

Making Major Decisions: Effect of a First-Year Seminar for Exploratory Students on Major Declaration

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Exploratory students enter college without a declared major but are actively searching for one that fits their values, interests, and skills. A first-year seminar (FYS) created for exploratory students provides guided support in the exploration process. The current study used multiple logistic regression to investigate the effect of the FYS on major declaration via change in major certainty. Findings show change in major certainty is a significant predictor for major declaration within the first year. The study has implications for both policy and practice related to the exploratory population.

Keywords: higher education, major declaration, first-year seminar, high-impact practice, exploratory students, retention

First-year seminar (FYS) courses have shown a consistent ability to support students through their initial transition to college, helping ensure their future success in postsecondary education (Jaijairam, 2016; Jessup-Anger, 2011; Kuh et al., 2008). Categorized as a high-impact practice, FYS courses are often academic or career-focused and introduce students to college learning and campus resources (Jaijairam, 2016; Kuh, 2008). However, the tendency for institutions to organize FYS offerings by a student's major means those who have yet to decide on an academic

discipline may receive inadequate support. As a result, students who have yet to declare a major, referred to as exploratory students, may be more likely to question their belonging at the institution, have unanswered questions about how to use campus resources, and lack engaging major or career exploration opportunities essential to their ability to decide on an academic major (Carduner et al., 2011; Foster, 2017). To address this need, the authors designed an FYS to help exploratory students find their best fit major or career path.

Research indicates that up to 75% of college students change their major at least once during their undergraduate career (Gordon & Steele, 2015). Exploratory programs offer students who have yet to choose a major additional support and resources to combat challenges and the stress of deciding on their own. A central goal of these departments and programs is to ensure students identify an academic path that fits their interests, uses their skills, and aligns with their values by the time they complete the first college year. The emphasis on first-year exploration avoids the potential consequences of multiple major changes, such as delayed graduation and extra financial costs (Denice, 2021; Sklar, 2018). This paper explores data from two cohorts enrolled in an FYS course designed to cater to the needs of exploratory students. The authors investigated the effect of course participation on student major declaration behaviors within the first college year.

Literature Review

First-Year Seminars

A growing literature base explores the role of first-year seminars, considered high-impact practices, in supporting a positive transition to college, helping institutions meet retention goals, and providing students with resources and opportunities they may not otherwise receive (Jajairam, 2016; Kuh, 2008). For example, Pittendrigh et al. (2016) found that persistence increased for students who took an FYS and doubled for students considered high-risk. Although support for FYS courses across higher education is strong, Porter and Swing (2006) found that influence on student persistence is dependent on course content and the skills students feel like they gain from it. Mindful of Porter and Swing's claim that self-selection may have influenced their findings, Culver and Bowman (2020) performed a quasi-experimental analysis on FYS courses to reduce the effects of self-selection and

motivation bias. They found that first-year seminars positively impact first-year satisfaction but do not significantly affect outcomes such as grades or retention. These results recognize the influence of a first-year seminar can be mediated by both institutional context and student motivation to take the course. Additionally, it becomes evident that students who are exploring major options and grappling with college transition may benefit from these interventions.

Needs of Exploratory Students

Formerly referred to as undecided, exploratory students are those who have yet to declare a major. Existing literature on exploratory students offers varied perspectives on supporting these students and the advantages or disadvantages of entering college without a declared major. Some first-year exploratory students use their initial semesters to pursue general education courses, transition to college life, and reflect on possible majors (Ellis, 2014). However, some studies have shown that these students may be less likely to persist beyond their first year (Leppel, 2001) and have a harder time with their college transition (Glaessgen et al., 2018). On the contrary, Spight (2020) found with a sample of 4,489 students that exploratory students did not differ significantly from decided students when it came to persistence or pre-college factors.

Initiatives addressing the specific needs of exploratory students include intentional advising efforts and programming in areas such as identifying values, interests, and skills and making connections from those areas to possible major and career paths (Damminger et al., 2009; Ellis, 2014; Steele, 2003). In addition to helping them find a major, studies show that it is essential for advisors to work diligently with exploratory students to provide knowledge of university resources and policies that may influence their exploratory journey (Gordon & Steele, 2015; Workman, 2015).

Major Exploration in Policy and Practice

Students may enter college as exploratory or become exploratory after enrollment. The fluidity of when students explore major options impacts various outcomes associated with time-to-degree completion and sense of belonging. Yue and Fu (2017) found that only 20% of students who did not have a major for more than half of their enrolled terms graduated compared to 61% of students who spent more than half of their enrollment with a declared major. Yue and Fu's findings also indicated

that decisions such as declaring, changing, and double majoring were among the most important factors in time-to-degree completion, second to academic performance.

Additionally, Workinger (2011) found that policies requiring major declaration at admission could be helpful for nontraditional and at-risk students, while traditional college students may benefit from policies that offer more flexibility. Finally, Donnelly and Borland (2002) investigated the timing of major declaration for exploratory students. They found that 63.5% of students had declared a major by the end of their third semester, and 93.5% had declared one before completing 46 credits. Moreover, they specifically noted that students entering disciplines requiring a significant number of prerequisites declared majors earlier, suggesting a possible connection between major-specific policies and the timing of major declaration behaviors.

In addition to variations in major declaration policies, institutions also differ in first-year seminar offerings. While some institutions offer FYS courses and other transition programming on an optional or program-specific basis, other institutions require every first-year student to take an FYS (Reid et al., 2014). In some cases, FYS offerings may be connected to a student's major (Damminger et al., 2009; Mamrick, 2005; Reid et al., 2014). While preprofessional or discipline-linked seminars help prepare students for their field of study, they inadvertently create a dilemma for students who have not yet declared a major. As exploratory student populations grow, addressing existing policies and initiatives that may affect time-to-degree completion and a student's perception of and certainty about their intended academic major becomes more important for institutions.

Responding to the literature's call to have intentional interventions that support exploratory student populations, the authors developed a first-year seminar specifically for students who have yet to declare a major. This course aimed to provide a high-impact practice as outlined by Kuh (2008) while helping students navigate the major decision-making process. The exploratory FYS works specifically to help students with major decisions, predicated on the belief that if students decide on a major that fits their skills and interests, their academic performance will be stronger. Thus, we developed the course to bring a high-impact practice to the exploratory student population and provide them with essential supports for the college transition and ability to declare a

major, as defined by the literature.

Methods

This study aimed to investigate factors influencing exploratory students' major declaration patterns after taking an FYS course developed to help them explore academic and career paths. The research question for the study was: Does change in major certainty during a first-year seminar course for exploratory students predict whether they will declare their major by the end of their first year? We hypothesized that a greater positive change in a student's major certainty while taking the FYS would make a student more likely to declare their major in their first college year, holding other influencing factors equal.

To test this hypothesis, the research team gathered data for two cohorts of exploratory students enrolled in the FYS course during the Fall 2018 and Fall 2019 semesters. All students were first-time-in-college students enrolled at a four-year public institution. Students in the course took a survey during Week 1 of instruction that asked a series of open-ended and multiple-choice questions associated with their participation in the exploratory program and FYS. We adapted Gordon's (1998) career decidedness continuum to assess major certainty. One question asked students to rate their level of major certainty on a 7-point scale ranging from "I do not have any idea which major I would like to pursue" (1) to "I am very decided on what major I would like to pursue" (7).

A postsurvey was distributed at the end of the course, 12 weeks later, asking students to rate their level of major certainty using the same scale. These pre and postexploration surveys were designed to determine how the course influenced such factors as certainty in declaring a major, certainty in a career path, and comfort with campus resources. The survey data were used in conjunction with institutional demographic data to create the variables for the study.

A logistical regression analysis was used to test the hypothesis. The primary outcome variable of the study measured likelihood that a student would declare a major by the end of the second term. The following variables were used in the model for predicting major declaration behaviors: change in major certainty between Week 1 and Week 12 of the FYS course, gender, race/ethnicity, number of credits

taken in the semester during the FYS course, college GPA after the first year, and amount of college credit brought in from high school. The change in major certainty variable was calculated using the difference between answers for the question “How would you rate your current level of uncertainty or certainty in the major selection process?” on the pre and postexploration surveys. The regression model was as follows:

$$Y_{Major\ Declaration} = \beta_0 + \beta_1 Change\ in\ Major\ Certainty + \beta_2 Gender + \beta_3 Race + \beta_4 Semester\ Hours\ during\ FYS + \beta_5 First\ Year\ College\ GPA + \beta_6 College\ Credits\ Transferred\ from\ High\ School + \varepsilon$$

The sampling pool for this study was 203 students. As the main predictor variable was change in major certainty over the semester they took the FYS, we could only use data from students who completed both the pre and postexploration surveys and responded to the major certainty questions. As such, 12 students who did not meet the previous criteria were excluded. A final sample size of 191 was used once we verified that each of the other variables had 191 observations.

We analyzed the data using the Stata 16 software package. Summary and descriptive statistics were run to identify proper variables and check for multicollinearity before running the regression model. We then ran multiple logistical regression models checking for the best-fit model, resulting in the model presented earlier. The findings were analyzed for significance and are detailed in the Results section.

Limitations

Several limitations in the study should be considered. First, the data consisted of a convenience sample of students who chose to take this course. The FYS course is not required for students in the exploratory program or as a university graduation requirement. As a result, the sample consists of students who specifically opted-in to the course. Factors such as socioeconomic status, race, gender, and motivation could influence which students decided to enroll in the course or be in the exploratory program. Additionally, only responses from students who took the FYS and completed the survey were used. In the final sample, white women are overrepresented as compared to the racial and gender makeup of the institution where the study was held. Although not representative of the institution’s overall population, the sample is

representative of the exploratory program.

We also acknowledge that multiple factors influence a student's decision to select a major. While we attempted to account for some factors to explore the impact of the course on major declaration, we acknowledge that experiences outside the FYS such as familial influence, participation in student organizations, peer connections, and other courses could be shaping factors for which we were unable to account in the data.

Results

Descriptive Statistics

Descriptive statistics were run for each variable to identify the number of observations, mean, and standard deviation (shown in Table 1). All variables of interest had 191 observations. As a result, no variable excluded any cases for the planned regression model. As convenience sampling was used, we analyzed the sample's demographics. We determined that white women were overrepresented, limiting our ability to determine the effects of race/ethnicity and gender in the models (see Table 1). Recognizing that demographic factors can play a large role in major decision-making, we included them in the model knowing that they would likely not be significant.

Table 1
Summary Statistics of All Variables in Model (N = 191)

Variable	M	SD	Min	Max
Major declaration	.79	.42	0	1
Change in major certainty	2.20	2.06	-3	6
Gender	.67	.47	0	1
Race	1.64	1.74	1	8
1st-semester credit hours	12.77	1.44	8	17
1st-year college GPA	3.57	.43	.182	4
College credits transferred from high school	20.33	14.10	0	67

In addition to overall summary statistics, we also examined a cross-tabulation of the main predictor variable, change in major certainty, with

the outcome variable, major declaration by the end of the first year (see Table 2). Based on this analysis, we noticed that the majority of students who declared a major had a positive change in major certainty over their semester in the FYS course.

Table 2
Cross-tabulation of Change in Major Certainty by Major Declaration

Change in major certainty	Major declaration		Total
	No	Yes	
-3.00	1	0	1
-2.00	3	4	7
-1.00	2	6	8
0.00	11	20	31
1.00	5	15	20
2.00	9	27	36
3.00	3	35	38
4.00	5	16	21
5.00	2	16	18
6.00	0	11	11
Total	41	150	191

Note. Change in major certainty variable is the difference in participants' post and presurvey scores.

Once we reviewed the summary statistics for each variable, we ran a Pearson correlation for each one to check for possible multicollinearity. At this step, we recognized that high school GPA correlated highly with several other variables and, thus, decided to exclude this variable from the model. We also decided not to use the student's grade in the FYS course as it correlated highly with gender and was not normally distributed. In addition, we decided to exclude concorded ACT scores, as this variable significantly correlated with college credits transferred from high school and did not add much to the model. Once we analyzed these correlations, we ran the regression model with major declaration as the outcome and the following as predictors: change in major certainty, gender, race, number of credits attempted during the first semester, first-year college GPA, and number of college credits brought in from high school. Table 3 provides a correlational matrix with the independent variables used in the final regression model.

Table 3*Correlation Matrix of All Variables in Model*

Variable	Major dec.	Change in maj. cert.	Gender	Race	1st sem. credit hrs	GPA	Credits from HS
Major dec.	1.00						
Change in maj. cert.	.24***	1.00					
Gender	.20**	.16*	1.00				
Race	.05	-.05	-.09	1.00			
1st-sem. credit hrs	.12	-.08	-.01	-.19**	1.00		
GPA	.35***	.01	.25***	-.04	.19**	1.00	
Credits from HS	.25***	-.10	-.03	.10	.06	.22**	1.00

* $p < 0.05$. ** $p < .01$. *** $p < .001$.

Regression Model

As the outcome variable, major declaration, is a categorical variable, we ran a logistic regression (see Table 4). As mentioned previously, when finding the best-fit model, we decided to exclude high school GPA, student's grade in the FYS, and concorded ACT scores as predictor variables because they either showed multicollinearity, were not significant for the model, or did not seem to fit with other predictors that could influence major declaration.

Table 4*Factors Predicting Major Declaration in the First Year*

Predictor Variables	Major Declaration
Change in major certainty	0.406*** (0.113)
Gender (female)	0.593 (0.447)
Race (white)	0.170 (0.143)
Semester hours during FYS	0.190 (0.159)
First-year college GPA	1.523*** (0.581)
College credits transferred from HS	0.0541*** (0.0191)
Constant	-8.981*** (2.845)
Observations	191

Note. Standard errors are in parentheses.

* $p < 0.1$. ** $p < 0.05$. *** $p < 0.001$.

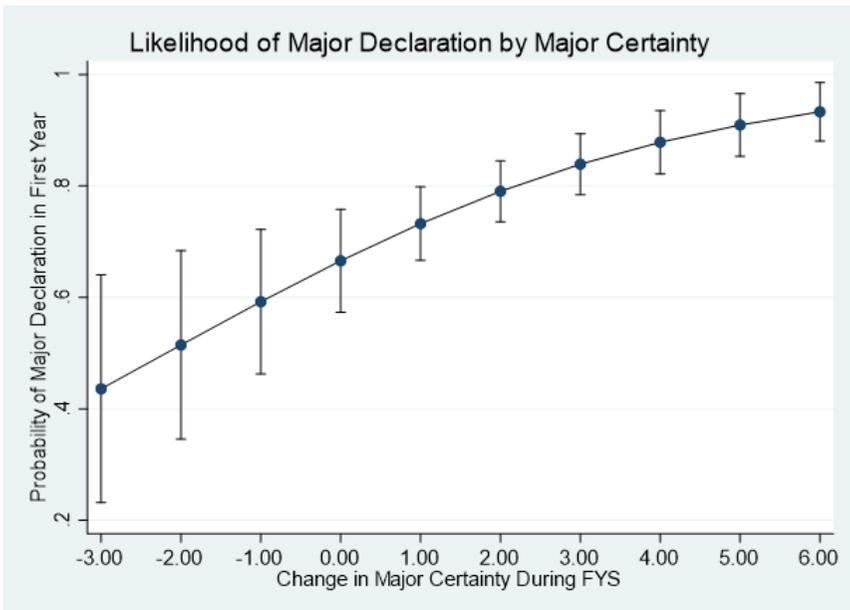
The model using six predictors resulted in a chi-square statistic with a statistically significant p -value at the .001 level, showing that the overall model is statistically significant. The fitted model equation follows:

$$\begin{aligned}
 Y_{\text{Major Declaration}} &= \beta_0 + 0.406\text{Change in Major Certainty} + 0.593\text{Gender} + 0.170\text{Race} \\
 &+ 0.190\text{Semester Hours during FYS} + 1.523\text{First Year College GPA} \\
 &+ 0.054\text{College Credits Transferred from High School} + \varepsilon
 \end{aligned}$$

While we understand that logistic regressions do not have an equivalent value to the r^2 value in ordinary least squares, it is important to note that the pseudo- r^2 value for the model was .245. As we are most interested in the influence of change in major certainty during the FYS on predicting major declaration, the data analysis focused on this variable. As seen in Table 4, change in major certainty is a significant variable in this model. Results show that every 1-unit increase in major certainty over the semester leads to a .41 increase in the log-odds of declaring a major by the end of the first year. Figure 1 displays the likelihood of declaring a major in the first year by change in major certainty for each score interval.

Figure 1

Likelihood of Major Declaration by Change in Major Certainty



In addition to change in major certainty, the regression model shows that first-year college GPA and the amount of college credit transferred from high school are also significant predictors of major declaration. The model shows that a 1-unit increase in GPA predicts a student to be 1.5 times more likely to declare a major in the first year, while every extra credit transferred from high school predicts a student to be .05 times more likely to declare a major. As anticipated, gender and race are not significant predictor variables for major declaration by the end of the first year. Neither is the number of credits taken simultaneously with the FYS.

Discussion

The results of this analysis allow us to reject the null hypothesis that change in major certainty while enrolled in an FYS does not affect major declaration by the end of the first year. In fact, the results show that change in major certainty during an FYS course for exploratory students had a positive impact on the likelihood that a student would declare a major by the end of the first college year. Given that 75% of undergraduate students change their major at least once during college (Gordon & Steele, 2015), it may benefit a student to begin their college career as exploratory and make strides toward declaring a major within the first year. Because the change in major certainty variable was a significant predictor of major declaration in the first year, evidence suggests the resources and content provided in the FYS may have influenced the timing of major declaration. These findings align with existing literature on the effects of high-impact practices and first-year seminars, specifically (Jajjairam, 2016; Kuh et al., 2008).

Major Declaration Predictors

The results of the model show that college GPA and credits transferred from high school are significant predictors for major declaration in the first year, suggesting important policy implications. Many majors have a threshold GPA and require students to have earned a specific number of credits before being admitted to the major. Therefore, it makes sense that students with higher GPAs and credits at entry would declare their major earlier than those with lower GPAs and fewer college credits. Accelerated college credit programs in high schools and university exploratory programs should identify areas of collaboration to ensure that students entering college with a significant amount of college credit can adequately explore major and career paths with sufficient support.

Similarly, exploratory programs, advisors, and administrators should use GPA as a risk indicator for likelihood to declare. Students with lower GPAs should receive targeted interventions to support their academic success and major exploration journey.

It is important to continue exploring factors that also contribute to major declaration and transitions to college. These include extrinsic motivators like familial influence, instructor relationships, and peer connections, as well as intrinsic motivations that students develop before and during college (Covarrubias et al., 2020; D'Amico Guthrie & Fruiht, 2020; Knapp et al., 2020). These influences should be considered holistically in exploratory advising, major exploration courses, and institutional assessments of student major declaration behavior.

Acknowledging Inequities in High-Impact Practices

The lack of representation of students from traditionally marginalized backgrounds in this study's sample (often defined as racial/ethnic minorities, first-generation, and low-income students) underscores calls for equity-minded high-impact practices in the existing literature (Finley & McNair, 2013; Kuh et al., 2017). Researchers are continuing to highlight the benefits of high-impact practices such as FYS courses on various student populations. Therefore, expanding FYS offerings and increasing the participation of traditionally marginalized students becomes a vital part of the student success agenda. Practitioners should consider FYS offerings, including major exploration content that cater to student identities such as first-generation status, gender, and/or racial-ethnic identity.

Conclusion

Our results indicate that additional research should explore FYS courses offerings with major exploration content and their impact on exploratory students. Despite acknowledged limitations, the study resulted in a statistically significant regression model showing that change in major certainty while taking an FYS course for exploratory students is a predictor of major declaration by the end of the first year. The results suggest that taking this course could benefit exploratory students by providing them with resources and guided exploration into their major and career choices, ultimately resulting in them being more certain in declaring their major. Supported decision-making helps ensure that students enjoy their major and meet requirements for said major. It may

also minimize other barriers to student success. Future studies should consider qualitative or mixed-method analysis to understand how students make meaning of their exploratory process to major declaration and the significance of FYS courses and similar interventions.

Additionally, it is essential for future research to include demographically representative samples of student populations and compare outcomes of exploratory students who participate in FYS courses to those who do not. Longitudinal studies could further assess the effects of an FYS course on factors such as retention and time to graduation for exploratory students.

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