

[36-303] A Study on Students' Change of Majors, What they Choose and Why.



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Our study

- Many students have considered switching majors.
- What factors cause students to stay in their major? if not transfer?
- Reasons and concerns regarding switching/retaining majors.
 - Time
 - Financial Concerns
 - Future job opportunities
 - Social influences
- Beneficial to prospective students
- Significant addition to school statistics.



Motivation/ Research Question

We gathered data on factors that affect a student's decision to change or retain their majors and how prevalent these factors are in the decision making process.



Sampling and Target Population Details

- Target Population: Carnegie Mellon Undergraduate Population
- Sampling frame: Carnegie Mellon C-Book email list
- Sampling Scheme: Random Sample without replacement, and post-stratification for data analysis
 - Sample Size: 1765 students (more details later)
 - Mode of Data Collection: Email invitation to the online survey link we created.

Sampling Size

- Total Undergrad population: 5619
- We've decided to include freshmen in our sample size
- Simple random survey without replacement
$$n_0 = (z^2)(SD^2)/(ME^2) = (1.96^2)(.5^2)/(.05^2) = 384.16$$
$$n > (N \cdot n_0)/(N + n_0); n > (4214 \cdot 384)/(4214 + 384) = 352.06$$
- Minimum response sample size: 353 responses
- Standard deviation: 1/2 95% CI 5% ME
- Increase minimum response sample 5 times to account for 20% response rate
- Final sample size: 1765 Students

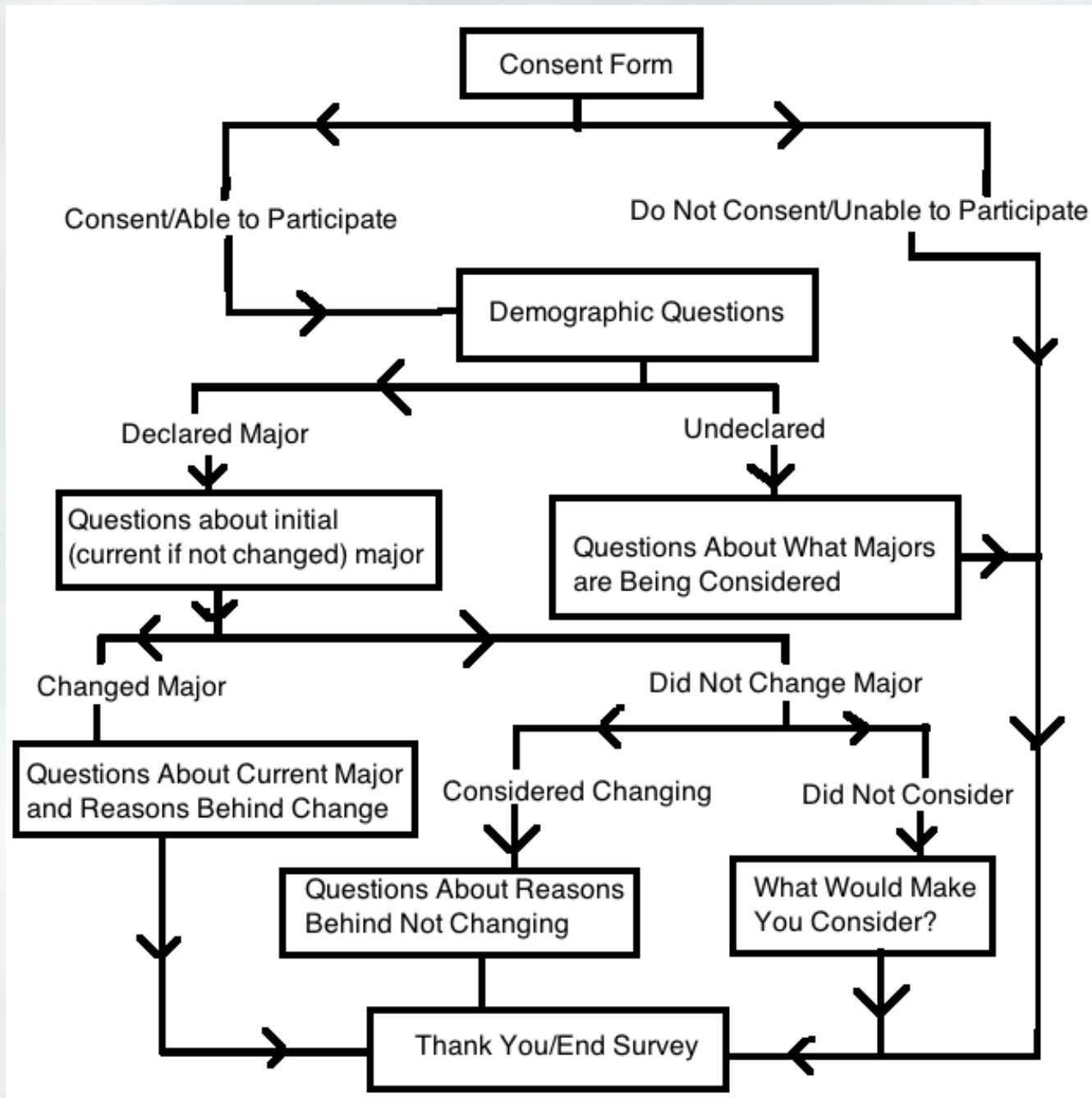


Sample Questions




- What led you to choose your current major?
- Would you pursue the field of your major in future professional career?
- Why did you leave your first major?
- Why did you choose your original major?
- What factors influenced your choice to change majors?
- Why didn't you change?
- Do you think the University should put more emphasis on major selection counseling?



Questionnaire Flowchart



The questionnaire

 <https://spreadsheets0.google.com/formResponse?hl=en&formkey=dGJlSHR5TIBKNzdHOEZKVmh5a1JLV2c6MQ&ptok=9103034>  

Major Satisfaction Survey - Consent Form

* Required

Major Satisfaction Survey

What is your gender? *

- ☐ Male
- ☐ Female

What year are you? *

- ☐ Freshman
- ☐ Sophomore
- ☐ Junior
- ☐ Senior
- ☐ 5th Year Undergraduate
- ☐ Other:

What college are you in? *

- ☐ CIT
- ☐ CFA

Problems

Non Response Problems (Our response rate is about 18.5%)

- Invalid emails from C-book
- People's unwillingness to complete survey
- Some people tend to skip open ended questions
- Invalid input into survey

Other Problems

- Getting responses from graduate students, students that have graduated, and PHD students. We have excluded these responses from our data analysis.
- More females responded than males

Gathering Responses

- Initial sample size: 1765 Students
- Two follow-ups

- 100 new random sample

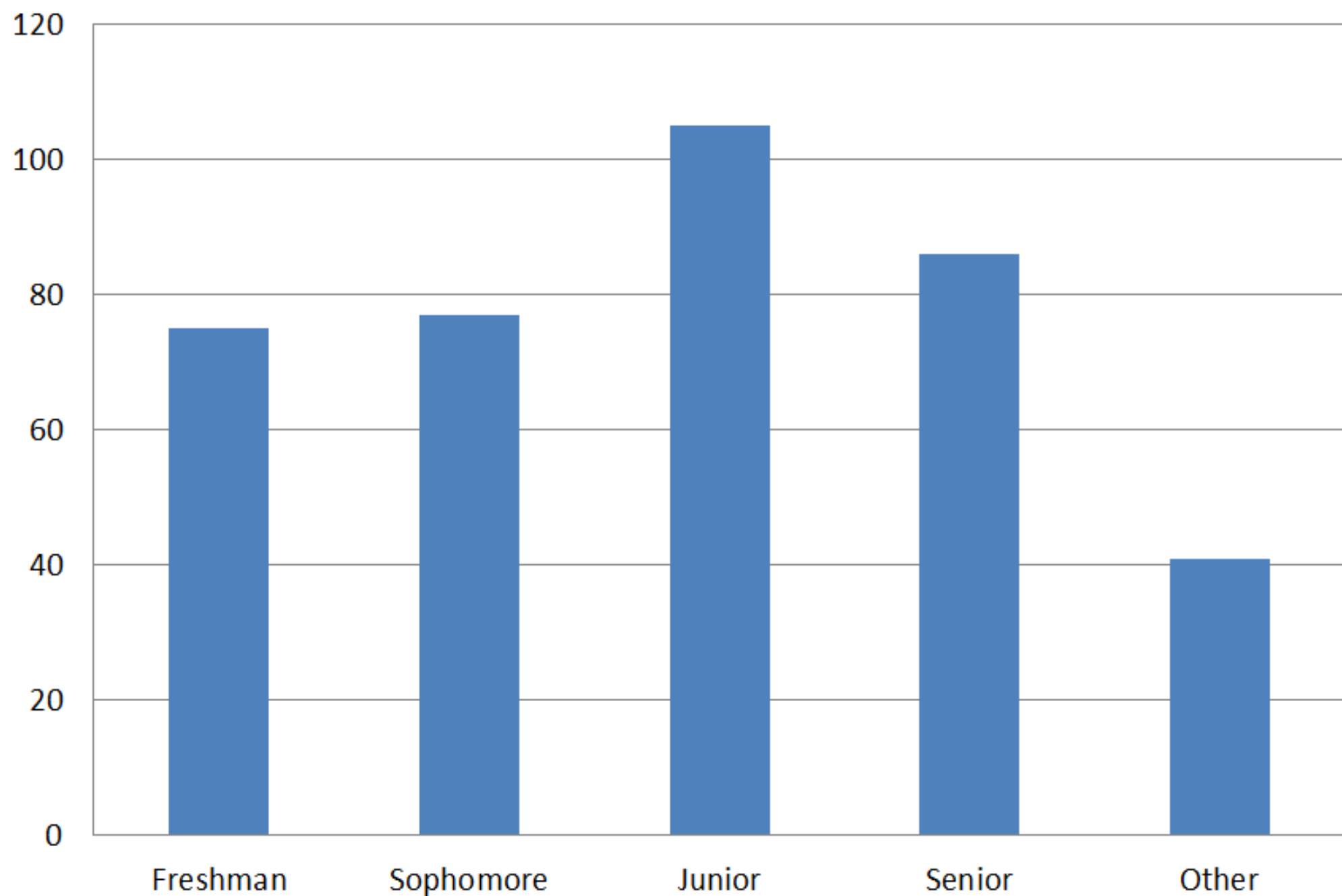
- 50 new random sample

Minimum Response Sample Size

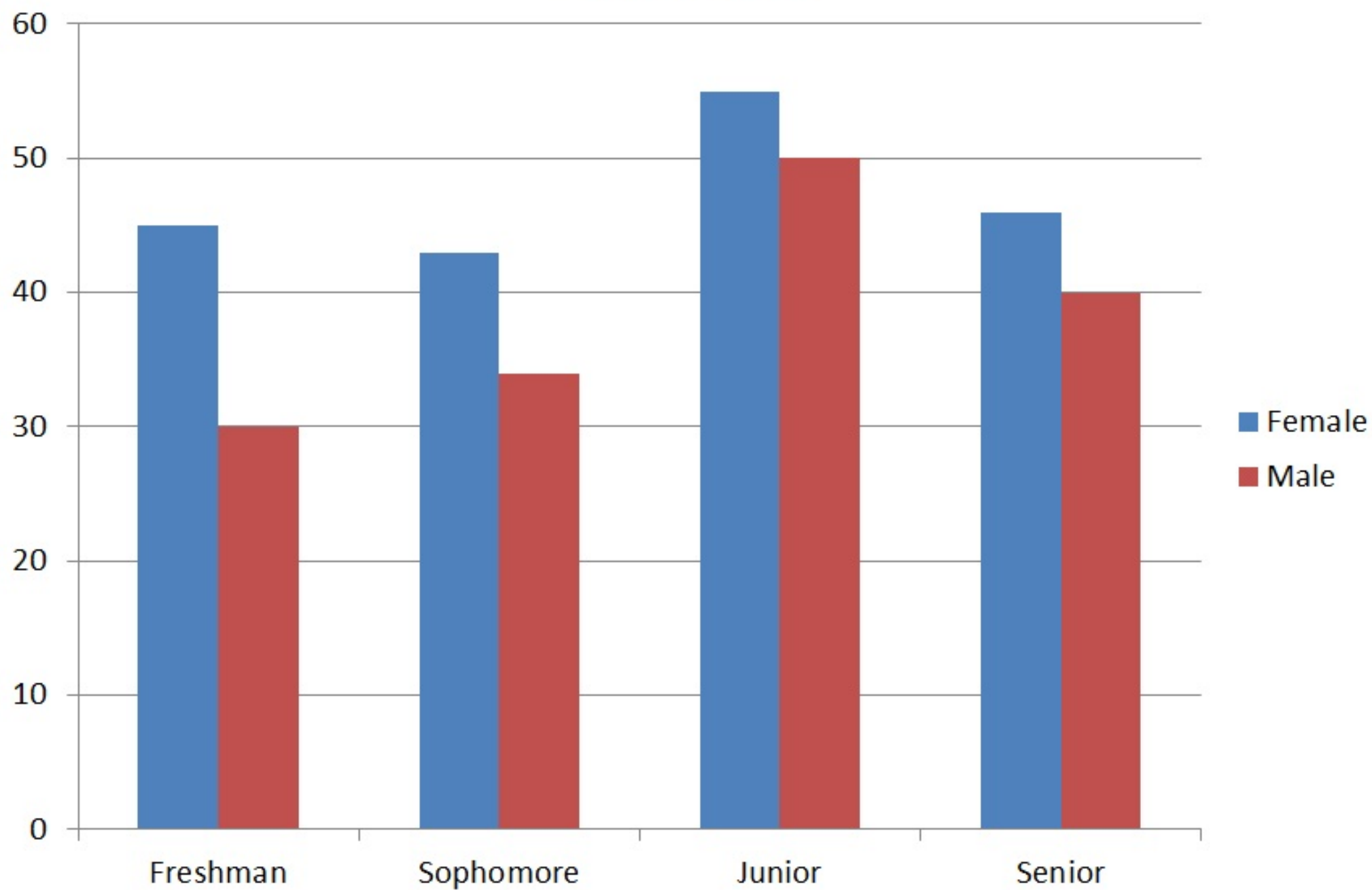
Total 354 Respondents.

18.5% Response Rate

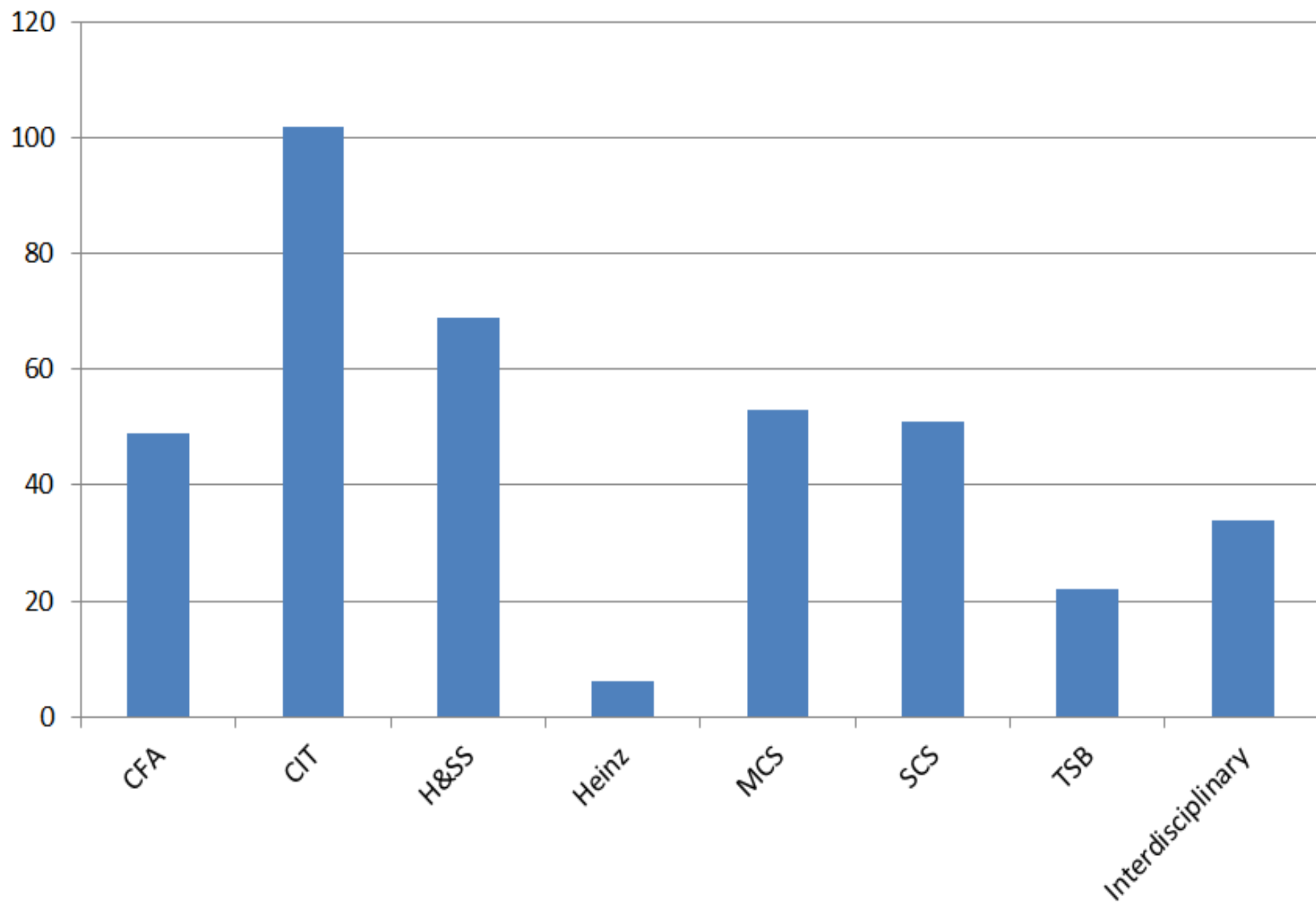
Number of Respondents per Year



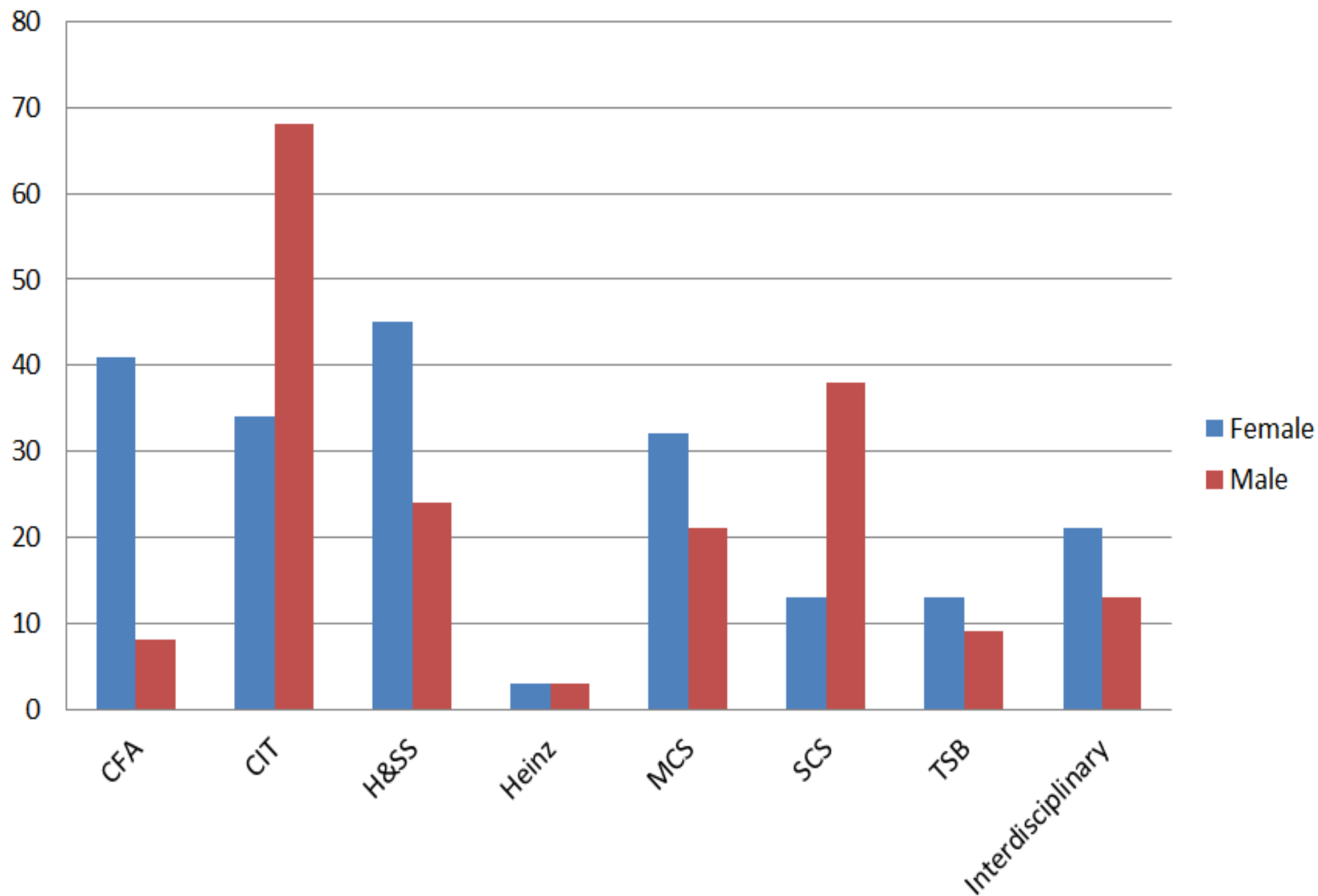
Gender, By Year



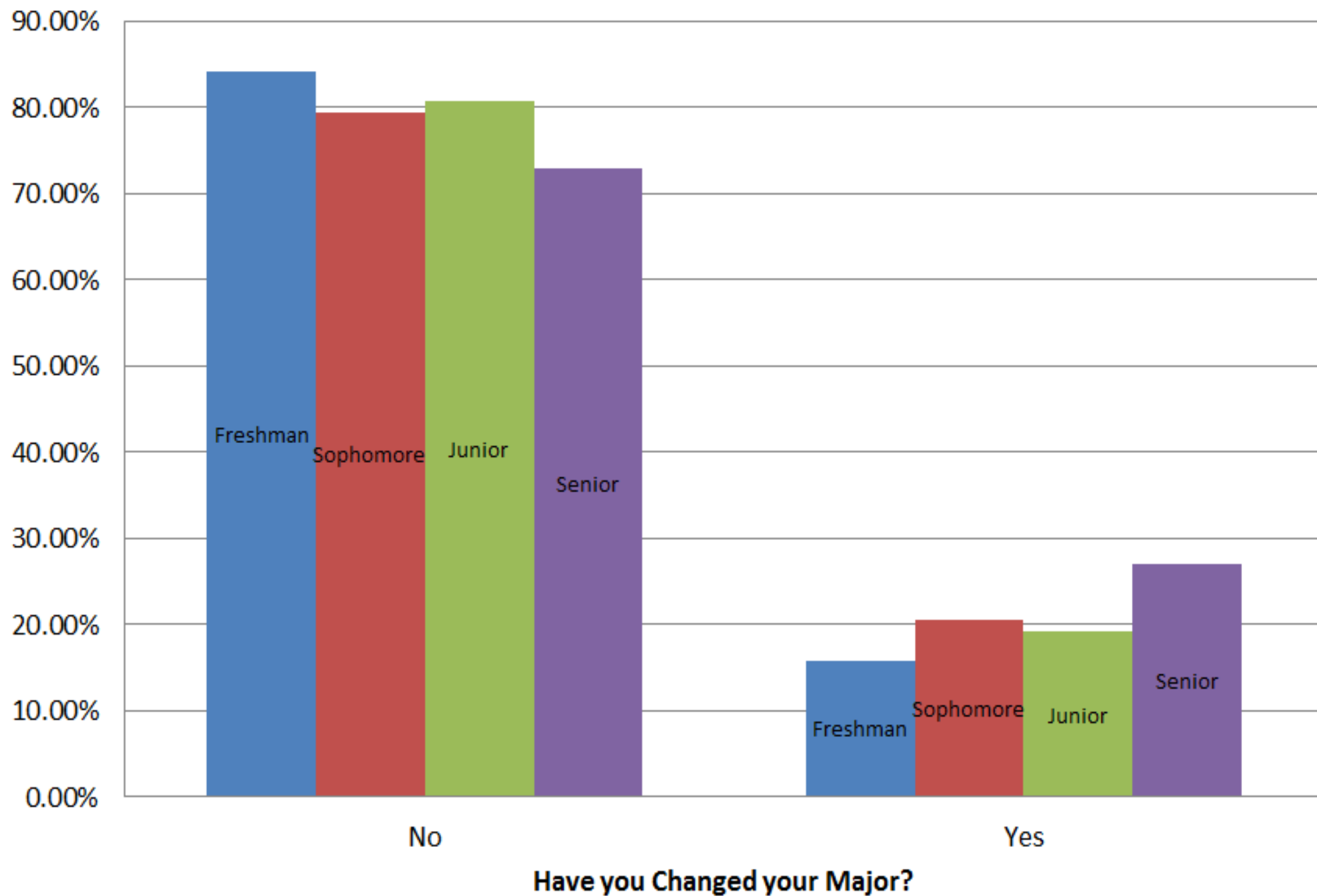
Number of Respondents, By College



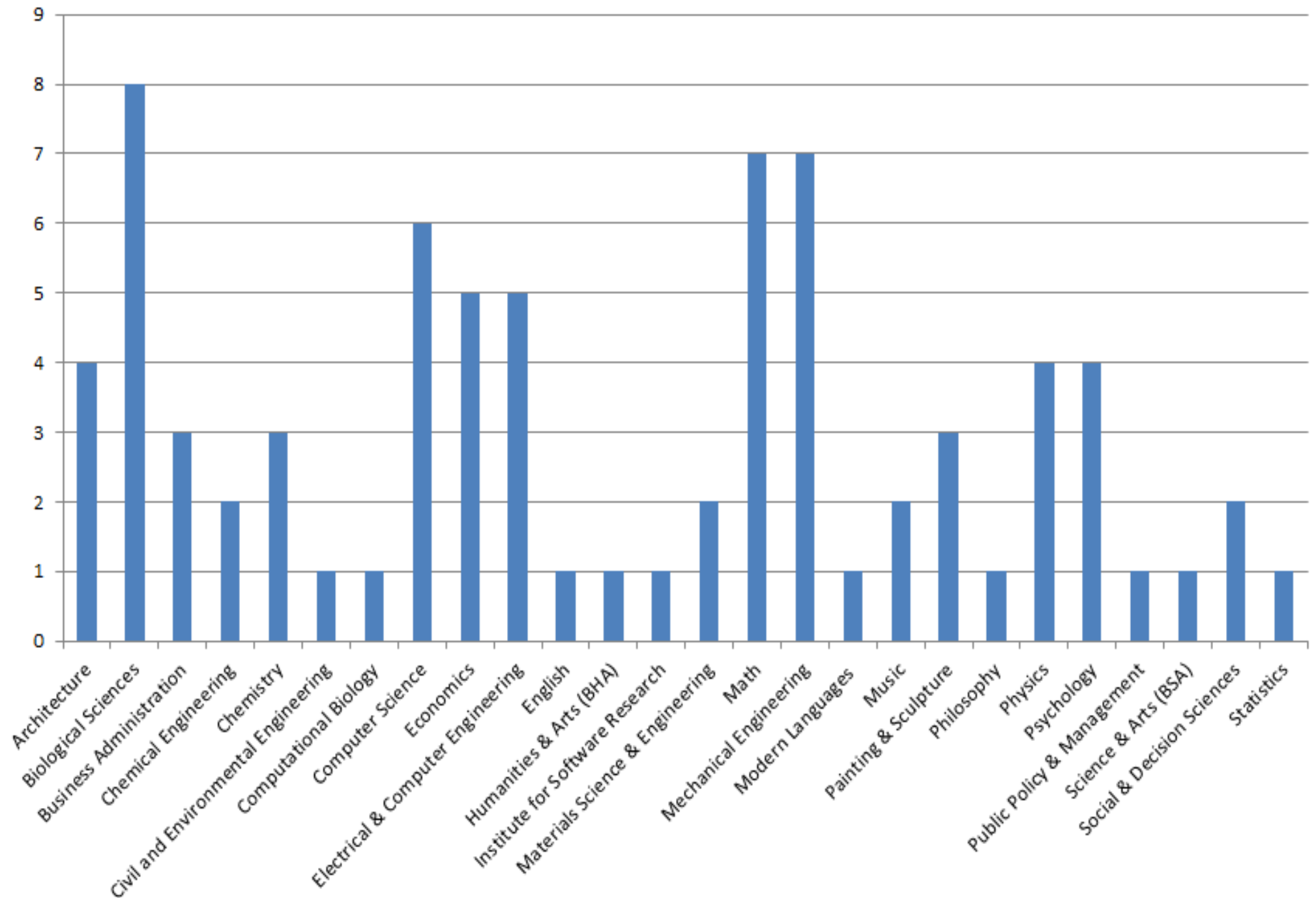
Gender, By College



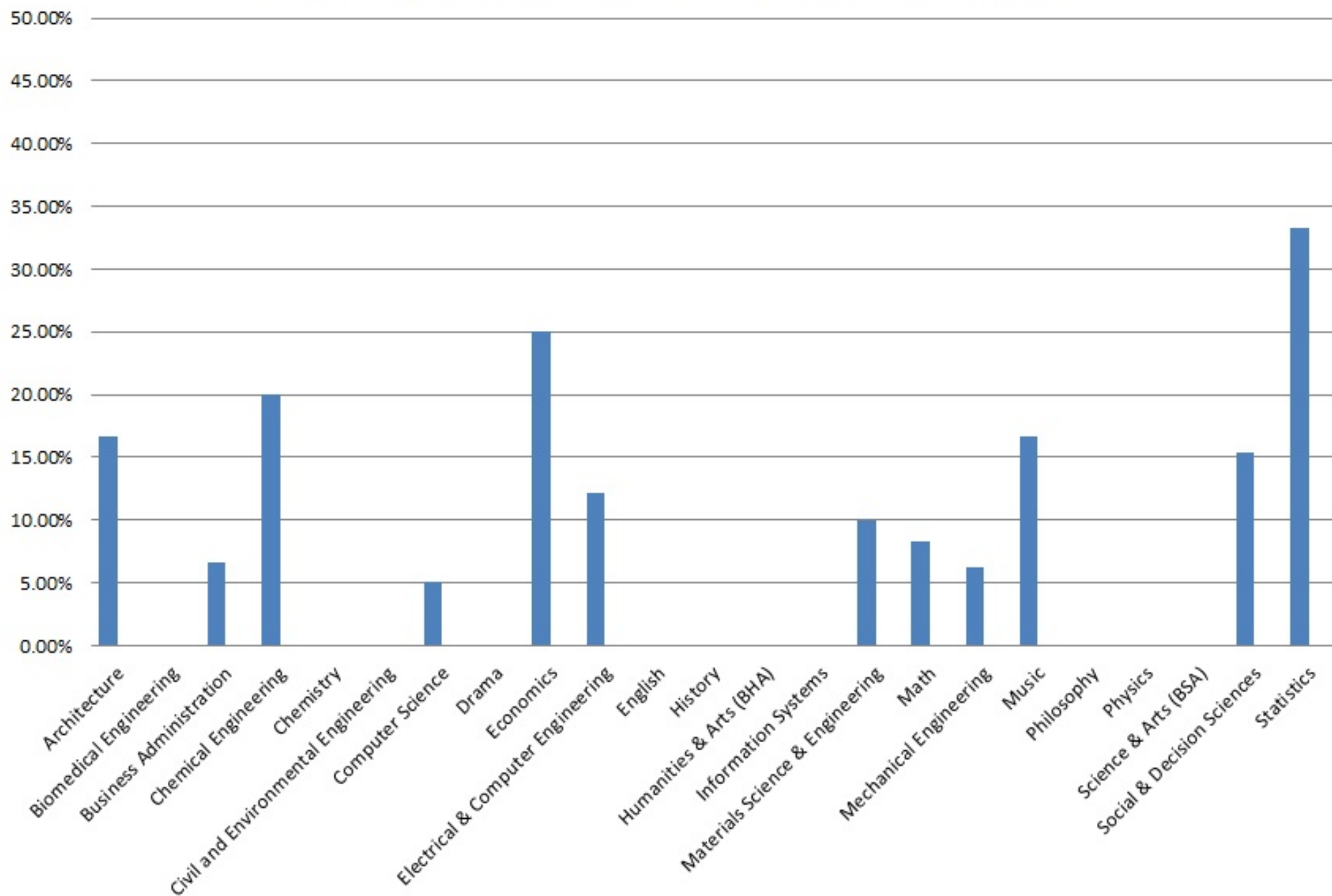
Have You Changed Major, By Year



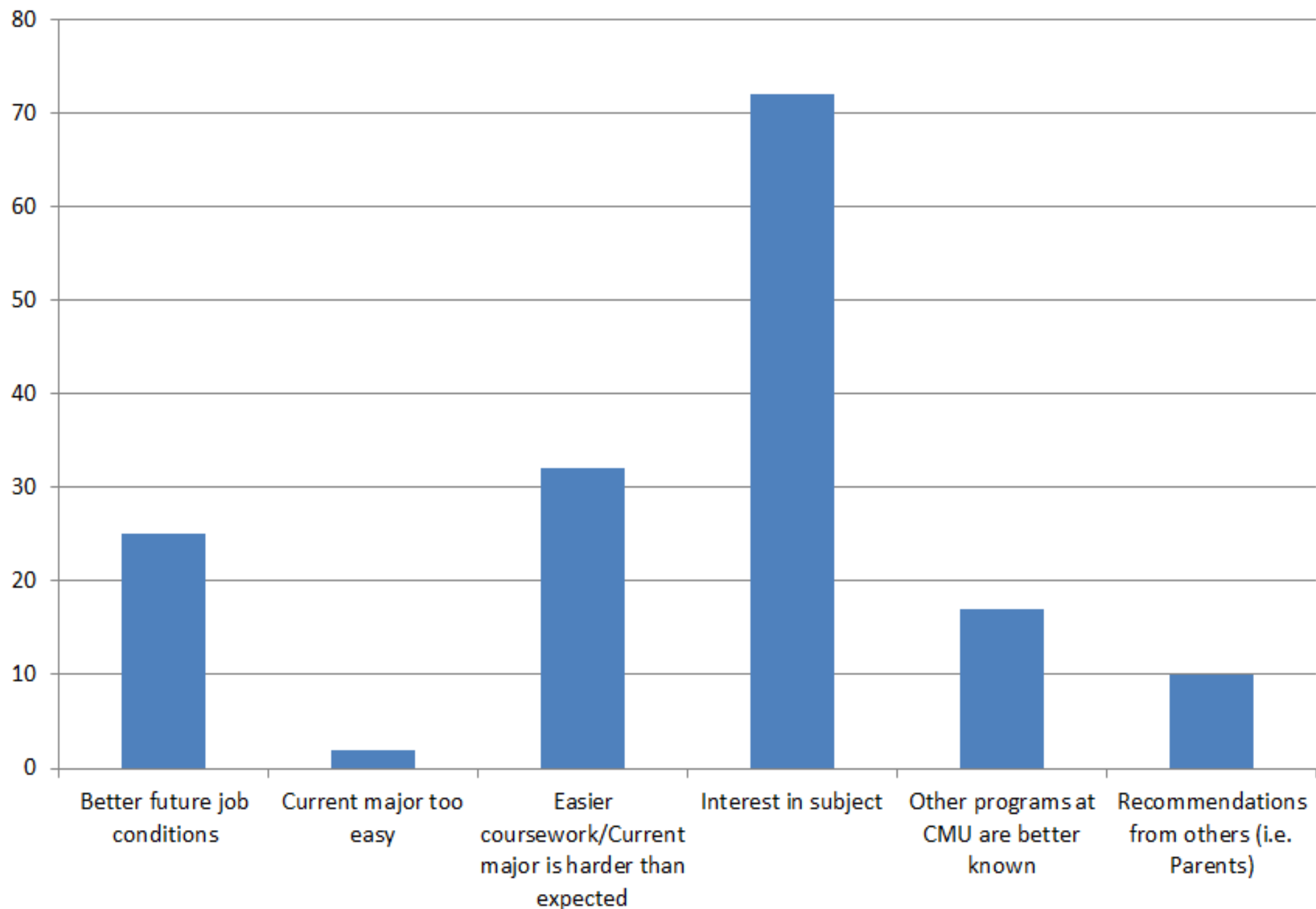
Previous Majors of People who have Switched



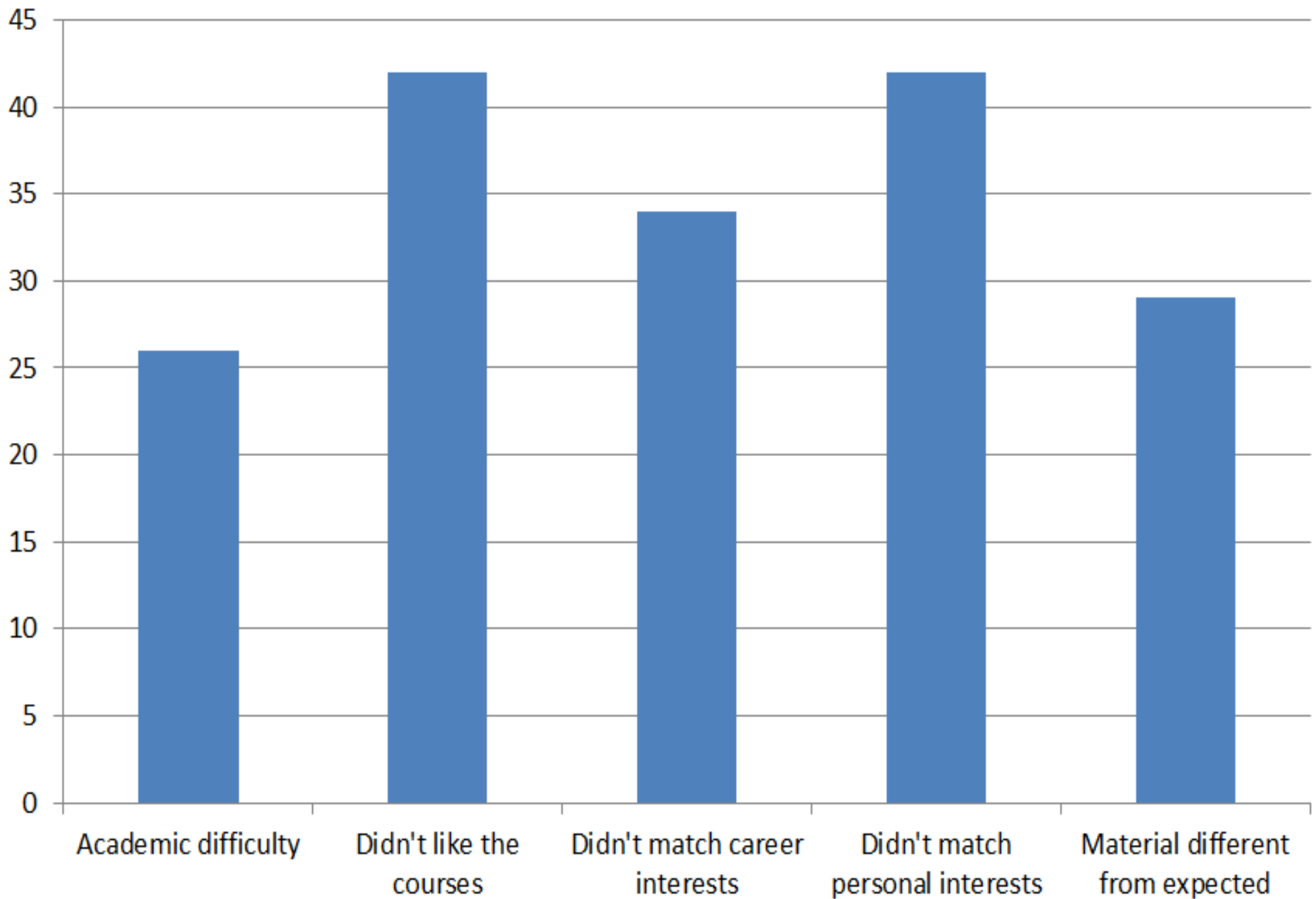
Percentage of Students that Do Not Like their Major



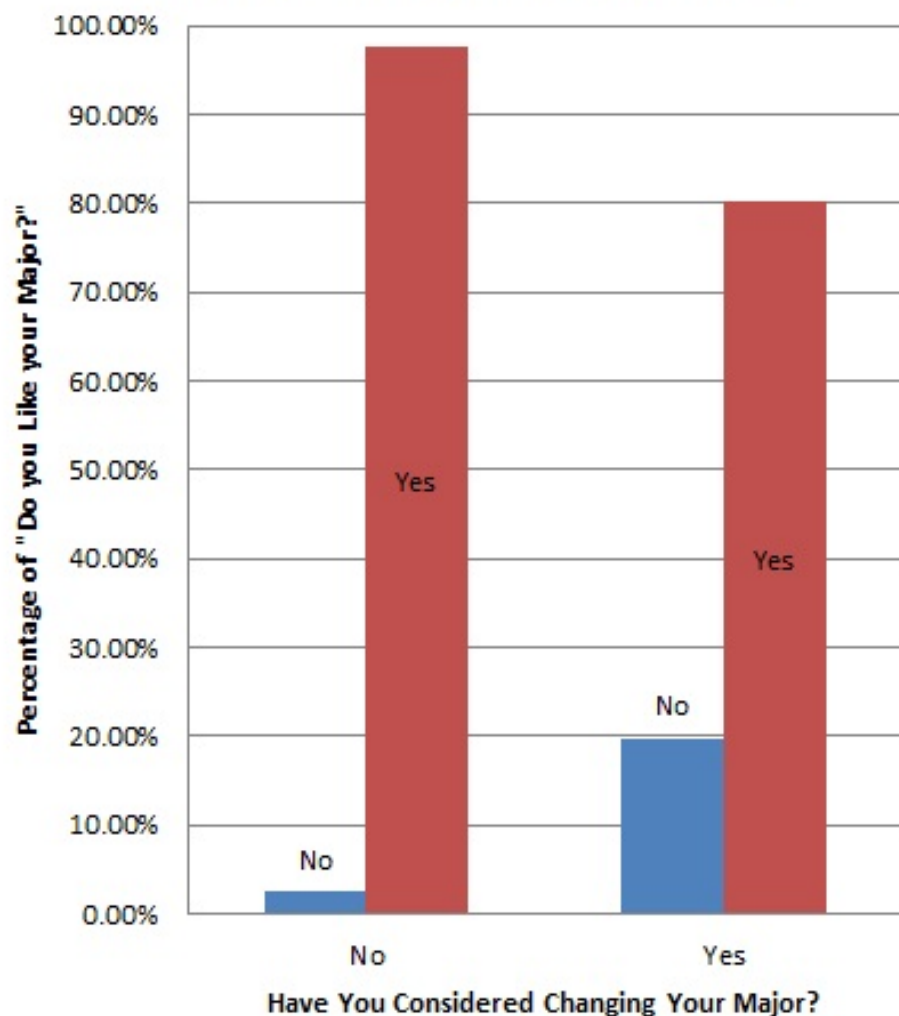
Why people (who Retained their Major) have Considered Changing



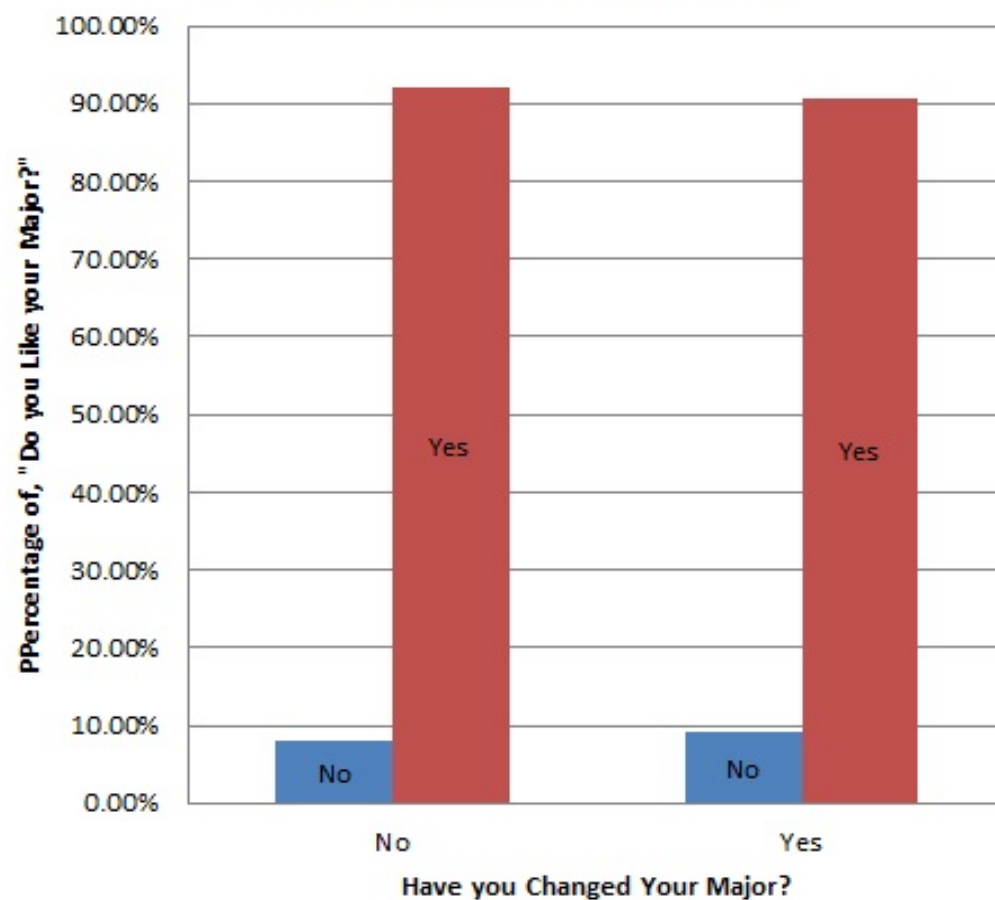
Why People (who Changed their Major) Decided to Change Majors



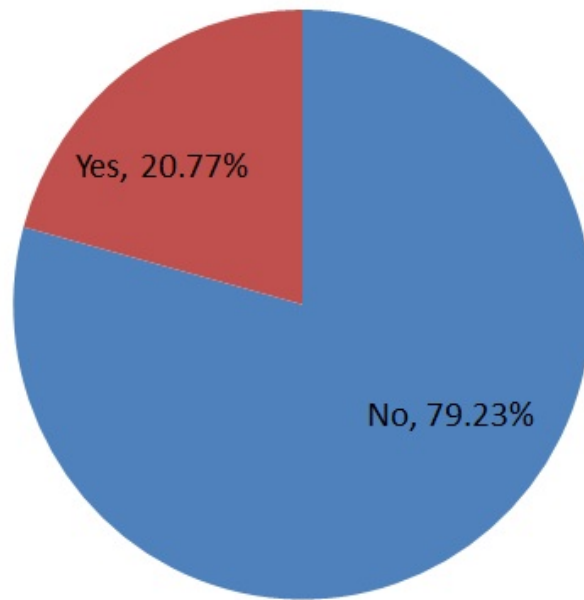
Considered Major: Like/Dislike



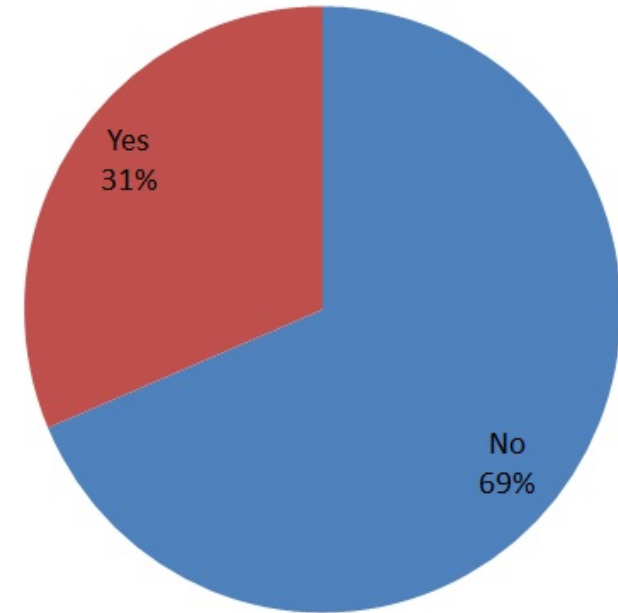
Changed Major: Like/Dislike



Have You Changed Majors?



Have You Considered Changing?

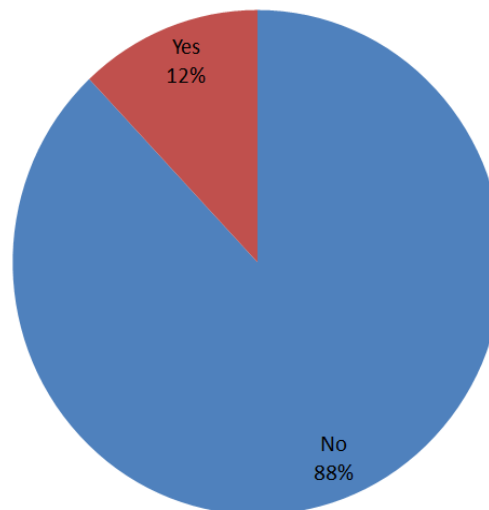


$$0.7923 \times 0.69 \times 0.12 = 0.0656$$

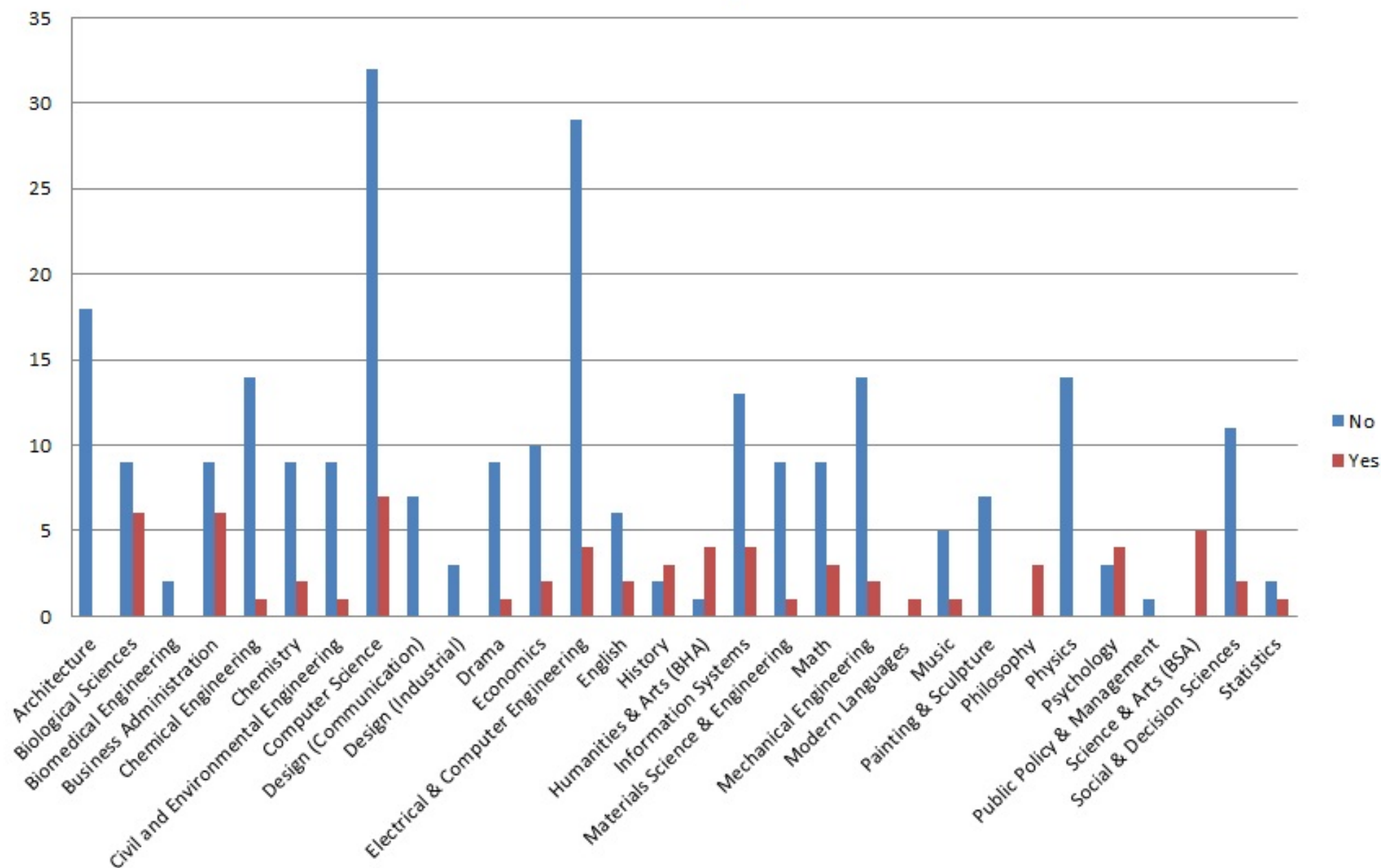
6.56%

$$20.77\% + 6.56\% = 27.33\%$$

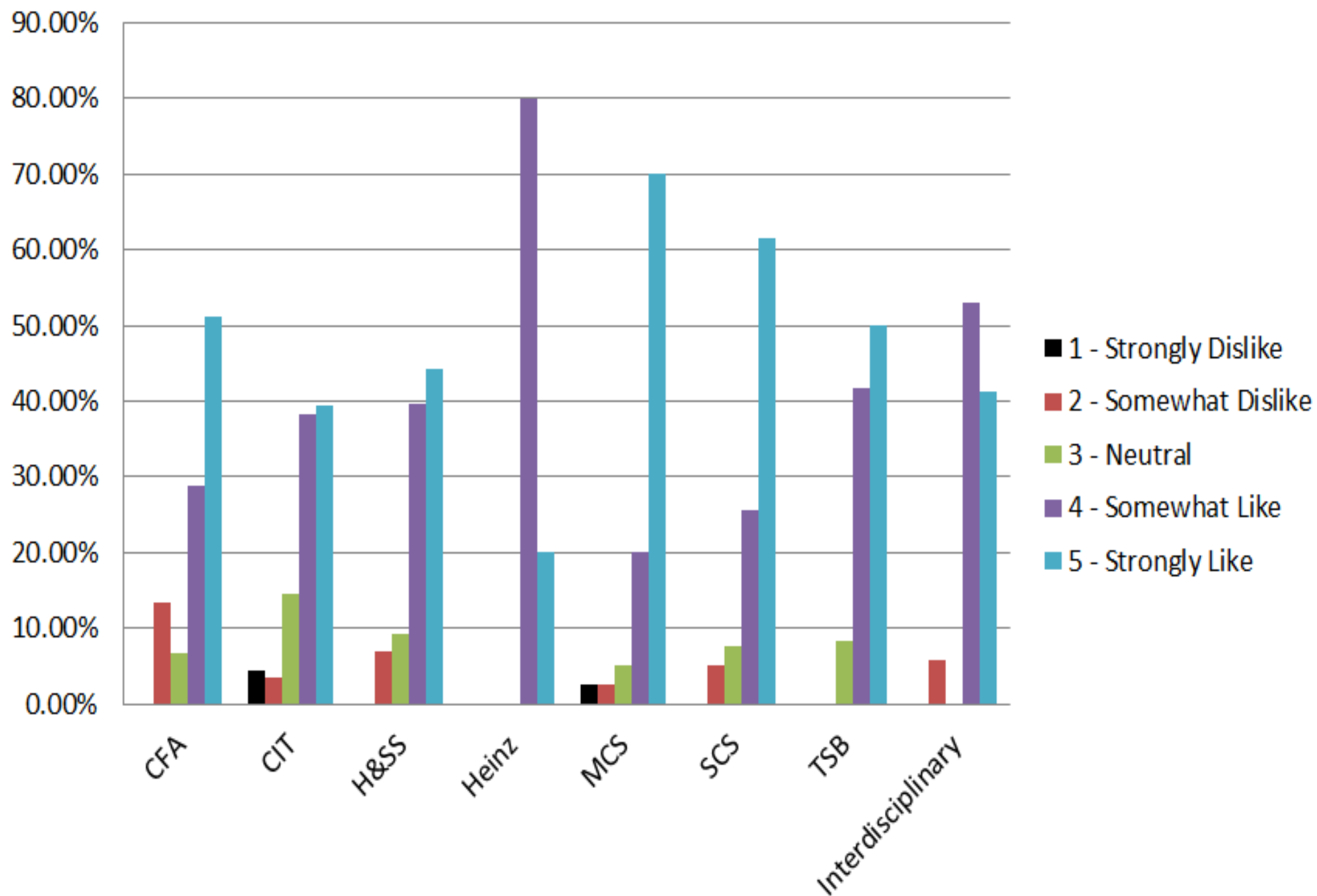
Would you consider without Restrictions?



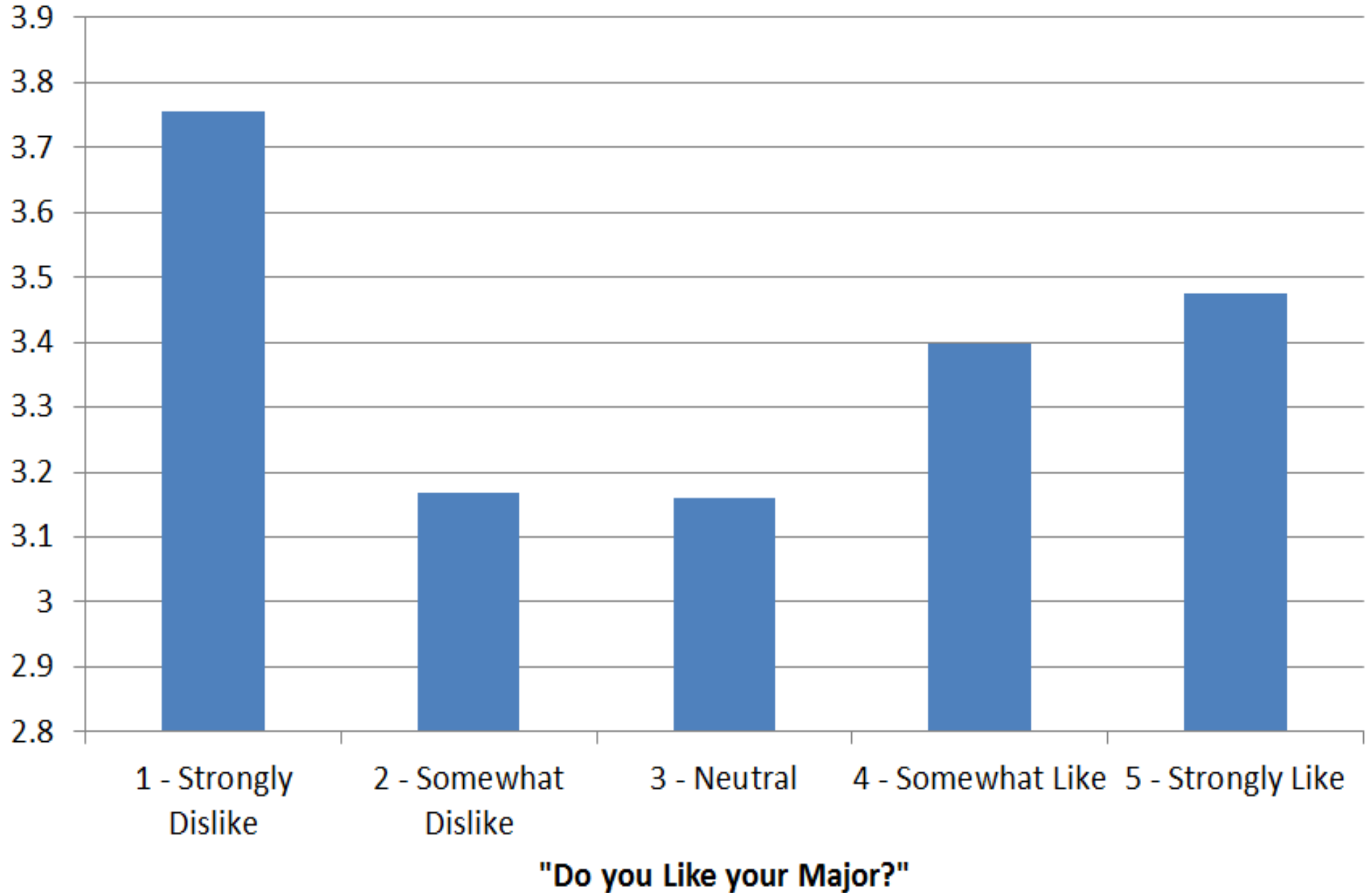
People who have Retained Majors, and People who have Changed Into Majors



Satisfaction Level by College



GPA vs Satisfaction with Major



Comparison with Existing Research

- "Survey of Major Changers", Presented by Dr. Judy Shoemaker of UC Irvine
 - Survey conducted to determine why students change majors and how easy the process is

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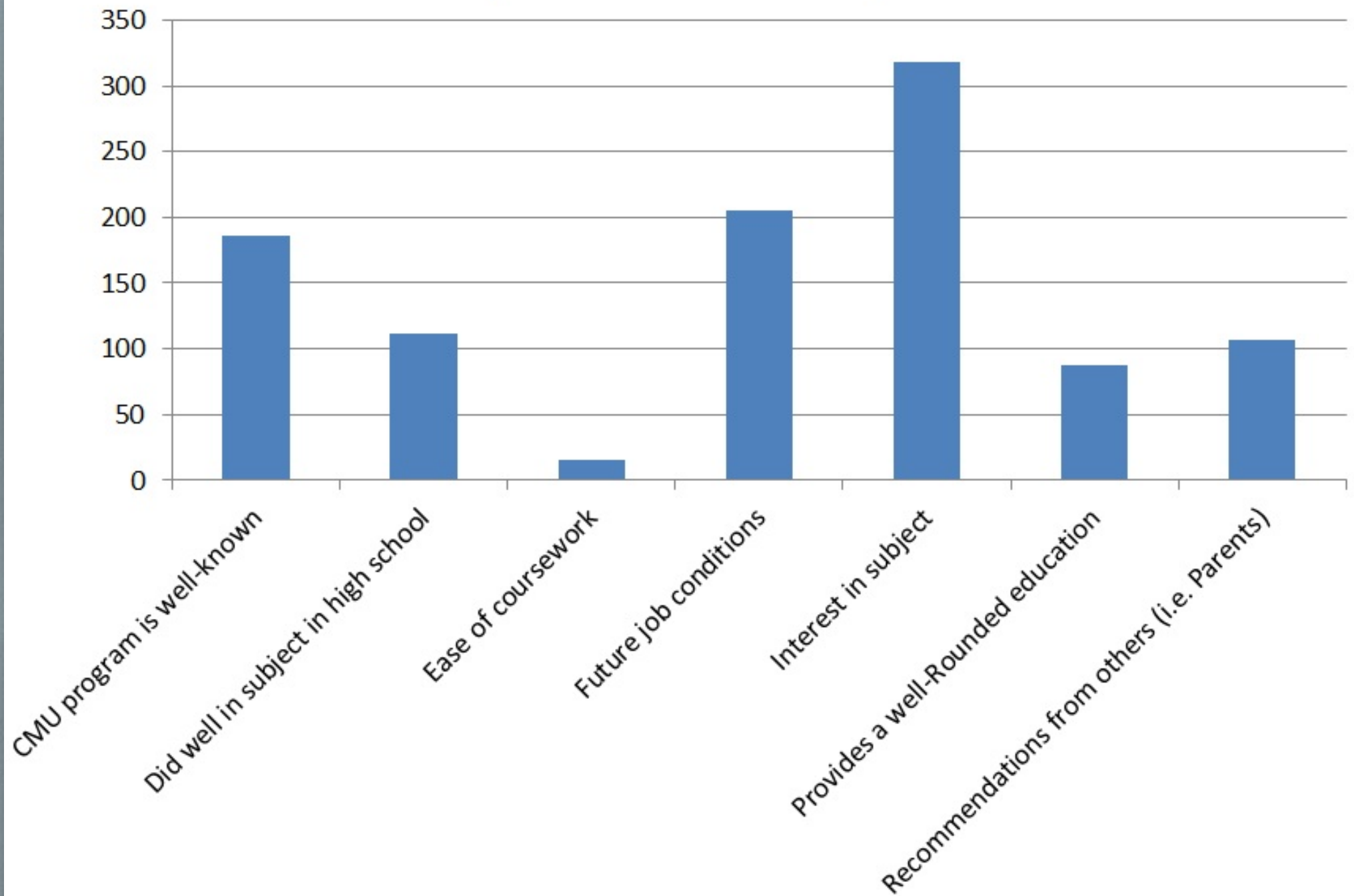
	UC Irvine	CMU
reasons for switching	75% courses are more interesting, 68% better match to career interests	Didn't like the course Didn't match personal interest
how soon did you start thinking about changing major	57% during first year	16% freshmen has changed majors 19% sophomore
recommendations	better information, curricular changes, academic advising	20% junior Academic advisors should be more supportive, helpful info sessions/events

Comparison with Existing Research

- Freshmen Keen to Switch Majors" - Jia Jianyu (December 27, 2010)
 - Survey regarding the high volume Chinese University students wishing to change majors

	Chinese University	CMU
% students changing major	60% before graduating	20%
Major factors contributing to choosing a major	66% career interest 7% earning potential 6% following advice from friends and family 12% sorta drifted into the major 9% other reasons, including inspiration from teachers	top 2: Interest in subject future job conditions

Why Did You Choose Your Major?



Student Feedback

Academic advisors should be supportive. I chose my major because I knew it would help me get into medical school not because I enjoy it. However, I knew that a lot of the stuff I would learn will never be used directly, and I am okay with that. My advisor is not.

Have several events where freshmen & sophomore can meet many juniors and seniors of a particular major-- so that they can ask questions about which courses are good, which professors are good, what about this major is so good/bad, etc.

I changed from ECE to Math to Statistics -- there was no overarching advisor who could help me get from CIT to MCS to H&SS. There is an emphasis within colleges but not between them.

I really love the coursework for social and decision sciences, but there are no jobs for this major. yes, we all have the skills, but no one wants to hire us because decision science is not a well known major. the career center is useless for us.

Shopping for classes should be encouraged.

Minis or lectures to describe each major

What we Learned

- C-Book is not very accurate and hard to sample from
- MassMail is a useful tool for survey distribution
- Some participants are lazy and do not accurately fill out the survey
- Post-stratification is difficult with multiple categories
- Get your Sample right the first time

Sources

- Carnegie Mellon University Common Data Set
- Distribution of grade levels at CMU
- The CMU undergraduate population distribution is used for weights calculation in our post-data-collection analysis

Any Questions?

Thank you!

