

# UNDERSTANDING UW-MADISON PHD CAREER PATHWAYS

## CAREER PREFERENCES, OUTCOMES, AND ALIGNMENT

University of Wisconsin–Madison Graduate School | August 2019

**National data suggests that newly minted PhDs face an early-career employment landscape characterized by greater levels of uncertainty and competition for academic positions compared to prior generations.<sup>1</sup>**

Popular reports of an “employment crisis” among new PhDs may stoke students’ anxiety over employment.<sup>2</sup> Yet national estimates put the unemployment rate of PhD-level scientists and engineers at just 2%—lower than the country’s overall jobless rate.<sup>3</sup>

Despite this conflicting picture of long-term PhD employment prospects, national data makes clear that a significant proportion of graduates end up pursuing careers outside academia in private industry, government

agencies, non-profit organizations, and other sectors.<sup>4</sup> Whether PhD students see these non-academic careers as desirable options prior to entering the job market, however, has been an outstanding question.

This data brief provides a window into the specific career preferences of UW–Madison PhD students, and examines the alignment of those preferences with the career outcomes of UW–Madison PhD alumni. The brief serves as a useful resource to university leaders and program staff concerned with how to better support the career preparation of UW–Madison doctoral students.

This brief is the first in a series of briefs based on student and alumni survey data collected as part of a national, multi-year study of career outcomes led by the Council of Graduate Schools. More information on the data and sample is detailed at the end of this brief.

## KEY FINDINGS

- **PhD students are interested in multiple employment sectors.** Although three-quarters of those surveyed view academic employment as highly desirable, one in four did not express a strong desire to work in academia. Many who desire postsecondary employment also express strong interest in for-profit, government, or non-profit jobs.
- **Employment preferences differ by gender and area of study.** Female students are more likely to desire non-profit work than their male peers, while male students are more likely to desire for-profit or government employment. Generally, Social Sciences and Arts & Humanities students are more interested in postsecondary employment, while Physical and Biological Sciences students are more interested in for-profit jobs.
- **Most PhD students who desire postsecondary employment are open to jobs in different types of institutions.** Positions at research universities are most desired by those aspiring to academic jobs. However, nearly three-fifths of those students also rate jobs in liberal arts colleges, master’s/regional universities, or two-year colleges as highly desirable.
- **PhD students have some understanding of labor market opportunities and outcomes for graduates in their area of study.** The relative desirability of employment sectors among students generally mirrors the employment rates of graduates in each area of study.
- **The traditional view of PhD programs as academic career training should be critically questioned.** Most students aren’t narrowly focused on careers in academia—a pattern reflected in the diversity of sectors where alumni are employed. Nearly half of all alumni report employment in sectors other than postsecondary education, which challenges the traditional view of PhD programs as academic career training alone.



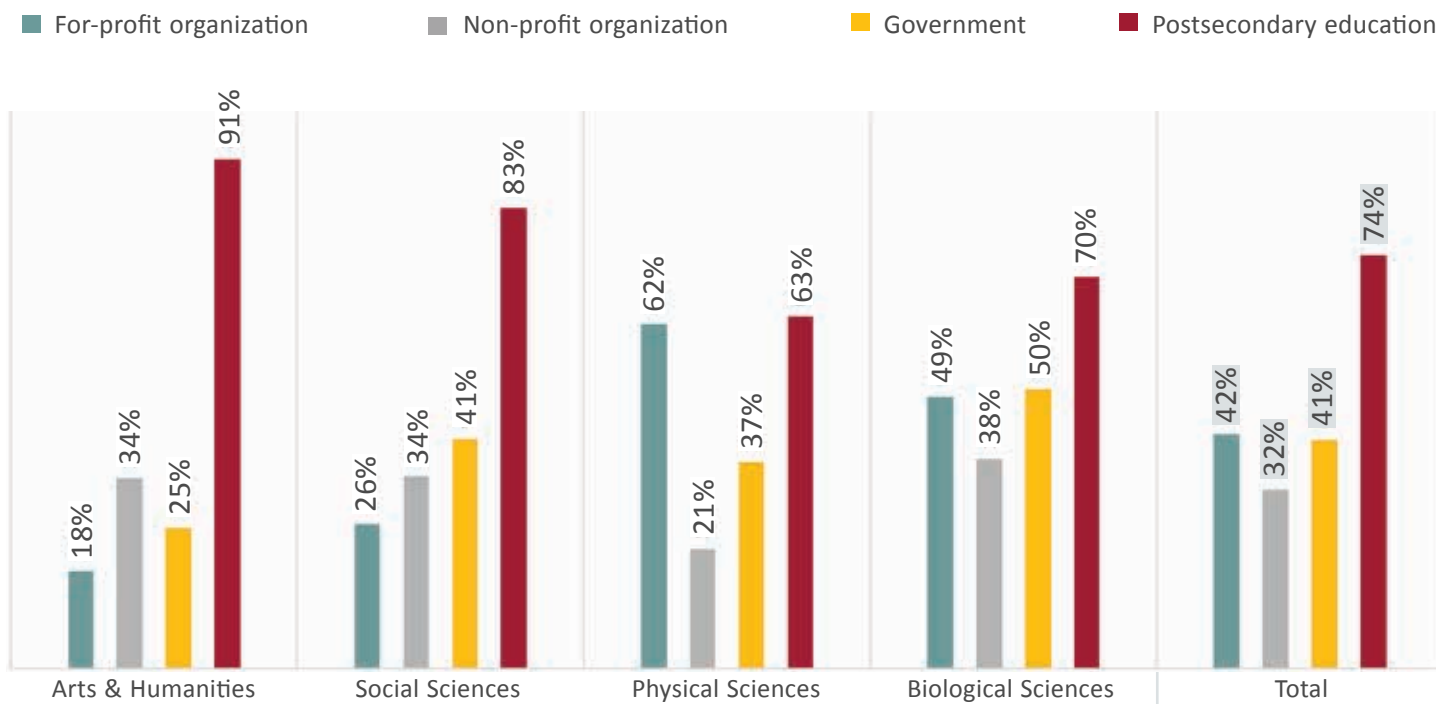
## WHAT ARE THE CAREER PREFERENCES OF PHD STUDENTS?

PhD students' career preferences are diverse—characterized by an interest in multiple employment sectors (figure 1). Among survey respondents, 74% hope to find employment in postsecondary education after completing their degree, indicating that such jobs would be “very” or “extremely” desirable. However, student interest in careers outside of academia is also robust with high percentages expressing a strong desire for employment in for-profit (42%), government (41%), or non-profit (32%) organizations after graduation. Notably, around a quarter of PhD students express only moderate or low desire for postsecondary employment—instead rating other sectors as more desirable.

PhD students pursuing different areas of study tend to prefer different employment sectors (figure 1). While interest in postsecondary employment is high among all students, those in the Arts & Humanities and Social Sciences are particularly likely to desire postsecondary employment after they graduate. Alternately, for students in the Biological and Physical Sciences postsecondary careers appear somewhat less desirable, with many students expressing interest in for-profit employment after graduation. In the Physical Sciences, nearly two-thirds of PhD students rate for-profit employment as highly desirable, while just half of those in the Biological Sciences say the same.



[FIGURE 1]  
EMPLOYMENT SECTORS DESIRED BY PHD STUDENTS



**Notes:** Students were asked how much they desire a particular employment sector on a 5-point scale (1=not at all; 2=slightly; 3=moderately; 4=very; 5=extremely). The top two categories were combined to indicate ‘desirable’ in this brief. Survey questions on preferred employment sectors were not mutually exclusive. Reported percentages therefore add up to more than 100%.

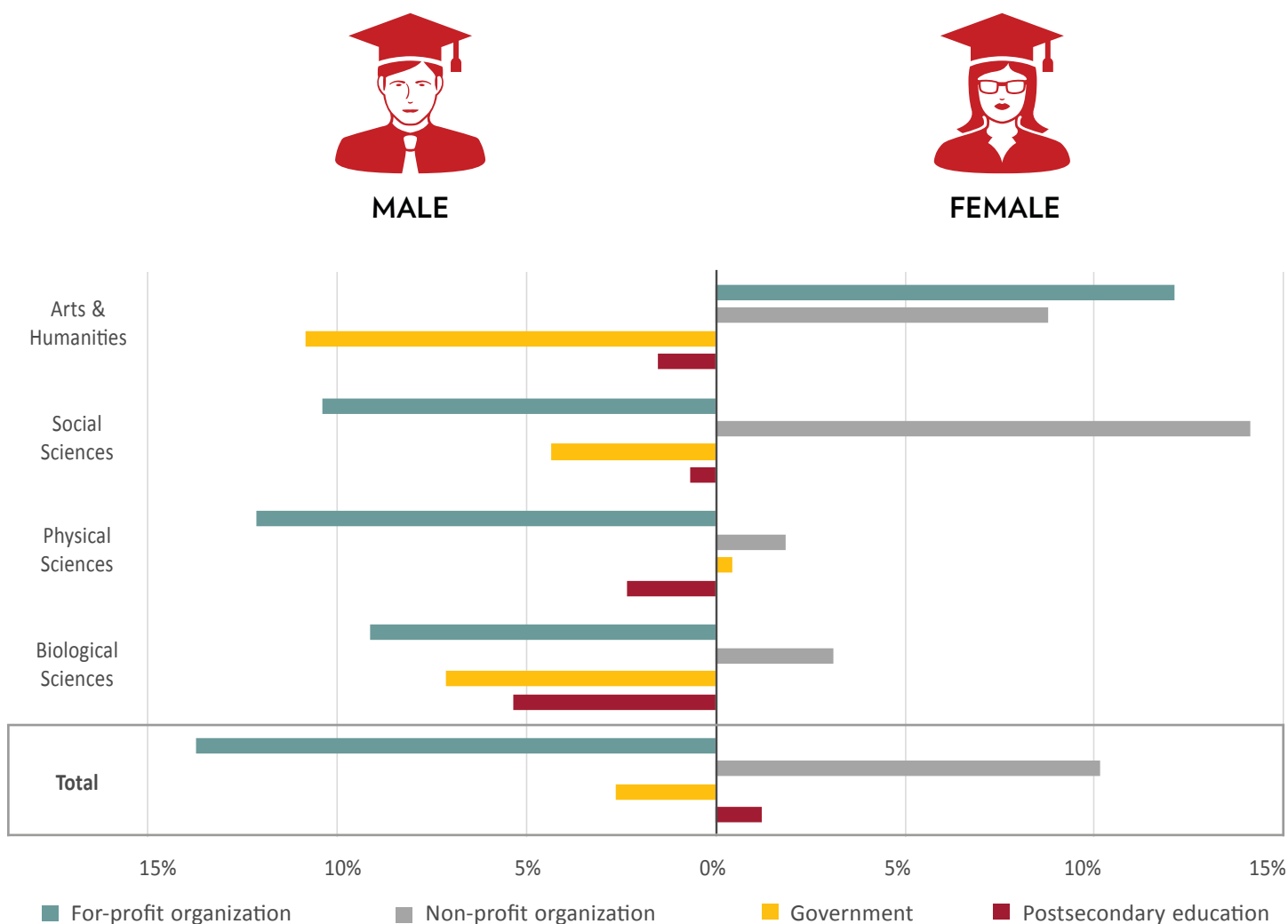


## HOW DO PHD STUDENTS' CAREER PREFERENCES DIFFER BY GENDER?

Male and female PhD students have somewhat different career preferences on average, with males more likely to desire for-profit employment and females more often interested in non-profit work (figure 2). This pattern is also reflected within individual areas of study. Interest in for-profit employment

among students in the Physical Sciences is around 12 percentage points higher among males compared to females. Conversely, female students in the Social Sciences are about 14 percentage points more likely than their male counterparts to rate non-profit employment as highly desirable.

[FIGURE 2] GENDER DIFFERENCES IN EMPLOYMENT SECTOR PREFERENCE



**Notes:** Figure 2 shows the difference in percentages of female (n=448) versus male (n=408) students desiring work in four different employment sectors. Bars facing left indicate a higher percentage of male students desiring the sector, while bars facing right indicate a higher percentage of female students desiring that sector. Percentages were calculated within each area of study, as well as for the total sample.



## WHAT TYPES OF POSTSECONDARY INSTITUTIONS DO PHD STUDENTS PREFER FOR EMPLOYMENT?

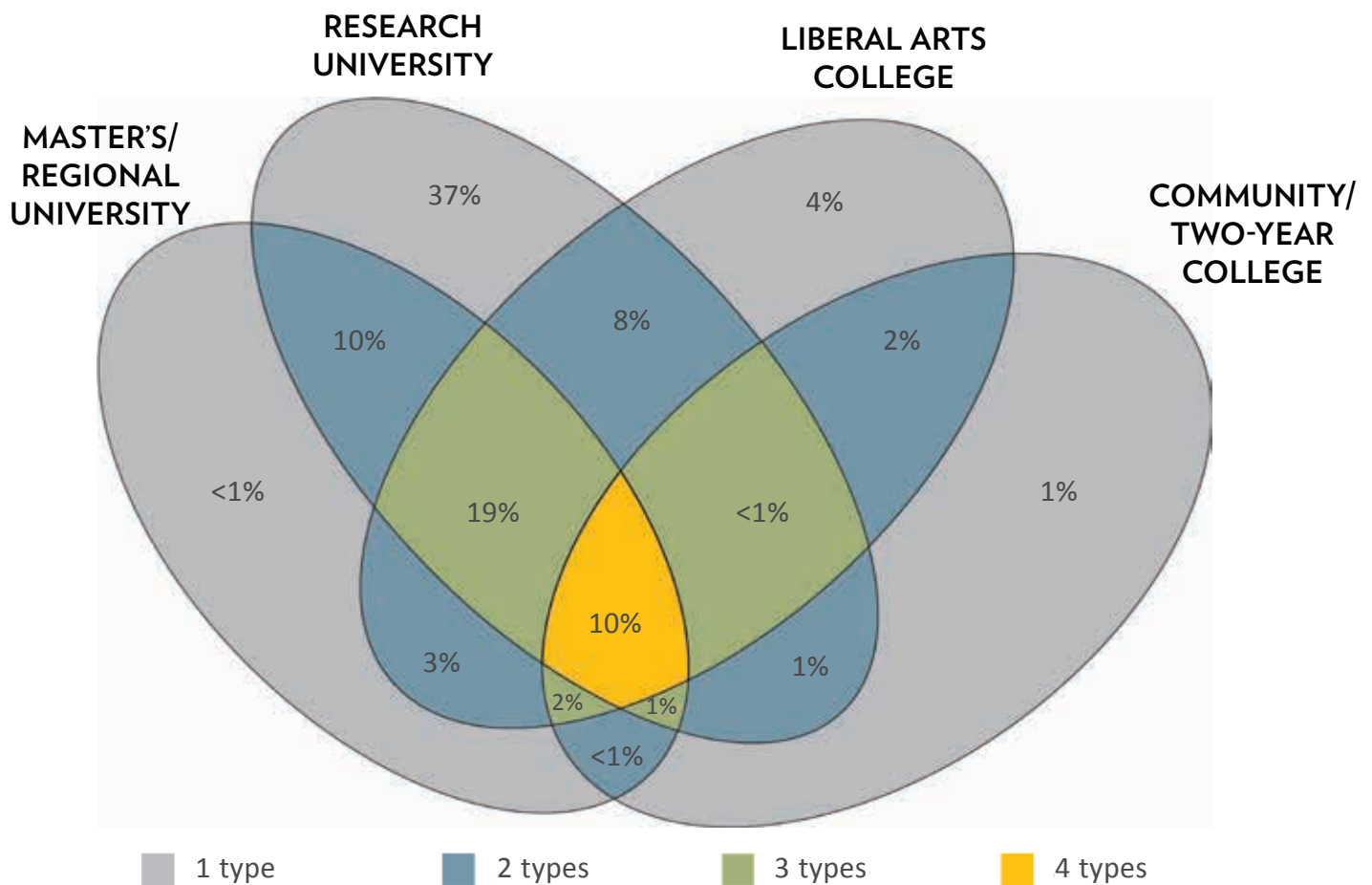
The postsecondary employment preferences of UW-Madison PhD students are characterized by their diversity (figure 3). Among the students who indicate a strong desire for postsecondary employment after they graduate, nearly 85% hope to find work at a research university (figure 3). Yet more than half of those interested in postsecondary employment—including 57% of those desiring work at a research university—appear equally open to other types of postsecondary employment. About one in five students, for example, report the same high level

of interest in working at a research university, a master's/regional university, or a liberal arts college. One in 10 students desiring postsecondary employment report the same high level of interest in all institution types including work at community or two-year colleges.



**57% OF THOSE DESIRING WORK AT A RESEARCH UNIVERSITY APPEAR EQUALLY OPEN TO OTHER TYPES OF POSTSECONDARY EMPLOYMENT**

**[FIGURE 3] TYPES OF POSTSECONDARY EMPLOYMENT PREFERRED BY PHD STUDENTS**



Notes: Figure 3 only represents students who indicated that postsecondary education was a desirable employment sector (637 out of 856 total).

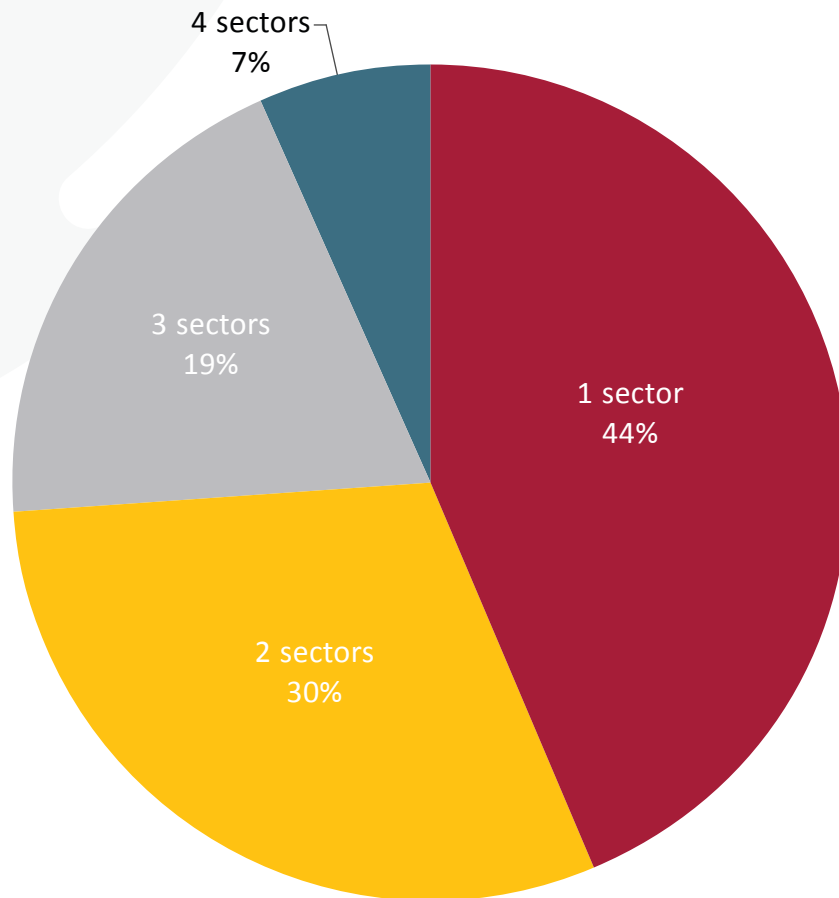


## HOW FOCUSED ARE PHD STUDENTS' CAREER ASPIRATIONS?

Most PhD students appear to take a broad view when it comes to their post-degree career aspirations. Less than half of students indicate a clear preference to find work in just one employment sector (figure 4). On the other hand, the approximately 50% of students reporting high interest in two or three different

employment sectors appears to challenge the notion that PhD students are narrowly focused on careers in postsecondary institutions. Notably, one in 14 students reports high interest in four different career sectors, which may indicate a general lack of clarity regarding their career direction.

**[FIGURE 4] NUMBER OF EMPLOYMENT SECTORS PREFERRED**



**Notes:** The employment sectors are postsecondary education, government, non-profit organization, and for-profit organization.



## HOW FOCUSED ARE PHD STUDENTS' CAREER ASPIRATIONS? (CONTINUED)

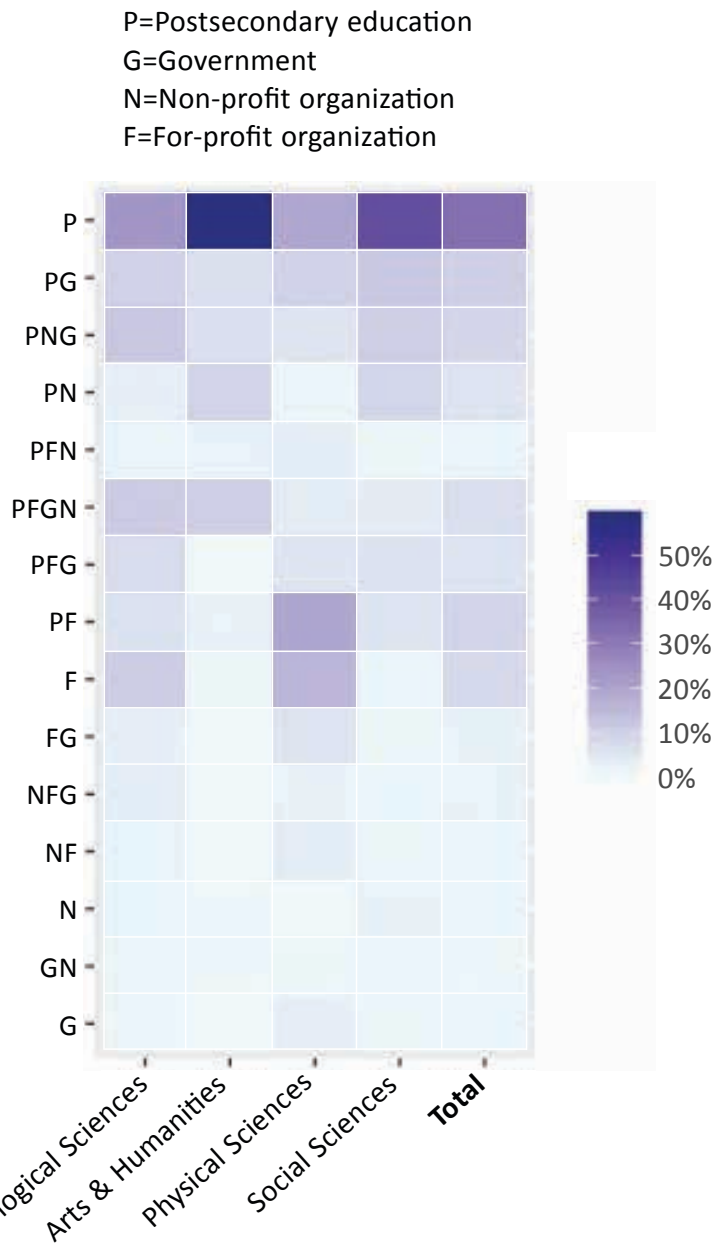
Most students with multiple employment sector preferences include both the postsecondary and for-profit sectors among those preferences (figure 5). This is particularly true among students in the Physical Sciences where 15% indicate that both employment sectors are highly desirable.

Among students with one clear career sector preference, that preference is most commonly postsecondary education (figure 5). About one-quarter of all PhD students overall report a singular preference for postsecondary employment over work in other sectors, with higher percentages of such students in the Arts & Humanities and Social Sciences. Nevertheless, a considerable number of students—particularly those in the Physical Sciences—appear to place a higher premium on for-profit organizations above all other employment sectors, including postsecondary.



RESPONDENTS REPORT A SINGULAR PREFERENCE FOR POSTSECONDARY EMPLOYMENT

[FIGURE 5]  
OVERLAPS IN CAREER PREFERENCES



Notes: Figure 5 represents the combination of employment sectors students reported as desirable. Percentages were calculated within each area of study and for the total sample.

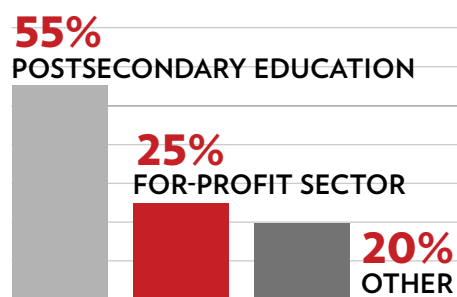


## HOW DO PHD STUDENT CAREER PREFERENCES ALIGN WITH ALUMNI OUTCOMES?

The employment profile of UW-Madison PhD alumni is highly diverse. Just over one-half work in postsecondary education, while around one in four works in the for-profit sector (figure 6). The remaining 20% are employed in other sectors such as government or non-profit organizations.

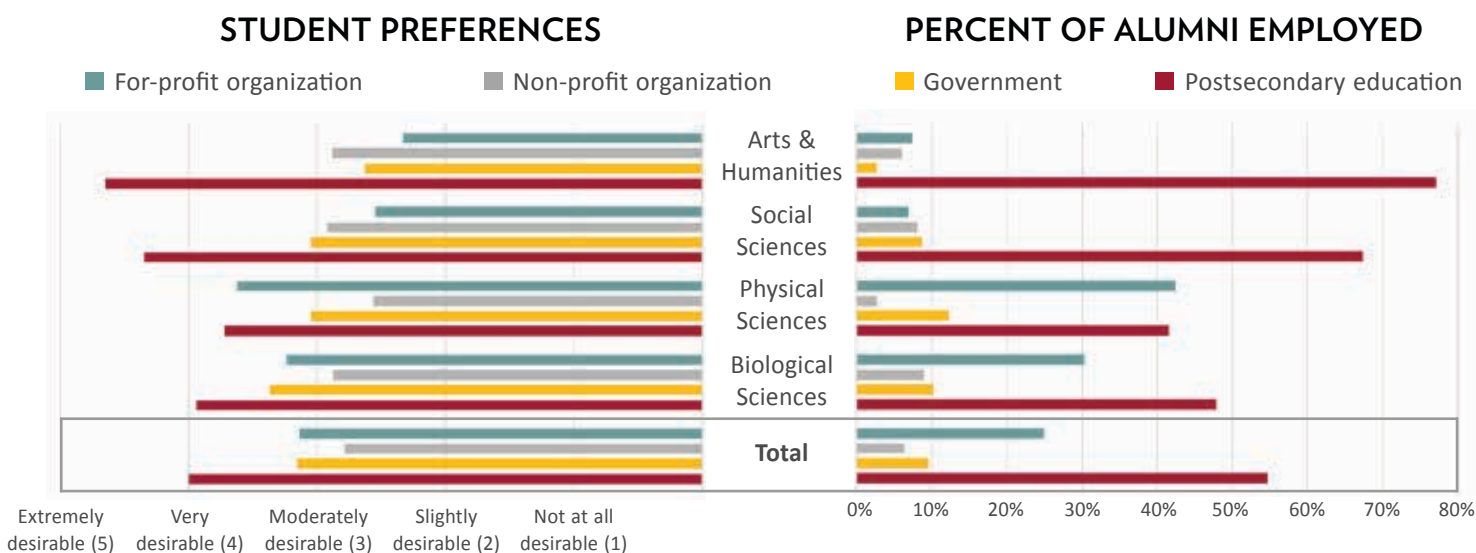
Though different measurement scales of student career preferences and alumni outcomes make comparison of the two difficult, general patterns suggest that students have some understanding of labor market opportunities and outcomes for graduates in their area of study (figure 7). The relative desirability of postsecondary employment across the four areas of study mirrors the relative postsecondary employment rates of alumni from each area. Similarly, the relatively high desirability of for-profit employment among students in the Physical and Biological Sciences mirrors the much higher rates of that type of employment among graduates compared to those in the Social Sciences or Arts & Humanities.

[FIGURE 6] EMPLOYMENT SECTORS OF ALUMNI



Our findings challenge the traditional notion of PhD programs as training students exclusively for work in academia. Students hold a diversity of career sector interests, which is also reflected in the diversity of sectors where alumni are actually employed. Nearly one-half of all alumni report employment in sectors other than postsecondary education, with notably higher percentages of those working outside academia in the Physical and Biological Sciences.

[FIGURE 7] ALIGNMENT OF CAREER PREFERENCES AND OUTCOMES



Notes: Students indicated how much they desire a career sector on a 5-point scale (1=not at all; 2=slightly; 3=moderately; 4=very; 5=extremely). The left side of the figure displays the average desirability of each career sector on this scale. The right side of the figure displays the percentage of PhD alumni actually employed in each sector.



## ABOUT THE DATA SOURCE AND SAMPLE

This brief is based on combined data from annual web surveys of UW–Madison PhD students and alumni. The surveys were designed by the Council of Graduate Schools (CGS) and administered by UW–Madison as part of the CGS PhD Career Pathways Coalition.<sup>5</sup> Alumni information is derived from survey data collected in fall 2017 and fall 2018, and student information is derived from survey data collected in spring 2018 and spring 2019.

The full combined alumni sample includes 1,430 PhD recipients who were three, eight, or 15 years post-degree at the time of survey fielding. The survey was sent out to all 4,449 PhD recipients for those graduation years, and had an overall response rate of 32%. Prior to analysis, 57 unemployed alumni were dropped, making the final alumni analysis sample 1,373. The combined student analysis sample includes 856 PhD students. Surveys were originally sent out to all enrolled PhD students who were two or five years into their program at the time of survey fielding (N=2,318). The overall student survey response rate was 37%.

## THE CGS PHD CAREER PATHWAYS COALITION

The Council of Graduate Schools PhD Career Pathways is a coalition of 70 doctoral institutions working to better understand and support PhD careers across all broad fields of study. Over the course of the project, universities collect data from current PhD students and alumni using surveys that were developed by CGS in consultation with senior university leaders, funding agencies, disciplinary societies, researchers, and PhD students and alumni. The resulting data allow universities to analyze PhD career preferences and outcomes at the program level and help faculty and university leaders strengthen career services, professional development opportunities, and mentoring.

## ACKNOWLEDGEMENTS

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## REFERENCES

<sup>1</sup> National Science Foundation. 2018. “Doctorate Recipients from U.S. Universities: 2017.” *Special Report NSF 19-301*. December 4, 2018. <https://nces.nsf.gov/pubs/nsf19301/>

<sup>2</sup> McKenna, Laura. 2016. “The ever-tightening job market for Ph.D.s: Why do so many people continue to pursue doctorates?” *The Atlantic*, April 21, 2016. <https://www.theatlantic.com/education/archive/2016/04/bad-job-market-phds/479205/>

<sup>3</sup> National Science Foundation, National Center for Science and Engineering Statistics, 2019. “Survey of Doctorate Recipients, 2017.” Last modified February 2019. <http://ncesdata.nsf.gov/doctoratework/2017/>.

<sup>4</sup> *ibid*

<sup>5</sup> Council of Graduate Schools, n.d. “Understanding PhD Career Pathways for Program Improvement.” Accessed August 15, 2019. <https://cgsnet.org/understanding-career-pathways>

Comments or questions about this brief can be sent to the Graduate School Office of Academic Analysis, Planning & Assessment at [data@grad.wisc.edu](mailto:data@grad.wisc.edu).