

Academic Stressors in First Generation and STEM major African-American Students

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Background

- Previous studies express that women and men of color are severely underrepresented across all professional-level occupations but particularly in the scientific and technical career fields (Beta, 1990; Sells, 1980; Smith, 1983).
- Although a relatively high proportion of African American students enter college with the intention to major in STEM fields, relatively few graduate with STEM majors (Brown, 2000; May & Chubin 2003). This may be a result of all the academic stress that comes with taking up STEM courses.
- Many first-generation college students experience higher education differently than their non-first-generation peers. (Davis, 2012).
- Several studies have identified unique characteristics of first-generation students that may influence their educational experience. Specifically, first-generation students tend to be: enrolled in college part-time, lower-income, less active in extracurricular activities, and less academically prepared than their peers (Bui, 2002; Nuñez & Cuccaro-Alamin, 1998; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996).

Present Study

Research Question 1: Are levels of educational stress different for African-American STEM and non-STEM majors?

Hypothesis 1: Based on prior research, it is hypothesized that African American students who undertake STEM majors are likely to experience more educational stress than African American students who are in a non-science major.

Research Question 2: Do First Generation African American students have higher levels of academic stress than non-First Generation African American students?

Hypothesis 2: First Generation African American students experience more academic stress when compared to non-First Generation African-American students at the University of Detroit Mercy.

Methods

Sample

Participants (N=105) were undergraduate students from the University of Detroit Mercy. Most participants were 18 or 19 years old (n=90; 85.5%). The majority of the participants who completed the survey were female (n=73; 69.5%). Most participants reported their cumulative grade point average (GPA) as being a 3.0 or greater (n=96; 91.4%). The mean number of credits participants reported taking this semester was 15.83, with a standard deviation (SD) of 2.35.

Procedure

Participants were recruited from the University of Detroit Mercy McNichols Campus by in-class verbal advertisements. Participants were asked to complete a 40 minute online survey that was designed as part of a larger study on factors related to health outcomes. Students received extra credit by professors for completing the survey by the discretion of the professor.

Measures

Meaning of Education: Stress Subscale (Henderson-King & Smith, 2006)

- Assessed the extent to which participants experiences with higher education was deemed stressful.
- Participants were asked to measure their level of academic stress from a range of 1 to 10. 1 meaning agree not to all and 10 being agree very much.
- High scores indicate higher levels of academic stress.

Race and Ethnicity

• Assessed participant race from choices which included Caucasian/European American, African-American, Middle Eastern, Asian, Hispanic, Native American/Hawaiian/Pacific Islander, and Multiracial/Multiethnicity.

STEM (Science, Technology, Engineering, and Mathematics) Majors

- STEM data is determined by their reported major of study.
- Students from the colleges of Engineering and Science, McCauley School of Nursing, Health Professions, and Dentistry are considered as STEM students.

First Generation

- Assessed participants first generation status by asking what was the highest educational degree that their mother or father completed.
- Options included less than high school, high school, Associate, Bachelor, Master, or Doctorate Degree.
- If a participant reported that their parent did not obtain a bachelors degree or greater, they are categorized as a first generation student.

African American Students	STEM Major (n=5)	Non-STEM Major (n=1)	Results	African American Students	First Generation (n=3)	Non-First Generation (n=3)
Academic Stress (Mean & Standard Deviation)	6.25 (.78)	5.17 (0)	Preliminary Results: African American students who are STEM majors reported more academic stress than the single African American participant who was not a STEM-major. African American first generation students reported more academic stress than those who are not first generation.	Academic Stress (Mean & Standard Deviation)	9.22 (.84)	7.92 (2.48)

Results

Caucasian Student	STEM Major (n=41)	Non-STEM Major (n=12)	Non-Caucasian Student	STEM Major (n=42)	Non-STEM Major (n=10)
Academic Stress (Mean & Standard Deviation)	6.57 (1.76)	7.34 (1.37)	Academic Stress (Mean & Standard Deviation)	6.51 (2.04)	5.73(1.89)

Supplemental Results:

Due to a small African American sample, broader trends regarding STEM status were compared between non-Caucasian students and Caucasian students. Non-Caucasian STEM majors reported more academic stress than non-STEM majors of the same category. Caucasian students of a non-STEM major reported more stress than their non-Caucasian counterparts of similar majors.

Discussion

• Hypothesis 1 was supported by the results that African American students who undertake STEM majors are likely to experience more academic stress. Hypothesis 2 was also supported since African American students who are First Generation college students experience more stress.

• The results from the African American STEM and non-STEM sample are not consistent with the findings of previous studies that relatively few African Americans complete and receive their STEM degree ((Brown, 2000; May & Chubin 2003). A high proportion of African American students enter college with the intention to major in STEM fields, relatively few graduate with STEM majors. Though only six African-Americans were included in the sample, five of those students were STEM majors.

• The findings from prior research are supported by this study as first generation college students reported experiencing more academic stress than their non-first generation peers across the board (Davis 2012).

• Although the mean scores of Caucasian STEM major students was 6.57 and Non-Caucasian students was 6.51, the averages are similar and future research is needed to determine if they are statistically different from one another.

Limitations

• Although Research Question 1 & 2 involved African-American students, only six African-American students participated in the online survey. This small sample limited our ability to assess whether there may be differences in academic stress between African American STEM and non-STEM Majors and between African American First Generation and Non-First Generation students.

• The results of these findings are limited in how in depth statistical analyses were not performed to ensure that they did not occur by chance.

Implications

• In order to learn more about academic stress in African American students, future researchers should design their recruitment to be aimed more towards members of the African American community. Administration should develop existing programs or create new ones to alleviate the stresses of first generation students. Programs should be implemented for non-Caucasian students in STEM to deal with academic stress.

• Non-STEM administrators should concentrate on Caucasian non-STEM major students who experience academic stress at the University of Detroit Mercy.

• Future research should assess which non-STEM majors have the highest levels of stress.

References

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