Gender Differences in the College Major Selection Process

Aidan Li

Xavier High School, New York

DOI: https://dx.doi.org/10.47772/IJRISS.2025.903SEDU0530

Received: 16 September 2025; Accepted: 22 September 2025; Published: 07 October 2025

ABSTRACT

This study examines gender differences in the college major selection process by evaluating how six influence categories and 18 factors impact the process. Rising sophomores at U.S. colleges (N=150) identified their top major choices and estimated the corresponding median salaries. After the actual salary data were reviewed, 46% of the respondents changed their selections. The respondents ranked six influence categories: personal interest, intrinsic major characteristics, major-related information, family, college, and high school factors. They rated 18 specific factors—including salary data, social media, YouTube, and family members—on a 5-point Likert scale. The findings revealed that the popularity of the major, books and websites in the traditional media category, YouTube and social media in general, and the influence of grandparents are more important to men than women. A probit regression model confirmed that Bankrate salary data significantly predict major-switching likelihood postintervention. A linear regression model identified personal interest, intrinsic major characteristics, salary data, YouTube, and books as significant predictors of actual median salary estimates. Forty-eight percent of women developed interest in their major by their sophomore year in high school, whereas 29% of men did.

Keywords: college major, gender differences, informational intervention, median salaries, YouTube

INTRODUCTION AND BACKGROUND OF STUDY

The choice of a college major is one of the most important decisions facing young adults. Prior work has shown that students who major in STEM and business have the highest cumulative earnings than do those with other majors (Kim et al. 2015). Differences in college majors are strongly related to the wage gap between men and women, accounting for 8% to 9% of the 20% wage gap between the genders (Brown and Corcoran 1997). While the gender gap in potential wages based on majors has declined slightly among the most recent college graduates, a large gender gap in potential wages based on majors still exists (Sloane et al. 2021). Men tend to major in the highest-paying majors, such as STEM majors, whereas women major in the lowest-paying majors (Polachek 1978; Ware & Lee 1988; Dickson 2010; Reuben et al. 2017; Quadlin 2020; Beffy et al. 2012; Gailey 2023). Staniec (2004) reported that students who consider money a very important aspect of their future career have a lower probability of choosing humanities or fine arts majors, but surprisingly, these students are also less likely to select STEM majors. A total of 45% of men major in business, and 35% major in humanities, whereas 58% of women major in humanities, and only 26% major in business (Reuben et al. 2017). Women are less likely to select STEM or business majors than men, and more like to select humanities majors that have lower wages.

Statement of the Problem

Since women tend to select majors with lower earnings than men, which contributes to the gender gap in earnings, it is important to understand what are some of the factors that lead men and women to select college majors differently.

Research Questions

The major questions analyzed in this study are as follows:

1) What are the factors that influence the selection process of majors in college?

2) Are there differences in the college major selection process between men and women?

To answer these questions, this study employs an information intervention in which college students who have yet to declare a major are asked to select their top-choice majors, shown median salary data, and then were asked to reselect their top-choice major. In addition, the survey participants are asked to rank or rate the importance of six categories of influencing factors, as well as 18 specific factors. Given the rise of social media usage globally, especially in young adults, this study is among the first to examine the impact of social media, i.e., YouTube, on the college major selection process. One reason why it is important to study gender differences in the college major selection process is that there is still a gender gap in majoring in STEM subjects, which then impacts median salaries among men and women. Much of the previous research on gender differences in STEM major selection has focused on a group of factors, such as family factors (influences of parents, siblings, and their educational levels, family income levels, or other family relatives' influences), high school factors (number of math and science courses and their grades, SAT, influence of high school math and science teachers or guidance counselors), and college factors (number of math and science courses, attitudes toward STEM majors, influence of female professors and role models, style of teaching). This study contributes to the body of research on the college major selection process by asking students to stack rank the six categories of factors, which include personal interest in the major, intrinsic major characteristics, major-related information, family, college, and high school factors.

LITERATURE REVIEW

Prior Research About Gender Differences in the College Major Selection Process

Many studies exist on the choice of college major and how various factors influence this important decision. Students are more likely to choose one major over another on the basis of the predicted future earnings stream of that major relative to others (Berger 1988). Previous studies have also shown that students' family income levels (Ma 2009; Mullen 2014; Quadlin 2017), political views and personalities (Porter and Umbach 2006), sending children to art or computer classes (Ma 2009), enjoying coursework, gaining the approval of parents and enjoying work at available jobs (Zafar 2013), higher than average earnings from parents' and siblings' jobs (Xia 2016), and earnings expectations and ability perceptions (Wiswall and Zafar 2015) all impact the major selection process. For finance majors, women are motivated by family members, whereas men are motivated by increased job opportunities (Hawash et al. 2020). Women also cited a perceived lack of quantitative skills for not choosing finance as their major (Hawash et al. 2020). Similarly, students' quantitative and verbal skills (as measured by math and verbal SAT scores) can explain a portion of the gender differences in selecting certain majors (Turner & Bowen 1999). For both men and women, increases in the math SAT score increase the likelihood of majoring in engineering, math and physical sciences, whereas the increase in likelihood is less for economics and life sciences relative to the humanities (Turner & Bowen, 1999). Women value helping the community more than men do, so they tend to major more in the life sciences than in engineering (Ma 2011). Women also have a lower self-assessment of their math abilities than men do, which negatively impacts them in majoring in STEM (Ma 2011). Ganley et al. (2018) reported that perceived gender discrimination is an important factor in determining gender differences in college major selection and that the perception that a college major may be unwelcoming to women may contribute to the lower proportions of women in certain STEM fields but not in others. Furthermore, once women are restricted from considering majors that they do not perceive to discriminate against women, they may choose majors that lead to higher paying careers (Ganley et al. 2018). Women major in STEM less frequently than men do, even controlling for ability and other individual, family and school characteristics (Staniec 2004). However, a significant reason why women are less likely than men to choose STEM majors is that women's

expected returns to STEM, relative to other majors, are lower than men's (Staniec 2004). As a result, success in attracting women to STEM may depend less on boosting the math abilities of young women and more on increasing their labor market returns for STEM majors (Staniec 2004).

Prior Research About Female Role Models & High School Influences

Women are more likely to major in certain majors, such as mathematics, statistics and geology, if they enroll in an introductory course taught by a female professor, who serves as a role model (Bettinger & Long 2005). However, having women faculty does not have a statistically significant effect on majoring in other fields underrepresented by women, such as engineering, physics and computer science, but rather reduces the likelihood of majoring in economics, psychology and education (Bettinger & Long 2005). An earlier study by Rask & Bailey (2002) of Colgate college students revealed that the greater the proportion of courses that women take with female faculty is, the greater the likelihood that they are to major in that department. Men were more likely to major in departments where they took courses with male faculty and minorities major in departments where they took courses with minority faculty, and the magnitude of this influence was the highest among white men (Rask & Bailey 2002). Solanki & Xu (2018) reported that women tend to be less engaged than men in general in STEM courses, but the gender gap in course behavioral engagement and attitudes narrows when a female instructor teaches a STEM course. While women are less inclined to ask a male STEM professor for help than men are (difference of 0.23 SD units), having a female instructor almost completely offsets this, because in a female instructor-led class, women are only 0.04 SD units less than men are in seeking help (Solanki & Xu, 2018).

High school teachers and guidance counselors may also have important impacts on whether women select STEM majors. Ware & Lee (1988) analyzed 1982 data from the High School and Beyond (HS&B), a national longitudinal study of the goals, attitudes, experiences, and achievements of high school seniors. High school teachers and guidance counselors impact female students' persistence in science and math and influence their decisions to enroll in math and science courses later (Ware & Lee 1988). While the greatest impact on the selection of a STEM major among both men and women is the number of years of math and science courses taken at college, women who prioritize their future family and personal lives are less likely to major in STEM (Ware & Lee 1988).

Prior Research With Information Intervention

Several studies have implemented an information intervention by presenting students with salary information by major and examining its impact. Ding et al. (2021) reported that 39% of students changed their first-choice major group preference in response to a wage information intervention. Most students shift from low paying majors to higher paying majors, and within STEM, students shift from science majors to engineering majors (Ding et al. 2021). Women were less likely to apply to and attend a STEM major, 15% less likely to shift into other high paying majors, such as economics or management, and more likely to enroll in majors that have lower mean starting salaries (Ding et al. 2021). Women are less likely to value extrinsic incentives for major choice, and women who prefer high paying majors are still less responsive to wage information than men are (Ding et al. 2021). Median salary data were significant in predicting the likelihood of switching majors after an informational intervention (Li 2025). Jiang and Zen (2025) conducted a field experiment with UC Berkeley seniors and reported that after presenting students with 25th percentile, 75th percentile, and median salary information by major, students updated their reservation wages toward the true salary info. There were no statistically significant differences in earnings or employment responses by gender, but students in high-paying majors are more likely to underestimate both the center and spread and the range of the wage distribution (Jiang and Zen 2025).

Porter and Serra (2020) implemented a different form of information intervention by exposing students in an introductory economics course to successful women who majored in economics. The intervention significantly increased the likelihood for women to major in economics from a baseline of 9 percent by an additional 8 percentage points, whereas there was no similar effect on men (Porter & Serra 2020).

Furthermore, the impacted women shifted from majoring in lower earning humanities majors into higher earning economics majors and were not diverted from high earning STEM majors (Porter & Serra, 2020).

Prior Research About YouTube and Social Media

As social media usage time increases among high school students, it is helpful to study the impact of YouTube on the college selection process. Molyneaux et al. (2009) analyzed vlog creation and consumption by gender and reported that more men (27%) than women (3%) visited YouTube daily and that men (50%) were more likely than women (13%) to post videos and comments on YouTube. Furthermore, while more than 60% of the female-authored vlogs and 48% of the male-authored vlogs were about personal topics, more men than women created videos about public- and technology-related topics (Molyneaux et al. 2009). Since college admissions advice videos on YouTube would best fit into the "public" category, it is likely that more men than women create, consume and comment on videos about college admissions and choosing college majors.

Novel areas of this study

This study contributes to the growing literature on the college major selection process by examining several novel areas. First, in addition to surveying the importance of the various factors affecting the major selection process, students were asked when they first became interested in their college major. In terms of the information intervention, students were not just asked to see if they would be interested in switching majors; they were also asked to estimate the median salaries of their selected majors. Finally, this study is one of the few that asked students about the impact of social media in general and YouTube, TikTok and Instagram in particular.

RESEARCH METHODOLOGY

Experimental Design

This study of gender differences in the process of selecting college majors is based on survey data from 150 college sophomores found in Li (2024), the focus of the paper is to compare Asian Americans with white students. One hypothesis is that if rising college sophomores who have not yet declared a major are presented with an information intervention of the median salary of different majors, they will be more likely to select a new major with a higher median salary (Li 2024). The median salary data for 151 college majors presented to students are from a 2023 online Bankrate article titled "Nearly 80% of graduates with the 20 most lucrative college degrees are men" (Gailey 2023). This data source was selected because of its easy access and accessibility to any student who searches for such salary information on Google or another search engine.

This study's survey (Li 2024) asked the students to specify the major they selected as their top choice when they were applying to their current college and then to estimate the median salary (in thousands of dollars) for those who graduated with the major. The survey also asked students for their top two major choices, followed by an estimate of each major's median salary. The median salary estimates are then compared with the actual median salaries for the majors. The absolute value of the differences was then averaged to provide a single number measuring how well the participants could estimate the median salaries. Students then stacked-ranked the importance of six influence categories, namely, their own interests in the major; characteristics intrinsic to the major; information about the major; family; college and high school factors, and rated 18 specific factors on a 5-point Likert scale on the basis of their importance to the major selection process (Li 2024).

Survey Execution

Since the target population of rising sophomores attending U.S. colleges who have not declared a major is relatively hard to find, four online platforms were used to recruit 150 survey participants from 7/18/24 to

8/6/24: Prolific (N=83), Connect by CloudResearch (N=32), Mechanical Turk (N=30) and Clickworker (N=5). The participants received $1.80 to $2.00 for submitting a valid response on a survey hosted by Qualtrics XM. The average survey response duration was 9.9 minutes (Li 2024).

Survey Treatment Groups

This study's survey leverages Qualtrics XM's survey flow randomizer feature to present the participants with one of the potential paths. In the initial phase of the survey, the survey randomly divided the participants into three groups: the control group, treatment group 1 and treatment group 2. The control group would not see the instructions or Bankrate median salary data or the questions asking them to select a new first and second choice major. After receiving 12 responses in the control group, the routing logic was changed to route new participants equally to the two treatment groups. This is because the number of rising sophomores who are participating in this study is relatively small, so to conserve this study's research budget for paying participants, every participant was routed to either treatment group 1 or 2 and asked to select a new major after the information intervention. The instructions to the participants in the two treatment groups are the same, except for the URL link to the Google spreadsheet containing the median salary data. Treatment 1 version of the spreadsheet removes the two columns in the Bankrate article showing the percentages of men vs. women who have selected that major, whereas Treatment 2 version contains the original median salary data as found in the Bankrate article. The two treatments were designed to test the hypothesis that women are more likely to choose a different major under Treatment 1. The rationale for this test is to determine whether there are differences in how women would choose new majors if they saw information about the gender mix of the different majors. One possibility is that women who examined median salary data containing gender percentage information would then select STEM majors less frequently. This could be due to a priming effect, where women who see gender information and how low the percentage of women with STEM majors is, would be influenced to select a non-STEM major.

FINDINGS AND ANALYSIS

Descriptive Results

This survey included 53% men, 45% women and 2% nonbinary participants (Li 2024). According to the 2019 National CIRP Freshman Survey (CFS), the gender identity of U.S. college freshmen is 42% men and 58% women (Stolzenberg, 2020). The CFS is frequently cited by researchers because it is administered annually by colleges across the United States and provides detailed data on incoming college students' background characteristics, high school experiences, attitudes, behaviors, and expectations for college. Compared with the 2019 CFS, this survey included significantly more men and fewer women (Li 2024).

TABLE 1: SURVEY PARTICIPANTS BY RACE AND GENDERS

	Men	Women	Nonbinary	Totals	Total %
Asian	36	16	2	54	36%
Black	7	13	0	20	13%
Hispanic	8	5	0	13	9%
White	29	31	1	61	41%
Other (Mixed)	0	2	0	2	1%
Totals	80	67	3	150	100%
Total %	53%	45%	2%	100%	

The grouping of the top choice of the majors selected by participants before the information intervention (their top choice major now) can be seen in Table 2. The top three categories are STEM (50%), business (25%) and social sciences (12%) (which includes education). Among men, 41 out of 80 (51%) selected a STEM major, as did 32 out of 67 women (48%). Comparing this study's distribution of intended college

majors vs. the 2019 CFS, STEM, and business majors are significantly overly represented, whereas social sciences, health & medicine, arts & humanities majors, and other/undeclared majors are underrepresented (Li 2024).

TABLE 2 TOP CHOICE MAJOR BY GROUPING BEFORE INFORMATION INTERVENTION

	Undeclared/Other	Arts & Humanities	Business	Health & Medicine	STEM	Social Sciences	Totals
Men	2	5	23	2	41	7	80
Women		5	14	5	32	11	67
Non-Binary		1			2		3
Totals	2	11	37	7	75	18	150
% of Total	1%	7%	25%	5%	50%	12%	100%
2019 CFS	14%	11%	13%	12%	34%	16%	100%

Twelve participants were in the control group and were not presented with the informational intervention, which is a Google Sheet containing the actual median salaries of all of the majors from the Gailey (2023) Bankrate article. The remaining 138 participants reviewed the spreadsheet and then selected majors, which were grouped into the categories shown in Table 3.

TABLE 3 TOP CHOICE MAJOR BY GROUPING, POST-INFORMATION INTERVENTION

Overall	Arts & Humanities	Business	Health & Medicine	STEM	Social Sciences	Totals
Men	4	17	2	42	6	71
Women	4	13	7	28	12	64
Non-Binary	1			2		3
Totals Overall	9	30	9	72	18	138
Treatment Group 1	Arts & Humanities	Business	Health & Medicine	STEM	Social Sciences	Totals
Men	3	8	1	19	2	33
Women	2	6	6	15	5	34
Non-Binary	1			1		2
Totals	6	14	7	35	7	69
Treatment Group 2	Arts & Humanities	Business	Health & Medicine	STEM	Social Sciences	Totals
Men	1	9	1	23	4	38
Women	2	7	1	13	7	30
Non-Binary				1		1
Totals	3	16	2	37	11	69

Seventy-two out of 138 (52%) selected a STEM major and split 35 and 37 from treatment groups 1 and 2, respectively. Among women, 15 and 13 selected STEM majors from treatment groups 1 and 2, respectively. However, of the 12 control group participants, 5 selected a STEM major before the intervention. It is likely that many in the control group would have continued to select a STEM major if they were in the treatment group. Forty-two out of 71 men (59%) selected a STEM major, as did 28 out of 64 women (44%). The percentage of men who selected a STEM major after the intervention increased by 8%, whereas the percentage of women decreased by 4%. Sixty-four out of the 138 (46%) selected a different major than the one they selected pre-treatment (Table 4). Comparing Tables 3 and 4, 36 out of 71 men (51%) and 27 out of 64 women (42%) changed majors.

TABLE 4 TOP CHOICE MAJOR BY GROUPING FOR PARTICIPANTS WHO CHANGED MAJORS POST-TREATMENT

Overall	Arts & Humanities	Business	Health & Medicine	STEM	Social Sciences	Totals
Men	2	7	1	24	2	36
Women		4	4	13	6	27
Non-Binary				1		1
Totals Overall	2	11	5	38	8	64
Treatment Group 1	Arts & Humanities	Business	Health & Medicine	STEM	Social Sciences	Totals
Men	2	2		9		13
Women		2	3	7	3	15
Non-Binary						0
Totals	2	4	3	16	3	28
Treatment Group 2	Arts & Humanities	Business	Health & Medicine	STEM	Social Sciences	Totals
Men		5	1	15	2	23
Women		2	1	6	3	12
Non-Binary				1		1
Totals	0	7	2	22	5	36

While the number of women who switched to STEM majors in treatment group 1 and treatment group 2 remained nearly the same (7 vs. 6), the number of men who switched to STEM majors increased from 9 in treatment group 1 to 15 in treatment group 2. Among the 64 participants who changed majors, only 7 changed from non-STEM majors to STEM majors. Although this is below expectations, the main reason is that the survey sample contained many more STEM majors than national averages did. Among the 38 participants who changed majors and selected a STEM major, 31 changed from one STEM major to another, especially a higher paying major. Forty-seven out of 64 participants (73%) selected a new major with a higher median salary. Sixteen out of 26 men (62%) and 9 out of 21 women (43%) changed to one of the STEM majors with a higher median salary (Table 5). Fifteen out of 64 (32%) selected majors with a lower median salary, and 2 out of 64 selected majors with the same median salary. Among the 15 participants who selected a major with a lower median salary, 13 selected a new major within the STEM field.

TABLE 5 TOP CHOICE MAJOR BY GROUPING FOR PARTICIPANTS WHO CHANGED TO MAJORS WITH HIGHER MEDIAN SALARIES POST-TREATMENT

	Arts & Humanities	Business	Health & Medicine	STEM	Social Sciences	Totals
Men	1	7	1	16	1	26
Women		4	3	9	5	21
Non-Binary						
Totals	1	11	4	25	6	47

While most research focuses on the college major decision process among high school seniors or college students, a significant percentage of students are interested in potential majors earlier in life. Twenty-seven percent of the students developed interest before their sophomore year in high school, 10% developed interest during their sophomore year, and approximately two-thirds developed interest after their sophomore year in high school (Table 6). Although 29% of men develop interest in their major by the sophomore year, almost half of women (48%) develop interest by the sophomore year (Li 2024).

TABLE 6 WHEN PARTICIPANTS FIRST DEVELOP AN INTEREST IN THEIR TOP CHOICE MAJOR

	Elem. school	Middle school	HS 1st Yr	HS 2nd Yr	HS 3rd Yr	HS 4th Yr	College Freshman	Totals
Men	7	7	3	6	15	24	18	80
Women	6	10	7	9	12	11	12	67
Non-Binary		1					2	3
Totals	13	18	10	15	27	35	32	150
% of Totals	9%	12%	7%	10%	18%	23%	21%	100%

Hypothesis Testing

Since men tend to major in the highest-paying majors, one key hypothesis is that men are more focused on the median salary information of their major than women are. Hypothesis H1 states that men estimate a median salary that is closer to the actual median than women do. H2 states that men will place greater importance on the Bankrate median salary data on a 7-point Likert scale. In terms of the six categories of influence factors, men stack rank family, characteristics about the major, and information about the major as more important than women do, while they rank their own interests and high school and college influence factors as less important than women do (H3). On a 5-point Likert scale for H4 through H6, men will rate all of the factors in the "characteristics intrinsic to the major" category as more important than women (H4). In the "information about the major" category, men will rate all eight of the traditional and social media items as more important (H5). Finally, in the "your family" category, men rate all of the items as more important than women do (H6). Table 7 summarizes the H1 to H6 hypotheses tested via the t test function in RStudio.

TABLE 7 SUMMARY OF HYPOTHESES TESTING RESULTS

Hypothesis	**Alt. Dir.**	**Men Mean**	**Women Mean**	**P-Value**	**Alt. Hypo.**
H1. Men will estimate a median salary for their top two choice majors that is less further apart from actual median.	Less	23.81	25.60	0.3271	FALSE
H2. Men will place a greater value on median salary data.	Greater	5.03	5.16	0.3244	FALSE
H3a. Your own interest, enjoyment and passion for the major.	Greater	2.34	2.25	0.3765	FALSE
H3b. Your family (parents, siblings, relatives).	Less	4.00	3.79	0.7929	FALSE
H3c. Your high school (teachers, counsellors, friends).	Greater	4.49	4.57	0.6135	FALSE
H3d. Your college (professors, counsellors, friends).	Greater	4.08	4.18	0.6710	FALSE
H3e. Characteristics intrinsic to the major (median salary, popularity, prestige, ease of finding a job).	Less	2.80	2.69	0.6628	FALSE
H3f. Information about the major (in social media, books and articles, websites).	Less	3.30	3.52	0.1473	FALSE
H4a. Median salary data by major.	Greater	3.79	3.58	0.1181	FALSE
H4b. Prestige of the major.	Greater	3.24	2.99	0.0842	FALSE
H4c. Popularity of the major.	Greater	3.00	2.52	0.0106	**TRUE**
H4d. Difficulty of the major.	Greater	3.19	2.97	0.1138	FALSE
H4e. Ease of finding a job after college with the given major.	Greater	3.75	3.73	0.4551	FALSE
H5a. Traditional Media - Books.	Greater	2.63	2.24	0.0247	**TRUE**
H5b. Traditional Media - Articles.	Greater	2.63	2.57	0.3760	FALSE

H5c. Traditional Media - Websites.	Greater	2.91	2.60	0.0443	**TRUE**
H5d. Traditional Media In General.	Greater	2.66	2.49	0.1766	FALSE
H5e. Social Media - YouTube.	Greater	2.91	2.30	0.0016	**TRUE**
H5f. Social Media - TikTok.	Greater	2.56	2.28	0.0804	FALSE
H5g. Social Media - Instagram.	Greater	2.65	2.33	0.0607	FALSE
H5h. Social Media In General.	Greater	2.94	2.36	0.0010	**TRUE**
H6a. Your parents.	Greater	3.38	3.27	0.2926	FALSE
H6b. Your siblings.	Greater	2.48	2.22	0.1302	FALSE
H6c. Your grandparents.	Greater	2.39	1.94	0.0165	**TRUE**
H6d. Other relatives.	Greater	2.30	2.07	0.1279	FALSE
H6e. Family friend who is not a relative.	Greater	2.65	2.34	0.0738	FALSE

Six of the specific hypotheses had P-values less than 0.05 (H4c. Popularity of the major; H5a. Traditional Media – Books; H5c. Traditional Media – Websites; H5e. Social Media – YouTube; H5h. Social Media In General; H6c. Your grandparents), so the null hypothesis H0 can be rejected, and the alternative hypothesis HA is true. H1 tests whether men's estimate of their top- and second-choice majors' median salaries would be less different from actuals compared with those of women. Although the men's mean (23.81) is lower than the women's mean (25.60), the P-value is greater than 0.05. The alternative hypothesis HA is rejected.

In terms of the median salary estimation data related to H1, Table 8 summarizes the over- or underestimation of the median salary of the participants' top choice major by gender and major grouping. The number in parentheses is the number of people, and the dollar figure is the average over or under estimation in thousands of dollars. Although the number of participants who overestimate (71) is approximately the same as those who underestimate (69), the average overestimated amount is $18,000, whereas the average underestimate amount is $30,000. The gender ratio for those who underestimated was 32-36 (men-to-women), and for those who over-estimated, the ratio was 42-27 (men-to-women). Compared with women, men are more likely to overestimate the median salary.

TABLE 8 AVERAGE OVER AND UNDER ESTIMATION OF MEDIAN SALARY BY GENDER AND MAJOR GROUPING

	Arts & Humanities	Business	Health & Medicine	STEM	Social Sciences	Average (+/-)
Overestimation						
Men	$16 (3)	$9 (9)		$21 (27)	$15 (3)	$18 (42)
Women		$7 (6)		$22 (18)	$27 (3)	$19 (27)
Non-Binary				$25 (2)		$25 (2)
Average Over-estimate	$16 (3)	$8 (15)		$22 (47)	$21 (6)	$18 (71)
Underestimation						
Men	-$72 (2)	-$13 (13)	-$51 (2)	-$35 (11)	-$61 (4)	-$33 (32)
Women	-$16 (5)	-$30 (7)	-$13 (4)	-$38 (12)	-$25 (8)	-$28 (36)
Non-Binary	-$1 (1)					-$1 (1)
Average Underestimate	-$28 (8)	-$19 (20)	-$26 (6)	-$37 (23)	-$37 (12)	-$30 (69)

Hypothesis H2 tests whether men will place greater value on the Bankrate median salary data than women do. The men's mean value is 5.03, the women's mean value is 5.16, and the P-value is greater than 0.05, so the alternative hypothesis is rejected.

Compared with women, H3 tests whether men will place more importance on the three influence factor groups (Your family, Characteristics intrinsic to the major, and Information about the major) and less importance on the remaining three groups (Your own interest, your high school and your college). This survey question was a forced stack ranking of the importance of the six factor groups (lower mean = more important). For all the tests in H3, none of the items had a P-value less than 0.05, so none of the null hypotheses were rejected. Interestingly, the stack rankings of the six groups of influence factors are the same among men and women (from most to least important): 1) own interests, 2) characteristics intrinsic to the major, 3) information about the major, 4) family, 5) college factors and 6) high school factors.

The hypotheses in H4, H5 and H6 were tested via a 5-point Likert scale on how important the factor is to the college major selection process (higher mean = more important). H4 tests whether men place greater importance on the five influence factors in the "characteristics intrinsic to the major" category than women do. Only H4c, the popularity of the major (men's mean = 3.00 vs women's mean = 2.52), where the P-value < 0.05, so the null hypothesis is rejected. For all the remaining tests in H4, none of the items had a P-value less than 0.05, so all of the other alternative hypotheses were rejected. H5 tests whether men place greater importance on all eight traditional and social media factors than women do. H5a, H5c, H5e and H5h all have P-values < 0.05, so their null hypotheses are rejected. Men place more importance on books, websites, YouTube and social media in general to provide information about potential majors. Although the men's means for the remaining four factors were all greater than the women's means, their P-values were not less than the 0.05 threshold. The P-values for Tiktok (0.0804) and Instagram (0.0607) were close to the 0.05 threshold.

H6 tests whether men place greater importance on all five of the "your family" factors than women do. H6c (Grandparents) has a P-value < 0.05, so the null hypothesis is rejected. Men place more importance on grandparents' influence than women do. Although the men's means for the remaining four factors were all greater than the women's means, the P-values were not less than the 0.05 threshold. The three most important groups of factors for both men and women were the same: 1) parents, 2) family friends, and 3) siblings. However, men ranked grandparents fourth and other relatives last, whereas women flipped the rankings among those last two.

Probit & linear regression model testing

The glm function in RStudio was used to test H7, H8 and H9 by running a probit regression model on various factors likely to impact whether a participant switches to a new major posttreatment (Li 2024). All participants who switched majors posttreatment were coded with "1," whereas participants who did not switch majors were coded with "0". H7 tests whether the participant's rating of the importance of the Bankrate median salary data significantly affects the probability of switching majors, H8 tests whether the actual median salary of the top choice major is significant, and H9 tests whether the treatment group is significant. From Table 9, the Bankrate Median Salary Data are significant at the 0.01 level in predicting students' probability of choosing a new major (affirming H7). Compared with women, men are more likely to switch majors, but this difference is not statistically significant (P-value is 0.1003). Although the estimated coefficient for the "Actual Median Salary" is slightly negative, meaning that the higher the actual median salary of the student's original top major choice is, the less likely the student will choose a new major, the P-value is 0.1607 and is not statistically significant (rejecting H8). Although the estimated coefficient for the "Treatment Group" is positive, meaning that participants in Treatment Group 2 are more likely to choose a new major than those in Treatment Group 1 are, the P-value is 0.4135 and is not statistically significant (rejecting H9).

TABLE 9 PROBIT REGRESSION MODEL RESULTS TO TEST H7, H8 AND H9

	Estimate	Std. Error	z value	P-value	Signif.
(Intercept)	-1.3197	0.8249	-1.6000	0.1096	
Men	0.3864	0.2351	1.6430	0.1003	
Non-Binary	-0.1904	0.7752	-0.2460	0.8060	
Treatment Group	0.1880	0.2299	0.8180	0.4135	
Bankrate Median Salary Data	0.2471	0.0765	3.2280	0.0012	**
Household Income	0.0506	0.0539	0.9400	0.3474	
Estimate of Median Salary	-0.0024	0.0039	-0.6250	0.5318	
Actual Median Salary	-0.0095	0.0068	-1.4030	0.1607	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The lm function in RStudio was used to test H10 through H12 by running a linear regression model on specific influence factors to estimate the impact on the actual median salary of the top choice major posttreatment (Li 2024). H10 hypothesizes that the two most important influence categories are the participants' own interest in the major and the intrinsic characteristics of the major, such as median salary information. The greater the importance of the Bankrate median salary data is, the greater the top choice major's actual median salary (H11). Finally, the higher the importance of YouTube is, the higher the top choice major's median salary (H12).

Table 10 shows the models used to examine which of the six influence groups impact the actual median salary of the top choice major. All the models compare the male and nonbinary gender data against the female data. Model I through Model VI add each of the six influence groupings, one by one. Model VII includes the two groupings that were statistically significant, whereas Model VIII includes all six groups. Only the "Own interest" factor in Model I and the "Intrinsic to Major" factor in Model V are significant, so H10 is affirmed. Model VII includes both the "Own interest" and "Intrinsic to Major" groups, which are still significant. Model VIII includes all six major groups, and only the "Own interest" factor was still statistically significant. As a result, the "Own interest" factor is the most important, followed by the "Intrinsic to Major" factor. In general, men selected majors that paid approximately seven thousand dollars more than majors selected by women did.

Although the most important of the six influence factor groupings is the "Own interest" category on the actual median salary of the top choice major, the effects of the 18 specific influence factors in each category could be quite different. Table 11 shows the various linear regression models used to estimate the actual median salary on the basis of the specific influencing factors. Models I through III examine the 18 factors by group. Among the 18 factors, the median salary, books and YouTube factors were significant at the 0.01 or 0.05 levels, so H11 and H12 are confirmed. Model IV includes these three specific factors, and they all remain significant. According to the coefficients and significance levels, the median salary factor is the most important factor, followed by YouTube and then books. Interestingly, the coefficient for the books factor is negative, meaning that a higher rating for the books factor results in a lower actual median salary estimate.

Finally, to explore the interaction of gender with a few of the most important factors in the estimation of the actual median salary, linear regressions containing gender interaction with one's own interest, median salary, and the YouTube factors one by one revealed that there was an interaction between gender and YouTube but no interaction between gender and one's own interest or median salary. Table 12 shows the linear regression model containing the own interest, median salary, and the interaction between gender and YouTube. The interaction factor of Men:YouTube is statistically significant at the 0.05 level, and its coefficient is -4.85, so YouTube is more important for women than men in the estimate of the actual median salary.

TABLE 10 LINEAR REGRESSION MODEL RESULTS TO TEST H10

Model #	I	II	III	IV	V	VI	VII	VIII
(Intercept)	69.4972***	79.6708***	71.682***	71.8661***	84.7813***	82.4334***	77.4958***	51.4913*
Men	7.0553*	7.2478*	7.1389*	7.1759*	7.6832**	6.5402*	7.5066**	7.1703*
Non-Binary	-8.9373	-9.9081	-12.3728	-10.3514	-13.4550	-12.1793	-11.1966	-9.7788
Treatment Group	0.2317	0.1029	-0.0838	0.0981	-0.5410	0.2084	-0.1556	0.6751
Household Income	0.0088	-0.3622	-0.4085	-0.4264	-0.3840	-0.3157	-0.0729	-0.0976
Parents Education	0.1152	0.4193	0.5143	0.6283	0.8107	0.5643	0.3840	0.1713
Own interest	3.1002**						2.5053*	3.6363**
Family		-0.7179						0.4517
High School			1.1837					1.6602
College				1.0430				2.2550
Intrinsic to Major					-3.0683***		-2.5378**	-1.1272
Info about Major						-1.8842		NA

TABLE 11 LINEAR REGRESSION MODEL RESULTS TO TEST H11 AND H12

Model #	I	II	III	IV
(Intercept)	50.6917***	72.4921***	69.5524***	51.9051***
Men	5.5651	5.4674 .	6.3445*	4.6816 .
Non-Binary	-6.7123	-20.9679*	-8.3720	-16.0203 .
Treatment Group	1.2041	-1.0450	0.2575	0.7111
Household Income	-0.6009	-0.7445	-0.2680	-0.7643
Parents Education	0.4582	1.3091	-0.0838	1.0840
Median Salary	5.1708**			5.2642***
Prestige	1.3168			
Popularity	1.3879			
Difficulty	-1.5730			
Ease of Job Search	0.8407			
Books		-4.5435**		-2.8408*
Articles		2.6358		
Websites		-1.1114		
Traditional Media		-0.4780		
YouTube		4.2078*		4.2532***
TikTok		-1.9672		
Instagram		-0.4934		
Social Media		3.5196 .		
Parents			2.7170 .	
Siblings			-0.2231	

Grandparents			1.5460	
Other Relatives			-1.0628	
Family Friend			-0.0683	

TABLE 12 LINEAR REGRESSION MODEL WITH GENDER-YOUTUBE INTERACTION

	Estimate	Std. Error	z value	P-value	Signif.
(Intercept)	42.5004	6.202	6.853	2.62E-10	***
Men	16.5765	6.1405	2.7	0.00787	**
Non-Binary	12.047	34.4268	0.35	0.72696	
Own interest	1.4417	0.9326	1.546	0.12455	
Bankrate Median Salary Data	5.5292	1.3175	4.197	4.98E-05	***
YouTube	5.3533	1.7004	3.148	0.00204	**
Men:YouTube	-4.8488	2.2198	-2.184	0.03073	*
Non-Binary:YouTube	-8.147	11.1504	-0.731	0.46631	

CONCLUSIONS AND RECOMMENDATIONS

To close the gap between women and men majoring in STEM fields, Ding et al. (2021) recommended implementing strategies such as distributing information about career prospects, exposure to women role models and mentoring. According to Table 6, 29% of men but 48% of women developed an interest in their top choice major by their sophomore year in high school. Women are also influenced by high school teachers and guidance counselors in the selection of math and science fields of study (Ware & Lee 1988). Among girls from fourth to twelfth grades, disinterest in math courses increases from 9% to 50%, whereas interest in science decreases from 66% to 48% (Sax & Harper, 2007). To major in STEM in college, it is helpful to have a strong foundation in math and science courses in high school. The pool of students majoring in quantitative majors in undergraduate and graduate programs is essentially formed by the twelfth grade in high school (Maple & Stage 1991). Students interested in quantitative fields experienced net losses at every educational transition point, with the greatest loss occurring from the transition from high school to college (Maple & Stage 1991). Maple & Stage (1991) also analyzed a longitudinal series of High School and Beyond (HS&B) data and reported that the choice of a college major in the sophomore year in high school is directly related to the eventual college major across both men and women, as well as whites and blacks. This result emphasized the need for early intervention (Maple & Stage, 1991). In high school, men are almost three times more likely than women to expect to major in STEM in college, so recruiting women during high school to plan to major in STEM in college is the key to actually encouraging women to graduate with STEM majors (Ma 2011). Since women care about helping the community more than men do, the message that STEM fields are of tremendous importance in helping the community and the world at large should be clearly conveyed to young women (Ma, 2011).

This study revealed that the influence of six out of 18 factors is more important to men than women in the college major selection process: the popularity of the major, books and websites in the traditional media category; YouTube and social media in general; and the influence of grandparents. After the information intervention, 46% of the participants selected a new major, and the median salary data significantly predicted the likelihood of switching majors. The linear regression model revealed that the students' personal interests in the major are the most important factor, and the major's intrinsic characteristics, including the major's median salary, are the second most important for estimating the median salary of the selected major. Among the 18 specific influence factors, the three that were statistically significant in estimating the actual median salary were the median salary data and YouTube (both positively correlated) and books (negatively correlated). This study is one of the first to study influence factors consisting of specific traditional and social media sources of information, such as YouTube, TikTok and Instagram. As high school students

increase their reliance on social media sources of information, future research at a more granular level on how various types of social media impact the college major decision process will be helpful.

RECOMMENDATIONS

Based on this study, the researcher makes the following recommendations: Guidance counselors should conduct group sessions with high school students starting in their sophomore year to discuss future career choices and the impact of college majors on future wages and correct any misconceptions. This could help students in the long run, as it would expose high school students to career and college planning. One potential benefit could be to encourage female students to consider STEM majors at a young age. The sophomore year is a good time for group counseling sessions because students still have time to change their course electives for the 11th and 12th grades, which could prepare them for certain college majors, i.e., to take calculus so that the students are better prepared to major in STEM in college.

REFERENCES

1. Beffy, M., Fougère, D., & Maurel, A. (2012). CHOOSING THE FIELD OF STUDY IN POSTSECONDARY EDUCATION: DO EXPECTED EARNINGS MATTER? The Review of Economics and Statistics, 94(1), 334–347. http://www.jstor.org/stable/41349179
2. Berger, M. C. (1988). Predicted Future Earnings and Choice of College Major. ILR Review, 41(3), 418–429. https://doi.org/10.2307/2523907
3. Bettinger, E. P., & Long, B. T. (2005). Do Faculty Serve as Role Models? The Impact of Instructor Gender on Women Students. The American Economic Review, 95(2), 152–157. http://www.jstor.org/stable/4132808
4. Brown, C., & Corcoran, M. (1997). Sex-based differences in school content and the male-women wage gap. Journal of Labor Economics, 15(3), 431–465.
5. Dickson, L. (2010). Race and gender differences in college major choice. Annals of the American Academy of Political and Social Science, 627(1), 108–124. https://doi.org/10.1177/0002716209348747
6. Ding, Y., Li, W., Li, X., Wu, Y., Yang, J., & Ye, X. (2021). Heterogeneous major preferences for extrinsic incentives: The effects of wage information on the gender gap in STEM major choice. Research in Higher Education, 62(8), 1113–1145. https://doi.org/10.1007/s11162-021-09636-w
7. Gailey, A. (2023, September 5). Nearly 80% of graduates with the 20 most lucrative college degrees are men. Bankrate. Retrieved from https://www.bankrate.com/loans/student-loans/top-paying-college-majors-gender-gap/
8. Ganley, C. M., George, C. E., Cimpian, J. R., & Makowski, M. B. (2018). Gender Equity in College Majors: Looking Beyond the STEM/Non-STEM Dichotomy for Answers Regarding Female Participation. American Educational Research Journal, 55(3), 453–487. http://www.jstor.org/stable/26643520
9. Hawash, R., Stephen, S.-A., & McCormick, M. (2020). Is Finance for Me? Gender Differences in Choice of Finance as a College Major. Journal of Higher Education Theory and Practice, 20(8). https://doi.org/10.33423/jhetp.v20i8.3231
10. Jiang, M., & Zen, K. (2025). Information Asymmetry in Job Search. https://econ.columbia.edu/wp-content/uploads/sites/18/2021/03/IAJS_JMP_Jiang-4.pdf
11. Kim, C., Tamborini, C.R., & Sakamoto, A. (2015). Field of study in college and lifetime earnings in the United States. Sociology of Education, 88(4), 320–339.
12. Li, A. (2025). Asian American College Major Choice: Median Salary Information Intervention and Analysis of Six Key Influence Categories. Journal of Higher Education Theory and Practice, 25(3), 93–104. https://doi.org/10.33423/jhetp.v25i3
13. Ma, Y. (2009). Family socioeconomic status, parental involvement, and college major choices: Gender, race/ethnic, and nativity patterns. Sociological Perspectives, 52(2), 211–234. https://doi.org/10.1525/sop.2009.52.2.211

14. Ma, Y. (2011). Gender Differences in the Paths Leading to a STEM Baccalaureate. Social Science Quarterly, 92(5), 1169–1190. http://www.jstor.org/stable/42956572
15. Maple, S. A., & Stage, F. K. (1991). Influences on the Choice of Math/Science Major by Gender and Ethnicity. American Educational Research Journal, 28(1), 37–60. https://doi.org/10.2307/1162878
16. Molyneaux, H., O'donnell, S., Gibson, K., & Singer, J. (2009). Exploring the Gender Divide on YouTube: An Analysis of the Creation and Reception of Vlogs. In Analysis: YouTube and Gender. Media Report to Women (Vol. 37, Issue 2).
17. Mullen, A.L. (2014). Gender, social background, and the choice of college major in a liberal arts context. Gender and Society, 28(2), 289–312. https://doi.org/10.1177/0891243213512721
18. Polachek, S.W. (1978). Sex differences in college major. Review, 31(4), 498–508.
19. Porter, C., & Serra, D. (2020). Gender Differences in the Choice of Major: The Importance of Women Role Models. American Economic Journal: Applied Economics, 12(3), 226–254. https://www.jstor.org/stable/26921834
20. Porter, S.R., & Umbach, P.D. (2006). College major choice: An analysis of person-environment fit. Research in Higher Education, 47(4), 429–449. https://doi.org/10.1007/s11162-005-9002-1
21. Quadlin, N. (2017). Funding sources, family income, and fields of study in college. Social Forces, 96(1), 91–120. https://doi.org/10.1093/sf/sox042
22. Quadlin, N. (2020). From major preferences to major choices: Gender and logics of major choice. Sociology of Education, 93(2), 91–109. https://doi.org/10.1177/0038040719887971
23. Rask, K. N., & Bailey, E. M. (2002). Are Faculty Role Models? Evidence from Major Choice in an Undergraduate Institution. The Journal of Economic Education, 33(2), 99–124. http://www.jstor.org/stable/1183389
24. Reuben, E., Wiswall, M., & Zafar, B. (2017). Preferences and biases in educational choices and labour market expectations: Shrinking the black box of gender. Economic Journal, 127(604), 2153–2186. https://doi.org/10.1111/ecoj.12350
25. Sax, L. J., & Harper, C. E. (2007). ORIGINS OF THE GENDER GAP: PRE-COLLEGE AND COLLEGE INFLUENCES ON DIFFERENCES BETWEEN MEN AND WOMEN. Research in Higher Education, 48(6), 669–694. http://www.jstor.org/stable/25704523
26. Sloane, C.M., Hurst, E.G., & Black, D.A. (2021). College majors, occupations, and the gender wage gap. Journal of Economic Perspectives, 35(4), 223–248. https://doi.org/10.1257/jep.35.4.223
27. Solanki, S. M., & Xu, D. (2018). Looking Beyond Academic Performance: The Influence of Instructor Gender on Student Motivation in STEM Fields. American Educational Research Journal, 55(4), 801–835. http://www.jstor.org/stable/26643550
28. Stolzenberg, E.B., Aragon, M.C., Romo, E., Couch, V., McLennan, D., Eagan, M.K., & Kang, N. (2020). The American Freshman: National Norms Fall 2019. Higher Education Research Institute, UCLA.
29. Staniec, J. F. O. (2004). The Effects of Race, Sex, and Expected Returns on the Choice of College Major. Eastern Economic Journal, 30(4), 549–562. http://www.jstor.org/stable/40326147
30. Turner, S. E., & Bowen, W. G. (1999). Choice of Major: The Changing (Unchanging) Gender Gap. Industrial and Labor Relations Review, 52(2), 289–313. https://doi.org/10.2307/2525167
31. Ware, N. C., & Lee, V. E. (1988). Sex Differences in Choice of College Science Majors. American Educational Research Journal, 25(4), 593–614. https://doi.org/10.2307/1163131
32. Wiswall, M., & Zafar, B. (2015). Determinants of college major choice: Identification using an information experiment. Review of Economic Studies, 82(2), 791–824.
33. Xia, X. (2016). Forming wage expectations through learning: Evidence from college major choices. Journal of Economic Behavior & Organization, 132, 176–196. https://doi.org/10.1016/j.jebo.2016.10.013
34. Zafar, B. (2013). College major choice and the gender gap. Journal of Human Resources, 48(3), 545–595. https://doi.org/10.3368/jhr.48.3.545