested. For the previous hypothesis, it was reported that the degree levels of mathematics teachers are significantly related to their fathers' educational levels.

TABLE XXXIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF EMPLOYING INSTITUTION, AND MOTHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Type of Institution

	Subjects' Type of Employing Institution and Mothers' Education					
Degree Level	Public			Private		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	5	5	6	7	2	1
M.S.	27	34	18	11	15	8
Doctorate	8	11	13	4	3	3
	40	50	37	22	20	12
	$X^2 = 4.2779$, df=4 p.>.05			$X^2 = 5.0381$, df=4 p.>.05		

Undergraduate Major

As a result of an analysis of responses concerning mothers' educational levels, the general conclusion can be established that parental education is related to the degree levels of mathematics teachers whose undergraduate major was mathematics. Hypothesis I tested this assumption for the variable "fathers' education" and a relationship between fathers' education and the degree levels of undergraduate mathematics majors is reported to be significant at the .05 level. The frequencies for subjects with mathematics as their undergraduate major in combination with mothers' education and degree levels, presented in Table XXXIV, were also tested, and these, too, reflected a significant relationship at the .05 level. However, the significant relationship between subjects' degree levels and their mothers' education is due primarily to further examination of percentage of this subjects' relationship on the master's and doctoral level. No significant relationship was reported between subjects' degree levels and the first two levels of mothers' education when a further analysis was made of the frequencies.

No generalization nor conclusions should be made regarding the relationship between mothers' education and degree levels of mathematics teachers with "other undergraduate majors because of the small number resulting from this classification.

Professional Experiences

Table XXXV shows that the proportions of degrees for teachers with college teaching as their only experience do not appear to reflect any educational relationship with their mothers' education. This is

TABLE XXXIV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE MAJOR, AND MOTHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Type of Major

Degree Level	Subjects' Type of Undergraduate Major and Mothers' Education					
	Mathematics			Other		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	12	4	5	0	3	2
M.S.	27	41	18	11	8	8
Doctorate	11	10	12	1	4	4
	50	55	35	12	15	14
	$X^2 = 9.8954$, df=4 $p.<.05$			Not Valid		

also the case for the mathematics teachers with "other" vocational experiences prior to college teaching.

A comparison of the results with Hypothesis I shows an acceptable variation. Fathers' education, tested under Hypothesis I, did prove to be a significant factor in ascertaining that a significant relationship does exist among degree levels of mathematics teachers with college teaching as their only professional experience.

Summary

The results of the analysis of data showed that the variable,

TABLE XXXV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF PROFESSIONAL EXPERIENCE, AND MOTHERS' EDUCATION

Results of Inter-educational Level Comparisons for each Type of Professional Experience

	Subjects' Type of Professional Experience and Mothers' Education					
Degree Level	College Teaching			Other		
	1-8	9-12	13-	1-8	9-12	13-
B.S.	5	5	4	9	1	2
M.S.	19	26	11	29	17	11
Doctorate	5	7	11	8	5	6
	29	38	26	46	23	19
	$X^2 = 7.5435$, df=4 p.>.05			$X^2 = 4.4563$, df=4 p.>.05		

"mothers' education" is significantly related to the degree levels of the men mathematics teachers. A detailed analysis of subjects with mathematics majors revealed a significant relationship at the .05 level between the mathematics teachers' degree levels and their mothers' education.

The results of testing Hypotheses I and II led to the generalizations that parental education is related to the degree levels of the teachers with undergraduate mathematics majors. Another generalization was that, among men subjects, a significant relationship exists between

parental education and the degree levels of the men mathematics teachers.

Conclusions regarding no significant relationship between parental education and mathematics teachers' degree levels can be made when the results of Hypotheses I and II are combined relative to "age of youngest child" of the mathematics teachers. Similarly, no relationship was noted between mathematics teachers' degree levels and their parents' education when the former groups' responses to the questionnaire were analyzed according to the age of their oldest child.

It was also noted that the variable, mothers' education, was less influential than fathers education among the mathematics teachers who received baccalaureate degrees from private institutions. The latter variable, fathers' education, was reported to be related significantly to the degree levels of the mathematics teachers. In a similar analysis, it was recognized that while mothers' education is not significantly related to the degree levels of mathematics teachers working in public institutions, there is significant relationship between the degree levels of mathematics teachers in public institutions and the education of their fathers.

Hypothesis III

Hypotheses I and II were tested for a significant relationship between parental education and degree levels of mathematics teachers on several selected variables that were given. One of the selected variables was that of undergraduate major. An analysis was conducted for each of the groups of subjects, those with mathematics as an undergraduate major, and those with "other" undergraduate majors.

Such intra-major analyses resulted in certain conclusions reported in the previous sections.

This section treats undergraduate major as a major variable and provides the results of an inter-major analysis of the data under several different conditions which serve to further clarify the relationship between undergraduate major and the degree levels of the mathematics teachers. This section then, consists of two-by-three frequency tables in which majors and degrees of mathematics teachers are recorded. The majors and degrees of the mathematics teachers are recorded for the general sampling, thus providing data for a test of the general hypothesis - degree levels of undergraduate mathematics majors versus that of undergraduate "other" majors.

Majors and degrees are also recorded for the mathematics teachers who are categorized according to age, sex, marital status, number of children, age of their youngest child, and age of their oldest child. The mathematics teachers' majors and degrees were also classified according to their undergraduate institutions, their institutions of employment and their professional experiences. From these variables, sub-hypotheses were tested in regard to undergraduate major versus academic preparation.

The general hypothesis that the undergraduate majors are not related to the degree level of the mathematics teachers was tested by the usual Chi-Square non-parametric procedure at the .05 level. As shown in Table XXXVI, the proportions for both types of undergraduate majors were essentially the same for each of the degree levels. This is exemplified by the fact that little more than 10 per cent of the subjects for both groups of majors had bachelor's degrees, nearly

two-thirds had master's degrees for both groups, and more than one-fifth were reported on the doctoral levels for both groups of majors. The results of the Chi-Square test revealed no significant relationship between degree levels and undergraduate majors.

TABLE XXXVI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL AND TYPE OF UNDERGRADUATE MAJOR

Results of Inter-major Comparisons

Degree Level	Subjects' Type of Undergraduate Majors		
	Mathematics	Other	Total
B.S.	21	5	26
M.S.	86	27	113
Doctorate	33	9	42
	140	41	181

$X^2 = .3090$, df=4, p.>.05

Marital Status

The differential influence that each of the statuses, marital and non-marital, might have on the academic preparation of the mathematics teachers with undergraduate mathematics majors and "other" undergraduate majors was explored. In Table XXXVII, the proportions for married

subjects and those for non-married subjects are given according to their undergraduate majors and their degree levels.

TABLE XXXVII

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, MARITAL STATUS, AND TYPE OF UNDERGRADUATE MAJOR

Results of Inter-major Comparisons for each Marital Status

Degree Level	Undergraduate Major and Marital Status of the Mathematics Teachers			
	Married		Not Married	
	Mathematics	Other	Mathematics	Other
B.S.	17	3	4	2
M.S.	69	21	17	6
Doctorate	26	6	7	3
	112	30	28	11
	$X^2 = .08220$, df=2 $p.>.05$		$X^2 = .1448$, $p.>.05$	

The married mathematics majors comprised 78.9 per cent of the sample's married subjects while the non-mathematics majors who were married were found to comprise 21.1 of the entire group of married mathematics teachers. However, the proportions for majors and non-majors were the same for each of the degree levels according to the

Chi-Square computations. This finding resulted in the generalization that married mathematics teachers' degree levels are not related to their undergraduate major.

The same type of statistically supported generalization can be made regarding the non-married mathematics teachers. The results of the Chi-Square test show that, regardless of the type of undergraduate major, the degrees of the mathematics teachers were not significantly related to the majors.

Age

From the standpoint of proportions, the extreme age groups representing the youngest and oldest subjects have a similarity of proportions for undergraduate mathematics majors and undergraduate "other" majors. These proportions, according to Table XXXVIII are more than four-fifths for majors and less than one-fifth for non-mathematics majors. Among the subjects 35-49, little more than two-thirds are undergraduate mathematics majors while nearly a third have "other" majors.

In testing the proportions of mathematics majors and "other" majors against degree levels for the age groups, 35-49 and 50-64, the results supported the hypothesis that no significant relationship exists between degree levels and undergraduate majors for these particular groups. No conclusions could be drawn about the influence or relationship between subjects aged 18-34 and their degree levels and undergraduate major. This is due to the small sampling recorded for the particular classification.

TABLE XXXVIII

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, AGE, AND TYPE OF UNDERGRADUATE MAJOR

Results of Inter-major Comparisons for each Age Group

	Undergraduate Major and Age of the Mathematics Teachers					
Degree Level	18 - 34		35 - 49		50 - Above	
	Mathematics	Other	Mathematics	Other	Mathematics	Other
B.S.	1	0	14	5	6	0
M.S.	43	8	32	17	11	2
Doctorate	12	3	13	4	8	2
	56	11	59	26	25	4
	Not Valid		$X^2 = .0951$, df=2 p.>.05		$X^2 = 1.3117$, df=2 p.>.05	

Sex

No particular sex seemed to predominate either of the categories, mathematics major or "other" major, according to the frequencies given in Table XXXIX. The 27 men who listed themselved as undergraduate majors in fields other than mathematics, and the 14 who are similarly recorded for the women subjects are little more than one-fifth of their respective groups. The mathematics majors for each sex comprise nearly four-fifths of their respective groups.

In addition to the lack of predominance of one sex for either type

of undergraduate major, the statistical analysis of the frequencies did not indicate a significant relationship of the sex with the academic preparation of the subjects.

TABLE XXXIX

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, SEX, AND UNDERGRADUATE MAJOR

Results of Inter-major Comparisons for each Sex

	Subjects' Sex and Type of Undergraduate Major			
Degree Level	Men		Women	
	Mathematics	Other	Mathematics	Other
B.S.	20	3	1	2
M.S.	46	18	40	9
Doctorate	26	6	7	3
	92	27	48	14
	X^2 - 2.5811, df=2 p.>.05		X^2 = 4.1478, df=2 p.>.05	

Number of Children

"Number of children" did not prove to be a significant enough variable to reflect any association between the mathematics teachers academic majors and their degree levels. The generalization arises from the Chi-Squares computed for each of the segments of the

population, the 100 with either three children or less, and the segment having four or more children. It can be concluded that the frequencies in Table XL are adequate representations of the mathematics teachers' siblings and degree levels for this sampling.

TABLE XL

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, NUMBER OF CHILDREN, AND TYPE OF UNDERGRADUATE MAJOR

Results of Inter-major Comparisons for each Group of Teachers

	Subjects' Number of Children and Undergraduate Major			
Degree Level	Three or less		Four or more	
	Mathematics	Other	Mathematics	Other
B.S.	8	2	13	3
M.S.	51	15	35	12
Doctorate	18	6	15	3
	77	23	63	18
	X^2 = .1078, df=2 p.>.05		X^2 = .7010, df=2 p.>.05	

Age of Children

Just as "number of children" was reported to have no relationship with the mathematics teachers undergraduate majors and degree levels,

the same can be said about the age of the respondents' children. The frequencies as presented in Tables XLI and XLII for the categories, age of oldest child and age of youngest child, were each tested. The results of Chi-Square tests show that the variables "age of children" and "number of children" provide no significant relationship between the degree levels of the subjects when undergraduate majors are considered.

TABLE XLI

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF OLDEST CHILD, AND TYPE OF UNDERGRADUATE MAJOR

Results of Inter-major Comparisons for each Group of Teachers

	Age of Subjects' Oldest Child and Type of Undergraduate Major			
Degree Level	Nine years or younger		Ten Years or older	
	Mathematics	Other	Mathematics	Other
B.S.	8	3	13	2
M.S.	55	16	31	11
Doctorate	15	6	18	3
	78	25	62	16
	$X^2 = .3816$, df=2 $p.>.05$		$X^2 = 1.8040$, df=2 $p.>.05$	

TABLE XLII

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF YOUNGEST CHILD, AND TYPE OF UNDERGRADUATE MAJOR

Results of Inter-major Comparisons for each Group of Teachers

	Age of Subjects' Youngest Child and Type of Undergraduate Major			
Degree Level	Nine years or younger		Ten years or older	
	Mathematics	Other	Mathematics	Other
B.S.	8	3	13	2
M.S.	52	19	34	8
Doctorate	20	5	13	4
	80	27	60	14
	$X^2 = 4.749$, df=2 p.>.05		$X^2 = .5233$, df=2 p.>.05	

Undergraduate Institution

Neither of the types of undergraduate institutions, public nor private, showed a significant relationship between the degree levels of mathematics teachers and their undergraduate major. The frequencies (See Table XLIII) which led to the above conclusion are very closely commensurate with the frequencies expected of this sampling. This is evidenced by the Chi-Squares that were computed. This leads to a generalization that there is not enough of a disparity in the degree levels of the two groups of subjects that would cause any noticeable

contrasts between types of majors. One could further assert the possibility that the comparative training of the two types of undergraduate majors may be due possibly to non-mathematics majors having other majors allowing for training commensurate with that of the majors.

TABLE XLIII

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE INSTITUTION, AND TYPE OF UNDERGRADUATE MAJOR

Results of Inter-major Comparisons for each Undergraduate Institution

	Subjects' Type of Undergraduate Institution and Type of Undergraduate Major			
Degree Level	Public		Private	
	Mathematics	Other	Mathematics	Other
B.S.	12	3	9	2
M.S.	44	17	42	10
Doctorate	17	5	16	4
	73	25	67	16
	X^2 = .0153, df=2 p.>.05		X^2 = .5079, df=2 p.>.05	

Place of Employment

No striking relationship was observed among the mathematics

teachers when comparing their undergraduate majors and degree levels with the kinds of institutions where the subjects teach. Despite the large number working for public institutions and its greater proportions with "other" undergraduate majors, no variations were detected between degree levels and undergraduate majors. Similar results were determined for subjects teaching mathematics for private institutions (See Table XLIV).

TABLE XLIV

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF EMPLOYING INSTITUTION, AND TYPE OF UNDERGRADUATE MAJOR

Results of Inter-major Comparisons for each Type of Institution

	Subjects' Type of Employing Institution and Type of Undergraduate Major			
Degree Level	Public		Private	
	Mathematics	Other	Mathematics	Other
B.S.	12	4	9	1
M.S.	58	21	28	6
Doctorate	25	7	8	2
	95	32	45	9
	X^2 = .2681, df=2 p.>.05		X^2 = .4235, df=2 p.>.05	

Professional Experiences

Professional experiences provided no differential effects between the mathematics teachers' earned degrees and their undergraduate institutions. The findings in regard to a relationship between degrees and undergraduate majors for subjects with college teaching as their exclusive professional experiences are analogous to the results obtained for subjects who reported having other teaching experiences.

The proportions given in Table XLV assert that for each of the types of undergraduate majors the approximate frequencies were expected of such samplings for either major. With some degree of caution, one might assume that subjects with other teaching experience seem to be on par academically with subjects having exclusive college teaching experience. Perhaps the former group was able to effect a transition to college teaching without academic pressures that ordinarily emanate from job differences and differences in undergraduate majors.

Summary

A prediction was made that type of undergraduate major was not related to the achievement of various degree levels of mathematics teachers. In determining the proportions of teachers with the two types of undergraduate major, mathematics and "other", this prediction was a valid one for the entire sample used in this study. There also is no significant relationship between undergraduate major and degree levels achieved when the sample is further classified according to: sex, age, marital status, number of children, age of children, type of undergraduate institution attended, types of employment institutions, and types of professional experience.

TABLE XLV

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, PROFESSIONAL EXPERIENCES, AND TYPE OF UNDERGRADUATE MAJOR

Results of Inter-major Comparisons for each Type of Professional Experience

Degree Level	Subjects' Type of Professional Experience and Type of Undergraduate Major			
	College Teaching		Other	
	Mathematics	Other	Mathematics	Other
B.S.	12	2	9	3
M.S.	42	14	44	13
Doctorate	17	6	16	3
	71	22	69	19
	$X^2 = 1.1889$, df=2 p.>.05		$X^2 = .5043$, df=2 p.>.05	

Hypothesis IV

An analysis was made to determine if the type of institution attended as an undergraduate (public versus private) is related to the degree level attained by mathematics faculties. For the general sample, there is no significant relationship between type of undergraduate institution attended and degree level subsequently attained (See Table XLVI).

TABLE XLVI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons

Degree Level	Subjects' Type of Undergraduate Institution Attended		
	Public	Private	Total
B.S.	15	11	26
M.S.	61	52	113
Doctorate	22	20	42
	98	83	181

$X^2 = .1856$, df=2, $p.>.05$

Age

Table XLVII presents the results of separate analyses for each of the mathematics teachers' age groups. No conclusions could be drawn regarding the relationship of undergraduate institution and degree level held by the teachers 18-34 years of age because of the small expectancies obtained for the bachelor's degree level. However, for the age groups 35-49, and 50-above, the proportions of the sample did permit a valid Chi-Square test. The results of the Chi-Square test indicated that for each of the latter two groups, no significant relationship exists between the earned degree level and type of undergraduate institution attended.

TABLE XLVII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE, AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons for each Age Group

	Subjects' Age and Type of Undergraduate Institution Attended					
Degree Level	18 - 34		35 - 49		50 - Above	
	Public	Private	Public	Private	Public	Private
B.S.	1	0	11	8	3	3
M.S.	33	18	22	27	6	7
Doctorate	8	8	8	9	6	4
	42	25	41	44	15	14
	Not Valid		$X^2 = .9380$, df=2 p.>.05		$X^2 = 1.4430$, df=2 p.>.05	

Sex

The frequencies presented in Table XLVIII show that the men subjects for both types of undergraduate institutions reflected very little variation in the proportions of their subsequent degree levels. When these proportions were tested for additional clarification of a relationship between degree levels and types of undergraduate institutions, no significant relationship was discerned.

The frequencies given in Table XLVIII do show somewhat higher variations on the degree levels of the women undergraduates of the

public and private institutions. However, the minor variations, when tested, were found to be attributable to chance.

TABLE XLVIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, SEX, AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons for each Sex

Degree Level	Subjects' Sex and Type of Undergraduate Institution Attended			
	Men		Women	
	Public	Private	Public	Private
B.S.	14	9	1	2
M.S.	31	33	30	19
Doctorate	19	13	3	7
	64	55	34	28
	X^2 - 1.6030, df=2 p. $>$.05		X^2 = 3.8582, df=2 p. $>$.05	

Marital Status

According to an analysis of the responses relative to the married mathematics teachers, no significant relations were found between the subsequent degree levels of undergraduates of public institutions and the undergraduates of private institutions. When

analyzing the responses of the unmarried teachers, the findings were similar (See Table XLIX).

TABLE XLIX

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, MARITAL STATUS, AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons for each Type of Marital Status

	Subjects' Marital Status and Type of Undergraduate Institution Attended			
Degree Level	Married		Not Married	
	Public	Private	Public	Private
B.S.	11	9	4	2
M.S.	51	39	10	13
Doctorate	20	12	2	8
	82	60	16	23
	X^2 = .0401, df=2 p.>.05		X^2 = 3.5148, df=2 p.>.05	

Number of Children

Table L presents the results of the Chi-Square test of a significant relationship between the baccalaureate degree holders working for private institutions and the baccalaureate degree holders working

for public institutions when "number of children" was controlled. No significant relationship was reported between the two groups of teachers above for the intervening variable "number of children."

TABLE L

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, NUMBER OF CHILDREN, AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons for each Group of Teachers

	Subjects' Number of Children and Type of Undergraduate Institution Attended			
Degree Level	Three or less		Four of more	
	Public	Private	Public	Private
B.S.	5	5	10	6
M.S.	38	28	23	24
Doctorate	11	13	11	7
	54	46	44	37
	$X^2 = 1.0485$, df=2 p.>.05		$X^2 = 1.0832$, df=2 p.>.05	

Age of Children

Tables LI and LII provide information about the mathematics teachers degree level, age of children and type of undergraduate institution

attended. From Table LI one observes no significant relationship between degree levels of subjects who attended public institutions as undergraduates and subjects who attended private institutions as undergraduates when the variable "age of youngest child" was considered. Table LII presents similar results for the variable "age of oldest child." Hence, "age of children" is not significantly related to the degree levels of the two groups of teachers: those who received their undergraduate degrees from public institutions and those who received their undergraduate degrees from private institutions.

TABLE LI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF YOUNGEST CHILD, AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons for each Group of Teachers

	Subjects' Age of Youngest Child and Type of Undergraduate Institution Attended			
Degree Level	Nine years or younger		Ten years and older	
	Public	Private	Public	Private
B.S.	7	4	8	7
M.S.	39	32	22	20
Doctorate	14	11	8	9
	60	47	38	36
	$X^2 = .2932$, df=2 p.>.05		$X^2 = .1500$, df=2 p.>.05	

TABLE LII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF OLDEST CHILD, AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons for each Group of Teachers

	Subjects' Age of Oldest Child and Type of Undergraduate Institution Attended			
Degree Level	Nine years or younger		Ten years and older	
	Public	Private	Public	Private
B.S.	6	5	9	6
M.S.	41	30	20	22
Doctorate	8	13	14	7
	55	48	43	35
	$X^2 = 2.5156$, df=2 p.>.05		$X^2 = 2.2315$, df=2 p.>.05	

Place of Employment

Table LIII presents the proportions used for testing the hypothesis that there would be no relationship between degree levels of the mathematics personnel teaching at public institutions and those teaching at private institutions when classified according to their undergraduate institution.

Among the mathematics teachers working for public institutions, no relationship exists between their undergraduate institution and their degree level. The results are similar for the mathematics

teachers who work for private institutions.

TABLE LIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF EMPLOYING INSTITUTION, AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons for each Type of Employment Institution

	Subjects' Type of Employment Institution and Type of Undergraduate Institution Attended			
Degree Level	Public		Private	
	Public	Private	Public	Private
B.S.	8	8	7	3
M.S.	45	34	16	18
Doctorate	17	15	5	5
	70	57	28	26
	X^2 = .3294, df=2 p.>.05		X^2 = 1.6458, df=2 p.>.05	

Undergraduate Major

Among the group of teachers with undergraduate majors in mathematics, no significant relationship exists between their degree levels and the type of undergraduate institution attended. Similarly, among those teachers with "other" undergraduate majors, no relationship

exists between degree levels and type of undergraduate institution attended. The frequencies by which these results were obtained are presented in Table LIV.

TABLE LIV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE MAJOR, AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons for each Type of Undergraduate Major

	Subjects' Type of Undergraduate Major and Type of Undergraduate Institution Attended			
Degree Level	Mathematics		Other	
	Public	Private	Public	Private
B.S.	12	9	3	2
M.S.	44	52	17	10
Doctorate	17	16	5	4
	73	67	25	16
	X^2 = .2487, df=2 p.>.05		X^2 = .1579, df=2 p.>.05	

Professional Experiences

Another facet of investigating the relationship of types of undergraduate institutions with degree levels of the mathematics

teachers was the scrutiny of the teachers' professional careers. The available data as shown in Table L V permits an examination of degree levels among those mathematics teachers who reported college teaching as their exclusive professional experience. A similar examination was made for the groups of teachers with other experiences prior to entering college teaching.

TABLE LV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF PROFESSIONAL EXPERIENCE, AND TYPE OF UNDERGRADUATE INSTITUTION ATTENDED

Results of Inter-institutional Comparisons for each Type of Experience

	Subjects' Type of Professional Experience and Type of Undergraduate Institution Attended			
Degree Level	College Teaching		Other	
	Public	Private	Public	Private
B.S.	8	6	7	5
M.S.	32	24	29	28
Doctorate	10	13	12	7
	50	43	48	40
	$X^2 = 1.9102$, df=2 p.>.05		$X^2 = 1.5112$, df=2 p.>.05	

No relationship exists between types of undergraduate institutions

and subsequent degree levels for the mathematics teachers who reported college teaching as their only professional experience. Also, no relationship exists between types of undergraduate institutions and subsequent degree levels for mathematics teachers who reported "other" professional experiences.

Summary

Recapitulating the findings of this section, one notes how homogeneous the two groups, baccalaureate degree holders from public and private institutions, were in regard to their academic preparation. These findings resulted when the data were subjected to numerous examinations based on classification principles relevant to this type of research and used in previous sections.

Initially, the mathematics teachers comprising the total sample were contrasted according to their undergraduate institutions and degree levels. No relationship was noted.

Groupings based on the personal characteristics of the mathematics teachers such as sex, age, marital status, number of children, and age of children, did not result in a significant relationship between undergraduate institutions and degre levels of the mathematics teachers. The results are also the same for the variables, "type of employing institution," "undergraduate major," and "professional experiences."

Hypothesis V

The relevancy of comparing the academic preparation of groups of teachers on the basis of their employing institutions has been

qualified by frequent references to several studies. Citing larger bodies of research such as the Eckert and Stecklein study (16, p. 76), it can be reported that particular significance can be attached to circumstances of graduate training as they apply to personnel who teach at certain kinds of colleges.

Robert P. Daniel (11, p. 388) has indicated that until the mid-forties the Negro private college provided an education for the majority of Negroes in college. His review of the different kinds of Negro institutions also indicated that since that time, the transition has been toward public colleges. Daniel also reported that the result of the predominance of the Negro private college led to a highly qualified faculty which found the private colleges more attractive than the public institutions. Weaver (54, p. 118), substantiated this contention in his appraisal of the Negro private colleges and universities. He also reported that the public institutions have been attempting to out-bid the private institutions for staff in order to satisfy accreditation requirements. These studies raise the question: Does a relationship presently exist between the degree levels of teachers working for public and private institutions?

This section is devoted to an exploration of the responses made by the mathematics teachers relative to the previously mentioned question. The investigation and analysis of the data began on a general level, investigating the degrees of the total sample with the types of institutions where they teach. According to the frequencies presented in Table LVI, no significant relationship exists between the degree levels of the public college and university teachers and the private college and university teachers.

TABLE LVI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-institutional Comparisons

Degree Level	Subjects' Type of Employing Institution		
	Public	Private	Total
B.S.	16	10	26
M.S.	79	34	113
Doctorate	32	10	42
	127	54	181

$X^2 = 1.6562$, df=2, p.>.05

Age

The responses of the mathematics teachers according to the inter-institutional comparisons of degrees for each age group are given in Table LVII. Among the mathematics teachers that were 18-34 years old, only one person was found to have a bachelor's degree. Fifty-one had earned the master's and fifteen were on the doctoral level. In reference to the entire sample of 181 mathematics teachers, the 51 who earned the master's degree represent almost 50 per cent of the entire sample.

With the exception of the lone bachelor's degree holder who was serving at a private institution, both public and private respondents were similar with respect to proportions found on the other degree

levels. These proportions when tested, indicated a lack of institutional influence between the degree levels of two groups of teachers - those teaching in public institutions and those teaching in private institutions.

TABLE LVII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE, AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-institutional Comparisons for each Age Group

	Subjects' Age and Type of Employing Institution					
Degree Level	18 - 34		35 - 49		50 - Above	
	Public	Private	Public	Private	Public	Private
B.S.	0	1	14	5	2	4
M.S.	33	18	35	14	11	2
Doctorate	9	6	16	1	7	3
	42	25	65	20	20	9
	$X^2 = 1.6523$, df=2 p. $\geq .05$		$X^2 = 3.7166$, df=2 p. $\geq .05$		$X^2 = 5.6519$, df=2 p. $\geq .05$	

There appears to be more apparent but still insignificant relationships in the degree levels of the public and private mathematics teachers in the age group, 35-49. The mathematics teachers of the private institutions had a greater proportionate share of master's

degree recipients in its group, but more bachelors and fewer doctorates than the mathematics teachers in public institutions.

Much more discernible contrasts were also observed among the mathematics teachers who were 50 years old or more. For an instance, more bachelor's degree recipients (4) were among the private college and university mathematics teachers, while the master's degree was the predominant degree for the teachers at public institutions. In addition, two of the 20 public college teachers possess only the bachelor's degree.

Such disparities in degrees among the public and private institution mathematics teachers, when tested, are significant at the .10 level, but not at the desired .05 level. The significance at the .10 level is suggestive at least of relationships between earned degrees and types of employing institutions for a sub-group of the mathematics teachers 50 years and older.

Sex

One sees from Table LVIII that the men who responded to this study from the public institutions are statistically no different from their male peers in private institutions when a collation of degrees is made.

The mathematics teachers in public institutions are proportionately less in terms of bachelor's degree holders and greater in terms of recipients of the master's and doctoral degrees. This perhaps accounts for the apparent variations that did exist.

Less contrasts in earned degrees are evident among the women mathematics teachers. Consequently, there is much less of a

relationship between the earned degrees of the women teachers in public institutions and the earned degrees of their peers in private institutions.

TABLE LVIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, SEX, AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-institutional Comparisons for each Sex

	Sex and Type of Employing Institution			
Degree Level	Men		Women	
	Public	Private	Public	Private
B.S.	13	10	3	0
M.S.	46	18	33	16
Doctorate	25	7	7	3
	84	35	43	19
	$X^2 = 3.1186$, df=2 p.>.05		$X^2 = 1.4205$, df=2 p.>.05	

Marital Status

Among the parallels to be noted relative to the married teachers is their similarity of proportions for master's degrees for both kinds of institutions. Beyond this, the two groups are disproportionate on other degree levels with the mathematics teachers in public

institutions still maintaining a positive distinction of fewer bachelor's degree holders and more doctorates as indicated in Table LIX. These apparent variations in degrees do not contribute to a significant relationship between the earned degrees of the teachers in public institutions and those in private institutions.

TABLE LIX

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, MARITAL STATUS, AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-institutional Comparisons for each Type of Marital Status

	Marital Status and Type of Employing Institution			
Degree Level	Married		Not Married	
	Public	Private	Public	Private
B.S.	11	9	5	1
M.S.	62	28	17	6
Doctorate	25	7	7	3
	98	44	29	10
	$X^2 = 3.0796$, df=2 p.>.05		$X^2 = .3556$, df=2 p.>.05	

Authentication of the hypothesis that marital status is not a relevant factor in degree levels of public and private groups of mathematics teachers is further substantiated by the findings regarding

unmarried subjects. As shown in Table LIX, the contrasts for this group are less apparent, and are not statistically significant.

Number of Children

No major deviations in the distribution of the institutional and degree attributes for the subjects with at most three children are reported. Therefore, one could not imply that a progeny of three at most, served as an intervening variable on the degree levels of the public and private college and university mathematics teachers.

The groups of subjects with the more numerous progeny of four children or more are not significantly related in terms of their earned degrees. Consequently, any distinctions between degree levels of the public and private mathematics teachers cannot be attributed to such a familial consideration as number of children. The data that resulted in these conclusions are presented in Table LX.

Age of Children

Tables LXI and LXII correlate the public and private college and university mathematics teachers' degrees with the ages of their oldest and youngest children. The proportions are listed according to the four separately tested classifications used throughout this study.

For each of the four individual Chi-Square tests that were computed, "age of children," there is no significant relationship between the academic degrees of the teachers in public institutions and their peers in private institutions.

TABLE LX

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, NUMBER OF CHILDREN, AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-Institutional Comparisons for each Group of Teachers

Degree Level	Number of Children and Type of Employing Institution			
	Three of less		Four or more	
	Public	Private	Public	Private
B.S.	6	4	10	6
M.S.	49	17	30	17
Doctorate	18	6	14	6
	73	27	54	27
	$X^2 = .9578$, df=2 p.>.05		$X^2 = 1.2931$, df=2 p.>.05	

TABLE LXI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL AGE OF OLDEST CHILD, AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-institutional Comparisons for each Group of Teachers

Degree Level	Age of Oldest Child and Type of Employing Institution			
	Nine years or younger		Ten years and older	
	Public	Private	Public	Private
B.S.	6	5	10	5
M.S.	51	20	28	14
Doctorate	16	5	16	5
	73	30	54	24
	$X^2 = 1.7389$, df=2 p.>.05		$X^2 = .6534$, df=2 p.>.05	

TABLE LXII

FREQUENCY DISTRIBUTION FOR MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF YOUNGEST CHILD, AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-institutional Comparisons for each Group of Teachers

	Age of Youngest Child and Type of Employing Institution			
Degree Level	Nine years or younger		Ten years and older	
	Public	Private	Public	Private
B.S.	5	6	11	4
M.S.	48	23	31	11
Doctorate	17	8	15	2
	70	37	57	17
	$X^2 = 2.1618$, df=2 $p > .05$		$X^2 = 1.5656$, df=2 $p > .05$	

Undergraduate Institution

The previous major hypothesis (Hypothesis IV) analyzed the data relative to the argument of the academic preparation of public undergraduates versus the degree levels of the private undergraduates. An effort to provide further clarification between baccalaureate institutions and degree levels of teachers was made when responses of the teachers working in public institutions were analyzed according to their degree levels and undergraduate institutions. A similar analysis was conducted for the mathematics teachers employed at private

institutions.

The present discourse provides additional information by presenting the results of the analysis in which the responses of teachers with baccalaureate degrees from public institutions were analyzed according to their degree levels and employment institutions. Similarly, an analysis was conducted for the mathematics teachers who received their undergraduate degrees from private institutions.

From the Chi-Square results presented in Table LXIII, one observes that the noted variations in proportions do not contribute to a significant relationship between the degree levels of the alumni of public undergraduate institutions who were found teaching in public and private institutions. Similarly, the alumni of private undergraduate institutions show no differentiated effects in degree levels while teaching at either the public or private institutions.

Undergraduate Major

For those teachers with mathematics as an undergraduate major, no relationship exists between their degree levels and the two types of institutions where they are employed. It can also be reported that among the teachers with "other" undergraduate majors, no significant relationship exists between their degree levels and the types of institutions where they work. Table LXIV presents the data by which these results were obtained.

Professional Experiences

Separation of the mathematics teachers according to their initial vocations permitted a test of the hypothesis that each of these

TABLE LXIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE INSTITUTION ATTENDED, AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-institutional Comparisons for each Type of Undergraduate Institution

Degree Level	Undergraduate Institution and Type of Employing Institution			
	Public		Private	
	Public	Private	Public	Private
B.S.	8	7	8	3
M.S.	45	16	34	18
Doctorate	17	5	15	5
	70	28	57	36
	$X^2 = 2.9388$, df=2 p.>.05		$X^2 = .7176$, df=2 p.>.05	

TABLE LXIV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE MAJOR, AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-institutional Comparisons for each Type of Major

	Undergraduate Major and Type of Employing Institution			
Degree Level	Mathematics		Other	
	Public	Private	Public	Private
B.S.	12	9	4	1
M.S.	58	28	21	6
Doctorate	25	8	7	2
	95	45	32	9
	$X^2 = 2.0564$, df=2 p.>.05		$X^2 = .0127$, df=2 p.>.05	

vocations would result in a relationship between degree levels and the two types of employment institutions. The data which is presented in Table LXV indicates no relationship exists between the degree levels of subjects with college teaching as their exclusive vocation and types of employment institutions. The results are similar for teachers with "other" vocations.

TABLE LXV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF PROFESSIONAL EXPERIENCE, AND TYPE OF EMPLOYING INSTITUTION

Results of Inter-institutional Comparisons for each Professional Experience

Degree Level	Professional Experience and Type of Employing Institution			
	College Teaching		Other	
	Public	Private	Public	Private
B.S.	9	5	7	5
M.S.	40	16	39	18
Doctorate	16	7	16	3
	65	28	62	26
	$X^2 = 1.1875$, df=2 $p.>.05$		$X^2 = 2.6413$, df=2 $p.>.05$	

Summary

One general hypothesis and eight sub-hypotheses were tested in an effort to determine whether between public and private institutions there is a significant difference in the academic preparation of their mathematics faculty holding different degree levels. For the total sample, it was determined that no significant relationship exists between degree levels of mathematics teachers and the type of institution in which they were employed.

It also was noted that proportions of mathematics faculty folding various degree levels do not differ significantly between public and private institutions when classified according to: age, sex, marital status, number of children, age of children, and professional experience. A lack of significant relationship between the degree levels of the subjects and the type of control of their employing institutions also was noted when the teachers were categorized according to their undergraduate institutions (public versus private); and their undergraduate majors (mathematics versus non-mathematical).

Hypothesis VI

Some evidence has already been presented regarding the relationship between each kind of professional experience and the degree levels of the mathematics teachers. The five previous sections presented the results of the analyses of data which indicated the relationship between the degree levels of mathematics teachers with only college teaching experience and the variables: parental education, type of undergraduate institution attended; type of undergraduate major, and type of their employing institution. Similar results involving the

same variables were presented for those teachers with "other" professional experiences.

The present section provides an expansion of the analyses of data to include inter-experience level comparisons as a means of further clarifying the relationship between degree levels of the mathematics teachers and their professional experiences. The demographic variables used in the previous sections were also included in the analyses of data being discussed in this section. These are: age, sex, marital status, number of children, age of youngest child, age of oldest child, undergraduate major, undergraduate institution attended, and employment institution.

In Table LXVI, the results of the examination of degree levels of subjects having the two types of professional experiences are presented. No significant relationship exists between the degree levels of the subjects and the type of professional experience they reported.

Age

Table LXVII presents the data relative to the relationship of age, degree levels and professional experiences of the mathematics teachers. For those subjects 18-34 years old, no conclusions can be stated about the relationship between their degree levels and their professional experiences because the small sampling of bachelor's degree holders precluded the use of the Chi-Square technique.

Among the teachers 35-49 years old, and also among those who were 50 years old or older, no significant relationship exists between degree levels and professional experiences.

TABLE LXVI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-Professional Level Comparisons

Degree Level	Subjects' Type of Professional Experience		
	College Teaching	Other	Total
B.S.	14	12	26
M.S.	58	57	113
Doctorate	23	19	42
	93	88	181

$X^2 = 1.7001$, df=2, $p. > .05$

TABLE LXVII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE, AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-professional Level Comparisons for each Age Group

	Subjects' Age and Type of Professional Experience					
Degree Level	18 - 34		35 - 49		50 - Above	
	College Teaching	Other	College Teaching	Other	College Teaching	Other
B.S.	1	0	10	9	3	3
M.S.	26	25	24	25	6	7
Doctorate	13	2	12	5	2	8
	40	27	42	43	11	18
	Not Valid		$X^2 = 3.421$, df=2 p. $>.05$		$X^2 = 2.9561$, df=2 p. $>.05$	

Sex

When each sex was investigated separately for an association of professional experiences and degree levels, the results were that among men, no significant relationship between degree levels and professional experiences existed.

Among the women subjects, some apparent variations in proportions were noted. However, as indicated in Table LXVIII, these variations resulted in a relationship between professional experiences and degree levels that met only the .10 probability level, not the desired .05 level.

TABLE LXVIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, SEX, AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-professional Level Comparisons for each Sex

	Subjects' Sex and Type of Professional Experience			
Degree Level	Men		Women	
	College Teaching	Other	College Teaching	Other
B.S.	11	12	3	0
M.S.	36	28	20	29
Doctoral	17	15	6	4
	64	55	29	33
	$X^2 = 1.4070$, df=2 p.>.05		$X^2 = 4.8013$, df=2 p.>.05	

Marital Status

Among the married subjects, similar proportions exist between the degree levels and types of professional experiences as indicated in Table LXIX. These similar proportions, when tested by the Chi-Square technique, indicate no significant relationship between the degree levels of the married mathematics teachers and their professional experiences.

An apparent relationship between professional experiences and degree levels was observed among those mathematics teachers who were not married. The relationship is statistically significant at the .02

level of significance. Perhaps the conspicuous frequencies which demonstrated that those in "other" professions had only the master's degree account for the statistically significant relationships between degree levels and professional experiences for this unmarried group. As indicated in Table LXIX, the subjects with exclusive college teaching experience were in a greater proportion on the doctoral level than the subjects with "other" professional experiences.

TABLE LXIX

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, MARITAL STATUS, AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-professional Level Comparisons for each Marital Status

Degree Level	Subjects' Marital Status and Type of Professional Experiences			
	Married		Not Married	
	College Teaching	Other	College Teaching	Other
B.S.	8	12	6	0
M.S.	53	37	3	20
Doctorate	13	19	10	0
	74	69	19	20
	$X^2 = 4.1435$, df=2 p.>.05		$X^2 = 8.9334$, df=2 p.<.02	

Number of Children

The distribution of frequencies for mathematics teachers having various degree levels, numbers of children, and professional experiences are given in Table LXX. The results of analyzing these frequencies indicated that for teachers with three children of less, no relationship exists between their degree levels and their professional experiences. Similar results can be reported for teachers with four or more children.

TABLE LXX

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, NUMBER OF CHILDREN, AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-professional Level Comparisons for each Group of Teachers

	Subjects' Number of Children and Type of Professional Experience			
Degree Level	Three or less		Four or more	
	College Teaching	Other	College Teaching	Other
B.S.	8	2	6	10
M.S.	40	26	16	31
Doctorate	13	11	10	8
	61	39	32	49
	$X^2 = 2.2463$, df=2 p.>.05		$X^2 = 2.4913$, df=2 p.>.05	

Age of Children

The age of subjects' oldest child figured prominently in the relationship between the teachers' degree levels and their professional experiences. From the results given in Table LXXI, one notes that for teachers with youngest child 9 years old or younger, a significant relationship exists between their degree levels and their professional experiences. This also is true for those teachers whose oldest child is 10 years or older.

TABLE LXXI

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF OLDEST CHILD AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-professional Level Comparisons for each Group of Teachers

	Age of Subjects' Oldest Child and Type of Professional Experience			
Degree Level	Nine years or younger		Ten years or older	
	College Teaching	Other	College Teaching	Other
B.S.	9	2	5	10
M.S.	43	28	13	29
Doctorate	8	13	15	6
	60	43	33	45
	$X^2 = 6.2013$, df=2 $p.<.05$		$X^2 = 6.4532$, df=2 $p.<.05$	

Where age of oldest child is 10 or more years, there was a tendency for subjects having only college teaching experience to have more representation on the doctoral levels. The reverse of this relationship is observed among the subjects whole oldest child is less than 10 years of age.

According to Table LXXII, the age of youngest child 9 years or younger, is not indicative of a significant relationship between degree levels of the mathematics teachers and their professional careers. A more apparent relationship is observed between degree levels and professional experiences of those teachers whose youngest child was 10 years old or more. The significance of this relationship, however, is at the .10 level and not at the .05.

Undergraduate Major

Table LXXIII presents results of the responses regarding a relationship between degree levels and professional experiences for the undergraduate mathematics major, and similar results of responses for the undergraduate "other" majors. For each of the types of undergraduate majors, no significant relationship exists between degree levels of the mathematics teachers and their professional experiences.

Undergraduate Institution

In Table LXXIV, each of the types of undergraduate institutions is examined for a relationship between the degree levels and the professional experiences of the mathematics teachers. Among the subjects who received their undergraduate degrees from public institutions, no significant relationship exists between the mathematics teachers degree

TABLE LXXII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, AGE OF YOUNGEST CHILD, AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-professional Level Comparisons for each Group of Teachers

	Age of Subjects' Youngest Child and Types of Professional Experiences			
Degree Level	Nine years or younger		Ten years or older	
	College Teaching	Other	College Teaching	Other
B.S.	5	6	9	6
M.S.	46	25	10	32
Doctorate	17	8	6	11
	68	39	25	49
	$X^2 = 1.4563$, df=2 $p.>.05$		$X^2 = 5.9561$, df=2 $p.>.05$	

TABLE LXXIII

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE MAJOR, AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-professional Comparisons for each Type of Undergraduate Major

	Subjects' Type of Undergraduate Major and Type of Professional Experience			
Degree Level	Mathematics		Other	
	College Teaching	Other	College Teaching	Other
B.S.	12	9	2	3
M.S.	42	44	14	13
Doctoral	17	16	6	3
	71	69	22	19
	$X^2 = 1.5011$, df=2 p.>.05		$X^2 = 2.0343$, df=2 p.>.05	

TABLE LXXIV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF UNDERGRADUATE INSTITUTION ATTENDED, AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-professional Level Comparisons for each Type of Undergraduate Institution

	Subjects' Type of Undergraduate Institution and Type of Professional Experience			
Degree Level	Public		Private	
	College Teaching	Other	College Teaching	Other
B.S.	8	7	6	5
M.S.	32	29	24	28
Doctorate	10	12	13	7
	50	48	43	40
	$X^2 = 1.8420$, df=2 $p. > .05$		$X^2 = 2.2556$, df=2 $p. > .05$	

levels and their professional experiences. No significant relationship exists between degree levels and professional experiences of the mathematics teachers who received their undergraduate degrees from private institutions.

Employing Institution

For the 127 mathematics teachers located at public institution, no significant relationship was determined between their degree levels and their professional experiences. Among the 54 mathematics

teachers working at private institutions the results are similar: no significant relationship exists between their degree levels and their professional experiences. Table LXXV presents the frequencies by which these results were obtained.

TABLE LXXV

FREQUENCY DISTRIBUTION OF MATHEMATICS TEACHERS' DEGREE LEVEL, TYPE OF EMPLOYING INSTITUTION, AND TYPE OF PROFESSIONAL EXPERIENCE

Results of Inter-professional Level Comparisons for each Type of Employing Institution

	Subjects' Type of Employing Institution and Type of Professional Experience			
Degree Level	Public		Private	
	College Teaching	Other	College Teaching	Other
B.S.	9	7	5	5
M.S.	40	39	16	18
Doctorate	10	16	7	3
	65	62	28	26
	$X^2 = 1.4102$, df=2 p.>.05		$X^2 = 2.1802$, df=2 p.>.05	

Summary

A general analysis of degrees and professional experiences did

not reflect a significant relationship between the two variables for the 181 mathematics teachers who were part of this study. Some significant relationships are noted, however, when several intervening variables were tested. The unmarried subjects' degree levels are significantly related to their professional experiences.

It was also reported that dividing subjects according to "age of oldest child" resulted in a significant relationship between the mathematics teachers' degree levels and their professional experiences. No significant relationship was determined between degree levels and professional experiences when responses of the teachers were analyzed according to such demographic characteristics as: age, sex, number of children, age of youngest child, undergraduate major and employment institution.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

A review of the purpose and the statistical design of the present study are presented in this chapter. Summaries of the results obtained by percentages and by Chi-Square tests are also presented along with conclusions, implications, and recommendations resulting from data accumulated.

Review of the Purpose and Statistical Design

The design for this dissertation was initiated in an attempt to determine whether there were significant relationships between levels of academic preparation of mathematics teachers in predominantly Negro colleges and universities and a number of demographic variables. The major demographic variables included were: the educational levels of the subjects' mothers and fathers; the types of undergraduate majors of the subjects; the types of undergraduate institutions attended by the subjects; the types of employment institutions of the subjects; and, the types of professional experiences of the subjects. Other variables considered in combination with the above were: age of subjects, number of their children, age of their youngest and oldest child, sex, and marital status.

The rationale for this study emanated from a review of the literature pertaining to college teaching in general, and to Negro college

and university teachers in particular. Information from the Negro College in Transition also generated much of the impetus for this study. In the beginning of the investigation it was assumed that the degree levels of the subjects arose from an association with their familial, educational, and vocational environments. The data were derived from personal interviews and interviews by mail. The result of these procedures was a 70.42 per cent response of the total number of teachers polled. These subjects included in the study represented 86.6 per cent of the institutions meeting the accreditation requirements for inclusion in this study. While the sample included a cross-section of the nation's predominantly Negro colleges and universities, most of the institutions were located in the Deep South.

The instrument developed for this investigation consisted of a two-page, structured questionnaire which requested information relative to personal, educational and professional characteristics of the subjects. The statistical techniques including presenting data of a general nature in percentages and then analyzing pertinent data by means of the Chi-Square test. The computations for this study were conducted at the Oklahoma State University Computer Center, Stillwater, with the aid of an IBM 1640 Computer.

Summary of Results Obtained from the Analysis of Data by Percentages

Findings relative to the characteristics of mathematics faculty members are:

1. Sixty-five per cent of the respondents were men; the median age of the teachers was 37.5 years; and, 78.45 per cent were married.

2. Two-fifths of the respondents' fathers and a third of the respondents' mothers had not gone beyond the eighth grade; and only one-fourth of the respondents' fathers and mothers attended college. Less than one-tenth of the respondents' fathers and mothers had taken graduate or professional work.

3. Public and private colleges contributed almost equally to the undergraduate preparation of the respondents.

4. Eighty-six per cent of the mathematics teachers had earned the master's degree. Thirteen per cent of this group had also earned a doctorate, and another 10 per cent of the master's degree holders indicated they were studying toward a doctorate.

5. More than two-fifths of the master's degrees have been awarded since 1960, and a third of these degrees was conferred by one institution.

6. Almost one-half of the mathematics teachers were awarded National Science Foundation stipends which were used to finance the master's degree program. Personal savings also proved to be another major source of financing the master's degree with approximately one-half of the teachers using this source.

7. Half of the mathematics teachers have had no professional experience other than college teaching; a third had taught at some time in elementary and secondary schools; and, the others (15 per cent) were from non-teaching jobs. The median years of service as a college teacher was 8.2 years.

Summary of Results Related to the Hypotheses

This section of the study summarizes the most important findings of the investigation relative to the relationship between degree levels and demographic variables.

1. There is a significant relationship between the subjects' degree levels and their fathers' education for the following groups: men mathematics teachers; teachers at public institutions; holders of the baccalaureate degree from private institutions; teachers whose undergraduate major was mathematics; and subjects with college teaching as their only professional experience.

2. There is a significant relationship between the subjects' degree levels and their mothers' education for the following groups: men mathematics teachers, and teachers whose undergraduate major was mathematics.

3. There is no significant relationship between subjects' degree levels and types of undergraduate major (mathematical versus non-mathematical), for the general sample, nor for the groups of subjects classified according to the selected demographic variables.

4. There is no significant relationship between the subjects' degree levels and types of undergraduate institutions (public versus private), for the general sample, nor for the groups of subjects classified according to selected demographic variables.

5. There is no significant relationship between subjects' degree levels and the types of employing institutions (public versus private) for the general sample, nor for the groups of mathematics teachers classified according to selected demographic variables.

6. There is a significant relationship between subjects' degree levels and types of professional experiences (college teaching versus "other" experiences) for subjects with children of various age levels, and for unmarried subjects.

Conclusions

Some evidence has been accumulated from this survey that substantiate the fact that significant relationships do exist between degree levels of subjects and certain demographic variables:

1. There is a significant relationship between degree levels of men subjects and their parents education. No conclusions could be drawn relative to the relationship between degree levels of women subjects and their parents' education because the distribution of the sample made it impossible to conduct a Chi-Square test.

2. There is a significant relationship between degree levels of subjects with undergraduate mathematics majors and their parents' education. No conclusions could be stated relative to the relationship between degree levels of subjects with "other" undergraduate majors and their parents' education because the

distribution of the sample made it impossible to conduct a Chi-Square test.

3. There is a significant relationship between degree levels of subjects employed at public institutions and their fathers' education. No conclusions could be stated about the relationship between degree levels of subjects working for private institutions and their fathers' education because the distribution of the sample made it impossible to conduct a Chi-Square test.

4. There is a significant relationship between degree levels of subjects who earned their baccalaureate degrees from private institutions and their fathers' education. However, there is no significant relationship between degree levels of subjects who earned their baccalaureate degrees from public institutions and their fathers' education.

5. There is a significant relationship between degree levels of subjects who started their professional careers as college teachers and their fathers' education. However, no significant relationship exists between degree levels of subjects with "other" first time professional experiences and their fathers' education.

6. There is a significant relationship between the degree levels of unmarried subjects and types of professional experiences. However, there is no significant relationship between degree levels of married subjects and types of professional experiences.

7. There is a significant relationship between degree levels of subjects with children of various age levels and the subjects' types of professional experiences.

Implications Relative to the General Characteristics of the Sample

The important findings of this study suggest several implications for future study:

1. From the results of this study, it seems apparent that there is a trend toward younger mathematics teachers in the predominantly Negro institutions. The median age of 37.5 years for this study

differs from the national figure of 43 years reported by Wright and Huyck (57, p. 20). The percentage of 18-34 year old teachers (37.1 per cent) reported for this study, also is greater than the percentage reported by Wright and Huyck (57, p. 20) for white institutions (33 per cent) and for Negro institutions (29 per cent). Further study should be undertaken to determine the factors facilitating the trend and also to determine the relationship of these factors to the degree levels of the mathematics teachers.

2. A second implication of this study is that more subjects are working for public institutions. Seventy per cent of the responses were from teachers working for public institutions. This trend toward a greater number of mathematics teachers working for public institutions may be attributed in part to the increasing importance of public institutions in Negro higher education. McGrath (35, p. 20) reports that "despite the fact that private institutions out-number public institutions, they enrolled only three-fifths as many students in 1963-64." He added that by 1970, the enrollment in public institutions should reach 65 or possibly 67 per cent. The factors facilitating a shift toward more mathematics teachers for public institutions and the relationship of these factors to the degree levels of this group of teachers should be investigated.

3. A third implication of this investigation is that a paucity of financial resources existed for the subjects to do doctoral work. While National Science Foundation stipends and personal savings assisted more than half of the teachers in financing their master's degree, no such resources were abundantly available for doctoral work. A special study of how doctoral level subjects financed their studies

might identify more appropriate means of pursuing the doctorate.

4. A fourth implication of this study is that Negro women chose to teach college mathematics in the same proportion that they chose college teaching as a career. This proportion (approximately one-third) is twice that of the national proportion for women in the college teaching profession, according to Wright and Huyck (57, p. 20). Because Negro women comprise such a significant proportion of their college faculties, further study of their degree levels is suggested.

Implications Relative to the Hypotheses

Additional topics for exploratory studies have been suggested by the results of testing the six major hypotheses:

1. Further investigation is suggested to determine if there exists a significant relationship between degree levels and: parental education of women subjects; parental education of subjects with "other" undergraduate majors; and, fathers education of subjects working for private institutions. The present study presents no results relative to a significant relationship between degree levels and the aforementioned demographic variables because the distribution of the sample prevented the use of the Chi-Square technique.

2. The writer suggests a study be conducted to determine why a significant relationship exists between fathers' education and the subsequent degree levels of holders of baccalaureate degrees from private institutions. This is suggested because no significant relationship exists between fathers' education and the subsequent degree levels of holders of the baccalaureate degree from public institutions.

3. The writer suggests an investigation be conducted to

determine why a significant relationship exists between fathers' education and the degree levels of subjects with college teaching experience. This is suggested because no significant relationship exists between fathers' education and degree levels of subjects with "other" professional experiences.

4. The writer suggests an investigation be conducted to determine why a significant relationship exists between degree levels of unmarried subjects and types of professional experiences. This is suggested because no significant relationship exists between degree levels of married subjects and types of professional experiences.

Recommendations

The objective of this investigation was to determine if significant relationships existed between degree levels of mathematics teachers and selected demographic variables. The results of this study might be suggestive in facilitating administrative decisions for those who are concerned with the planning of graduate education for this particular group of teachers. Therefore, the writer recommends the following:

1. Administrators at employing institutions, educational foundations and graduate schools should recognize the youthful trend of mathematics teachers and design continuous doctoral programs for them. A continuous study period of from two to three years duration, with adequate financing is suggested. Such a continuous program would compress the duration of the doctoral studies, improve its quality, and would also minimize the attrition rate. Adequate financing is needed in order to ease some of the financial stress that

occurs between family commitments and educational requirements.

2. Administrators at employing institutions and at graduate schools should recognize the significant proportion of women mathematics teachers and should include them in any planning for graduate education of mathematics teachers working for predominantly Negro institutions.

3. Administrators at educational foundations and graduate schools should recognize the varying proportions of mathematics teachers working for public and private institutions. They should provide for graduate training and financial assistance commensurate with these proportions. This would assure each group of adequate opportunities for such training.

4. Effective means should be provided for an early identification of potential college teachers and suitable academic and professional experiences should be provided for the potential college teachers. Academic experiences should include preparation for graduate school by means of seminars, independent study and other activities similar in nature. Professional experiences should include some college teaching assignments during the prospective college teachers' senior year in preference to the regular internship program that has most teacher-oriented students interning in elementary and secondary schools.

5. If elementary and secondary schools continue to provide significant numbers of college mathematics teachers, special programs relative to the philosophy of college teaching, the psychology of teaching college students, and the content of college mathematics should be instituted.

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APPENDIX A

EXHIBIT 1

REPORT OF MAIL AND PERSONAL INTERVIEWS CONDUCTED, BY INSTITUTION AND BY NUMBER

Name of Institution	Number of Teachers	Responses Received	Rosters Provided	Institutions Visited
Agricultural and Technical State University	10	8	x	
Alabama A&M	6	5		x
Alabama State	6	4		x
Albany State	8	6	x	
Alcorn A&M	5	2	x	
Arkansas AM&N	9	9	x	
Atlanta University	1	1	x	
Barber Scotia	2	1	x	
Benedict	1	1		x
Bennett	4	4	x	x
Bethune Cook	3	3	x	x
Bishop	2	2		x
Bluefield State	2	2	x	
Central State	0	0	x	
Cheyney State	2	1	x	
Claflin	2	2	x	
Clark	5	4	x	
Delaware State	2	2	x	

EXHIBIT 1 (Continued)

Name of Institution	Number of Teachers	Responses Received	Rosters Provided	Institutions Visited
Dillard University	3	3	x	
Elizabeth City	4	2	x	
Fayetteville	5	4	x	
Fisk	3	3		x
Florida A&M	5	4	x	x
Florida Memorial	3	2		x
Fort Valley	6	6	x	
Grambling	16	6	x	
Hampton	6	1	x	
Howard	5	2	x	
Huston Tillotson	3	3	x	
Jackson State	6	6		x
Johnson C. Smith	5	2		x
Kentucky State	0	0	x	
Knoxville	2	2	x	x
Lane	1	1	x	
Langston	4	1	x	
LeMoyne	1	1	x	
Lincoln, Mo.	0	0	x	
Lincoln, Pa.	0	0	x	
Livingstone	3	2	x	
Maryland State	3	1	x	
Morehouse	0	0		

EXHIBIT 1 (Continued)

Name of Institution	Number of Teachers	Responses Received	Rosters Provided	Institutions Visited
Morgan	7	4	x	
Morris Brown	4	1	x	
Oakwood	2	2	x	x
N.C.C.	0	0		
Paine	1	1		x
Philander Smith	0	0		
Prairie View	3	3	x	
Saint Augustine's	2	2	x	
Saint Paul's	0	0		
Savannah State	6	6	x	
Shaw	4	3		x
Spelman	3	1		x
South Carolina	6	4	x	
Southern	21	13	x	
Stillman	2	1	x	
Tennessee A&I	11	7	x	
Texas Southern	13	8	x	
Tougaloo	1	1	x	
Tuskeegee	0	0		
Virginia State	8	6	x	
Virginia Union	0	0	x	
Xavier	0	0		
West Virginia State	2	2	x	

EXHIBIT 1 (Continued)

Name of Institution	Number of Teachers	Responses Received	Rosters Provided	Institutions Visited
Wilberforce	3	2	x	
Wiley	2	2	x	
Winston Salem	3	3		x
Total	257	181		

EXHIBIT 2

PARTICIPATING COLLEGES AND UNIVERSITIES,
BY TYPE OF CONTROL

Faculty Members in the Following Institutions of Higher Education were Included in the Sampling for This Study.

Public Universities

Alabama State
Alabama A&M
Florida A&M
Howard
Jackson State
Agricultural and Technical State University of North Carolina
North Carolina
Prairie View
Southern
South Carolina State
Tennessee A&I
Texas Southern

Public Colleges

Arkansas A&M
Albany State
Alcorn
Bluefield State
Central State
Cheyney State
Delaware State
Elizabeth City
Fayetteville
Fort Valley
Grambling
Kentucky State
Langston
Maryland State
Morgan State
Savannah State
West Virginia
Winston Salem

Private Universities

Atlanta
Fisk
Hampton

Private Colleges

Barber Scotia
Benedict
Bennett
Bethune-Cookman
Bishop
Lincoln
Livingstone
Morehouse
Morris Brown
Oakwood

EXHIBIT 2 (Continued)

Private Colleges (Continued)

Claflin	Paine
Clark	Philander Smith
Dillard	St. Augustine
Florida Memorial	Shaw
Huston-Tillotson	Spelman
Jarvis Christian	Stillman
Johnson C. Smith	Texas Southern
Knoxville	Tougaloo
Lane	Virginia Union
LeMoyne	Wiley

APPENDIX B

EXHIBIT 1

LETTER TO DEPARTMENT CHAIRMEN

Dear Department Chairman:

In connection with my doctoral research at Oklahoma State University, I have planned to study the academic preparation of mathematics faculties on small college campuses. The study will concentrate on personal, professional, and some institutional factors contributing to their academic preparation.

I solicit your assistance in this study by asking if you will provide me with a list of your Negro Mathematics faculty members.

Dr. John C. Egermeier, associate director for the Oklahoma State University Research Foundation, is directing my study of this topic. You may contact him for verification of this study.

Thanking you for your cooperation, I remain

Sincerely yours,

Paul B. Mohr, Sr.

EXHIBIT 2

COVER LETTER TO RESPONDENTS

Dear Colleague:

For some time I have been interested in an appraisal of the academic preparation of faculty members located in our predominantly Negro colleges and universities.

Dr. John C. Egermeier, associate director for the Oklahoma State University Research Foundation, is directing my study of this topic in connection with my dissertation research. It is felt that the results might be of significance to individuals and institutions and foundations interested in our mathematics faculties.

You can assist me a great deal by completing the short questionnaire enclosed. The respondents will not be identified so as to preserve individual confidence. If you will complete the form with as much detail as possible, I will be grateful.

Thanking you for your cooperation, I remain,

Sincerely yours,

Paul B. Mohr, Sr.

PBM: abc

Enclosure

EXHIBIT 3

LETTER TO RESPONDENTS FROM MAJOR ADVISOR

Dear Faculty Member:

Your cooperation is being solicited to assist in a research project that is worthy of consideration.

Mr. Paul Mohr, a doctoral student here at Oklahoma State University, is conducting the study concerning patterns and trends of academic preparation among selected mathematics teachers.

This scholarly study is expected to provide results that will be of benefit to the entire realm of college teaching.

I, along with other members of Mr. Mohr's advisory committee, hope that you will make the study a success by completing the attached questionnaire and returning it promptly to the designated address.

Sincerely yours,

John C. Egermeier
Associate Director
Oklahoma State University
Research Foundation

EXHIBIT 4

FOLLOW-UP LETTER

Dear Colleague:

Some time ago, I mailed you a questionnaire entitled A Survey of Mathematics Faculties in Selected Institutions.

Could you assist me by completing this form and responding by return mail? Your response would be helpful in the completion of the survey.

If you have already mailed the questionnaire, please accept my thanks.

Sincerely yours,

Paul B. Mohr, Sr.

APPENDIX C

EXHIBIT 1

SAMPLE QUESTIONNAIRE

Reference No._____

A STUDY OF MATHEMATICS FACULTIES
IN
SELECTED INSTITUTIONS

I. Personal Information

For each item below, please indicate the necessary information by placing the appropriate number on the correct line to the right of each item.

A. Marital Status: 1 = married. 2 = not married. A._____

B. Sex: 1 = male. 2 = female. B._____

C. Your present age: 1 = under 25. 2 = 25-34. 3 = 35-49. 4 = 50=65. 5 = 65 and above. C._____

D. Number of children. D._____

E. Age of oldest child. E._____

F. Age of youngest child. F._____

G. Highest grade or degree earned by your father. G._____

H. Highest grade or degree earned by your mother. H._____

II. Academic Preparation

A. Please record below your academic preparation, beginning with the highest degree earned. Please give the specific name of your degree(s).

1._____Doctorate. _____Academic major.

_____Academic minor. _____ Granting Institution

_____Year degree was conferred. _____Year of initial enrollment.

Hours in mathematics: _____. (semester) _____ (quarter)

Hours beyond the doctorate_____. (semester) _____ (quarter)

EXHIBIT 1 (Continued)

2. _____Master's degree. _____Academic major.

_____Academic minor. _____Granting Institution.

_____Year degree was conferred. _____Year of initial enrollment.

Hours in mathematics: _____ (semester) _____ (quarter)

Hours beyond the Master's _____ (semester) _____ (quarter)

3. _____Bachelor's degree. _____Academic major.

_____Academic minor. _____Granting Institution.

_____Year degree was conferred. _____Year of initial enrollment.

Hours in mathematics: _____ (semester) _____ (quarter)

Hours beyond the Bachelor's _____ (semester) _____ (quarter)

B. Please give the number of different courses in each of the following areas in which you have earned graduate credit.

_____Analysis _____Probability and Statistics

_____Algebra _____Foundations of Mathematics

_____Geometry _____Computer Science

_____Topology _____Methods courses in Mathematics

Other areas: (Please specify)_____

_____

C. Please check the sources you have used to finance your graduate training.

1. Federal Sources	Master's	Doctorate
NSF Summer Institutes	_____	_____
NSF Science Faculty Fellowships	_____	_____
NSF Summer Fellowships for Secondary Teachers	_____	_____
NDEA Loans	_____	_____
NDEA Fellowship	_____	_____
G.I. Bill	_____	_____

EXHIBIT 1 (Continued)

Other type federal sources: (Please specify along with appropriate degree). _____

_____

2. Private Fellowships	Master's	Doctorate
Southern Region	_____	_____
Southern Fellowship Fund	_____	_____
Carnegie Foundation	_____	_____
Danforth Foundation	_____	_____
Ford Foundation	_____	_____

Other fellowship sources: (Please specify along with appropriate degree). _____

_____

3. Other Sources	Master's	Doctorate
Parents	_____	_____
Personal Savings	_____	_____
Borrowed Funds	_____	_____
Assistantship	_____	_____
Spouse's earnings	_____	_____
Instructorship	_____	_____
Sabbatical Leave	_____	_____

Other financial sources: (Please specify along with appropriate degree). _____

_____

D. Does your present institution have professional leave policies permitting advanced academic training? _____Yes. _____ No.

E. If your answer to the above item is yes, is financial aid provided in the leave policies? _____ Yes. _____ No.

F. Have you held a full-time job in an occupational field other than college teaching since you earned the bachelor's degree? (Do not include summer appointments). _____ Yes. _____ No.

G. If your answer to the above item is yes, please give a descriptive title for each occupational field and dates of employment:_____

_____

_____

H. How many years, including the present one, have you been on the full-time staff of any college or university? _____years.

EXHIBIT 1 (Continued)

III. Present Position

A. Please indicate the necessary information by placing the proper number on the correct line to the right of the following item.

Rank: 1 = Instructor 2 = Assistant Professor A._____

3 = Associate Professor 4 = Full Professor

5 = Department Head 6 = Other (specify)

B. Please give the length of service in your present position, including the current year. _____years.

C. What per cent of your total professional activities in the fall would you estimate was devoted to:

_____% Teaching _____% Administration

_____% Research and Writing _____% Other (specify)

D. Please list the courses you have taught this year.

_____. _____. _____. _____. _____.

_____. _____. _____. _____. _____.

Please feel free to add any information you feel may be helpful in explaining or completing your answers.

Please complete and return to: Studies in Mathematics Education
306 Gundersen Hall
Oklahoma State University
Stillwater, Oklahoma 74074

VITA

3

Paul B. Mohr, Sr.

Candidate for the Degree of

Doctor of Education

Thesis: A STUDY OF NEGRO MATHEMATICS FACULTIES IN PREDOMINANTLY NEGRO INSTITUTIONS

Major Field: Higher Education

Biographical:

Personal Data: Born in Waco, Texas, August 19, 1931, the son of Mr. and Mrs. Dean Mohr. Married to Jacqueline Hart in 1953 and the father of two children.

Education: Graduated from Gibbs High School, St. Petersburg, Florida, in 1949; attended Morehouse College in 1949; received the Bachelor of Science Degree from Florida A and M University in 1954, with a major in mathematics; received the Master of Science in Education from the University of New Mexico in 1960 as a participant in the National Science Foundation Academic Year Institute, with a major in mathematics; completed requirements for the Doctor of Education degree at Oklahoma State University, May, 1969.

Professional Experience: Mathematics teacher, Sixteenth Street Junior High School, St. Petersburg, Florida, 1954-55 and 1957-59; mathematics teacher and director of public relations - student publications, Gibbs Junior College, St. Petersburg, Florida, 1960-65; Industrial Specialist, Atomic Energy Commission, Summer, 1967; since 1966, mathematics teacher, on leave of absence from St. Petersburg Junior College.