

MAJOR BIASES: HOW GENDER AND ETHNICITY INFLUENCE COLLEGE
MAJOR PERCEPTIONS

by

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ABSTRACT

The purpose of this study is to investigate whether college students' gender and ethnicity affect perceptions of how well they fit into a college major. Previous studies have found that undergraduate major is significantly correlated with job stability and job satisfaction (U.S. Department of Education, 1998; 2001). Previous research has also shown gender-based expectations in hiring decisions (Rudman & Glick, 2001). Men are expected to possess agentic traits (competent, ambitious, independent), whereas women are expected to possess communal traits (helpful, nice, nurturing). The proposed study will use 3 (major description: agentic vs communal vs neutral) X 3 (student ethnicity: White vs Hispanic vs Black) X 2 (student gender: male vs female) mixed experimental design. Participants will be randomly assigned to evaluate either all male or female students from White, Black, and Hispanic ethnic backgrounds. Participants will be given a description of a major that either coincides with stereotypically masculine, stereotypically feminine, or will not align with gender stereotypes. Participants will then complete evaluations of the students' personality traits and degree of fit in the described major. I hypothesize that participants will rate women as more social and artistic, whereas men will be rated as more realistic and conventional. I also hypothesize that men and women will be rated as equally investigative and enterprising. Regarding evaluations of fit, I predict that perceived fit will be higher for women in communal majors and higher for men in agentic majors. Participants will have the opportunity to receive course credit by participating in SONA. The results of this study may suggest reformation in the

process of advising and representation of college majors to increase inclusivity.

I. MAJOR BIASES: HOW GENDER AND ETHNICITY INFLUENCE COLLEGE MAJOR PERCEPTIONS

Selecting a college major is one of the most critical decisions an undergraduate student makes. Major selection can position students into a preferred workforce, that then transitions into a high-paying job, and results in a fulfilling career. In a study conducted by Lisa Dickson, roughly 29% of students entered college with no clear idea of their intended field of study (Dickson, 2010). Uncertainty of college major can present itself as an issue because undergraduate majors are significantly correlated with job stability and job satisfaction (U.S. Department of Education, 1998, 2001). As major life decisions go, determining what field of study to enter is not to be taken lightly. The decision on what to study can have lasting effects, and because of the importance of this decision, college advisers encourage students to pursue their passions. But how does an individual know what their passions are, and furthermore what major best aligns with those passions? The purpose of proposed study is to investigate whether college students' gender and ethnicity affect perceptions of how well they fit into a college major.

There are several career aptitude assessments that aid in assisting individuals to better understand how their personal attributes factor into the prospective success and satisfaction of different college majors. Several studies have gone further examining the impact of personality on college major selection. Astin (1993) argues that students with certain personality characteristics are more likely to select majors that best align with their traits. One study by Porter and Umbach, piggy backs off Astin's statement by further exploring the role of personality on college major selection. What they found was that personality had extreme predictive implications on student major choice. Porter and

Umbach also noted that students who scored high on the investigative scale were less likely to major in a non-science field, whereas students with high scores on the artistic scale were more likely to major in an arts or interdisciplinary field. Similarly, students with high scores on the social scale were prone to major in a social science or interdisciplinary field (Porter & Umbach, 2006). Understanding how personality is associated in the determination process of college major, can be useful in directing students to the field of study that best fits them.

Another important component of academic selection is gender and ethnicity, and how segregation occurs in certain majors. Studies examining the representation of women (Hagedorn, et al. , 1996; Leslie & Oaxaca, 1998; National Research Council, 1991) and people of color (Leslie & Oaxaca, 1998; National Research Council, 1994) in the science and engineering fields, have been reported as being substantially underrepresented in comparison to the overall field. Classifying men and women into different jobs has a variety of repercussions, including decreased job satisfaction and increased stress as well as increased employee turnover (Reskin, et al., 1999). The same can be said for college major selection. If a student is not satisfied with their major, they are less likely to continue; however, if they stick with their major, they may not be content with their job down the line. As a result, the compensation for the investment they made when determining that major would not receive its full value. It should be noted that gender stereotypes are taught from a young age and continue with the individual well into their adult years. These stereotypes result in women being predominantly employed in occupations that are viewed as communal, whereas men are largely employed in occupations that are viewed as agentic (Frankowski, 2017).

Ethnicity also factors into academic selection based on the premise that people of color are less likely to select a major where they are one of the few minorities represented (Porter & Umbach, 2006). If students do choose a major where there are few people of color, attrition is likely (Porter & Umbach, 2006). Being cognizant of the disparities amongst people of color and individuals of both genders can assist in resolving the gap that is present in select majors. The purpose of this study is to examine students' perceptions of the communal and agentic characteristics of college majors and how these perceptions can shape minority men and women's college major decisions.

In order to understand the value and social benefits behind selecting a college major, John Holland's vocational choice theory can be observed. Holland's theory is referred to when coding for personality traits in relation to college major selection. Vocational choice theory by definition explains "natural events in terms of a system of concepts and laws that relate those diverse concepts to each other" (Gall, Borg, & Gall, 1996). The theory expands on the notion that a career or college major interest are expressions of an individual's personality. According to Porter and Umbach, human behavior is a result of the interaction between individuals and their environments (Porter & Umbach, 2006). Holland further breaks down personality and states that an individual can be a combination of two or more out of six personality traits, with the six personality characteristics being realistic, investigative, artistic, social, enterprising, and conventional. Realistic focuses on concrete, tangible, and practical activities that are often associated with mechanical engineering and military science. Investigative personalities target creation, investigation, and problem solving, with majors pertaining to biology and mathematics. Now artistic emphasizes innovation and creativity aligned

with disciplines such as English and theater. The focal point of social majors such as political science and nursing is geared toward the healing or teaching of others. Enterprising personalities are oriented toward highlighting leadership development and reward popularity, which is what is often needed in business, and computer science majors. Lastly, conventional aims on keeping an outlook that is concerned with orderliness and routines. Accounting and data processing are examples of conventional disciplines (Porter & Umbach, 2006). Rayman & Atanasoff compare Holland's vocational choice theory to the common saying "birds of a feather flock together," because this is how characteristic work environments develop. Where there is a good fit between personality characteristics and college major, the individual is more likely to be successful, feel satisfied, and lead a productive academic experience (Rayman & Atanasoff, 1999). Previous studies support the notion that personality allies with major, there is a congruence, and therefore the "person and environment is related to higher levels of educational stability, satisfaction, and achievement" (Feldman et al., 1999, p. 643). Understanding the implications associated with personality on academic selection is favorable for students unsure of what field they are best suited to study.

Although personality plays an important role on major selection, it should be noted that gender and ethnic segregation amongst college majors is another important constituent. In a study conducted by Porter and Umbach, data from the Cooperative Institutional Research Program (CIRP) Student Information Form over a three-year period of three first full-time degree-seeking cohorts entering in the Fall of 1993, 1994, and 1995, and who graduated within six years were observed. The purpose of the study was to identify the relationship amongst ethnicity, gender, and personality in order to

identify its impact on the selection of majors. The study utilized four college major categories for the dependent variable that were comprised of arts and humanities, interdisciplinary, social sciences, and life and natural sciences. The independent variables present in the study were utilized to understand the factors affecting major choice and consisted of six divisions: demographics, parental influence, academic preparation, future views of the academic career, political views, and personality. A multinomial logit model was employed and the findings from the study reported that in comparison to men, women are significantly more likely to select interdisciplinary and social science majors over science majors.

Porter and Umbach also noted racial and ethnic disparities amidst Whites and minorities. They found that in relation to Whites, Blacks are more likely to select interdisciplinary and social science majors over science majors. Hispanics are more likely than Whites to choose an arts and humanities, interdisciplinary or social science major over a science major. It was also established that when an individual exhibits higher academic self-efficacy they are less likely to choose a science major. The study also suggested that the more liberal a student felt, in terms of political affiliation, the more likely they were to choose a non-science major. The study reported their findings in respect to personality, aligned with John Holland's vocational choice theory that students who scored high on the investigative scale were less likely to major in a non-science field, whereas individuals who scored high on the artistic scale were more likely to major in an arts or interdisciplinary field. Porter and Umbach concluded their study by discussing how racial differences, are a significant predictor of student major choice.

Most individuals are introduced to gender stereotypes at a young age. These

stereotypes continue well into the adult years and can cause disparities amongst college majors. Eagly and Karau (2002) proposed the role congruity theory as a way to explain the gender inconsistencies pertaining to leadership roles but also view the effects it has on stereotyping career fields. If we look at majors such as nursing and teaching, they best align with how women are “expected” to be, which is warm, sensitive, and polite, that are communal traits (Eagly et al., 2000; Prentice & Carranza, 2002). Men however are expected to be more self-reliant, competitive, and aggressive, which are agentic traits. Women and men can therefore experience societal pressures to pursue careers that align with the stereotypical traits they are expected to embody (Eagly et al., 2000). Communal majors are often associated with low status work. This type of association can cause prejudices to become present when a stereotype about a select group is incongruent with what is thought to be the attributes necessary for success in particular social roles. When a stereotyped group member and an incongruent social role become joined in the mind of the perceiver, this inconsistency lowers the evaluation of the group member as an actual or potential occupant of the role, and could be why some individuals switch major. Eagly and Karau thus propose that communal and agentic attributes especially illuminate the issues of prejudice. The activation of beliefs about women and men, by gender-related cues, thus influence people to perceive women as communal but not very agentic and men as agentic but not very communal. In turn, these prescriptions affect how men and women are viewed in their professional lives and have direct and indirect implications for the careers they choose (Frankowski, 2017).

Several college majors and occupations exhibit unequal representation for men and women (Cohen, 2013; Larivière, et al. , 2013). Gender role stereotypes are shown to

impact how individuals assess college major selection for both sexes. The research carried out by Frankowski, evaluated how men's and women's career tracks are measured within the gender role congruity theory framework. As stated previously, role congruity theory is the presumption that the positions that men and women hold in society are with respect to their realistic and idealistic traits. By this, realistic is how everyday men and women are described in their social and professional roles whereas idealistic is the opinioned belief of those genders' roles. Frankowski's study was conducted online and was comprised of predominantly Hispanic students from the University of Texas at El Paso. He conducted two studies with the first one measuring participants judgements over men and women when uncertainty in selecting a college major was present. Experiment one tested the hypothesis that both men and women are urged to peruse gender role congruent careers. Participants were asked to evaluate the extent to which they deemed that the target should pursue a gender role congruent or incongruent career path. Participants were also asked to gauge the targets' skills, prospective success, and happiness in the major. The study utilized a two (target gender – between-subjects, randomly assigned) by three (stereotype congruent, incongruent, or neutral career track – within subjects) mixed design. Participants then evaluated the targets' possible career tracks; the track the target is currently pursuing as well as the potential to change path. Lastly participants provided insight as to whether the current and possible future career track aligned with the target. The results provide evidence that people make gender role stereotypical judgments about career tracks, but only for women.

The second study also examined the impact gender has on college major selection

but in reference to framing the career paths as either communal or agentic. The experiment used a two by two by three mixed design in which target gender and stereotype role content (agentic or communal terms) were between-subjects factors, and gender role congruence of the career track (stereotype congruent, incongruent, or neutral) was a within subjects factor. Participants were then randomly assigned to one of four conditions in which they read about male or female targets with career framings that were either agentic or communal. Once the initial description from the first experiment was read, participants then examined another paragraph about the standard characteristics of people who are successful in the career, which were either agentic or communal. The findings showed career choices for women were rated more favorably when they were stereotype congruent where in comparison men stereotype incongruent career choices were rated more favorably. Overall, the study demonstrated a consistent gender stereotype effect on college major selection.

Gender segregation in the work force is one of the defining elements of gender inequality in modern societies according to Philip Cohen, a professor of sociology at the University of Maryland. Cohen discusses the levels of task differentiation pertaining to women and men in the gender segregation of work. His findings suggest that a common measure of segregation is consistent with dissimilarity. This measure reports that the percentage of men, or women, would have to change occupations to make the gender distribution equal across all occupations (Duncan & Duncan, 1955). The most gender-segregated occupations are secretaries with the majority being 96% female and construction workers at 98% male, with both occupations obtaining a low income. In comparison the highest paid occupations consisted of managers, lawyers, and chief

executives. The occupations are male dominated comprising of 67-78% male however they are not completely segregated. At the college level both men and women continue to pursue gender-typed courses of study, despite the capability to deter from traditional gender majors, students reinforce the conventional gender divisions which then disrupts the occupational integration. Consequently, gender segregation throughout professional fields remains strong, whether suggested by areas of study (Charles & Bradley, 2009) or professional specialization (Ku, 2011).

College major selection among college graduates differs significantly by gender, race, and ethnicity. Lisa Dickson's research further explores this phenomenon by investigating whether these variations are present at the start of college and whether academic preparation has any impact on determining a field of study. Dickson's study employed the use of administrative data from the University of Texas at Austin, the University of Texas at San Antonio, and the University of Texas–Rio Grande, known then as the University of Texas Pan-American. A total of 6 different college major categories were utilized in this study and was comprised of natural and physical sciences, business, social science, engineering and computer science, humanities, and undecided. The findings suggested that college major selection varies by race and ethnicity. Individuals who reported their major as undeclared was most common among African American men. Social science majors were most common among African American and Hispanic women whereas natural & physical science majors are the least common among White women. Ultimately academic preparation, race, and gender are associated with initial choices of major which becomes imperative when initial major choice significantly affects final major choice.

Another factor that influences both gender and ethnicity academic selection is socioeconomic status and parental influence. In a study conducted by Ma, a total of 14,681 students from White, Black, Hispanic, and Asian backgrounds were selected from the National Educational Longitudinal Study (NELS), that ran from 1988–1994. The study focused on the responses of Whites and Asian Americans primarily. The results from the study found that lower socioeconomic children favor financially advantageous college majors such as computer science and engineering. A family's socioeconomic status was also seen to have differential effects on men and women and for minorities and whites. Men from a high socioeconomic family were still expected to pursue lucrative careers, whereas women from comparable backgrounds did not. Parental involvement in children's domain-specific education exerts significant effects on children's college major choice. Although this study primarily examined Asian American, similar studies in the future could be conducted to understand the experience of other minority groups. It could assist in identifying why African Americans, and Hispanics continue to fall behind whites in socioeconomic status long after the lifting of legal barriers to their advancement in society (Xie & Goyette, 2003).

Research exploring the implementation of resources beneficial for encouraging minority students to pursue fields in science where notably they are underrepresented, is beneficial when exploring the perceptions individuals have to certain college majors. Villarejo et al. (2008) developed a two-stage survey/interview design where a total of 322 University of California, Davis alumni participated. The purpose of the study was to explore what interventions influence the career choices, with a focus on majors in life sciences. Previous research has identified three categories of factors that influence the

occupational choices made by college students. The first one being, background characteristics of students upon graduation. The characteristics were comprised of ethnicity, sex, socioeconomic status, high school performance, SAT scores, and occupational and educational aspirations. The second factor was the structural characteristics of the institution attended, such as size, selectivity, location, and racial/ethnic makeup. Whereas the third factor was based on individual student experiences during college and was made up of factors such as courses taken, grades, amount and quality of faculty contact, social environment, and participation in supplementary educational or advisory activities. The results from the survey expressed that the most beneficial interventions for promoting fields in science were early recruitment and enrichment strategies, supplementary instruction, undergraduate research opportunities, creation of a supportive peer community, and interaction with faculty and other mentors. These factors were shown to increase the proportion of underrepresented minorities who complete college with science majors.

Present Study

The present study builds upon the existing literature by focusing its attention primarily on the relationship amongst race and gender and the selection of college major. It will incorporate the evaluations of communal and agentic traits in order to identify bias that occur when discussing particular majors. The study will also attempt to answer the question of whether particular factors such as race, gender, and personality play a role in college major choice.

It should be noted that previously little research has been conducted in respect to

college major selection and the potential implications of race, gender, and personality. We therefore hypothesize that participants will rate women as more social and artistic, whereas men will be rated as more realistic and conventional. We also hypothesize that men and women will be rated as equally investigative and enterprising. Regarding evaluations of fit, we predict that perceived fit will be higher for women in communal majors and higher for men in agentic majors.

Method

Participants

Three hundred and ten (N=310) Texas State University students enrolled in introductory psychology courses will have the opportunity to participate in an online survey through SONA. The survey should last roughly thirty minutes. Participants will be admitted into the study regardless of ethnicity, sex, or employment status. The participants will receive course credit.

Materials

Demographics

Participants will indicate their age, gender, ethnicity, class rank, and college major. Participants will also be asked to identify the highest level of education for both parents along with gross household income for the previous year. An additional twelve questions pertaining to likelihood of making dean's list and high school preparation for college will be evaluated upon a 7pt. Likert scale.

Extent of “fit” with major

Six questions pertaining to whether a student fits into the major will be measured on a 6pt. Likert scale from (1- strongly disagree; 6- strongly agree). With higher scores indicating that the student successfully aligns with the major. Questions will entail whether “[Target name] has the skills to succeed in this major” and if “[Target name] is similar to other students in this major?”

Personality of student

Six questions regarding to whether a student had the personality traits to fit into an agentic, communal, or neutral major will be measured on a 6pt. Likert scale. The (1- not at all; 6- extremely) scale will indicate that higher scores stipulate a strong alignment to the personality being presented. Participants will be asked “to what extent does [Target name] appear to be practical” and “does [Target name] appear to be a good problem solver?”

Major Description

Participants will be randomly assigned to either an agentic, communal, or neutral major description. All three groups will be assigned to evaluate three males from White, Black, and Hispanic ethnic backgrounds or three females again from white, black, and Hispanic ethnic backgrounds. All three groups will be asked to determine if the pseudo students fit well into the major described.

Agentic major description. Participants will view a description that reads, “students in this major develop the skills and knowledge needed to understand and solve complex problems. Students are expected to assert themselves in the classroom and to be highly competitive. Success in this major requires strong leadership abilities and to

persevere in the face of challenges”.

Communal Major Description. In this group, participants will be provided a description that states, “students in this major develop the skills and knowledge needed to understand and solve complex problems. Students are expected to help their peers in the classroom and to be devoted to caring for others. Success in this major requires strong compassion for people and the ability to understand different perspectives when working with others”.

Neutral Major Description. Participants in this group will examine the description of students in this major develop the skills and knowledge needed to understand and solve complex problems. Students are expected to be curious learners in the classroom and to be highly ambitious. Success in this major requires working independently and the ability to be self-reliant.

Chicago Face Database

Six images, 3 men and 3 women from White, Black, and Hispanic backgrounds were contracted from the Chicago Face Database (Correll & Wittenbrink, 2015). All photographs presented neutral faced individuals with grey shirts.

Internalized misogyny scale

Seventeen questions relevant to internalized misogyny will be used. The questions represent statements that minimize the value of women, present women as untrustworthy, and favor men in terms of gender biases. Each question will be rated on a 6-pt. Likert

scale from (1-strongly disagree; 6-strongly agree). Higher scores will present a strong disfavor for women.

Procedure

The study will use a between 3 (major description: agentic vs communal vs neutral) X 3 (student ethnicity: White vs Hispanic vs Black) X 2 (student gender: male vs female) mixed experimental design, with a Factorial ANOVA being used to analyze the mean scores of both dependent variables. Participants in introductory psychology courses will be invited to participate in a study that measures students' perceptions of the communal and agentic characteristics of college majors and how these perceptions can shape minority men and women's college major decisions. Participants will be able to access the survey through SONA and will be randomly assigned condition of agentic, communal, or neutral major description. All participants, regardless of experimental condition, will once more be randomly assigned to three students from an all men or all women cohort. Each participant will view three students from White, Black, and Hispanic backgrounds. Participants will see a photograph with three descriptors, two positive and one negative. Participants will then judge the students' possible career tracks; rating how well the student aligned with the described communal, agentic, or neutral major. Ranking on personality and perception of fit within the described major will then be completed. Participants will then be asked to complete both an internalized misogyny scale and demographics questionnaire. Evaluations on the skills, future success, and future happiness that the student will acquire in this major will also be asked. The neutral faced photographs will come from the Chicago Face Database (Correll

& Wittenbrink, 2015). Incorporating the pseudo students could allow participants to feel invested in the evaluation processes since evidence from previous studies using hypothetical applicants demonstrates effectively modeling the processes that occur in relation to actual applicants (Cleveland, 1991).

Next, participants in all three conditions, will then be instructed to complete the internalized misogyny questionnaire. All participants will be presented with demographic questions in order to collect data on age, gender, ethnicity, class rank, college major, parents' highest education, and gross household income. Participants will then be thanked for taking part of the study.

Discussion

This study will investigate whether factors such as race, gender, and personality play a role in college major choice by using a three by three by two mixed experimental design. Participants enrolled in Texas State University undergraduate psychology courses will be eligible to partake in the study. They will be randomly assigned to one of three college major descriptions: communal description, agentic description, or a neutral condition. Participants will then be randomly assigned to three students from an all men or all women cohort, viewing three students from White, Black, and Hispanic backgrounds and then evaluating competency, success, and happiness within that major will be assessed. Participants will be asked to complete a demographics questionnaire followed by an internalized misogyny questionnaire. We propose that participants will rate women as more social and artistic, whereas men will be rated as more realistic and

conventional. We also expect to find that men and women will be rated as equally investigative and enterprising. Lastly, we predict that the perceived fit will be higher for women in communal majors and higher for men in agentic majors.

From analyzing prior literature, this study will aid in understanding as to why students select particular college majors. Additionally, participants will be randomly assigned to conditions in order to evaluate personality, gender and ethnicity whereas in other studies participants would evaluate two out of the three. Many other studies focused their experimentation on gender, but our study is concerned with a broader implication pertaining to field of study. It is possible prior studies were less representative of minorities because until recent years universities had been predominately populated by White students. Finally, because our study will compare gender and ethnicity, as well as personality, our results will clearly demonstrate the most factors of academic determination.

Whether or not our findings suggest gender and ethnicity impact college major selection, we will be able to share our results and advise students to select majors that best align with personal background and capabilities. College majors are costly investments, therefore despite gender and ethnicity, students benefit from learning when selecting a college major that best aligns with them, and in turn result in greater success. This is a valid, real world issue, especially when college tuition along and student debt are on the rise.

One potential threat to internal validity could arise due to a mixture of demand characteristics. Participants will be exposed to rating pseudo students and then

themselves, this back to back rating may cause participants to guess our hypothesis. This could bias their answers on the demographic's questionnaire or pseudo student evaluations if they decide to answer according to what we expect to see rather than how they honestly feel.

In terms of external validity, our sample will generate findings that are generalizable to other minorities and other settings. Our demographics will focus on undergraduate Texas State University students. This study was designed to investigate whether college students' gender and ethnicity affect perceptions of how well they fit into a college major. Uncertainty in college major selection is an issue that is not exclusive to a certain demographic, but rather is experienced by individuals cross-culturally and pertains to individuals across all ethnicities and socioeconomic statuses. Despite the narrow location and limited representation of the study, our research is generalizable in other university and workforce settings.

The present study could serve as a model for how future researchers in gender inequities could examine the choice of college major, and furthermore aid in investigating college majors beyond a binary classification system. In a study conducted by Ely (1994) it was reported that women's social identities in their workplaces reflect prevailing gender stereotypes, in particular establishments with little representation of women in leadership positions. Future studies could consider testing the affects people of color experience when they feel as they are not represented fairly. Findings might suggest that individuals who are not accounted for may experience staff retention. Although the study viewed classifying men and women into different jobs caused decreased job

satisfaction and increased stress as well as increased employee turnover (Reskin, et al., 1999), the same could be prevalent in minorities when their needs are not met. Previous studies examined the byproducts gender and personality have on academic selection, but few have focused on ethnicity. Future studies could incorporate ethnicity and personality as a mean to assist selecting college major because notably understanding how minorities form interests before college may be the key to affecting the representation of people of color in the pipeline. Adjustments in course descriptions could be utilized as a way to produce more inclusivity in that typically agentic and communal majors could be presented as more neutral. Understanding the impacts of personality could aid in the findings, determine new efficient ways to ensure undergraduate college major satisfaction.

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