

**DEMOGRAPHICS, ATTITUDES, AND MOTIVATIONS
OF FEMALE MATHEMATICS GRADUATE STUDENTS
AT THREE ALABAMA UNIVERSITIES**

(DESCRIPTIVE)

Much research has been conducted on gender differences in learning mathematics. Females begin school with a self-confidence and an advantage over males. This advantage begins to diminish between the third and sixth grades. Females' strengths in mathematics is computations. Concept development appears to be the advantage at the junior high school level that males have over females (Marshall, 1987).

Math anxiety in junior high school has been attributed to students declining to take optional mathematics courses in senior high school, therefore reluctant to select college curriculums that require mathematics. The worry component was found to be common in both genders. Whereas, females reported stronger negative affective reactions (nervousness, tension, unpleasant physiological reactions during testing) to math than did males (Wigfield, 1988).

Gender differences at the college level consistently found that females tended to have equal if not higher grades but males had higher Scholastic Aptitude Test (SAT) scores in math. This was found in three different freshman mathematics courses: algebra, pre-calculus, and calculus (Bridgeman, 1991).

Learned helplessness is the condition when a person perceives a task to be very difficult and would therefore give up after failed attempts. Learned helplessness has been associated with students unwilling to continue after failure. Females have been found to follow this pattern (Miller, 1986).

YOU MENTION
LEARNED
HELPLESSNESS
- BUT DON'T
MAKE THE
CONNECTION
WITH GENDER
DIFFERENCES
IN MATH. YOU
NEED TO DEVELOP
THIS SEGMENT
MORE TO TIE IT
IN TO YOUR
PROBLEM STATEMENT

Statement of the Problem

Eventhough research indicates that by high school females begin to direct their educational endeavors away from mathematical requirements, there *does* exist a population of female graduate students in mathematics. This researcher has found no information on who these females are.

← SO, WHY IS THIS A PROBLEM?
WOULD HAVING ACCESS TO SUCH
INFORMATION BE USEFUL?
HOW?

Purpose of the Study

The purpose of this descriptive study will be to collect until now unknown demographic, education and career motivation, and attitudinal data on females in graduate level mathematics from the following three universities in Alabama: Auburn University (Auburn), University of Alabama (Tuscaloosa), and University of South Alabama (Mobile).

SPECIFIC
AND
TO THE
POINT

Significance of the Study

The perceptions of females' abilities, rather inabilities in mathematics has become a stereotype for educators, employers, but most importantly the female students themselves. Females begin their mathematics education with vigor and competence. By the end of high school, females feel that their capabilities and anxieties limit them in pursuing educations and careers in mathematics.

There *does* exist a population of females that are breaking the stereotype of male dominance in graduate level mathematics. Nothing is known about this population as a whole. Their demographics, motivations, and attitudes would give a very useful description for educators and employers to study. Knowing about these females would enable high school females to envision themselves as mathematicians. Few females pursue degrees, especially advanced graduate level degrees, in mathematics. This descriptive study would enlighten, may be even motivate other females to follow.

WHAT
WOULD BE
THE VALUE
(SIGNIFI-
CANCE) IN
THIS?
EXPLAIN.

Limitations

This is a descriptive study, not to be generalized to any other populations outside the three universities. Future research using more universities in the state, Southeast, etc. would give a broader description of female graduate students in mathematics.

Random selection is not feasible for this study. It will be necessary for the mathematics graduate departments at Auburn University, University of Alabama, and University of South Alabama to distribute this questionnaire to each of its female graduate students and encourage their responses. The questionnaires will be answered on a volunteer basis. The graduate school personnel's conscientious distribution is vital to this study.

The response rate will also effect its validity. The actual number of female graduate students and their proportion to their male counterparts in each of the three programs must be known at the precise time the questionnaires are being sent to determine an accurate response rate. If there is only a small number of female students to be surveyed, their complete participation would be vital to create an adequate description.

The following lists unresolved weaknesses to this study that must be taken into consideration:

- 1) **Volunteer Sampling** The characteristics of volunteers willing to answer and return these questionnaires will most likely differ from those failing to complete and return the questionnaires (Rosenthal-Rosnow, 1975). This could possibly effect the description of the population. ← (WHAT DO YOU EXPECT THE NATURE OF THESE DIFFERENCES WILL BE?)
- 2) **Non-respondents' Bias** The characteristics of those unwillingly to participate would not be included in the description, therefore effecting its results. ← (THIS IS THE SAME AS #1)
- 3) **University Cooperation** The questionnaire has questions about the females' attitudes and perceptions of the universities. The universities may be reluctant to have their students negatively report. Confidentiality and anonymity needs to be established. (THIS IS YOUR JOB AS RESEARCHER)
- 4) **Valid Accounts** This study relies on the honesty and integrity of each participant to complete the questionnaire to the best of her ability. There would be no way to ensure that the data on their attitudes is accurate. This self-report must be nonintimidating to each of the participants.

Methodology

The survey included in the Appendix will be pre-tested for reliability on subjects at Auburn University at Montgomery (AUM) and Troy State at Montgomery (TSUM).

A letter will be sent to each of the mathematics graduate departments at Auburn University, University of Alabama, and University of South Alabama explaining the intent of this descriptive study is to assess their female graduate student population regarding their demographics, attitudes and motivations. The survey will be included. A week later, a phone call will be made to each university polling the number of female graduate students in their mathematics departments.

Upon agreement from the universities, the precise number of surveys will be sent to each department having been number coded to keep account of the responses. No names will be entered on the surveys. The departments will distribute the surveys including an instruction sheet regarding return procedures and stamped envelopes to each of their female students. Two weeks later, a reminder postcard will be sent to each university notifying them of the number of surveys not returned and encouraging them to have their female students participate.

GOOD
TECHNIQUE

The data collected will be computed and reported using the following types of Descriptive statistics: 1) Central tendency statistics such as mean, median, and mode. 2) Dispersion statistics such as variance, standard deviation, range and percentiles. The descriptive reports will be sent to the three universities that participated in this study.

DON'T
NEGLECT
THE USE
OF
PERCENT-
AGES.

WORKS CITED

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APPENDIX

age: ___ birthdate: _____ birthplace: _____ **CODE NUMBER** _____

birth order: _____ marital status: _____

number of children: _____ handedness: _____ high school rank: ___ out of _____

ACT score: _____ undergraduate degree(s): _____

undergraduate university: _____

GRE scores: Composite _____ Verbal _____ Analytical _____ Quantitative _____

undecided strongly disagree somewhat disagree agree somewhat agree strongly agree

1 2 3 4 5 6

1) I participate in recreational activities at least once a week with other people.

1 2 3 4 5 6

2) I plan to finish my graduate program in mathematics.

1 2 3 4 5 6

3) I feel that I have been treated differently at this university compared to my male counterparts.

1 2 3 4 5 6

4) I plan to work in my mathematics field directly after completing my degree.

1 2 3 4 5 6

5) I have a job while I am in graduate school.

1 2 3 4 5 6

6) I would advise other females to seek math degrees.

1 2 3 4 5 6

7) I have experienced sexual harrassment at this university during my graduate studies.

1 2 3 4 5 6

8) In retrospect, I would seek my graduate degree again in mathematics.

1 2 3 4 5 6

9) I liked math in elementary school.

1 2 3 4 5 6

10) I liked math in junior high school.

1 2 3 4 5 6

11) I liked math in senior high school.

1 2 3 4 5 6

12) I relate well to male graduate students.

1 2 3 4 5 6

13) I relate well to my professors in the mathematics department.

1 2 3 4 5 6