

A FOCUS ON CONCENTRATION:

How Do Harvard Students Choose their Field of Study?

Introduction

For many Harvard students, the question “Why Harvard?” is central to their academic journey. Initially, it may mean “Why choose Harvard?”—the foundation of Visitas and those weeks before May 1. Once the dust of Opening Days settles, however, the conversation shifts from reasons for coming to reasons for being here. With this paper, we sought to unpack this second, crucial question. How and why do Harvard students select their concentrations? What are the key factors that shape this choice, and how do students weigh their relative importance?

In twenty years, it will matter very little whether we chose to comp *The Crimson* or *The Advocate*, whether we took STAT 104 or STAT 110, whether we went to hear the President of Ghana or the Secretary of State. Of course, there are decisions that matter—internships and jobs and studying abroad—but these are extra-Harvard, things that only really affect us once we leave the Harvard bubble.

Choosing a concentration, however, is different. It is permanent—uniquely so. In twenty, thirty, forty years, when we’ve forgotten much about our time at Harvard, our concentration will still be emblazoned on our diplomas. Your concentration dictates your day-to-day coursework, your academic community, and, crucially, the body of knowledge you accumulate from Harvard. If you accept that the most important part of college is academics, concentration choice is perhaps the single most important individual decision a Harvard student can make.

We entered this project with a number of anecdotal and experience-derived hypotheses about concentration choice. Some factors are not unique to Harvard and are omnipresent in the development of students’ academic interests everywhere. We suspected that these included personal intellectual passions, gender expectations, family pressure, and natural talent in a given subject area. While women are historically underrepresented in STEM fields, we were curious to see whether that still holds true at Harvard today. Are there specific concentrations with precipitous gender divides? Other factors—such as the role of advising, collegiate grades, and institutional messaging—do not begin to shape academic paths until students integrate themselves into the campus. Given Harvard’s

recent focus on bolstering its academic advising offerings, we were especially interested to see how advising was considered by students in their concentration choices.

We were also particularly interested in the role of the finance and consulting industries in shaping concentration choice. This influence is uniquely felt at Harvard and other elite institutions known for such recruiting. Each fall, email lists are flooded with invitations to “coffee chats” and “career fairs” and “networking events.” According to *The Crimson*, 34% of the Class of 2019 indicated that they were entering consulting or finance (Freed and Khaloon). Given that, for the same Class of 2019, when asked in their first year about anticipated employment, only 8.2% indicated consulting or finance (Freed and Khaloon), it seems evident that something occurred during their four years at Harvard to precipitate such a drastic change. Could it be that inadequate advising in students’ first and second years failed to encourage students to pursue their own academic interests and passions? Though a causal lever for this shift is beyond the scope of our project, through interviews and quantitative data, we hope to identify some interesting correlations.

The uniquely enticing nature of finance and consulting recruiting creates a noteworthy tension between those fields and students who wish to pursue a career on the basis of academic passion. Parallel to this difference is a tension between STEM and humanities concentrations. The recent public push for an increased focus on STEM, manifested on Harvard’s campus by the construction of the new SEAS building, is terrific in that it supports STEM students with unprecedented resources. However, this dialogue perhaps poses negative pressure on non-STEM students. Students’ process of major selection, we predict, will serve to illuminate these tensions.

The mission of Harvard College is to “educate the citizens and citizen-leaders for our society.” Inherent to this mission is a sense of service, an underlying ideal that graduates of Harvard ought to go out into the world and contribute in some meaningful way to society. It seems critical that such a mission be underlied by the freedom, felt as well as stated, to pursue the subjects about which students are most passionate. By analyzing concentration choices, we hope to discover whether or not we should be concerned about the degree of freedom with which Harvard students are currently choosing their fields of study.

Literature Review

I. Gender Expectations

One of the most fundamental ways existing literature examines differences in major choice is along the basic demographic factor of gender, a factor in which we were also interested. Today's gender disparities in major choice are rooted in centuries of educational barriers, traditional gender roles, and other iterations of sexism. While education has progressed substantially towards equity, there still exist significant differences in major choice along gender lines. Indeed, Radcliffe College did not officially merge with Harvard University, allowing women to earn degrees from Harvard, until October 1, 1999—a date after many current undergraduates were born (Helderman & Sofen).

Much of the literature has attempted to derive the principal reasons for the continued imbalance of genders across different majors. One emblematic national survey of first-year American college students, conducted by UCLA, found little difference between genders and minority status groups in terms of high school GPA or SAT scores (Moakler & Kim, 134). These data suggest that differences in major choice among these groups are not reflective of differences in pre-collegiate preparation or ability. However, women and minorities reported lower academic and mathematics confidence than men and nonminorities (Moakler & Kim, 134). Given that women and minorities are historically underrepresented in STEM majors, yet they do not seem less capable or prepared, the lack of “confidence” in STEM fields may be contributing to the underrepresentation.

However, existing literature is divided; some research suggests it is not confidence but professional and faculty representation that is the missing link. A survey of 161 Northwestern University sophomores found evidence that gender differences in major choice are mutable and that female professors may change female students' beliefs and preferences toward science and engineering (Zafar). Zafar suggests that the gender gap may be a matter of faculty and industry underrepresentation; “just raising the expectations of women may not be enough to eradicate the gap” (Zafar, 558). At Harvard, the average department has 25% female faculty, while three departments have none at all (Ling). Only seven departments have more female than male faculty, including Women, Gender, and Sexuality (83%); Theatre, Dance, and Media (75%); and Romance Languages and Literatures (70%) (Ling). Clearly, these issues of representation exist at our own

institution. There is a dearth of Harvard-specific concentration choice research, as confirmed by the Office of Institutional Research (OIR) itself, which we hope to remedy with our project.

Research into this topic has examined not only the initial choice but also changes in major among genders. Analyzing the data from the nationally representative “2004/09 Beginning Postsecondary Students Longitudinal Study,” researchers found that male students in traditionally female-dominated majors were 2.5 times more likely to switch majors than their male colleagues in non-female-dominated majors (Riegle-Crumb et. al.). However, female students in male-dominated majors were no more likely to switch majors than their female colleagues in other majors. The researchers proposed two explanation for these findings, both of which can be reconciled with the issues of confidence and representation articulated above. First, male-dominated majors often have the connotation of higher status or higher salary, potentially rendering them more desirable and less likely to be abandoned. Second, a smaller percentage of women enter male-dominated fields than the inverse (Riegle-Crumb et. al.), which may indicate that stereotype threat simply exerts pressure earlier for women than men and precludes women from declaring a male-dominated major in the first place. Of course, gender does not exist in isolation but intersects with other demographic factors such as race. One study used data from the National Education Longitudinal Study of 1988 to compare differences between Asian-American students’ choice of college majors to that of other groups. They find that there is little difference between Asian men and Caucasian men, but that there is a significant difference among women—more specifically, that “Chinese, Filipino, and Southeast Asian women are all more likely to choose more lucrative college majors than white women” (Song & Glick). Pulling at these threads will be an important facet of our project.

Differences in major choice along gender lines are salient because they account for a substantial part of the wage gap in the earnings of individuals with several years of college education (Zafar, 546). We hope our research can provide Harvard guidance on how to mitigate this inequity.

II. Parental Background and Socioeconomic Status

Though important, not all differences in major choice can be attributed to gender. A critical influence upon a student’s academic development is familial background, both the household socioeconomic status (SES) and parental education. In early childhood, career aspirations are often modeled after “parents, celebrities, fantasy characters, and imagination,” as well as gender-based

norms gleaned through media (Killam, Wise & Weber). Media, however, typically offers unrealistic depictions of working life, leading to inaccurate expectations. “Increasingly, students receive career information starting in middle school...but often are not provided with information regarding current market demand for associated jobs and associated salaries; thus a student may select a college major and initial career path with little concern for realistic aspects of working” (Killam, Wise & Weber, 177). As children grow older, “compelling coursework, peer experiences, and the impact of internship, athletic and volunteer experiences” (Killam, Wise & Weber, 176) emerge as significant influences on major choice. We sought to collect and analyze a repository of such narratives through student interviews.

Yet even as students develop greater autonomy and build external communities, parents have a significant influence on post-secondary plans. “In families where one or both parents are doctors, attorneys or college professors, the choice not to attend college with the goal of a lucrative career is likely not considered an option, and the initial selection of major is heavily influenced by parents regardless of the student’s ability” (Killam, Wise & Weber, 178). Additionally, research suggests that individuals from families with high incomes are more likely to select college majors that will result in careers with high incomes (Killam, Wise & Weber, 179).

Much of the literature substantiates the importance of both parental occupation and SES in shaping major choice. A 1989 survey conducted by the federal government found that students who considered it important to be affluent are more likely to major in business (Leppel et. al., 2001). A 2009 study analyzing data from the National Education Longitudinal Study following students from 1988-1994 found that students from low SES backgrounds disproportionately favor more lucrative college majors, as compared with higher SES peers (Ma, 2009). The effect of SES on selection of major is greater for women than for men; interestingly, however, as the SES of women increases, they became *less* likely to select business as their major, while the inverse is true of men (Leppel et. al., 2001). Perhaps most interestingly, mothers in professional jobs influenced male children’s major choice more strongly than female children’s choice; fathers in professional jobs influenced female children more strongly. While inaccessible in large data sets, such threads of experience may be discoverable through individual interviews. To our knowledge, this facet of major choice has not been examined specifically at Harvard, which has a uniquely high concentration of highly educated,

professional parents who may exert a strong degree of influence over their children's choice of major.

III. The Decision Process: Priorities and Misinformation

Clearly, demographic factors like gender, parental background and SES shape students' self-conception and major choice. But that decision is ultimately a choice, and it would be a grave mistake to ignore students' individual autonomy in making it.

The literature has taken many different approaches and proposed numerous frameworks for understanding how individuals choose a major. In the Northwestern study referenced above, the most important factors in choice of major were enjoying coursework, enjoying work at potential jobs, and gaining the approval of parents (Zafar). Non-pecuniary outcomes, such as enjoying work and reconciling work and family, explain only half of the choice for males but more than 75% of the choice for females (Zafar). Other studies have proposed that differences in personalities compel choice of major. Vedel and Larsen analyzed differences in majors using the Big Five personality traits, finding that "arts/humanities students scored higher on Agreeableness, Neuroticism, and Openness, but low on Conscientiousness compared to most other groups" (Vedel and Larsen). This indicates that there is a personality aspect to major choice beyond in-college socialization.

How do these underlying personality traits inform a person's priorities, which in turn influence major choice? Yu and Levesque-Bristol leverage self-determination theory (SDT) in an attempt to highlight the different motivations that students have for pursuing given majors, from intrinsic (learning for the sake of learning) to extrinsic (learning for some external reason like getting a job or acing an exam), finding, for example, that humanities majors were more intrinsically motivated than economics majors (Yuv & Levesque-Bristol). It is important to distinguish between students who enter college decided and undecided upon a major. A survey of students at King Fahd University found that initially undecided students choose majors based on jobs, salary, prestige, and interest, while previously decided students made their selections based on 1) interest in the major, then 2) demonstrated ability in the major, and then 3) jobs/salary/prestige—a notably inverted hierarchy of priorities relative to the decided students (Aldosary & Assaf). Beyond a desire for money, more effective dissemination of information regarding major-associated jobs may lead to selection of majors for more "classically admirable" reasons — such as interest and confidence —

rather than fiscally motivated ones. We aim to examine the availability of information to Harvard underclassmen through the academic advising process, and make informed suggestions about what more “effective dissemination” might look like at Harvard.

At its core, the choice of major comes down to an individual’s priorities: the pursuit of purely academic passion or a means to a lucrative end? Some literature suggests that students tend to choose majors they believe to be the most profitable. This may change over the course of time in college as new pressures exert themselves. Wrote Yale student Marina Keegan, “I [asked] freshman after freshman what they thought they might be doing upon graduation. Not one of them said they wanted to be a consultant or an investment banker.” (Deresiewicz, 17-18). In a more scientific study, researchers asked hundreds of NYU undergraduates about their expected future earnings as well as population earnings (Wiswall and Zafar, 118). Students of all backgrounds consistently misestimated earnings. Updated with accurate earnings figures, about half of all respondents changed their beliefs about the likelihood that they would graduate with a specific college major (Wiswall and Zafar, 154).

These contemporary results substantiate a long trail of evidence that earnings potential is a major factor in choice of major—although perhaps to different degrees among different groups. A 1987 national survey of recent college graduates found that women are less influenced by the future earnings potential of each major when selecting majors than men, and that white students are less influenced by the future earnings potential of each major when selecting a major than non-white students are (Montmarquette et. al.). It will be important to see if these results hold up at Harvard, where there is so much peer pressure and institutional support for the pursuit of consulting and finance careers. We are especially interested in how prospective careers in finance and consulting, among the most lucrative of professions, inform students’ decision-making and perhaps pull students away from their academic interests. As one elite college student reflected, “It’s hard to build your soul when everyone around you is trying to sell theirs” (Deresiewicz, 15).

It should not be surprising that something as consequential as one’s collegiate studies cannot be easily attributed to any one factor. Evidently, both demographic and individual factors play a role, although the literature disagrees on the extent and importance of each. There are a number of documented patterns among racial, gender, and SES groups. In our study, we hope to build on these patterns with non-demographic factors such as academic interest and peer/family pressures.

Data and Methods

I. Methods

We adopted a three-pronged approach to distill our understanding of the concentration choice process at Harvard. First, we obtained a dataset from the Office of Institutional Resources (OIR). We ran a number of analyses of these data in R, Python, and Excel, looking for patterns among the variables and producing visualizations of interesting findings. This is a particularly rich dataset that alone merits its own research paper. While analysis of these data form a robust part of this paper, we acknowledge that we have barely scratched the surface of possible analyses and consider our learning from this dataset to be ongoing.

The second arm of our research consisted of 12 interviews with Harvard sophomores about their concentration choice process. We hoped to build on interesting initial findings from the OIR data in our interview questions. We debated the merits of interviewing seniors, who have lived through three years of Harvard and can speak to a longer trajectory of concentration choice, and sophomores, who were directly making their concentration choices during the period of our research. Ultimately, we are glad to have decided to interview sophomores to achieve our goals, which were a) to extract from students the narrative of how they developed their academic interests and b) to accumulate qualitative data about which factors students were considering in their concentration choice and how they rated the relative importance of those factors. We recruited interviewees by reaching out to sophomores that we knew. We acknowledge that this is a limitation of our research design; we did not choose participants randomly. However, we divided the interviews evenly, conducting four each. Additionally, in an effort to reduce homogeneity of experience, we did not interview more than two students that we knew from the same context (i.e. club or team). The interviews served as an important complement to the OIR data, which did not offer the same depth and color as a narrative experience. We recorded, transcribed, coded and analyzed these interviews, looking again for consistent patterns or sentiments shared by students. We then distilled these findings into visualizations and excerpted representative quotes.

The third phase of our research was a brief survey about concentration choice. Because it was intended to substantiate our interview findings, survey questions were developed based on the

categories and patterns we identified in our interviews. The survey was administered online to Mather House students (sophomores, juniors, and seniors) over a period of a week. While the survey was administered to only one upperclassman house, all 12 houses serve as microcosms of the Harvard upperclassman population, with the only non-random aspect of the house sorting algorithm ensuring that the houses reflect the school's greater diversity at large. Given this guaranteed reflection of the greater Harvard population, selecting one house as a sample of the upperclassman student body does not introduce additional biases and therefore is a valid simplifying assumption for a study with limited time and resources. We recruited respondents by emailing our survey over the Mather House email list and by stationing ourselves in the Mather dining hall for an afternoon to recruit in person. We did not incentivize completion of the survey with a reward. Analysis of the survey data, especially in comparison to our interview and OIR data analysis, constitutes the final component of our examination of concentration choice.

We acknowledge that each member of our research team, as well as the team as a whole, has certain characteristics and biases that may affect our project. Shelly has accepted a job in post-graduate consulting, Meaghan is surrounded by juniors currently in the interview cycle but is not pursuing it herself, and Kalos is more removed from the post-graduate world as he first declared his concentration during the writing of this paper. Additionally, we each bring our own demographic factors to the table. Each of us necessarily, then, has access to a certain pool of experience not known to the others, while each of us also has blind spots given where we are in the system. We discussed protocol for interviewing and standardized our interview questions with the effort of ensuring that interview experiences do not vary significantly across interviewees. We also relied on quantitative data and transcripts where possible to avoid bias in interpretation.

Our research was conducted with the utmost respect for student privacy, confidentiality, and well-being. We obtained informed consent from all participants via a consent form explaining our process and the ability to opt out at any time. We clarified the purpose of our study for interviewees before beginning, giving them a sense of what to expect without telling them how we would like them to respond. We only asked questions necessary to our research question and did not probe needlessly into potentially sensitive subjects such as SES. We sought to create a neutral but welcoming interview environment in which students felt comfortable sharing their personal

experience of major choice. We stored survey and interview transcription data in a password-protected medium accessible only to our research team for the duration of our project. We do not attribute names or identifiable characteristics to data in this paper or to the public.

II. Data

The OIR dataset contains student data from the Harvard Classes of 2015, 2016, 2017, 2018 and 2019, for a total of 8113 students. After data cleaning, only 7541 entries were maintained (see Appendix D for a more thorough discussion of data cleaning). For each student (anonymized), the dataset indicates a student's intended concentration upon college entry, the concentration declared in sophomore year, and the final concentration they graduated from Harvard with. It also contains the demographic indicators of under-represented minority (URM) status, sex, and first-gen/low-income (FGLI) status. Finally, the dataset indicates whether students' immediate post-graduate plans entailed consulting, finance, or additional schooling. The dataset divides concentrations into four divisions: Arts & Humanities, Social Sciences, Sciences, and SEAS (School of Engineering and Applied Sciences). We refer to this collective dataset as the OIR dataset in our analysis below.

Of the 12 sophomores we interviewed, we spoke with 8 women, 3 men, and one non-binary-identifying individual; interviewees were 75% Caucasian, 16% Asian American, 8% African American and 8% Caucasian/Asian American. All 4 divisions were represented, and one student was undecided. Interviewees varied in their interest in finance and consulting as well.

We received 72 responses to our survey, representing 17.9% of the population of Mather House. 42 respondents (58%) were female and 30 (42%) were male, and 53.5% were Caucasian, 21.1% Asian, 12.7% Hispanic or Latino, 2.8% Black or African American, and 9.9% indicated "Other" for ethnicity. Our respondents represented a range of upperclassman grade levels, socioeconomic statuses, and concentration divisions.

Results

I. Overview

Our analysis revealed the breakdown of influences on concentration choice at Harvard.

Figure 1 reflects our interview findings, while Figure 2 displays data from our survey. We examine these factors below.

II. Developing Interests

Almost all interviewees (n = 11) enter college intending to concentrate in an extension of their best high school subject. Similarly, 81% of survey respondents indicated natural ability/skill was either moderately, very, or extremely important in their concentration decision. It is unsurprising that there is considerable overlap between a student’s best and favorite subject. Students are likely talented at a given subject because of a natural inclination towards it. This natural proclivity, coupled with the validation of performance, compels them to devote more time to the subject, further bolstering their skills. One student (male, SEAS) described this relationship as a “positive feedback loop”:

“I realized that I was less comfortable with English than I was with math. And so it was a positive feedback cycle of being better at math. And so I enjoyed it more. And then the more I enjoyed it, the more excited I was to do the problems.”

However, students also reported pressure to excel in at least one subject area. In this sense, precollegiate specialization may be viewed as a negative byproduct of elite college admissions, limiting students at an early stage from pursuing a breadth of subjects outside their primary skill set. Said another student (male, Sciences):

“Given how much of a pressure cooker my high school was, [my academic interests] probably

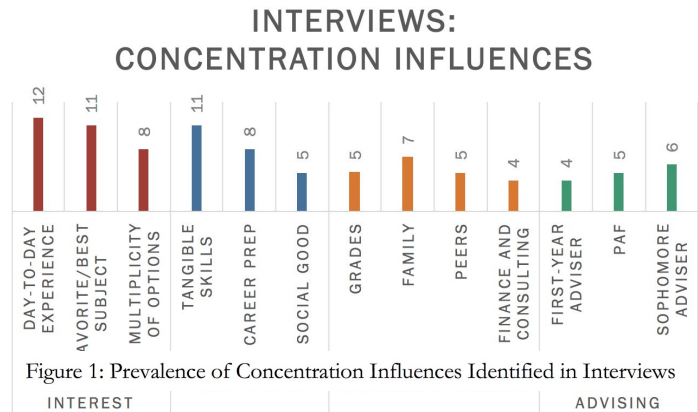


Figure 1: Prevalence of Concentration Influences Identified in Interviews

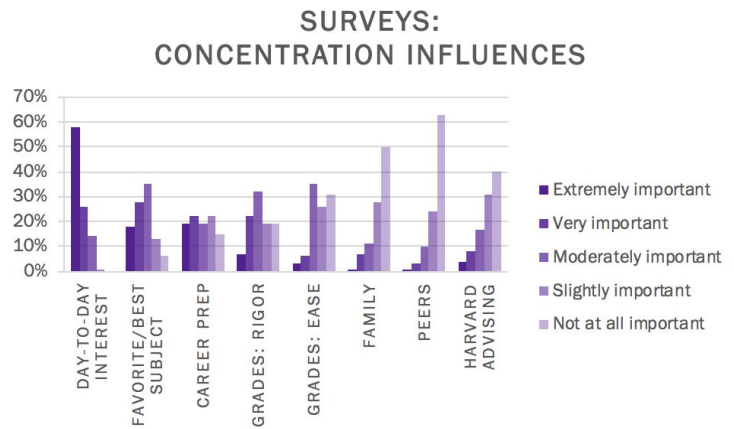


Figure 2: Prevalence of Concentration Influences Identified in Survey

had something to do with my GPA as well.”

III. Choosing a Concentration

Academic Interest

The unanimity of academic interest was considerable; every interviewee (n = 12) cited **academic interest** as the primary influence on their concentration choice, and 99% of survey respondents indicated academic interest was either moderately, very, or extremely important in their decision. Phrases like “passion,” “enjoy,” “interesting,” “cool,” “curiosity” and “excitement” were common among student responses. We identify below two main categories of academic interest.

The first is **day-to-day experience**. Students want to enjoy their coursework and are inclined to take the classes that consist of the material and assignments that they enjoy most. Thus, they choose a concentration that allows them to meet these goals. However, as noted above, this sense of enjoyment may be inextricable from academic performance, especially in the performance-based environment of an elite university. We discuss this more later.

The second is **belief in multiplicity of options**. Some students understand their undergraduate concentration as a stepping stone to a number of different careers and do not believe they are limited by their concentration choice. Students expressed that this was especially true at Harvard, the prestige of which will support future job searches no matter what one’s degree says. With this understanding, certain students feel empowered to study what they want to study, without fear that they will be unable to find a job or be restricted to a given profession.

“Real World” Applications

Second to their individual academic interest, interviewees also expressed that they chose a concentration based on how they believe it will allow them to interact with the “real world.” Three primary perspectives emerged: **acquisition of tangible skills, social good, and career preparation**.

The most common reason for choosing a concentration with regards to post-collegiate life was to **acquire tangible skills**. Almost all interviewees (n = 11) expressed a desire to “bring something to the table,” “learn things in a lot of different areas,” and, above all, to “prepare for the real world.” Interestingly, the manifestation of this desire was different among divisions. Some

STEM-identifying interviewees expressed a certain degree of disdain for humanities subjects, on the basis that such concentrations do not add to one's tangible skills. Said one student (female, SEAS):

“I don't want to exit college never having done multivariable calculus. I feel like that's just like...what did you do in college?”

Conversely, humanities students—and their professors—expressed “insecurity” about this perception that their concentrations are not “practical.” As two students (both female, Humanities) shared:

“My history professor keeps trying to convince us that history teaches us skills that are relevant to the real world.”

“There is an undercurrent belief that humanities subjects aren't important and aren't going to get you a real job. I feel insecure about that actually.”

Other students felt the pressure of **career preparation** (n = 8). Interestingly, this was true of 75% of STEM-concentrating interviewees compared to 60% of Humanities and Social Science interviewees. These results were mirrored by our survey, in which STEM concentrators were more likely to indicate that career prospects influenced their concentration choice than any other group (80%), including Social Sciences concentrators (60%) and especially Arts and Humanities concentrators (11%). The observed divide in importance of career preparation across distributions seems to reflect the above-mentioned perception that studying the humanities does not adequately prepare one for “real world careers.” It is interesting that students felt the need to choose a concentration relevant to their career at the same rate that they expressed the belief that they would be able to pursue a number of options with any given undergraduate concentration (**multiplicity of options**; n = 8); while these influences might be understood as contradictory, four of twelve students expressed both. Said one student (male, Sciences):

“If I get excited about a certain job or career, that could direct me to choose [a concentration] because it might build a better set of skills or make me look better if I'm going to find a job.”

These findings were reflected in our analysis of the OIR data. Statistics, economics, and computer science—three of the concentrations most associated with career preparation—are the three least

likely to send students to graduate school (see Figure 3). This suggests that there is a population of students in these concentrations who selected the concentration specifically for preparation for the workforce, which skews the ultimate percentages.

A smaller number of students ($n = 5$) expressed a desire to choose a concentration that would allow them to achieve the greatest degree of **social good**. Said one undecided student (female):

“As I think a lot of people do, I always had this notion of ‘I want to change the world.’ And I saw environmental challenges as the ones I would want to spend a large portion of my life tackling, and I saw the best avenue to do that as engineering.”

IV. External Pressures

Family

While external pressures, in general, ranked the lowest in significance among survey respondents, the primary external pressure for student concentration choice among interviewees was that of **familial expectations** ($n = 7$). Where present, familial preferences for concentration centered on those that were “serious,” “standard,” “widely known,” and “legitimate.” It is worth noting that some students felt this pressure from one or both parents, while others felt it from extended family members. Some families were fairly explicit about their hopes:

“If I suddenly told my parents I was going to do only philosophy...or something they didn't see as immediately useful in the real world...perhaps they would put up a fight.”

“My grandparents and my aunts and uncles thought of me as ‘Future Doctor.’ They're shocked and a little annoyed when I tell them, ‘I don't think I'm gonna do that anymore.’ They definitely have encouraged me to stay in bio and take classes that wouldn't put me too far behind if I wanted to go back to a pre-med track.”

Other students remarked that the familial pressure they felt was incongruous with their family's ostensible rhetoric:

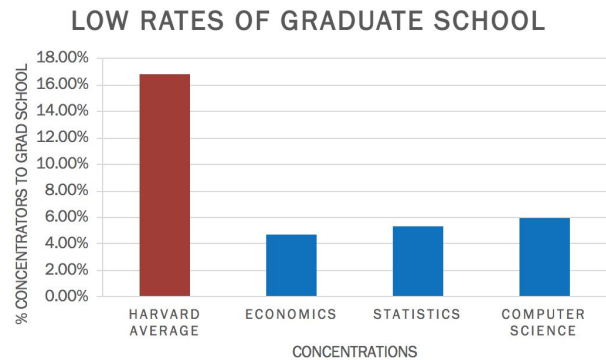


Figure 3: Concentrations with Low Rates of Graduate School-Bound Students

“They try to tell me, ‘We’ll love you no matter what what you do.’ But when I talk about chemistry, they get so excited. You know, ‘You’re going to be a breakthrough scientist or discover some really important thing that’s going to change the world.’ In the past, when I talked about wanting to major in music instead, they wouldn’t have the same kind of excitement.”

Almost all interviewees were quick to emphasize that their families had “their best interests at heart,” demonstrating that the presence of this pressure had not disrupted familial bonds and that they did not resent their families for this pressure.

Academic Performance

Another frequently cited external pressure was the **stress of academic performance** (n = 5), specifically GPA. Many students will consider their relative ability to do well in a given concentration as part of their concentration decision process. This may be seen as a natural collegiate extension of the overlap between “best” and “favorite” subject in high school. Students tend to enjoy what they excel at and excel at what they enjoy. Good grades in a given concentration can serve as positive reinforcement of students’ skill. Interestingly, 61% of survey respondents indicated that the rigor of a concentration was moderately, very, or extremely important in their choice, while 44% of students indicated the same for ease of concentration. Different populations of students choose concentrations because they are perceived as easier or harder. Clearly, the desire to perform academically is on students’ minds as they make this decision.

However, the pernicious underside of this pressure is the effect on students’ mental health when grades are not favorable. Students consistently shared that both initial concentration choice and potential changes in concentration were heavily influenced by grades. One student (female, SEAS) shared:

“There’s constant moments of doubt of whether if I’m smart enough to do these concentrations. I try to remind myself that I’m surrounded by the highest achievers in the country and that a B+ isn’t a catastrophe...that my grades shouldn’t deter me from pursuing something.”

Peers

When asked directly, most students did not cite **peers** as direct influences on their concentration choice, and it remained the least influential factor among survey respondents.

However, there was evidence that students were aware of their peers' interaction with concentration choice ($n = 5$). One student remarked that they perceive certain concentrations (specifically, Social Studies, Applied Mathematics, and History & Literature) as being "hot" among students. Another student added that different social circles can sometimes have notable clusters of concentrations (i.e., overlap in the outdoors community with engineering and the biological sciences). Additionally, all interviewed athletes cited athletics as an influence on their schedules and concentrations.

Gender

Among concentrations at Harvard, a few exhibited notable differences from the national average in terms of gender (see Figure 4; blue indicates surprisingly male concentrations, while purple indicates surprisingly female concentrations; citations for the national averages can be found in Appendix E). Discrepancies of particular note include Mathematics (82% male at Harvard vs. 60% nationally), Music (76.5% male at Harvard vs. 56.4% nationally), History of Art and Architecture (73.8% female at Harvard vs. 42% nationally for architecture and 58% nationally for art), and Human Evolutionary Biology (71.2% female vs. 58% nationally for Biology). The scope of this project does not include explanations

for these trends in general, though we offer two conjectures to be addressed in future work: first, we conjecture that such dominant ratios, however they began, represent a positive feedback loop; that is, if a male student walks into a History of Art and Architecture class, that student is more likely to be uncomfortable or feel out of place due to the relative lack of similar peers, potentially increasing the likelihood that this student leaves the concentration, which in turn reinforces the ratio. Second, we point out that Mathematics and Music are the two concentrations where students most often came to Harvard knowing that they wanted to major in this field before eventually declaring it (79% of Music concentrators and 62% of Mathematics concentrators). This indicates that Harvard's

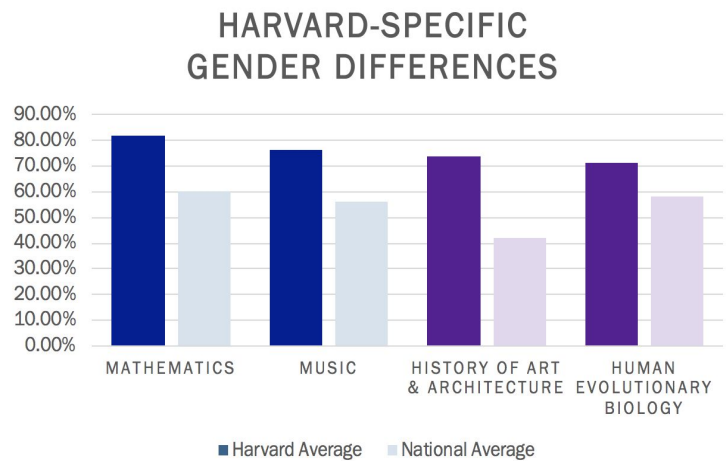


Figure 4: Surprisingly Gendered Concentrations at Harvard

admissions practices, whether because of internal factors (i. e. admissions policy) or external factors (i. e. high school enrichment programs preferentially admitting male students), are related to perpetuating the gender imbalance in the two male-dominated fields discussed above. We believe Harvard administrators should explore what exactly is driving his gender gap at Harvard.

Finance and Consulting

It is worth noting that we interviewed sophomores, who are typically more removed from the finance and consulting recruiting process than upperclassmen. Even so, students suggested that these careers were already influencing concentration choice, as embodied by this opinion of one student (female, Social Science):

“I feel like a lot of people will justify their concentration by saying they’re going to go into consulting. I’ve heard a lot of people go into economics thinking it will help with consulting, saying, ‘I’m just going to plow through EC10, I gotta concentrate in ec.’ I don’t understand why people do that.”

When asked if Harvard had a preference for student concentrations, most students asserted that the institution did not. However, there was an acknowledgement that certain concentrations and careers are given a bigger platform and a louder microphone on campus. According to one student (male, SEAS), nothing quite rivals the prevalence of finance and consulting on campus, especially with regards to the Ivy League pipeline:

“So many people in my grade are recruiting. It’s something that I have been forced to think about more than I would otherwise...It’s just so dominant in the conversation of what Ivy League or graduates of very, very good schools do right after college. It’s something that we’re prompted to consider.”

There was a consistent sentiment among students of feeling sucked into the finance and consulting world despite not having an interest in it. Said one student (male, Sciences):

“I got mentally sucked into recruiting and I was very nervous that I wasn’t applying to all these big CS companies like Google and Microsoft and whatever. And then I sort of realized that I didn’t want to be doing any of those jobs.”

Another student (female, Humanities) expressed that her choice of a concentration not typically

associated with these industries had an isolating effect:

“It feels weird choosing such a small concentration...being separated from the hordes of people who are going through recruiting to work in finance or consulting. I feel like almost everyone's doing that. And then I'm like, ‘What am I supposed to do?’ There's less of a framework or path for you to follow after college.”

Interestingly, many students proposed the pursuit of finance and consulting as mutually exclusive with pursuing one's pure academic interests. The baseline assumption here is that students are not excited about the study of finance and consulting. Said one student (female, Social Science):

“I remember my ec TF last year would always make fun of everyone, like, ‘Oh, you guys are all taking ec because you're passionate about it?’ And it was always just a joke. They know how things work.”

We were intrigued by this suggestion of instructor awareness of a lack of academic interest in such careers. If this is truly how students and instructors understand their participation in economics, one of Harvard's largest concentrations at Harvard, what does that say about the school's expressed desire to support students in the pursuit and development of their academic passions?

However, this awareness of a lack of academic interest is perhaps well-founded. Analysis of the OIR dataset revealed that amongst students who ultimately get a job in finance or consulting, those who intended to declare a concentration in Social Sciences were **16.6%** *less* likely than average to have switched to another division by senior year. In contrast, students who get a job in finance or consulting and originally intended to concentrate in Humanities, Science, or SEAS are 71.2%, 37.6%, and 21.8%, respectively, *more* likely than average to have switched to another division by graduation. These numbers are striking and indicate that going into finance or consulting correlates strongly with aligning concentration choice with this desire. Specifically, finance or consulting students in Social Sciences don't switch concentrations as often as average, likely because the Economics concentration is in Social Sciences and therefore offers the clearest path to finance and consulting jobs within the division (59.2% of Economics concentrators go into finance or consulting, the highest percentage of any concentration). On the other hand, Humanities does not have concentrations which feed students to finance and consulting at high rates, and therefore there is a large outflow of finance/consulting students from Humanities to other divisions. Note that

which division they leave to does not matter, as the top three concentrations for sending students to finance or consulting are Economics (59.2%), which is in Social Sciences, Statistics (57.1%), which is in Sciences, and Applied Mathematics (49.6%), which is in SEAS. Therefore, there are clear pathways to finance and consulting in all non-Humanities divisions, likely explaining the large percent of switching by intended Humanities students. However, intended Sciences and SEAS students who go into finance or consulting switch at high rates also, which can perhaps be attributed to the perception on campus that Economics is the easiest pathway to these jobs, a belief that was commonly held among our interviewees.

We were further interested in the relationship between demographic factors and choice of these careers. Although FGLI students report career prospects as highly important in their concentration selection process (Ma, 2009), analysis of the OIR data revealed that this population is less likely than the average Harvard population to go into finance or consulting. 21.1% of FGLI students pursue finance/consulting, compared to 24.1% of non-FGLI students pursuing these jobs. Gender also plays a role in going into finance or consulting; while Harvard is 52% male, 61% of finance/consulting-bound students are male. Minority status also affects the results; while 24.4% of non-URM students go into finance/consulting, only 19.2% of URM students do so. While determining the cause of these trends is beyond the scope of this paper, we hypothesize that there are three factors at play driving these trends: hiring preferences, career support, and concentration support. We discuss these hypotheses below, but hypothesis testing is left to future work.

With regard to hiring preferences: it could be that finance and consulting companies, whether implicitly or explicitly, select for traits that exist (or are perceived to exist) more frequently in male, non-URM, or non-FGLI students. For example, these firms often cite confidence as a desirable trait, and so perhaps students with more role models in these industries ultimately are more confident in their interviews, leading to a greater success rate.

With regard to career support: interviewing for these jobs is a difficult and time-consuming process requiring hours of studying and attending events. Perhaps these under-hired demographic groups do not have access to the same resources as their counterparts, or perhaps do not learn of the recruiting process's requirements as early as their counterparts, leading to lower success rates.

With regard to concentration support: among the three concentrations that most often send

students to finance and consulting jobs (Economics, Statistics, and Applied Mathematics), there are some notable under-representations of minority groups which likely contribute to the above observed discrepancies. Concerning gender, Economics is only 32.6% female, Statistics is only 32.4% female, and Applied Mathematics is only 35.4% female, despite Harvard being 48% female. Concerning URM status, Economics is 16.6% URM, Statistics is 9.3% URM, and Applied Mathematics is 10.9% URM, despite Harvard being 17.4% URM. Concerning FGLI status, Statistics is 18.2% FGLI and Applied Mathematics is 13.1% FGLI, despite Harvard being 21.4% FGLI (note that Economics is at 22.3% FGLI, above the average). The gender gap, URM gap, and FGLI gap in obtaining finance and consulting jobs are all potentially attributable to the corresponding gaps in concentration demographics. One potential explanation for these gaps is a perceived lack of support for these minority groups in these concentrations.

V. Academic Advising

Given Harvard's recent focus on Academic Advising, we were also interested to see how that was reflected in student experiences. Generally, students did not view formal academic advising as an important factor in their decision; 71% of survey respondents indicated that Harvard advising was either not at all important or only slightly important in their concentration choice. Multiple students expressed that their advisers had "just kind of signed off on whatever I was taking" or "just signed the paper and let me do whatever I said I was gonna do." One student (female, SEAS) remarked that "no one has ever persuaded me to change the courses that I chose."

The variety in students' academic advising experiences, however, is reflective of the range of Academic Advisers at Harvard. Where students had successful interactions with advisers, it was primarily because those advisers had direct experience with a) **the student's academic interests** or b) **the Harvard undergraduate experience**. Many students expressed excitement about receiving an adviser in their own department. Among interviewees, students who were proactive enough to seek out such mentors on their own found consistent, considerable value in the concentration-specific advice they received. Student experiences with PAFs varied from neutral to positive. Fairly universally, interviewees emphasized the value of receiving academic advice directly from a fellow Harvard student.

VI. Switching Concentrations

Because sophomores have not yet completed their Harvard careers, we relied on the OIR data to draw conclusions about switches in concentration. While 33.2% of Harvard students switch concentration divisions between freshman and sophomore year, only 26.4% of students who ultimately go to graduate school switched divisions between freshman and sophomore year. This suggests that students who go to graduate school may be exceptionally good and/or passionate about their given subject and therefore feel less pressure to switch out. If that is the case, one's perceived ability to perform in a given concentration division is a driving factor of concentration choice.

Our hypothesis that interest in finance and consulting influences concentration choice after arriving at Harvard was substantiated by the data. Of the four divisions, students are least likely to switch out of Social Sciences by a significant margin (25.7% between freshman and sophomore year vs. the average of 33.2%; a similar pattern exists from freshman to senior year and sophomore to senior year). We believe this may be because job-preparation and post-graduate prospects offered by Economics (the largest Social Science concentration, representing one third of all Social Science concentrators) compel students to stay in Economics. Conversely, SEAS and Sciences are the divisions that people switch out of the most (39.3% and 37.2%, respectively). We suspect this is because the difficulty of SEAS and Sciences concentrations drives people away, which would be in keeping with the pressures of grades and academic performance that we identified as significant influences on concentration choice.

Conclusion

We entered this project with the goal of understanding the process and influence of concentration choice at Harvard. Our examination of this question carried us to many corners of campus. It took us to the OIR space on Mass Ave, to various dining halls and meeting rooms where we spoke with current sophomores about their experiences, and to Mather House, where we surveyed the upperclassman population. Each of these data sources informed our analysis of the other; we built our interview questions from our initial OIR findings, while both of those shaped the survey we created. Using statistical analysis in R, Python, Excel and Google Sheets, data visualization, and qualitative interview coding, we drew a number of conclusions.

Academic interest stands out as the most important influence on concentration choice cited by students. This is primarily informed by students' day-to-day experience and undergirded by a belief that, no matter what they study, they will have a number of options upon graduation. However, a student's favorite subject is also difficult to extricate from their best subject, as many students feel pressure to "shine" within their concentration both before and during their time at Harvard.

Students also want to leave Harvard able to contribute to the "real world," in terms of tangible skills, career preparation, and, to a lesser degree, social good. These three motives seem aligned with Harvard's mission "to educate the citizens and citizen-leaders for our society." However, as a liberal arts school Harvard does not offer pre-professional degrees like marketing or business, and the unease that this lack of professional training causes in students was apparent in student interviews.

To a lesser degree, the external pressures of family, academic performance, peers, and finance/consulting were also influential on students' concentration choice. We do not identify cause for concern among family and peer influences; students seem able to separate their own concentration desires from these outside groups. Pressure to perform academically did seem to impact students' concentration choice more than these authors consider ideal, in some cases having a profoundly negative impact on students' mental health. We believe there is room for continued growth on Harvard's part to mitigate these outcomes. It would be interesting to see in future studies whether there is a difference between perceived concentration difficulty and grades. Were students not graded, it is possible that they would be more inclined to pursue concentrations for reasons of pure academic interest. However, the risks of removing grades are not lost on the authors, and therefore we do not advocate a specific solution beyond further consideration of the issue.

Our beliefs about the role of finance and consulting at Harvard were largely confirmed by our findings. These careers take up more space on campus and in students' minds as they progress through Harvard, and we do see significant evidence of an influence of these careers on concentration choice. If Harvard wishes to support students in pursuit of their academic passions, there may be space to fortify on-campus programming that educates students about post-graduate options besides finance and consulting, including graduate school and the public sector.

There were some interesting divides along demographic factors of gender, URM, and FGLI status. In particular, we see potential evidence of undersupported female, URM, and FGLI students in the finance and consulting recruiting processes, and we find wide demographic gaps in finance / consulting-pipeline concentrations. While the discovered correlation is not necessarily proof of an internal Harvard issue, we recommend that Harvard continue to evaluate equity of opportunity at the school, in particular seeking to address the discussed demographic gaps. Furthermore, we discussed concerning gender gaps in specific departments, and recommend addressing these as well.

Finally, we identified two characteristics that make academic advising useful to students: connection to students' academic interests and to the modern Harvard undergraduate experience. While an adviser who possesses neither characteristic may still be helpful, there is a far greater likelihood of utility among someone who possesses one or both. For this reason, we recommend that Harvard facilitate the connection of students with departmental advisors at the end of their first year, when they indicate a concentration interest. These advisors need not be official or permanent, but formalizing the structures by which students can receive advice from departmental experts will help less proactive students to benefit from earlier and more focused advice. Furthermore, we strongly recommend that PAFs be encouraged to facilitate discussions of academic experience. Harvard's desire to buttress its Academic Advising program is not mutually exclusive with this effort. Students derive tremendous value from their peers' recommendations and that should be supported on an institutional level.

There is considerable room for future research and improvement in equalizing the processes by which different students choose to enter different concentrations and subsequent careers. Ultimately, we hope that we can continue to work towards a future in which more students feel supported—by their university, family, peers, and advisors—to pursue the subjects about which they are most passionate. The idea of multiplicity of options should be cultivated; none of us need be limited by the fine print on our degree. Harvard is at its best when students feel empowered to dive into the subjects that get them out of bed. Said one student, “I know I can make more of my Harvard experience experience if I follow my academic curiosities.” We believe this future is one worth working towards for all students.

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