PH.D. COMPLETION AND ATTRITION

Analysis of Baseline Demographic Data from the Ph.D. Completion Project

Ph.D. Completion
and
Attrition:

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ISBN: 1-933042-18-4

Printed in the United States

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FOREWORD

By Debra W. Stewart, President, Council of Graduate Schools

This volume is intended to complement the previous volume in this series, *Ph.D. Completion and Attrition: Analysis of Baseline Program Data from the Ph.D. Completion Project* (CGS, 2008). Ideally, the two publications will be read sequentially, allowing the introductory materials in the former to serve as a context for the latter. Realizing, however, that in some instances only the latter publication may be available, or of interest, to certain readers, I provide once again some general context for the project as a whole and place this volume within that context.

I began the Foreword to the first volume by highlighting the following quotation that says it all about why we have chosen to focus our initial energies on simply documenting empirically the pattern of completion in selected graduate programs.

"Knowing what to measure and how to measure it makes a complicated world much less so. If you learn how to look at data in the right way, you can explain riddles that otherwise might have seemed impossible. Because there is nothing like the sheer power of numbers to scrub away layers of confusion and contradiction [sic]*."* (Levitt and Dubner, 2005, p. 14)

Doctoral education in the United States is the model for much of the rest of the world, a status that justifies the expense born by both the students who earn these degrees and by the institutions that award them. Expense all around is measured not only in financial terms but also recorded in the time and effort of students and their professors.

It was the stature and the costliness of the doctoral enterprise that motivated the graduate community in the mid-1990s to launch a self-examination directed at identifying areas of weakness and at generating strategies for addressing them. The result has been a proliferation of studies and reports on doctoral education in the United States. These reports focused on different disciplines, different subsets of graduate students, different time frames, and the efficacy of different interventions (CGS, 2004). By 2003, it was clear that all of this work provided an enormously rich stew for creative speculation about how

doctoral education might be further strengthened, a context that was probably essential for motivating the "jewel in the crown of higher education" to believe that even it could benefit from polishing. It was also clear that the time had come for CGS to launch a national initiative that would result in firming up a foundation for specific best-practice recommendations to U.S. graduate schools, programs, funders, and policymakers.

In order to reach this point, two things had to happen. First, we needed to identify a common empirical measure for assessing positive change. And second, in selecting that mode of measurement, we needed to think about the critical leverage points that could help unpack the mélange of issues that had emerged in the "rich stew" of discussion and scholarship cited above. We settled on student completion and attrition rates from Ph.D. programs as the key point of leverage to ultimately generate best-practice recommendations to improve the effectiveness of America's Ph.D. programs.

Completion was the key because we believed that of all of the issues raised in nearly a decade of our self-criticism of doctoral education, the most urgent issue was that too few students admitted into U.S. doctoral programs actually graduated. We also believed, as Levitt and Dubner note in the quotation introducing this Foreword, that "there is nothing like the sheer power of numbers to scrub away layers of confusion and contradiction." We hoped that if we could launch a project that would empower all stakeholders, especially the deans of U.S. graduate schools, to lead conversations with faculty and students about what the completion and attrition rates actually were, and about what kinds of interventions might most successfully be implemented to improve completion, that alone would move the conversation forward. But if we could actually study a carefully selected set of interventions, specifically designed to address attrition in clearly defined disciplinary, programmatic, and university settings, we could ultimately generate the information upon which solid best-practice recommendations could be provided by CGS to our membership community. The Ph.D. Completion Project is aiming to achieve that objective.

This publication, *Ph.D. Completion and Attrition: Analysis of Baseline Demographic Data from the Ph.D. Completion Project,* is the second in a series of monographs forthcoming from the project. Most CGS publications advance best practices in defined fields or, at the very least, describe the current state of discussion regarding best practices in emerging fields. Like the first publication in our major national demonstration project on Ph.D. completion and attrition, this second monograph is both similar to and different from the typical CGS

publication. Most readers familiar with CGS publications will be struck by the fact that this monograph trades in the currency of numbers rather than the more typical broad policy-statement or curriculum-oriented best-practice document. The publication, like its predecessor, gives more emphasis to presenting data than to interpreting its meaning, though of course we do some of both. It invites more attention to the granularity of charts, tables, and numbers rather than the 10,000-foot-view prose that is our normal trade. But we begin in the first two volumes with this level of granularity precisely because we believe that now is the time for action to increase Ph.D. completion and that this action needs to be based on both a solid empirical understanding of the current situation and a transparent approach to how completion and attrition are calculated. While there is a best-practice element to this monograph, it lies in the elaboration of a methodology for assessing Ph.D. completion and attrition in the fine grain essential to moving the discussion forward. The CGS completion team headed by Robert Sowell struggled over how far we should go in interpretation of the demographic baseline data. The story told by some of the tables, for example those highlighting significant differentials in completion rates across racial/ethnic and gender groups, is not a "good news" story. We were all drawn immediately toward explanations and action. But the purpose at this stage is neither to interpret nor to "fix" but rather simply to document and report. Hence throughout this monograph, as in the prior volume, the research team comes down generally on the side of less rather than more interpretation.

Here again we must stress the caveat that we offered in the first baseline program data volume. The data displayed here were provided by institutions selected in a national competition that invited graduate schools to record their own history of completion by demographic groups within broad fields, craft strategies to address issues, implement those strategies, and measure their impact in part by continued tracking of student completion across demographic groups. Participants were selected for inclusion based on the belief that they were committed to carrying through with these tasks. As it turned out, the project also represents a set of institutions that are broadly representative of doctoral-granting institutions: public and private, large and small, geographically dispersed universities, with reasonably diverse missions regarding doctoral education. Nonetheless, we do not claim this data set to represent the universe of doctorate-granting universities or programs in the United States. The sample is limited in both fields covered and characteristics of institutions participating. But the field coverage does provide good insight into core disciplines as well as into most major broad fields of doctoral study. And the "judgmental sample" does give a window into performance at typical major public and private, geographically dispersed, and large and small

institutions. The bias is clearly in the direction of universities and graduate schools tangibly committed to the mission of systematically understanding and acting upon the challenge of increasing completion rates and specifically addressing differentials across demographic groups.

Other important data-gathering activities will allow interested parties to consider the universe of research doctoral programs with respect to at least some of the aspects of completion and attrition documented here.[1] But the Ph.D. Completion Project institutions as a whole provide a benchmark against which institutions who equally aspire to measure and then act on completion differences they may identify across demographic groups can assess their own performance. We are pleased to share this baseline demographic data, knowing that it will inevitably launch an active and hopefully very fruitful national discussion about achieving success for all students in doctoral education.

1 National Academy of Sciences, National Research Council, An Assessment of Research-Doctorate Programs, forthcoming.

ACKNOWLEDGEMENTS

By Debra W. Stewart, President, Council of Graduate Schools

Many organizations and individuals deserve thanks for their commitment to this project, for supporting it financially, and for bringing it to fruition through their labors and their leadership. Let me begin with our funders. First thanks go to the Pfizer, Inc., for both its very generous financial support of the infrastructure for the Ph.D. Completion Project and for the specific funding for the entire fields of the Sciences, Engineering, and Mathematics. The deep commitment of Pfizer to developing the domestic talent pool in America and to building a global talent pool emerged in the very first conversation we had about increasing completion as a key strategy for success. Their commitment has been sustained throughout. There would be no Ph.D. Completion Project without the leap of faith that the leadership of Pfizer Global Research and Development and Pfizer Corporate Human Resources took with CGS in the early days. Deep thanks also go to the Ford Foundation, whose strong support of the Humanities and Social Sciences allowed us to expand the project to those important fields.

The case that we made to Pfizer and the Ford Foundation was based in part on the dialogue that occurred at an invitational workshop that CGS held in spring of 2003 with funding from the Alfred P. Sloan Foundation and the National Science Foundation. Thanks also to both the Sloan Foundation and NSF for this critical early support.

Then in the spring of 2004, as a result of the generous programmatic grants provided by Pfizer and Ford, CGS embarked upon one of the largest and most diverse efforts ever undertaken to address the underlying issues behind student completion of and attrition from Ph.D. programs across the Sciences, Engineering, Mathematics, Social Sciences, and Humanities. After reviewing a strong pool of 46 proposals, an external advisory committee selected 21 universities for funding as Research Partners to spearhead this effort. The remaining 25 universities were invited to participate as Project Partners. In 2007, a strengthened commitment to the project by both Pfizer and Ford enabled the pool of partnering institutions to grow in Phase II, with the addition of eight new Research or Data Partners and continued funding to 14 Research Partners from Phase I of the project. It is the great partnership between Pfizer

and the Ford Foundation that will continue to sustain the Ph.D. Completion Project through 2010.

Of course, in addition to the funders, we offer our deep thanks to the member universities that are the core partners in this project. We are grateful to all those who have informed and improved this project: the student respondents, the committed faculty, and the graduate deans and senior leaders in graduate education who have served as principal investigators or otherwise supported this important effort. We also acknowledge the good work of the project Advisory Board. To the Advisory Board members, listed in Appendix A, we say thank you for the sound counsel, the thoughtful selection of participants, the willingness to provide periodic advice, and the sustained commitment to reading drafts and offering comment as we begin to publish findings from the initial phase of the project. In particular, for their very careful reviews of this volume, I want to extend a sincere thanks to Pam Benoit, Vice Provost for Advanced Studies and Dean of the Graduate School, University of Missouri; Karen Klomparens, Dean of the Graduate School, Michigan State University; and Richard Shavelson, Professor of Education and Psychology, Stanford University.

Final thanks go to the professional efforts of the CGS staff (and friends) in all phases of this project. At the formative stages of the project I thank Joan Lorden, Les Sims, Carol Lynch, Robert Sowell, Jennifer Slimowitz, and Daniel Denecke for their good efforts and advice as we convened the discussions and developed the proposal to the funders. In the first phase of the project thanks go to Daniel Denecke for his very important program direction and Helen Frasier and Matthew Loveless for their tireless efforts in data collection. And in the current phase of the project, including data analysis, authoring publications, and continuing project leadership, I offer very special thanks to Robert Sowell, the director of the Ph.D. Completion Project, as well as Kenneth Redd, Ting Zhang, Nathan Bell, and Emily Neubig who have provided their expertise in data collection and analysis and to Lewis Siegel, for his especially helpful ongoing advice and counsel. Like everything at CGS, the volumes emerging from this project are the result of a team effort. But it is only fair to recognize the unique leadership of Robert Sowell and the special and determined labors of the Sowell, Zhang, Bell and Redd team that brought this current publication to fruition.

CHAPTER 1
Introduction

Background

Most students who begin Ph.D. programs in America do so with the intention of completing their degrees. Whether the student is Hispanic American, African American, or Native American; whether male or female; whether U.S. domestic or international, the journey for most students is presumed to end with degree completion. Yet anecdotally we have heard from many institutions and across many fields that completion is not demographically neutral. Conventional wisdom, as well as some field specific research, suggests that while completion rates for all student may be lower than optimal, the "failure to complete" problem is notably more serious among students from underrepresented populations: both women and minorities.[2]

If true, this lower completion rate raises serious concerns on two fronts. One of course relates simply to equality of access and opportunity issues. Since we know that given the normal restriction of range on characteristics that students tend to bring with them into any particular graduate degree program, there is no reason to suspect that one demographic profile should be less successful that any other in completing that program based on any entering characteristic. Hence, a simple commitment to equality of opportunity calls us to examine and address the reasons causing this differential. The other serious concern relates directly to issues of U.S. competitiveness. We know for example that about one-third of individuals from the millennial generation (those born between 1982 and 1994) are underrepresented minorities (Hispanic Americans, African Americans, or Native Americans), yet underrepresented minorities earn graduate degrees at less than one-half the rate of Whites[3] (U.S. Census Bureau, 2008; Snyder, et al, 2008). If in fact any significant explanation for this differential relates to our failure to graduate those who get as far as admission to Ph.D. programs, this is a waste of talent that no country in our knowledge-based economy can afford.

2 For an overview of prior studies by other organizations and individuals on doctoral completion and attrition see *Ph.D. Completion and Attrition: Analysis of Baseline Program Data from the Ph.D. Completion Project* (CGS, 2008).

3 In this publication, the term "Whites" refers to non-Hispanic Whites.

Of course the entire Ph.D. Completion Project, within which this demographics study is lodged, is motivated by the recognition that even small improvements in completion rates, both in absolute terms and in time-to-degree, would substantially address pressing workforce issues relating to the economic health and competitiveness of the United States. These issues include an increasing demand for workers with graduate-level training, the need for a more robust domestic talent pool, and, the specific subject of this analysis, the small representation of women and minorities completing Ph.D. degrees. An equally important motivation is the desire to see more students from every demographic group reap the full rewards of the time and effort that they invest in doctoral study. In many cases, failure to complete the Ph.D. or to complete it in a timely manner takes a high toll not only on national competitiveness but also on the lives of individual students. The Ph.D. Completion Project will ultimately document innovations in graduate education that impact economic health and competitiveness by helping individual students, especially women and minorities, fully and expeditiously realize their academic goals. In this monograph, by presenting the baseline data on completion by demographic group, we provide the empirical foundation for universities to begin to benchmark the efficacy of those individual institutional efforts to enhance the success of all doctoral students.

Project Overview

In response to an awareness in the graduate education community of the national and individual implications and consequences of high levels of attrition from doctoral programs, the Council of Graduate Schools (CGS) initiated the Ph.D. Completion Project to examine and document attrition and completion patterns at a variety of universities, to develop and model intervention projects designed to both improve completion rates and reduce attrition, and to study and validate the impact of these interventions on Ph.D. completion. The project was made possible by the generous support of Pfizer, Inc. and the Ford Foundation, with two phases of funding.

In Phase I (2004-2007) funding was provided to 21 major U.S. and Canadian universities, which as Research Partners provided baseline completion and attrition data and created and piloted interventions aimed at improving completion rates and reducing attrition.[4] An additional 25 Project Partner

4 Baseline completion and attrition data from the one Canadian university participating as a Research Partner in Phase I of the Ph.D. Completion Project were used for analyses by program and gender, but not for analyses by citizenship and race/ethnicity, due to differing demographic definitions.

universities participated in various aspects of the project.[5] This pool of universities was expanded in Phase II (2007-2010) with additional funding from Pfizer, Inc. and the Ford Foundation. Twenty-two Research Partners and 18 Project Partners are included in Phase II (2007-2010). The wide range of universities participating in the project was designed to ensure that the findings and practices that emerge will be applicable to the majority of U.S. universities engaged in doctoral education.

Each Research Partner was required to provide program-level completion and attrition data for cohorts of students entering Ph.D. programs from 1992-93 through 2003-04. The institutions submitted data for a minimum of five programs in SEM (Science, Engineering, and Mathematics)[6] fields and a minimum of three in SSH (Social Sciences and Humanities) fields. Each institution was also required to submit baseline completion data by demographic characteristics (i.e., gender, citizenship, and race/ethnicity for domestic students)[7] for the same period and same programs, but only at the broad field level (Engineering, Life Sciences, Mathematics & Physical Sciences, Social Sciences, and Humanities).

The goal of the Ph.D. Completion Project is to provide universities with proven strategies for positive change. In particular, the project seeks to identify interventions that increase Ph.D. completion rates of underrepresented minorities in all fields, as well as the completion rates of women, especially in SEM fields in which their overall completion rates are lower than those of men.

The project focused initially on completion rates for minorities because data from the U.S. Census Bureau suggest that the minority share of the college-age population will increase by 14% between 2007 and 2015, while the White, non-Hispanic college-age population will decrease by 6% in the same time period. Women were also a focus because although they make up one of the fastest growing segments of graduate student enrollment, their participation is overwhelmingly at the master's level and in non-SEM fields (CGS, 2007). Thus, to ensure a reasonable level of domestic production of Ph.D.s in SEM fields, the graduate community must address attrition of these groups first. We know that many of the policies, procedures, and practices that can be put in

5 For a complete listing of Research Partners and Project Partners in Phase I of the project, see Appendix B.

6 We use the term "SEM" in this publication, rather than the more commonly used "STEM" (Science, Technology, Engineering, and Mathematics), because we group Social Sciences (which are typically included in the definition of STEM) with Humanities.

7 Domestic students include U.S. citizens and permanent residents.

place to address attrition for these groups will increase completion for majority groups as well. Hence, the project considers all students, with special attention to minorities and women.

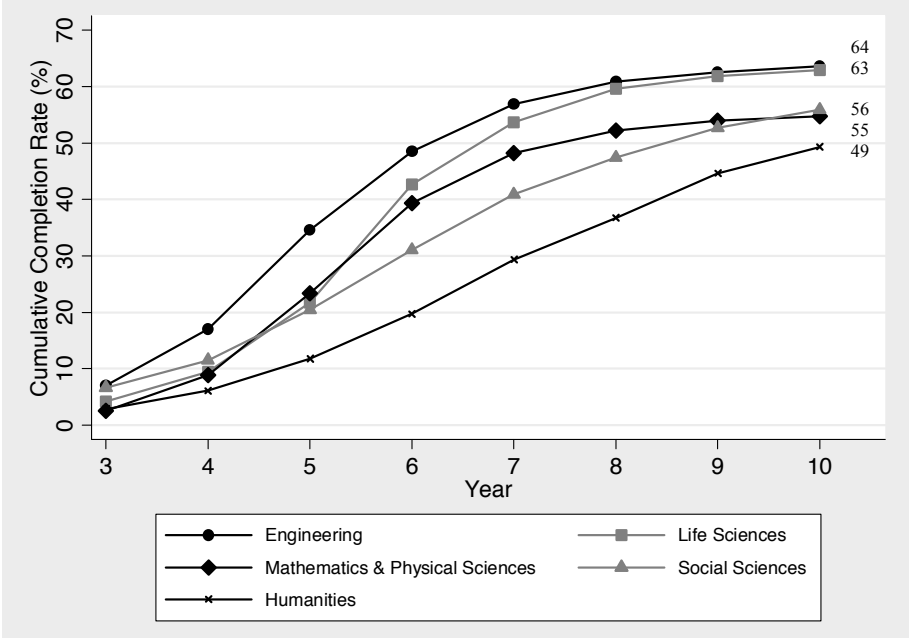
Overview of the Ph.D. Completion Project Publications

A 2004 CGS publication, *Ph.D. Completion and Attrition: Policy, Numbers, Leadership and Next Steps*, helped set the agenda for the Ph.D. Completion Project. It summarized the current state of knowledge about completion of and attrition from doctoral programs in the U.S. and Canada and described measures that research universities were taking to increase Ph.D. completion rates.

In early 2008, CGS published *Ph.D. Completion and Attrition: Analysis of Baseline Program Data from the Ph.D. Completion Project*. The publication provided an overview of the Ph.D. Completion Project and focused on the baseline program completion and attrition data from 30 of the universities that participated in Phase I of the project. The data were broken down by discipline, broad field, entering cohort size, and institution type (public or private). These data will serve as a baseline from which to measure the impact of new policies, procedures, and practices designed to improve completion rates.

At the aggregate level, the data showed that 57% of the doctoral candidates in the sample completed their degree programs within a ten-year time span. However, Ph.D. completion rates varied by broad field, ranging from a high of 64% in Engineering to a low of 49% in Humanities (Figure 1.1). Within broad fields, completion rates varied widely across disciplines. For example, the cumulative ten-year completion rate in Electrical Engineering was about 56%, compared with 78% in Civil Engineering.

Figure 1.1 Cumulative Ph.D. Completion Rates by Broad Field



The cumulative ten-year completion rate in all SEM fields combined was noticeably higher than in all SSH fields combined—59% versus 53%—but the combined SSH completion rate appeared to keep increasing after the ten-year mark. This finding suggests that a number of students in these broad fields will earn their degrees after ten years and that the differences in ultimate completion rates between broad fields may diminish. The earlier 2008 publication also found that completion rates at public universities did not differ much from those at private universities, and cohort size generally did not affect completion rates.

It is important to note that while some universities focus on six- or seven-year completion rates, the Ph.D. Completion Project publications describe ten-year completion rates. We do so to capture important information about what drives completion and document when it occurs.

This publication, *Ph.D. Completion and Attrition: Analysis of Baseline Demographic Data from the Ph.D. Completion Project*, focuses on completion rates broken down by demographic characteristics (gender, citizenship, and race/ethnicity). It includes an analysis of the demographic data submitted by 24 of the universities that participated in Phase I of the project.

A subsequent publication will focus on exit surveys collected both from students who completed their programs and from those who did not. Another forthcoming publication will report on self-assessments and interventions being implemented by the participating universities.

As the project develops and as additional data are submitted and analyzed, CGS will study the impact of groups of interventions designed to improve completion rates. Some of these may prove to be most effective within specific fields and programs across most or all universities, whereas other interventions may work better in some institutional contexts than in others. While the project will probably be unable to isolate one strategy from all others as having a decisive effect on completion, there should be a demonstrable impact of groups of interventions, and case studies will supplement the quantitative analysis.

The culminating publication in this series, scheduled for release in 2010, will include a comprehensive analysis of the quantitative and qualitative data submitted by the partnering universities in Phases I and II of the Ph.D. Completion Project, as well as a description of those policies and practices that appear to have had a demonstrated effect on completion rates and attrition patterns over time. It is our hope that the findings of the Ph.D. Completion Project will transform our understanding of the factors that contribute to higher Ph.D. completion rates nationwide, particularly for women and minorities.

We continue this publication with an examination in Chapter 2 of the changing demographics of doctoral students. These demographic changes underscore the need for improved completion rates among women and minorities. The project's data and methodology are described in Chapter 3, followed by analyses of completion rates by gender, citizenship, and race/ethnicity in Chapters 4, 5, and 6, respectively. The monograph ends with a summary and conclusions.

Although primarily designed to provide baseline data for institutions participating in the Ph.D. Completion Project, this publication, like its predecessor, should be valuable to the graduate community at large, as well as to other stakeholders in the doctoral enterprise. Not only does it present a system for collecting meaningful and accurate data across fields and institutions that should make the sharing of such data more transparent; it also may provide benchmarks for other universities as they scrutinize their own patterns of attrition and completion.

CHAPTER 2
Examining the Changing Demographics of Doctoral Students

Background

Increasing the number of individuals with graduate education, particularly racial/ethnic minorities and women at the doctoral level, is crucial for meeting the future workforce needs of the United States. The Bureau of Labor Statistics estimates that by the year 2014 the United States may face a substantial labor shortage, because whereas the economy is projected to produce nearly 19 million new jobs, the total labor force is predicted to rise by less than 15 million persons (Hecker, 2005; Toossi, 2005). Economic growth, combined with retirements from the "baby-boomer" generation, will create nearly 55 million job openings over the next decade. More than one-third of the new employment opportunities could be available to highly educated workers, particularly those in Engineering, Computer Sciences, and Physical Sciences fields (Toossi, 2005). The potential shortage of skilled workers thus could adversely affect future American economic competitiveness and growth (Southerland, 2003).

The impending labor shortage comes at the same time that America's population of racial and ethnic minorities will be rising substantially. According to data from the U.S. Census Bureau, the population of Hispanic American and African American citizens will collectively rise 15% between 2007 and 2015; in the same time span, the White, non-Hispanic total population will increase by just 2%.

The continuing small number of women and minorities with doctoral degrees, particularly in SEM fields, is an ongoing concern related to the workforce development, economic health, and competitiveness of the United States. Improving doctoral completion rates of women and underrepresented minorities will be a key component of the strategies that should be implemented to meet our nation's present and future workforce needs. Even small improvements in doctoral completion rates would substantially address many of these workforce issues. Beyond these economic issues, there is the issue of justice, of seeing to it that in doctoral education the playing field is leveled for men and women,

U.S. and international students, and students of both majority and minority racial/ethnic groups.

Over the past decade, there have been dramatic shifts in the demographics of students entering doctoral programs, particularly the number of candidates from traditionally underrepresented groups. As described in this chapter, national data show that in a relatively short period of time, U.S. doctoral programs have enrolled an increasing number of women, minorities, and international students.

Shifts in Doctoral Student Demographics

According to the National Center for Education Statistics' National Postsecondary Student Aid Study (NPSAS—NCES, 2004 & 2006a), from academic year 1992-93 to 2003-04 (the years of data collection for Phase I of the Ph.D. Completion Project) the number of students enrolled in doctoral programs in the fields of study similar to those covered by the Ph.D. Completion Project at U.S. universities rose 36%, from 172,200 to 233,500 (Table 2.1).[8] Three groups of students have led the enrollment surge in doctoral enrollment in these fields. The first and most prominent growth has been in the number of women seeking doctorates. The number of female Ph.D. students increased 83% from 1992-93 to 2003-04, while the enrollment of male Ph.D. students rose just 11%. In 1992-93, women represented just 34% of the students in doctoral programs, but by 2003-04, women accounted for 46%.

The number and percentage of minority doctoral students have also grown rapidly.[9] Collectively, the number of African American, Hispanic American, Asian American, Native American, and multi-racial/multi-ethnic students seeking doctorates in the fields of study similar to those covered by the Ph.D. Completion Project doubled, and their share of total enrollment rose from 17% in 1992-93 to 25% in 2003-04. The increase was most pronounced among Hispanic Americans, whose share of total enrollment doubled. In contrast, the White, non-Hispanic proportion of doctoral students fell from 83% to 75%, as the rate of growth in White student enrollment trailed that of all other groups.

The third area of growth in doctoral student enrollment occurred among international students. The number of non-U.S. citizens (temporary residents)

8 All of the demographic data for doctoral students discussed in this section come from the National Center for Education Statistics, 2004 and 2006a.

9 Information on students by race/ethnicity includes only U.S. citizens and permanent residents.

enrolled for doctoral study in the United States rose 65% between 1992-93 and 2003-04, while domestic enrollment increased just 27%. As a result, international students' share of total doctoral enrollment grew from 23% to 28%.

Table 2.1 Demographic Characteristics of Doctoral Students in U.S. Graduate Programs,* 1992-93 and 2003-04

	1992-93		2003-04		Percent Change, 1992-93 to 2003-04
	Est. Number	% of Total	Est. Number	% of Total	
Estimated Total Enrollment*	**172,200**	**100%**	**233,500**	**100%**	**36%**
Gender					
Men	113,652	66%	126,090	54%	11%
Women	58,548	34%	107,410	46%	83%
Race/Ethnicity**					
White, non-Hispanic	142,926	83%	175,125	75%	23%
African American	8,610	5%	14,010	6%	63%
Hispanic American	5,166	3%	14,010	6%	171%
Asian/Pacific Islander	15,498	9%	21,015	9%	36%
Other***	Low N	Low N	9,340	4%	--
Citizenship Status					
Domestic	132,594	77%	168,120	72%	27%
International	39,606	23%	65,380	28%	65%

*Includes only students enrolled in fields of study comparable to those in the Ph.D. Completion Project.

**Includes only U.S. citizens and permanent residents.

***Includes Native Americans, Alaska Natives, and multi-racial/multi-ethnic persons.

Low N means that the survey sample size was too low to generate a reliable estimate.

Source: National Center for Education Statistics, 2004 & 2006a.

Doctoral Student Enrollment by Broad Field

Despite their overall enrollment gains, the number of women and racial/ethnic minority students in science and engineering doctoral programs remains low. In 2003-04, among the fields similar to those included in the Ph.D. Completion Project, just 8% of female doctoral candidates were enrolled in Engineering, compared with 24% of men (Table 2.2). On the other hand, a substantially higher percentage of women than men were enrolled in Social Sciences doctoral programs (43% versus 21%). International students were also much more likely than domestic doctoral students to be in Engineering and Mathematics & Physical Sciences.

Among U.S. citizens and permanent residents, African Americans were the least likely to be enrolled in SEM fields. While more than half the African American

doctoral students were in Social Sciences, only 10% were in Mathematics & Physical Sciences, and 14% were in Life Sciences. Roughly 21% of Hispanic Americans were in Life Sciences, but only 6% were enrolled in Engineering. While the increased gender and racial/ethnic diversity of students engaged in doctoral studies is welcome news, it appears that women and minorities remain underrepresented in the science and engineering fields that are critical for economic growth in the 21st century.

Table 2.2 Distribution of Doctoral Students in U.S. Graduate Programs* by Field of Study, 2003-04

	Engi-neering	Life Sciences	Mathe-matics & Physical Sciences	Humani-ties	Social Sciences
Total (All Students)*	16%	19%	18%	16%	31%
Gender					
Men	24%	18%	24%	14%	21%
Women	8%	19%	12%	18%	43%
Citizenship Status					
Domestic	10%	19%	16%	18%	37%
International	34%	17%	25%	9%	15%
Race/Ethnicity**					
White	9%	19%	16%	19%	37%
African American	8%	14%	10%	13%	55%
Hispanic American	6%	21%	16%	19%	38%
Asian/Pacific Islander	20%	23%	18%	11%	27%
Other***	13%	19%	12%	23%	33%

Due to rounding, details may not total to 100%.

*Includes only students enrolled in fields of study comparable to those in the Ph.D Completion Project.

**Includes only U.S. citizens and permanent residents.

***Includes Native Americans, Alaska Natives, and multi-racial/multi-ethnic persons.

Source: National Center for Education Statistics, 2006a.

Implications of Demographic Changes

It is clear from the data presented in this chapter that the demographics of doctoral students have changed since 1992-93, and there is no evidence to suggest that trends reported herein will not continue in the future. The demographic categories of domestic students that are producing the largest increases in Ph.D. enrollment (i.e., underrepresented minorities and women) are also groups that traditionally have the lowest completion rates. This causes concern about the ability of the United States to meet future workforce needs, particularly in SEM fields.

The Ph.D. Completion Project aims to place these demographics in context so that graduate deans and others can share techniques and best practices for improving doctoral completion rates, especially among the growing populations of students from underrepresented groups. The baseline demographic data presented in this monograph will serve as a starting point from which to measure the impact of intervention strategies designed to improve doctoral completion.

CHAPTER 3
Data and Methodology

Data

As noted in Chapter 1, this publication focuses on completion rates by demographic characteristics (gender, citizenship, and race/ethnicity). The data included in the analyses were submitted by 24 of the Research and Project Partners that participated in Phase I of the Ph.D. Completion Project.[10] These data were submitted in 2005 and include doctoral students who entered their Ph.D. programs in academic years 1992-93 through 2003-04.

The templates (see Appendix C for a sample) used to collect baseline demographic data are similar to the templates used for the program-level completion data reported in the previous Ph.D. Completion Project publication, *Ph.D. Completion and Attrition: Analysis of Baseline Program Data from the Ph.D. Completion Project* (CGS, 2008). Separate templates were completed for each of six broad fields: Engineering, Life Sciences, Mathematics, Physical Sciences, Social Sciences, and Humanities. For the analyses that are reported in subsequent chapters, Mathematics and Physical Sciences were combined into one broad field, Mathematics & Physical Sciences, to be consistent with the taxonomy used in most other studies on doctoral education. Within each broad field, separate templates were completed for female, male, and international students, as well as for each of the following U.S. racial/ethnic groups: Native American, African American, Asian American, Hispanic American, White, and "Other." The numbers of students who started Ph.D. programs each year from 1992-93 through 2003-04 were entered into the first column of the template. In the remaining columns the institutions reported the numbers of the entering students who left the program after receiving master's degrees, the numbers who were admitted to candidacy, the numbers who completed Ph.D. degrees in each year from the third through tenth year after they started their Ph.D. study, and the numbers of students who were still enrolled in the program after ten years.

10 For a complete listing of Research Partners and Project Partners in Phase I of the project, see Appendix B. It should be noted that 30 institutions provided data used in the program analyses, but only 24 institutions provided demographic data used in the gender analysis and/or citizenship and race/ethnicity analysis.

The data submitted in the templates constitute two separate databases used in the analyses of completion rates. One database contains the data used to analyze completion rates by gender. It will be referred to hereafter as the gender database. The second database was used to analyze the completion rates for domestic versus international students as well as for U.S. racial/ethnic groups. This database will be referred to in the remainder of this document as the citizenship, race and ethnicity database.

The gender database includes data for a total of 41,017 students at 24 institutions who started doctoral programs from academic years 1992-93 through 2003-04. Thirty-seven percent of these students are female and 63% male. The citizenship, race and ethnicity database contains data for 39,758 students from 23 institutions.[11] Sixty-seven percent, or 26,631, are domestic (U.S. citizens or permanent residents) students and 33% are international. The domestic students are distributed across U.S. racial/ethnic groups as follows: 6% African American, 9% Asian American, 4% Hispanic American, 75% White, and 6% "Other." Because of the small numbers of Native American students reported in the templates described above, they are included in the "Other" category. Also, completion rates for the "Other" category are not reported because the makeup of the category, except for the Native Americans, is not known.

It should be noted that the percentages presented in the previous paragraph represent the distribution of students over the 12-year period and that the distributions change over time, as will be discussed below. Tables D.1 and D.2 in Appendix D provide data on the numbers and distribution of students across gender, citizenship, and race/ethnicity.

The distribution of students across broad fields is approximately 22% in Engineering, 13% in Life Sciences, 32% in Mathematics & Physical Sciences, 19% in Social Sciences, and 14% in Humanities. Again, these distributions change over time, as can be seen in Table D.3, and as discussed below.

The primary metric used in this study is the completion rate ten years after starting the Ph.D. program. Therefore, only data for students starting from 1992-93 through 1994-95 could be used to compute ten-year completion rates. As noted in Chapter 1, while universities sometimes focus on six- or seven-year completion rates, the Ph.D. Completion Project publications describe ten-year completion rates in order to capture important information about what drives completion and to document when it occurs.

11 The gender database includes one Canadian institution that is not included in the citizenship, race and ethnicity database.

In order to examine changes in completion rates over time, seven-year completion rates were analyzed for two three-year cohorts of students. The first cohort group comprises students who started in 1992-93 through 1994-95 (the same cohort used in the ten-year analysis) and the second cohort group comprises students who started in 1995-96 through 1997-98. We refer to these two groups as the A-Cohorts and B-Cohorts, respectively, in the remainder of this publication.

Data for the A-Cohorts are presented in detail in Appendix D. The gender database for the A-Cohorts consists of data for 9,683 students, 36% female and 64% male. There are 9,369 students in the A-Cohorts whose data are included in the citizenship, race and ethnicity database. Seventy-four percent of these students are domestic and 26% are international. The distribution of the 6,936 domestic students in the A-Cohorts is as follows: 6% African American, 8% Asian American, 3% Hispanic American, 78% White, and 4% "Other." These low representations of minority students in the A-Cohorts translate to a few very low numbers in some of the racial/ethnic groups when they are distributed across broad fields. For example, there are fewer than 30 Hispanic American students in Engineering (20) and Life Sciences (24). There are only 25 African American students in Life Sciences.

The B-Cohorts gender database contains data for a total of 9,396 students, 37% female and 63% male. Of the 9,069 students in the citizenship, race and ethnicity database, 31% are international, five percentage points higher than in the A-Cohorts. The racial/ethnic make-up of the 6,256 domestic students in the B-Cohorts is as follows: 6% African American, 7% Asian American, 4% Hispanic American, 76% White, and 5% "Other."

While completion rates will not be reported for students entering from 1998-99 through 2003-04, the students are grouped into two additional three-year cohort groups. Students entering from 1998-99 through 2000-01 are referred to as the C-Cohorts and those entering from 2001-02 through 2003-04 as the D-Cohorts. These data (Appendix D) are presented for the purposes of showing the demographic changes among the students in the Ph.D. Completion Project programs over time and of comparing these changes with the changing national demographics described in Chapter 2.

The proportion of women in the D-Cohorts (students entering from 2001-02 through 2003-04) is four percentage points higher than in the A-Cohorts (40% versus 36%). Although this trend is consistent with the overall national growth in female enrollment discussed in Chapter 2 (12 percentage points),

the percentage point increase is much lower. This lower percentage probably reflects the fact that approximately 60% of the programs in the Ph.D. Completion Project are in SEM fields.

The C- and D-Cohorts include 37% international students, compared with 26% for the A-Cohorts and 31% for the B-Cohorts. Consequently, the proportion of domestic students drops by 11 percentage points, from 74% to 63%, from the A-Cohorts to the C- and D-Cohorts. This trend is consistent with the national findings reported in Chapter 2 (a five percentage point decline), but the percentage point decrease is much larger. Once again, the larger percentage probably reflects the fact that approximately 60% of the programs in the Ph.D. Completion Project are in SEM fields.

Changes in the distribution of domestic students across the ethnic groups from the A-Cohorts to the D-Cohorts are as follows: Asian Americans increased from 8% to 10%, African Americans were unchanged at 6%, Hispanic Americans increased from 3% to 4%, Whites decreased from 78% to 71%, and "Others" increased from 4% to 8%. These changes are within two percentage points of the changes in national data reported in Chapter 2 for all domestic racial/ethnic groups.

It is also important to compare the distribution of students across fields in the Ph.D. Completion Project with national statistics in the same fields included in the Ph.D. Completion Project. Seventy percent of the D-Cohort students in the Ph.D. Completion Project were enrolled in SEM fields and 30% in SSH fields. Of all U.S. doctoral students enrolled in the five Ph.D. Completion Project broad fields in 2003-04, 53% were enrolled in SEM fields (Table 2.2). Sixty-one percent of the domestic students in the D-Cohorts were enrolled in SEM fields while 45% nationally were enrolled in SEM disciplines in 2003-04. Enrollment of women in SEM fields in the D-Cohorts was 18 percentage points higher (57% versus 39%) than for all women nationally in Ph.D. Completion Project fields in 2003-04. Based on these comparisons, it is evident that the share of SEM students included in the Ph.D. Completion Project was higher than the national share during a comparable time period. This is due to the fact that institutions participating in the Ph.D. Completion Project were required to include a minimum of five programs from SEM fields and a minimum of three from SSH fields in the project.

Methodology

In Chapters 4, 5, and 6 of this monograph, mean completion rates by gender, citizenship, and race/ethnicity, respectively, are presented and compared. In each of these three chapters, mean completion rates are presented for all students, for students in SEM versus SSH fields, and for students in each of the five broad fields. Completion rates are also presented and compared for each of the demographic groups by institution type and by time of entry into the Ph.D. program (A- versus B-Cohorts). Line and/or bar graphs with explanations are used to present cumulative and annual completion rates. Significance tests were conducted on the data in order to examine whether the observed differences in the ten-year or seven-year completion rates are statistically significant at the 0.10 significance level, and these results are reported in the text and in tables.

Several significance tests were used in order to take into account the unique sampling distribution of the Ph.D. Completion Project data. The data comprise non-randomly selected samples for the completion rates. The unit of analysis is an entering cohort of a specific group of Ph.D. students who started the Ph.D. program in the same year, at the same institution, and in the same broad field. The mean completion rates were computed by weighting cohort sizes. Completion rates being compared are from independent samples with unequal sample sizes and unequal variances.

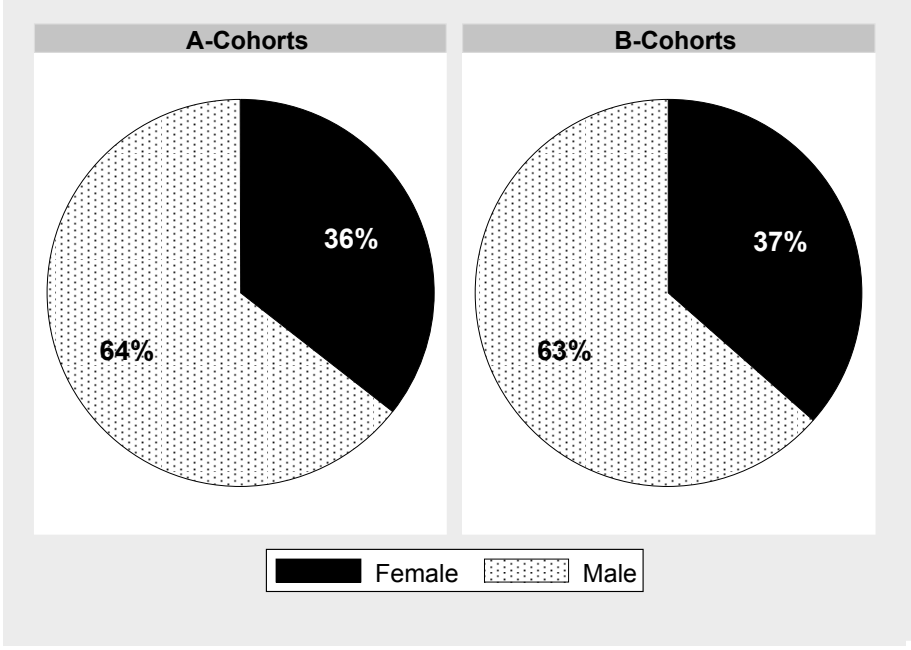
Among the significance tests used, an adjusted t-test was chosen to accommodate the aforementioned unique sampling distributions. All t-tests were conducted in pairs with adjusted degrees of freedom, e.g., African Americans versus Whites in Life Sciences, or Hispanic Americans in Engineering versus Hispanic Americans in Humanities. In the case of mean completion comparisons across racial/ethnic groups, results of the independent t-tests were compared to the results of alternative multiple comparison procedures that considered the heterogeneity of sample sizes and variances. Few differences were found. Adjusted t-test results at the 0.10 significance level are reported.

CHAPTER 4
Completion Rates by Gender

Overview

This chapter focuses on completion rates for female and male students entering Ph.D. programs from 1992-93 through 1997-98. There are data for a total of 9,683 students in the A-Cohorts (students who started their Ph.D. programs from 1992-93 to 1994-95) and for 9,396 students in the B-Cohorts (students entering from 1995-96 through 1997-98). The gender distribution does not change substantially from the A-Cohorts to the B-Cohorts; in both the A- and B-Cohorts, male students account for almost two-thirds of all entering students, as can be seen in Figure 4.1.

Figure 4.1 Gender Distribution



The following sections of this chapter compare cumulative and annual completion rates by gender from various perspectives: at the aggregate level, by field, by institution type, and by time of entry into the Ph.D. program (A-

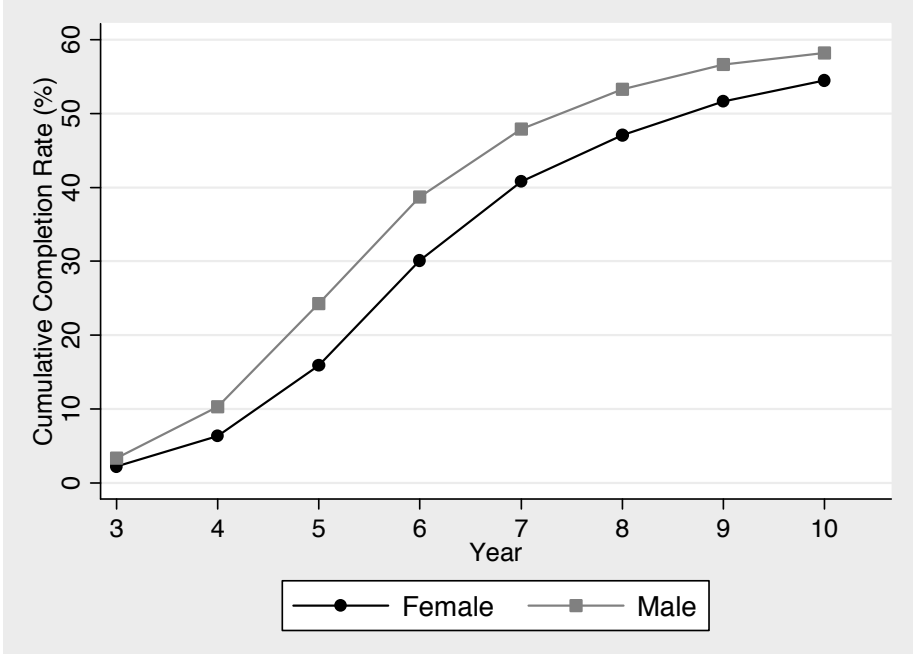
versus B-Cohorts). Detailed data for each of these analyses can be found in Appendix H. The t-test is used to determine if differences in cumulative completion rates between men and women are statistically significant at the 0.10 level, and results are presented in the text.

Ten-Year Completion Rates

Overall Completion Rates

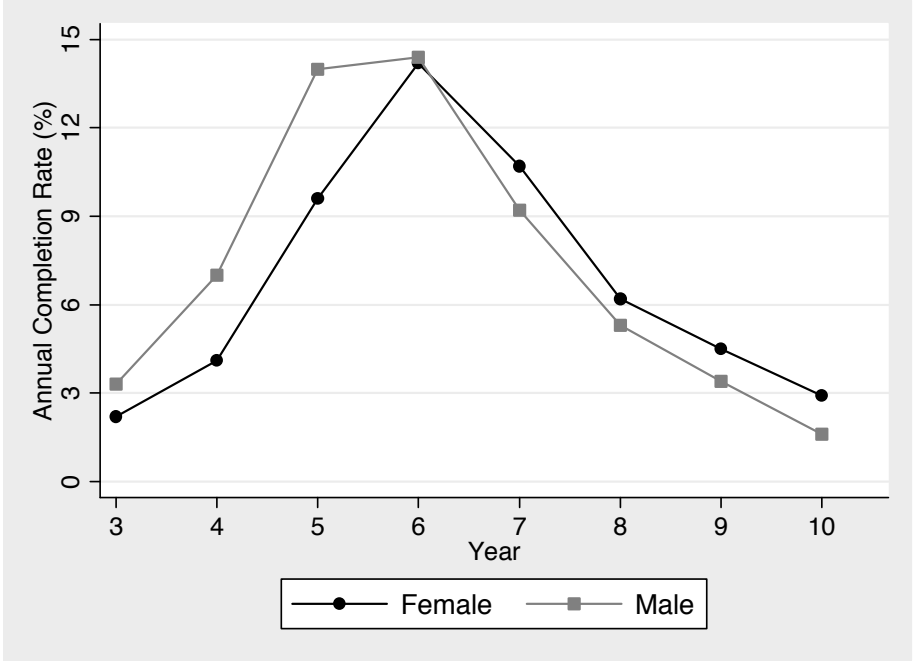
Consistent with data presented in the earlier Ph.D. Completion Project baseline data publication, *Ph.D. Completion and Attrition: Analysis of Baseline Program Data from the Ph.D. Completion Project* (CGS, 2008), the cumulative ten-year completion rate for the A-Cohorts is 57%. As Figure 4.2 shows, the cumulative completion rates for men are higher than for women in every year from years three through ten. The gap between men and women starts at approximately one percentage point in year three and reaches a maximum of nine percentage points in year six. By year ten the difference between the cumulative completion rates is reduced to approximately three percentage points, when it is 58% for males and 55% for women. This difference in ten-year completion rates between men and women is statistically significant.

Figure 4.2 Cumulative Ph.D. Completion Rates by Gender



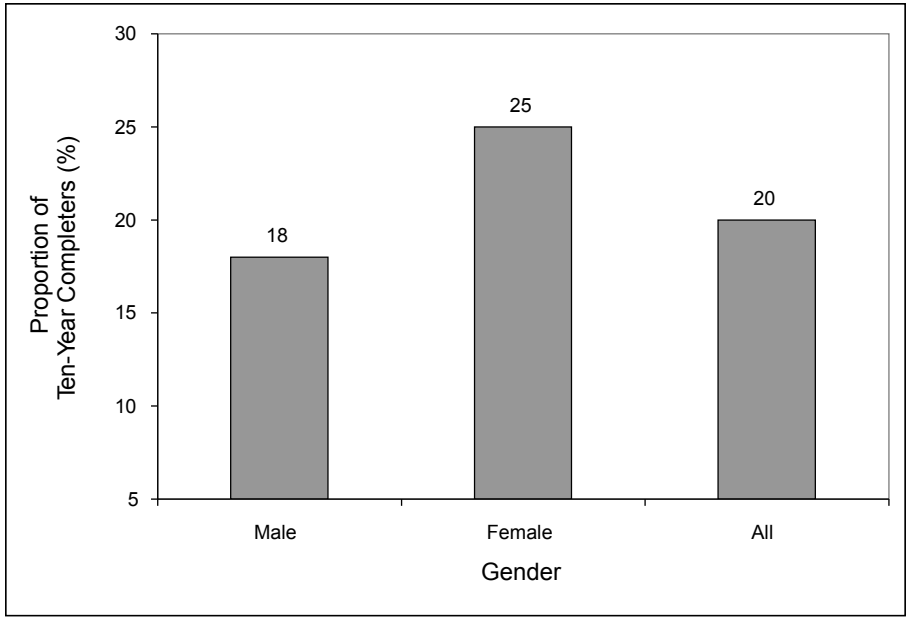
Annual completion rates are another way of comparing completion for men and women. As can be seen in Figure 4.3, the annual completion rates for men are one to four percentage points higher than for women in years three through five. At year six women complete at essentially the same annual rate as men and they complete at slightly higher annual rates in years seven through ten. Although these smaller, later differences between the Ph.D. completion rates of men and women are not enough to overcome the much larger annual deficits that women incurred by year six, the gap of nine percentage points between men's and women's cumulative completion rates is reduced to only three percentage points by year ten.

Figure 4.3 Annual Ph.D. Completion Rates by Gender



Earlier we addressed the question of why we study completion rates at ten years when many institutions focus on six- or seven-year rates. One of the reasons is that in the analysis of baseline program completion data (CGS, 2008) it was determined that 20% of the students who complete Ph.D. degrees in ten years complete them after year seven (Figure 4.4). Analysis of gender data produces the same results. However, there are important differences in late completion (after year seven) as a function of gender. Twenty-five percent of the women who complete in ten years do so after year seven compared with 18% of men.

Figure 4.4 Proportion of Cumulative Ten-Year Ph.D. Completion Occurring after Year Seven



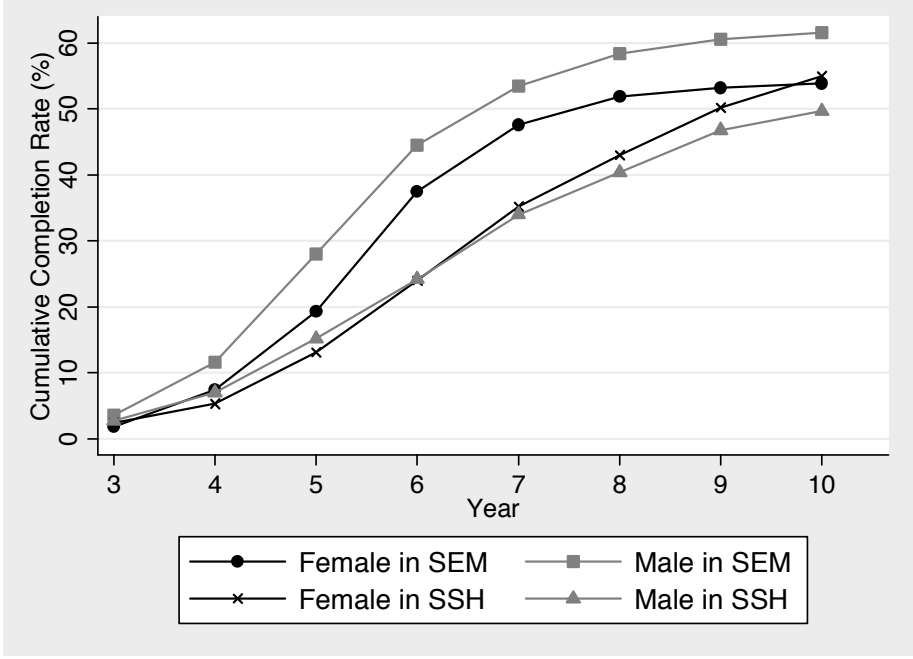
SEM versus SSH Fields

For the A-Cohorts, the gap between men's and women's cumulative ten-year completion rates is even more pronounced in SEM fields. As can be seen in Figure 4.5, the cumulative completion rate for men is eight percentage points higher than for women in the SEM disciplines at year ten. On the other hand, the cumulative completion rates for men and women are essentially the same in the SSH disciplines from years three through six, but after year six women surpass men and by year ten complete at a higher rate by five percentage points. The gender gaps of the ten-year cumulative completion rates are statistically significant for both SEM and SSH fields. Additionally, male students have a substantially higher cumulative ten-year completion rate in SEM fields than in SSH field and this field difference is statistically significant. For female students, cumulative ten-year completion rates in SEM and SSH fields are similar.

The slopes of the cumulative completion rate curves (Figure 4.5) from years eight through ten suggest that few students (particularly women) will complete degrees in the SEM disciplines after year ten. However, it appears that students

will continue to complete degrees in the SSH disciplines after year ten, with women likely to complete at a higher rate than men. This is consistent with data presented in the previous Ph.D. Completion Project baseline data publication (CGS, 2008).

Figure 4.5 Cumulative Ph.D. Completion Rates by Gender for SEM and SSH Fields

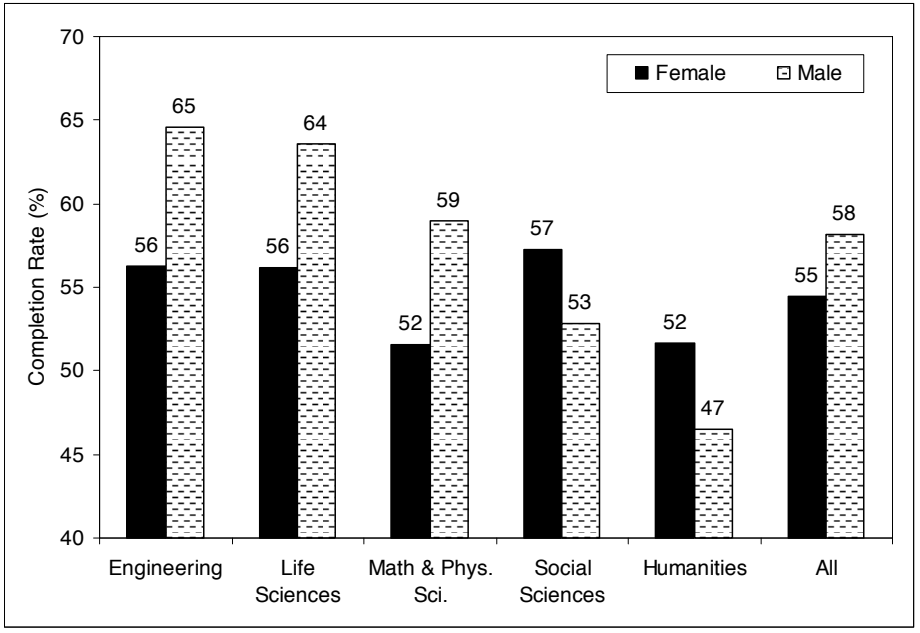


Broad Fields

The difference in cumulative ten-year completion rates for men and women in each of the five broad fields can be seen in Figure 4.6. Men complete at higher rates than women in Engineering, Life Sciences, and Mathematics & Physical Sciences, while women complete at higher rates in Social Sciences and Humanities. The largest gap is in Engineering where men complete at a rate nine percentage points higher than women. Men's completion rates exceed women's by eight percentage points in Life Sciences and by seven percentage points in Mathematics & Physical Sciences. Women, on the other hand, complete at a five percentage point higher rate than men in Humanities and a four percentage point higher rate in Social Sciences. Figures E.1 through E.12, in Appendix E, display cumulative and annual completion rates by gender and broad field.

It is also important to look at the ordering of completion rates for women and men, respectively. Among the five broad fields women complete at the highest rate (57%) in Social Sciences. They complete at the same rate (56%) in Engineering and Life Sciences and at an equal rate (52%) in Humanities and Mathematics & Physical Sciences. Men complete at the highest rates in Engineering (65%) and Life Sciences (64%), and at the lowest rate in Humanities (47%).

Figure 4.6 Cumulative Ten-Year Ph.D. Completion Rates by Gender and Broad Field



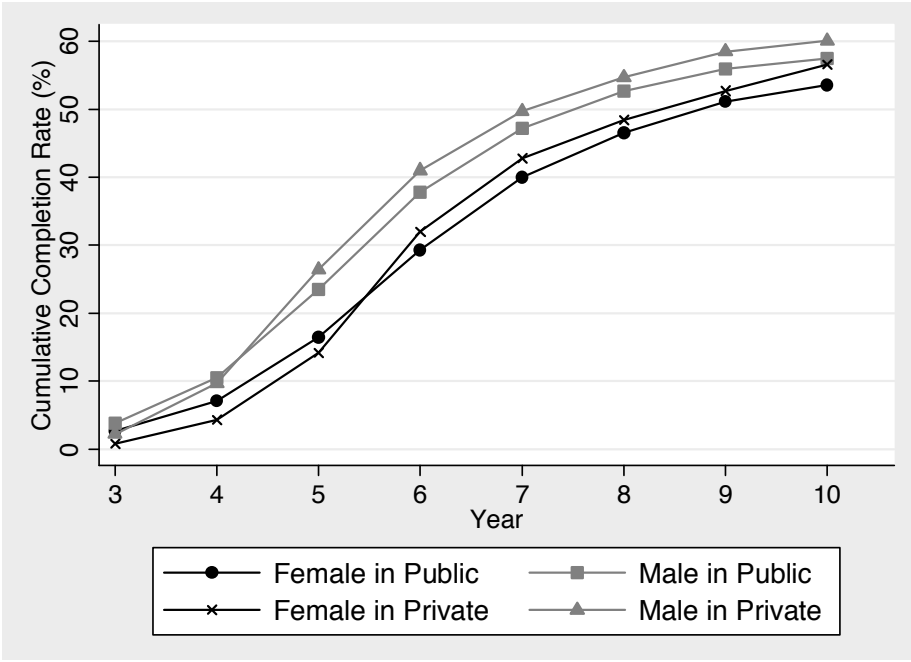
In order to determine if the gender differences in completion rates are statistically significant, t-tests were run on all combinations of gender and broad fields. The higher cumulative completion rates experienced by men than by women in each of the three SEM broad fields—Engineering, Life Sciences, and Mathematics & Physical Sciences—are statistically significant. However, the higher completion rates for women than for men in Social Sciences and in Humanities are not statistically significant.

Completion Rates by Institution Type

While cumulative ten-year completion rates for both female and male students are slightly higher at private institutions than at public institutions, the differences are minimal (Figure 4.7) and not statistically significant.

As was the case with overall completion rates, men complete at higher rates than women in both public and private institutions. The gender difference in the completion rates at public institutions is statistically significant, but the difference at private institutions is not significant.

Figure 4.7 Cumulative Ph.D. Completion Rates by Gender and Institution Type

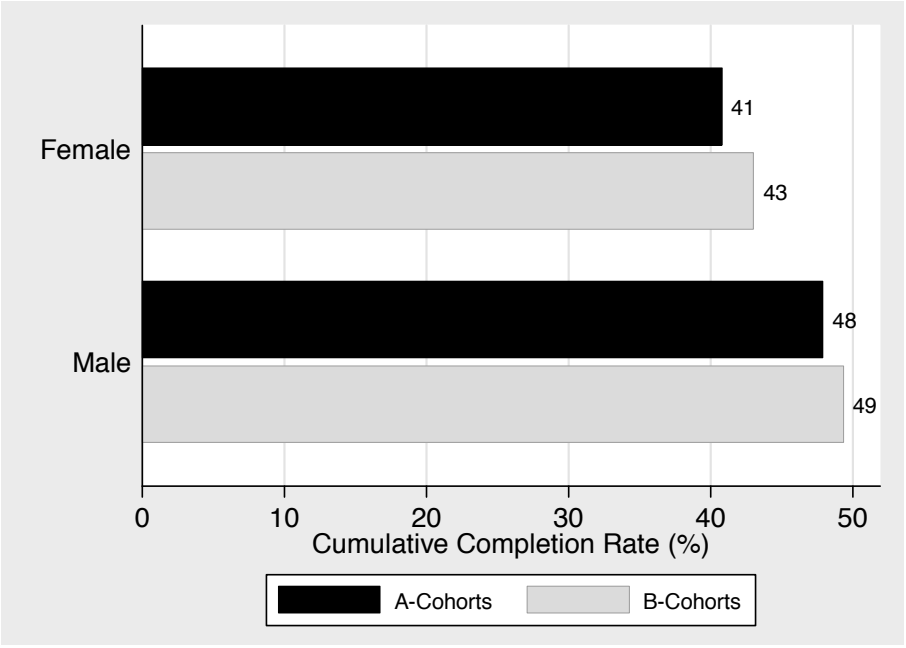


Seven-Year Completion Rates for A- and B-Cohorts

Because ten-year completion rates were available only for students in the A-Cohorts, in an effort to determine if completion rates changed over time, we compared cumulative *seven-year* rates for female and male students in the A- and B-Cohorts (Figure 4.8). The overall differences are very small and not statistically significant. Both female and male students complete at

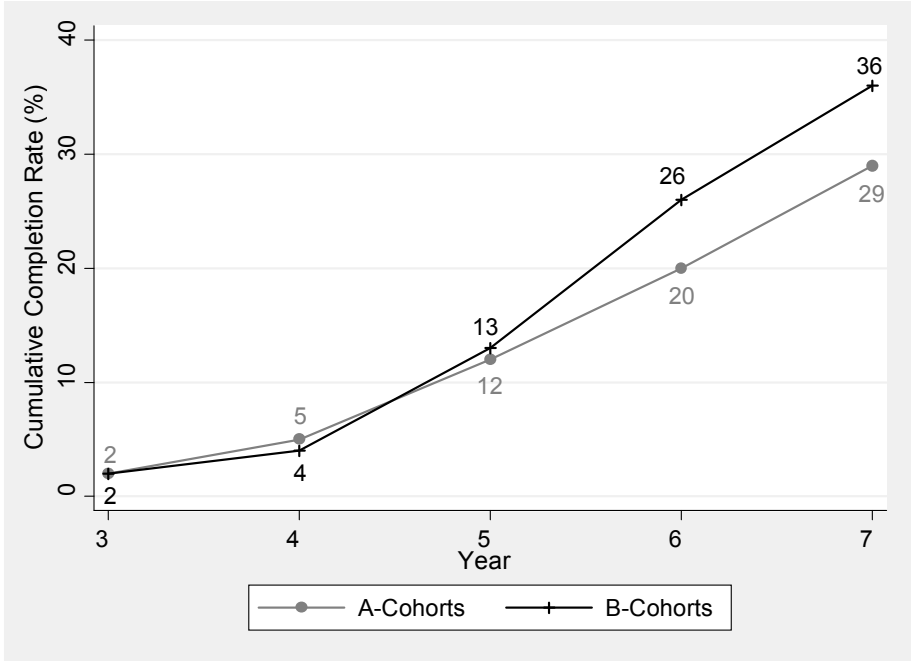
slightly higher rates (up to two percentage points) in the B-Cohorts than in the A-Cohorts. Men in both the A- and B-Cohorts complete at rates about six to seven percentage points higher than women. As was reported earlier this gender gap closes to three percentage points at year ten for A-Cohort students. Three additional years of data will be needed to determine if this holds true for the B-Cohorts.

Figure 4.8 Cumulative Seven-Year Ph.D. Completion Rates for A- versus B-Cohorts by Gender



The differences in cumulative seven-year completion rates over time for both female and male students in each of the broad fields are small and not statistically significant, with one exception. Men in Humanities in the B-Cohorts complete at a rate that is seven percentage points higher than men in Humanities in the A-Cohorts (Figure 4.9), and this difference is statistically significant.

Figure 4.9 Cumulative Ph.D. Completion Rates for A- versus B-Cohorts for Male Students in Humanities



Summary of Findings

In the gender database there are a total of 9,683 students in the A-Cohorts (students who started their Ph.D. programs from 1992-93 through 1994-95) and 9,396 students in the B-Cohorts (students entering from 1995-96 through 1997-98). Women comprise 36% of the A-Cohorts and 37% of the B-Cohorts. The cumulative ten-year completion rate for men is approximately three percentage points higher than the rate for women (58% versus 55%). This difference is statistically significant. In the aggregate SEM fields and in each of the three SEM fields, men have higher cumulative completion rates than women, and these differences are statistically significant. Women have a higher cumulative ten-year completion rate than men in the aggregate SSH fields and in each of the two SSH fields. The difference in the aggregate completion rate is statistically significant, while the differences in the two individual SSH fields are not. Differences in completion rates between public and private institutions are not statistically significant. In both public and private institutions, men have higher cumulative completion rates than women, but this gender gap is statistically significant only in public institutions, not in private institutions.

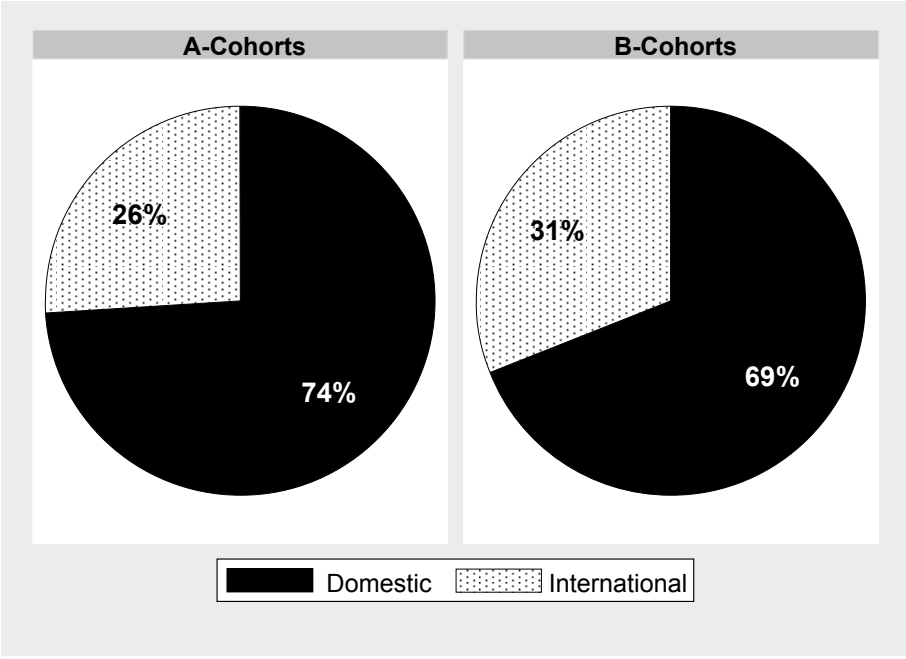
The cumulative seven-year completion rates in the B-Cohorts are slightly higher than those in the A-Cohorts for all students and for both female and male students, respectively; however, the seven-year completion rate differences between the A- and B-Cohorts are not statistically significant, except for men in Humanities.

CHAPTER 5
Completion Rates by Citizenship

Overview

This chapter presents completion rates for domestic and international students. It is based on the citizenship, race and ethnicity database, which includes data for 9,369 students in the A-Cohorts and 9,069 in the B-Cohorts. International students represent 26% and 31% of the A- and B-Cohorts, respectively (Figure 5.1).

Figure 5.1 Citizenship Distribution



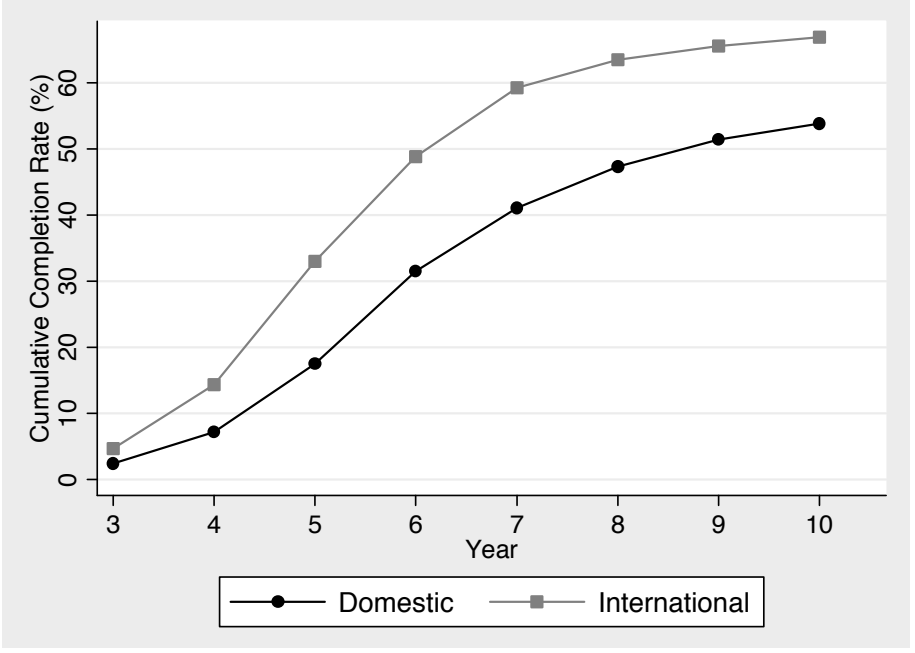
The following sections compare completion rates between domestic and international students at the aggregate level, across fields, by institution type, and for A- versus B-Cohorts. Detailed data for each of these analyses can be found in Appendix H. Significance tests for all the comparisons were conducted, and statistically significant results at the 0.10 significance level are reported.

Ten-Year Completion Rates

Overall Completion Rates

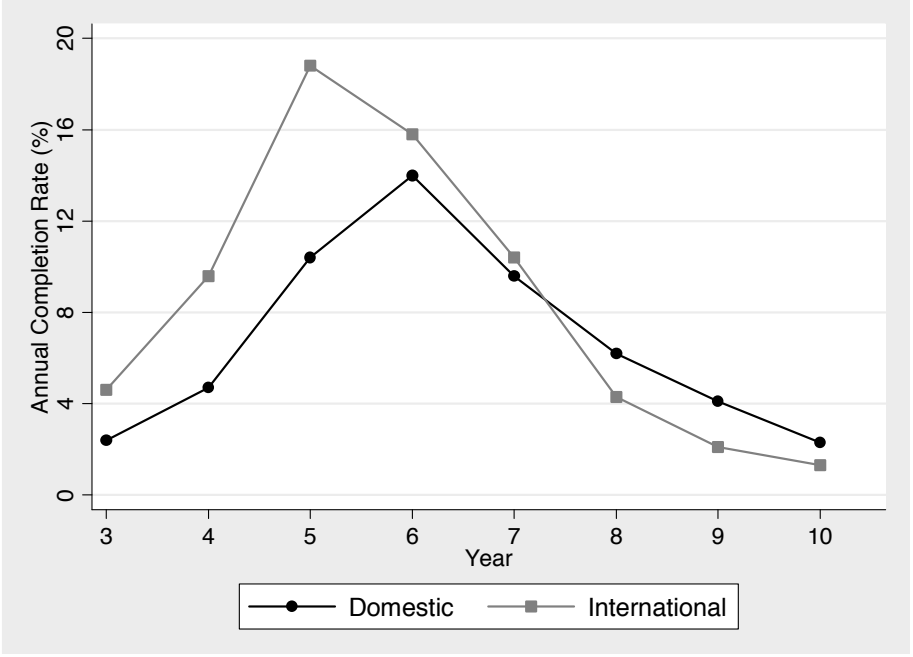
The cumulative completion rate for the A-Cohorts is 57%, the same completion rate as the A-Cohorts in the gender database, as described in Chapter 4, and the program data, as described in the previous publication (CGS, 2008). As shown in Figure 5.2, the cumulative ten-year completion rate for international students is 67%, 13 percentage points higher than for domestic students (54%). This citizenship difference is statistically significant.

Figure 5.2 Cumulative Ph.D. Completion Rates by Citizenship



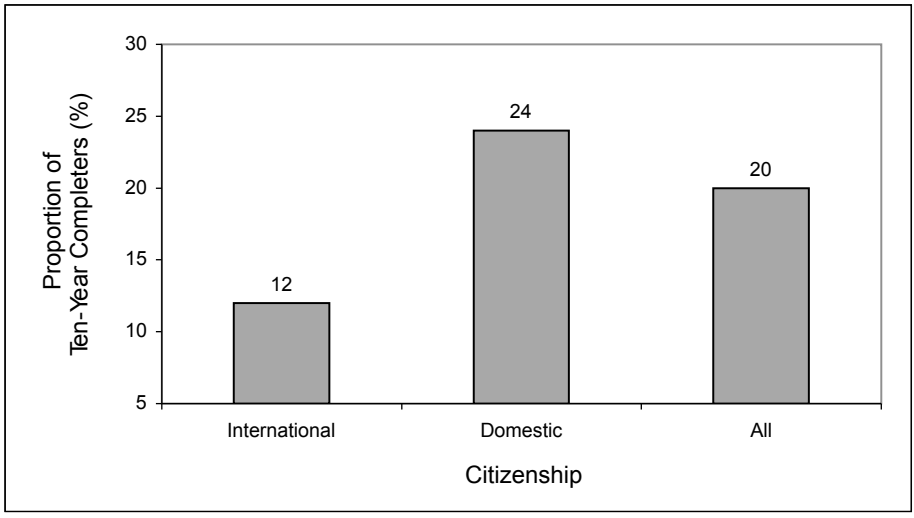
The largest gap between the cumulative rates for international and domestic students is at year seven when international students complete at a rate that is 18 percentage points higher than the rate for U.S. citizens and permanent residents. This large difference at year seven can be attributed to higher annual completion rates for international student in years three through seven, as shown in Figure 5.3. The difference in international and domestic annual completion rates is as high as eight percentage points in year five. After year seven, domestic students complete at higher annual rates than their international peers.

Figure 5.3 Annual Ph.D. Completion Rates by Citizenship



The proportion of ten-year completers who earn their degrees after year seven is higher for domestic than for international students. Approximately 12% of the international students who complete the Ph.D. in ten years complete after year seven, while 24% of domestic students who complete in ten years complete after year seven (Figure 5.4).

Figure 5.4 Proportion of Cumulative Ten-Year Ph.D. Completion Occurring after Year Seven

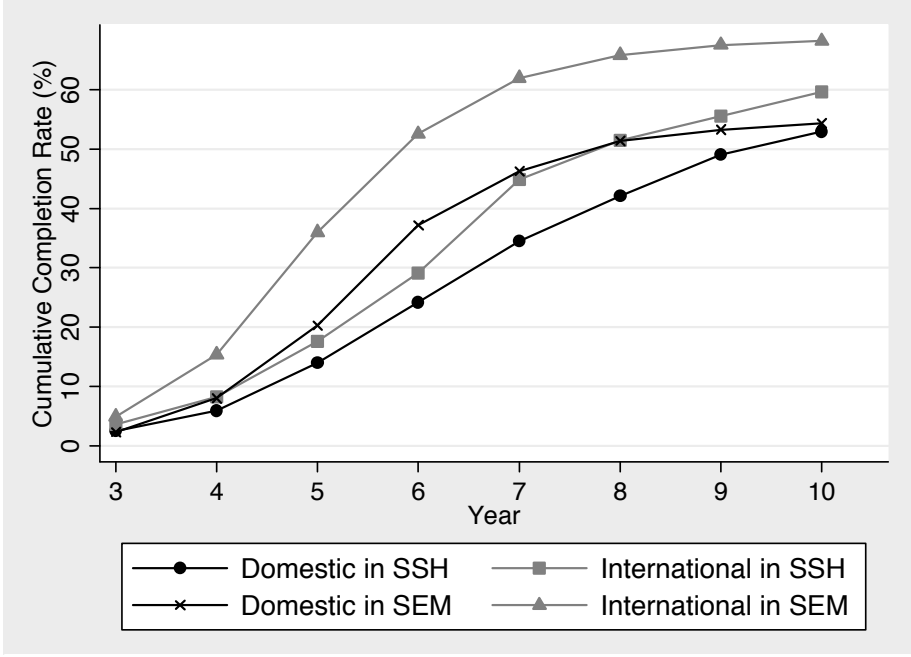


SEM versus SSH Fields

International students complete at a higher cumulative rate than domestic students in both SEM and SSH fields. However, the difference between international and domestic completion rates is larger for SEM fields than for SSH fields (Figure 5.5). At year five, the difference between international and domestic SEM cumulative completion rates is 16 percentage points, and that difference decreases to 14 percentage points at year ten. The difference in ten-year cumulative completion rates in the SSH fields is half the difference for SEM fields at seven percentage points.

International students have higher cumulative ten-year completion rates than domestic students in both SEM and SSH fields, and the differences are statistically significant. International students complete at higher rates in SEM fields than in SSH fields, and this difference is also statistically significant.

Figure 5.5 Cumulative Ph.D. Completion Rates by Citizenship for SEM and SSH Fields

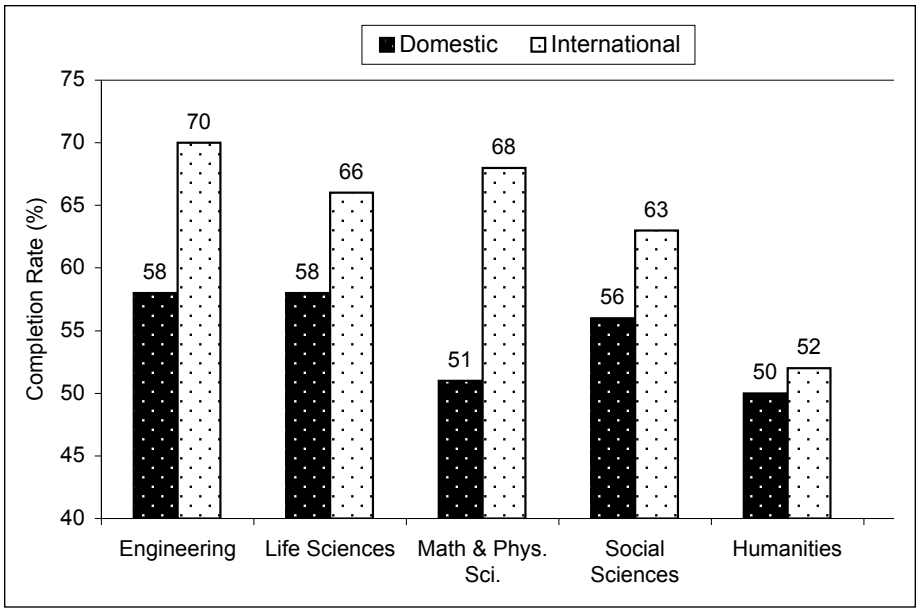


Broad Fields

At the broad field level, the cumulative ten-year completion rate difference between international students and domestic students is greatest in Mathematics & Physical Sciences (17 percentage points). International students complete at higher rates than domestic students in the other four broad fields, but in Humanities the difference is just two percentage points. International students in Engineering graduate at the highest rate (70%). Domestic students in Humanities graduate at the lowest rate (50%), but it should be noted that international Humanities students (52%) and domestic Mathematics & Physical Sciences students (51%) have similar cumulative completion rates at year ten.

More details on completion rates by broad field can be found in the Appendix F where graphs of ten-year cumulative and annual completion rates are presented for each of the five broad fields.

Figure 5.6 Cumulative Ten-Year Ph.D. Completion Rates by Citizenship and Broad Field

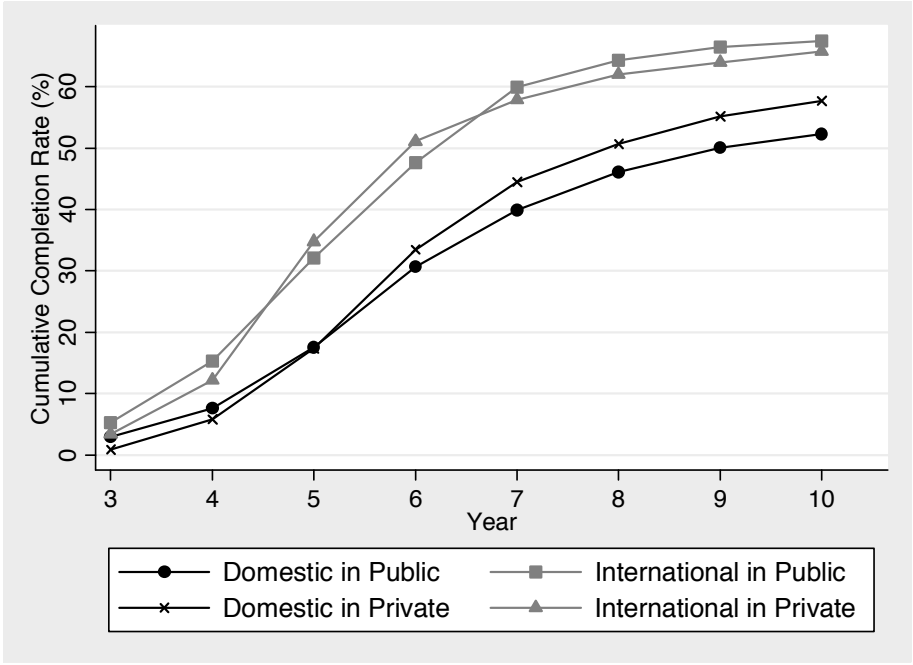


Based on the broad field data shown in Figure 5.6, the higher cumulative ten-year completion rates for international students when compared with domestic students are statistically significant for four of the five broad fields—Engineering, Life Sciences, Mathematics & Physical Sciences, and Social Sciences. While international students complete at a higher rate in Humanities than domestic students, the difference is not statistically significant.

Completion Rates by Institution Type

As noted in previous chapters, and as can be seen in Figure 5.7, the differences in students' Ph.D. completion rates by institution type are very minimal. Cumulative completion rates are slightly higher in public institutions than private institutions until year five for domestic students and until between years four and five for international students. After year five, domestic students complete at a higher rate in private institutions. At about year seven, international students again complete at a higher rate in public than private institutions.

Figure 5.7 Cumulative Ph.D. Completion Rates by Institution Type and Citizenship

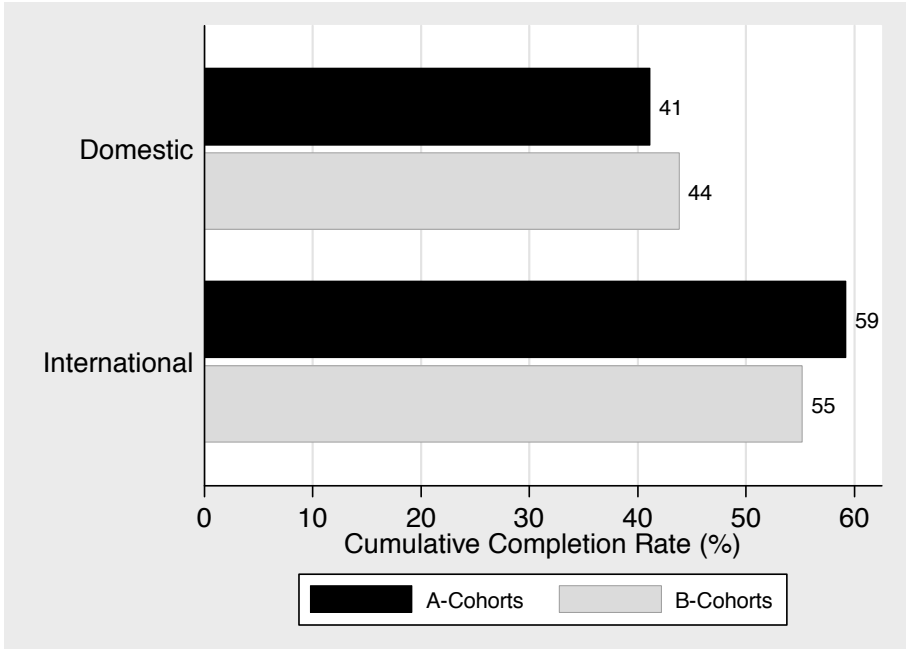


International students have higher cumulative ten-year completion rates than domestic students at both private and public institutions. These differences are statistically significant. Domestic students at private institutions complete at a higher rate than at public institutions, and the difference is statistically significant.

Seven-Year Completion Rates for A- and B-Cohorts

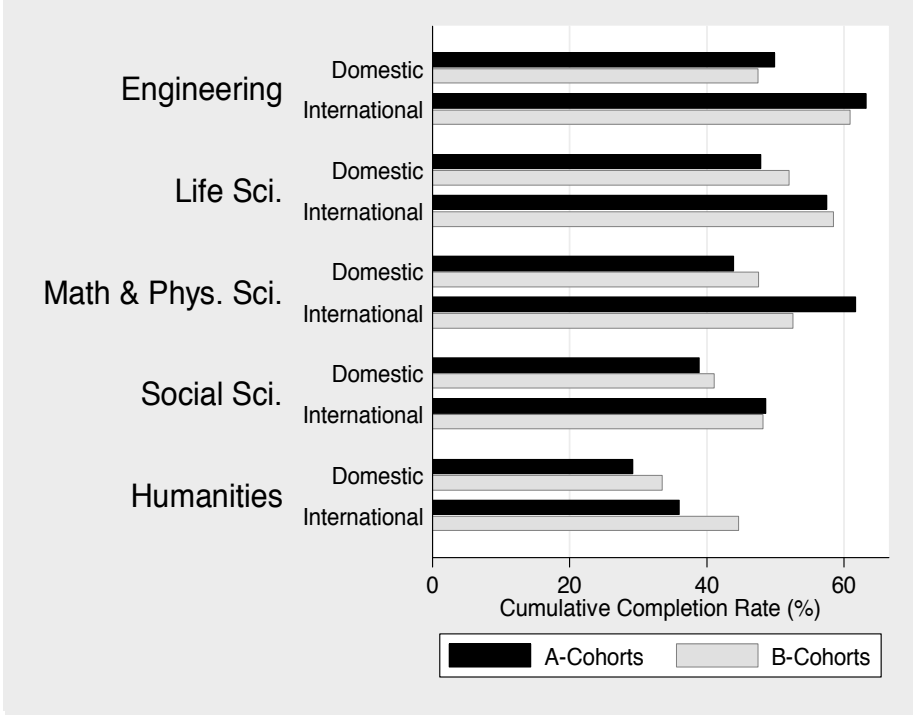
Cumulative seven-year completion rates improved over time for domestic students, but not for international students. As shown in Figure 5.8, domestic students' completion rates increased three percentage points from the A- to B-Cohorts, while international completion rates decreased by four percentage points. This increase for domestic students is not statistically significant; however, the decrease in the completion rates of international students in the B-Cohorts is statistically significant.

Figure 5.8 Cumulative Seven-Year Ph.D. Completion Rates for A- versus B-Cohorts by Citizenship



Much of the difference in completion rates across all broad fields can be attributed to students in Mathematics & Physical Sciences, where international students in the B-Cohorts complete at a rate nine percentage points lower than those in the A-Cohorts. This difference is illustrated in Figure 5.9, and it is statistically significant.

Figure 5.9 Cumulative Seven-Year Ph.D. Completion Rates for A- versus B-Cohorts by Citizenship and Broad Field



Summary of Findings

The citizenship database contains data for 9,369 students in the A-Cohorts and 9,069 students in the B-Cohorts. Less than one-third of all students are international students—26% of the students in the A-Cohorts and 31% of those in the B-Cohorts. International students have substantially higher completion rates than domestic students. The overall cumulative ten-year completion rate for international students is 67%, 13 percentage points higher than for domestic students, and this difference is statistically significant. International students also complete at higher rates in both SEM and SSH fields, across broad fields, and at both private and public institutions. These differences are all statistically significant with one exception—the cumulative ten-year completion rate lead for international students is not statistically significant in Humanities. Finally, domestic students in the B-Cohorts have higher cumulative seven-year completion rates than those in the A-Cohorts, although this difference is not statistically significant. On the other hand, international students in the B-Cohorts have lower cumulative seven-year completion rates than in the A-Cohorts, and this difference is statistically significant.

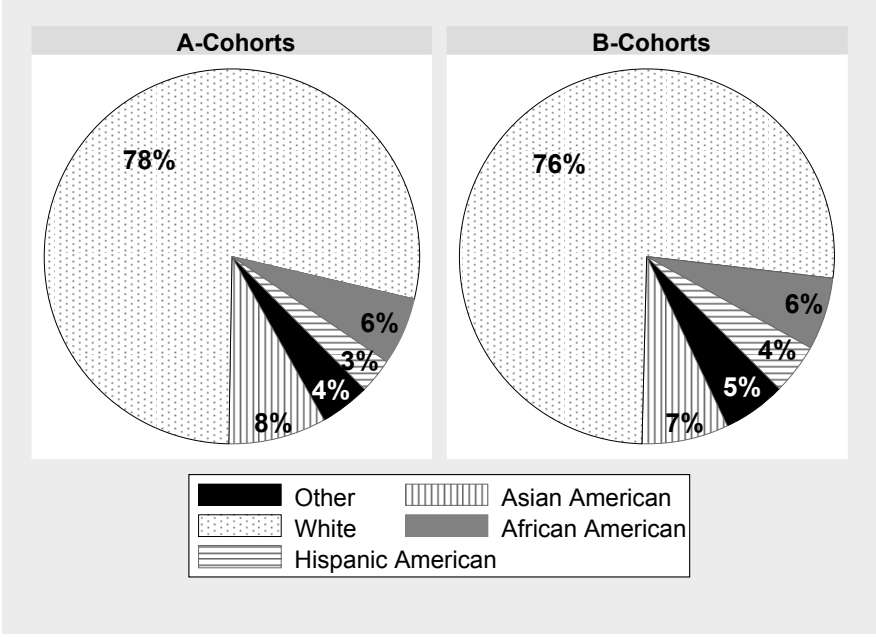
CHAPTER 6
Completion Rates by Race/Ethnicity

Overview

The race/ethnicity database is a subset of the citizenship, race and ethnicity database. It represents six categories of U.S. citizen and permanent resident students: Native American, Asian American, African American, Hispanic American, White, and "Other." Overall, the race/ethnicity database contains data for 6,936 students in the A-Cohorts and 6,256 students in the B-Cohorts. Because the numbers were very small for Native American students, any analysis using these data would not be representative of the population; therefore, they were moved into the "Other" category.

As can be seen in Figure 6.1, both the A- and B-Cohorts have similar racial/ethnic compositions. Whites constitute 78% and 76% of the total domestic enrollment in the A- and B-Cohorts, respectively. African Americans constitute 6% of the students in both the A- and B-Cohorts. Hispanic Americans make up 3% of the A-Cohorts and 4% of the B-Cohorts, while Asian Americans are 8% and 7%, and "Others" are 4% and 5% of the A- and B-Cohorts, respectively. The "Other" category is not included in the data presented in the rest of this chapter because, except for the Native Americans, its composition is unknown.

Figure 6.1 Race/Ethnicity Distribution of U.S. Citizens and Permanent Residents



The following sections compare cumulative ten-year completion rates by race/ethnicity at the aggregate level, across fields, and by institution type. Cumulative seven-year completion rates are compared between the A- and B-Cohorts to examine whether entering time affects completion rates. Detailed data for each of these analyses can be found in Appendix H. Statistical significance is tested for each comparison and significant results at the 0.10 level are presented.

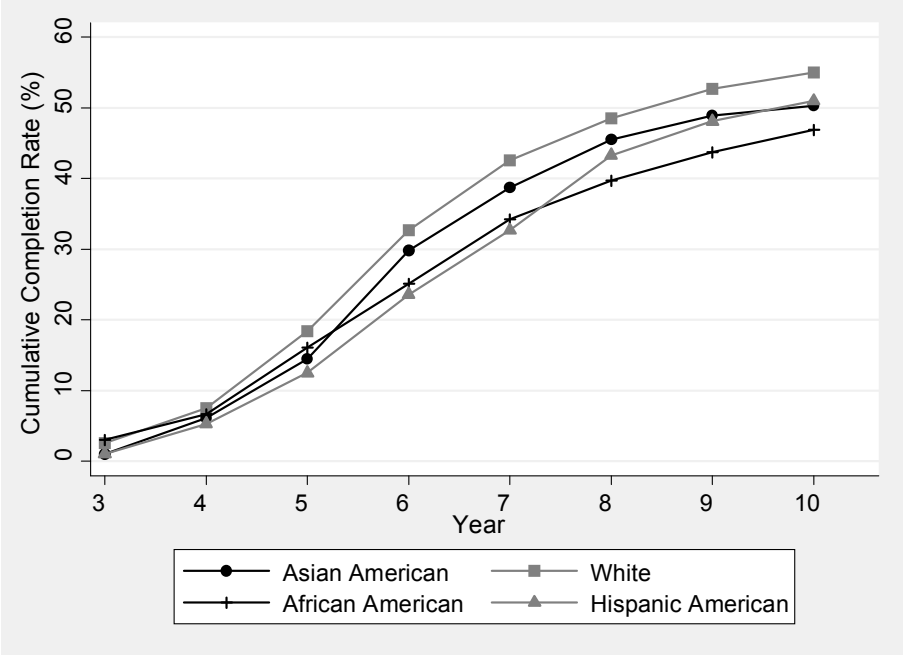
Completion rates across the four racial/ethnic groups and five broad fields should be viewed with some caution because of the wide range of numbers of students in the various categories. As can be seen from the data reported in Appendix D, Table D.1, the numbers in the A-Cohorts range from 20 Hispanic American students in Engineering to 1,629 White students in Mathematics & Physical Sciences.

Ten-Year Completion Rates

Overall Completion Rates

White students have the highest cumulative completion rates from years four through ten among the domestic students (Figure 6.2). Asian American students have the second highest completion rates between years six and nine. They are surpassed in that final year by Hispanic American students. Hispanic American completion rates are the lowest of all the racial/ethnic groups from years three through seven. Shortly after year seven the Hispanic American rate surpasses the African American rate and between years nine and ten moves ahead of the Asian American rate. African Americans complete at higher rates than Hispanic Americans from years three through seven but fall below Hispanic Americans in years eight through ten.

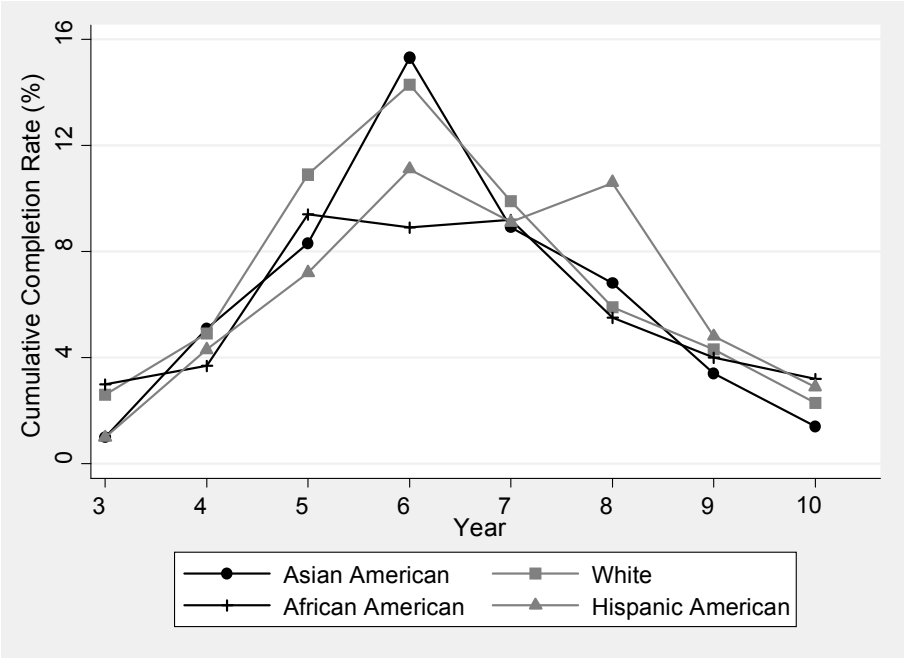
Figure 6.2 Cumulative Ph.D. Completion Rates by Race/Ethnicity



White students have higher cumulative ten-year completion rates than both African American students and Asian American students, and these differences are statistically significant.

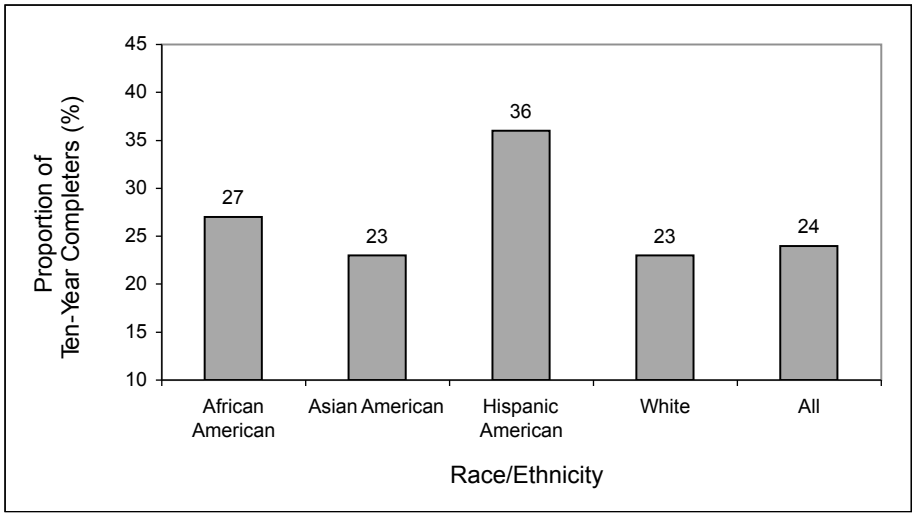
White students' and Asian American students' higher cumulative completion rates (Figure 6.2) are largely due to their higher annual completion rates at year six (Figure 6.3). At year eight, Hispanic Americans have the highest annual completion rate among the racial/ethnic groups, which is why the cumulative completion rate for Hispanic Americans students surpasses that of Asian American students by year ten.

Figure 6.3 Annual Ph.D. Completion Rates by Race/Ethnicity



As reported in Chapter 5, twenty-four percent of all domestic students who complete Ph.D. degrees in ten years complete after year seven. The proportion of White and Asian American students who complete after year seven is 23% (Figure 6.4). Twenty-seven percent of African Americans and 36% of Hispanic Americans complete after year seven.

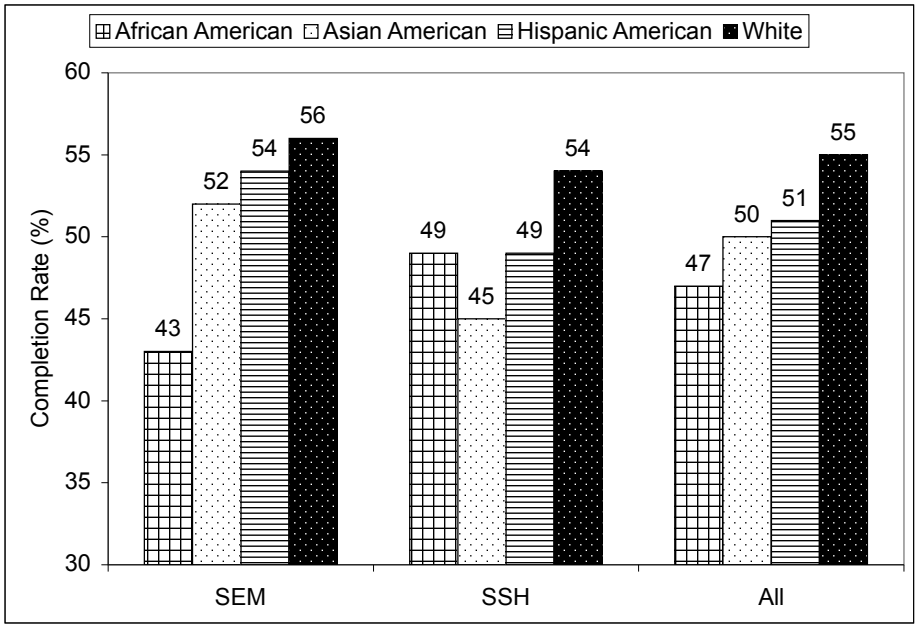
Figure 6.4 Proportion of Cumulative Ten-Year Ph.D. Completion Occurring after Year Seven



SEM versus SSH Fields

White students have the highest cumulative ten-year completion rates when compared with other U.S. racial/ethnic groups in both SEM (56%) and SSH (54%) fields (Figure 6.5). In the SEM fields, completion rates for Hispanic American students follow closely behind Whites at 54%, and Asian Americans are also not far behind at 52%. African American students complete at the lowest rate among the racial/ethnic groups in the SEM fields at 43%. African American and Hispanic American students complete at a 49% rate in the SSH fields, four percentage points ahead of Asian American students, who complete at the lowest rate.

Figure 6.5 Cumulative Ten-Year Ph.D. Completion Rates by Race/ Ethnicity for SEM and SSH Fields



In SEM fields, Whites, Asian Americans, and Hispanic Americans all have higher cumulative ten-year completion rates than African Americans, and these differences are significant at the 0.10 level. In SSH fields, Whites complete at a higher rate than all other racial/ethnic groups, but only the difference between Whites and Asian Americans is statistically significant.

The cumulative ten-year completion rates in SEM fields are higher than in SSH fields for Whites, Asian Americans, and Hispanic Americans; the opposite holds true for African Americans. The completion rate difference between SEM and SSH fields is statistically significant only for Asian Americans.

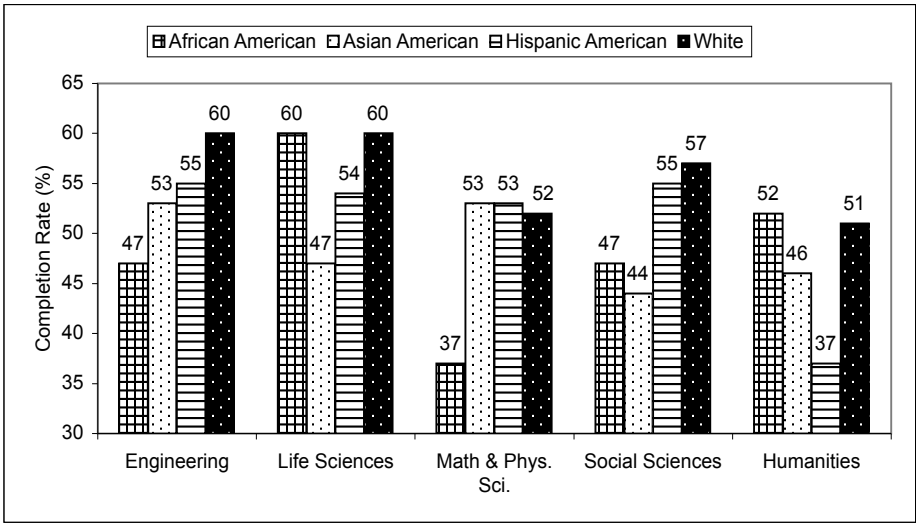
Broad Fields

Cumulative ten-year completion rates for the broad fields within SEM and SSH fields vary widely. Within the SEM fields, White students complete at the highest rate in Engineering (60%). African Americans and Whites complete at the highest rates in Life Sciences, both at approximately 60%. Asian American and Hispanic American students complete at a slightly higher rate (53%) than White students (52%) in Mathematics & Physical Sciences. African American

students complete at the lowest rates in Engineering (47%) and Mathematics & Physical Sciences (37%), and Asian American students complete at the lowest rate (47%) in Life Sciences.

In the SSH fields African American students complete at the highest rate in Humanities (52%) and White students complete at the highest rate in Social Sciences (57%). Hispanic American students are only two percentage points behind White students in Social Sciences at 55%, and Whites closely follow African Americans in Humanities at 51%. Asian Americans complete at the lowest rate in Social Sciences (44%), while Hispanic Americans are the lowest in Humanities (37%). More details of the cumulative and annual ten-year completion rates are presented in Figures G.1 through G.14 in Appendix G.

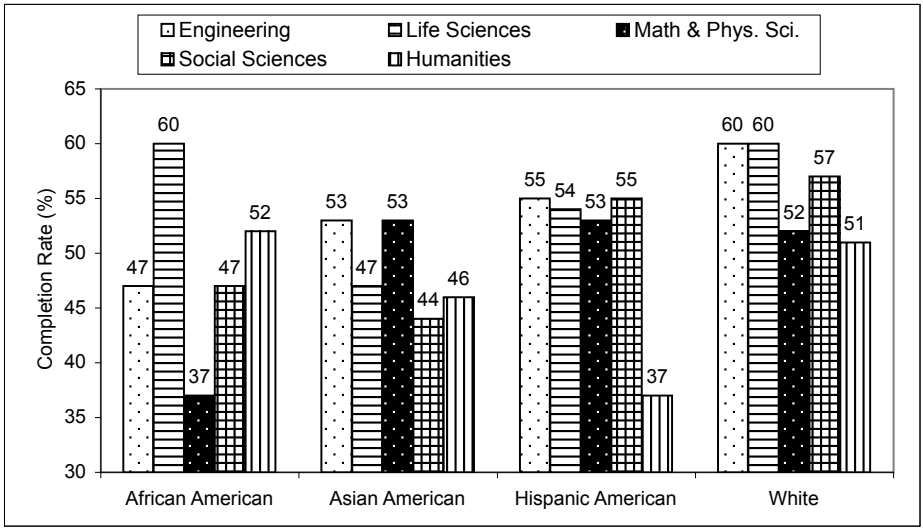
Figure 6.6 Cumulative Ten-Year Ph.D. Completion Rates by Racial/ Ethnic Group for each Broad Field



Another perspective on the cumulative ten-year completion rates for U.S. racial/ethnic groups is presented in Figure 6.7 by reporting completion rates across the five broad fields for each racial/ethnic group. From this graph it can be seen that African Americans have a much higher completion rate (60%) in Life Sciences than in any of the other broad fields. Their second highest completion rate (52%) is in Humanities, eight percentage points lower. These compare with a 47% completion rate in both Engineering and Social Sciences. The lowest completion rate for African Americans is in Mathematics & Physical Sciences at 37%.

Asian American students' highest cumulative ten-year completion rates (53%) are in Engineering and Mathematics & Physical Sciences. Their completion rates in the other three broad fields are in the 44% to 47% range. Hispanic American students complete at similar rates (53-55%) in four of the five broad fields and fall far behind in Humanities, where their ten-year completion rate is only 37%. The completion rates for White students are highest in Engineering and Life Sciences (60%). Their completion rate in Social Sciences (57%) is not far behind. The lowest completion rates for White students are in Mathematics & Physical Sciences (52%) and Humanities (51%). Details of the ten-year completion rates by broad field for each racial/ethnic group are presented in Figures G.11 through G.14 in Appendix G.

Figure 6.7 Cumulative Ten-Year Ph.D. Completion Rates by Broad Field for each Racial/Ethnic Group



Again, t-tests are used to determine if the differences in completion rates for various race/ethnicity pairs are statistically significant at the 0.10 level. Results of the tests that are statistically significant are shown in Tables 6.1 and 6.2.

White students complete at higher rates than African Americans in Engineering, Mathematics & Physical Sciences, and Social Sciences, and Whites complete at higher rates than Asian Americans in Engineering, Life Sciences, and Social Sciences. Asian Americans, Hispanic Americans, and Whites all complete at higher rates than African Americans in Mathematics & Physical Sciences. All of these differences are statistically significant as shown in Table 6.1.

Table 6.1 Statistically Significant Race/Ethnicity Differences by Broad Field

Race/Ethnicity			Broad Field
White	>	African American	Engineering
White	>	Asian American	Engineering
White	>	Asian American	Life Sciences
White	>	African American	Mathematics & Physical Sciences
Asian American	>	African American	Mathematics & Physical Sciences
Hispanic American	>	African American	Mathematics & Physical Sciences
White	>	African American	Social Sciences
White	>	Asian American	Social Sciences

Table 6.2 shows the statistically significant completion rate differences between broad fields for each racial/ethnic group. The cumulative ten-year completion rates for African Americans in Life Sciences and in Humanities are higher than their rate in Mathematics & Physical Sciences. Whites complete at higher rates in Engineering, in Life Sciences, and in Social Sciences than in Mathematics & Physical Sciences and in Humanities.

Table 6.2 Statistically Significant Broad Field Differences by Race/Ethnicity

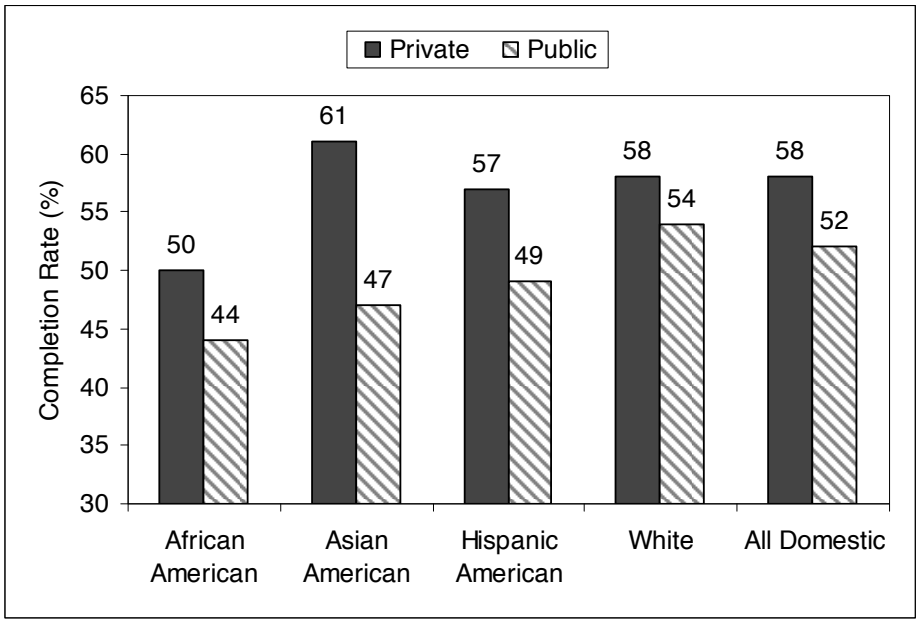
Race/Ethnicity	Broad Field		
African American	Life Sciences	>	Mathematics & Physical Sciences
African American	Humanities	>	Mathematics & Physical Sciences
White	Engineering	>	Mathematics & Physical Sciences
White	Engineering	>	Humanities
White	Life Sciences	>	Mathematics & Physical Sciences
White	Life Sciences	>	Humanities
White	Social Sciences	>	Mathematics & Physical Sciences
White	Social Sciences	>	Humanities

Completion Rates by Institution Type

Over all broad fields combined cumulative ten-year completion rates for domestic students at private universities (58%) exceed those at public institutions (52%), as can be seen in Figure 6.8. Also, all racial/ethnic groups complete at higher rates in private than in public institutions. The differences range from four percentage points for Whites to 14 percentage points for Asian Americans. Interestingly, Asian Americans complete at a higher rate (61%) in private institutions than Whites (58%), whereas Whites complete at seven

percentage points higher in public institutions than Asian Americans (54% versus 47%).

Figure 6.8 Cumulative Ten-Year Ph.D. Completion Rates by Race/Ethnicity and Institution Type

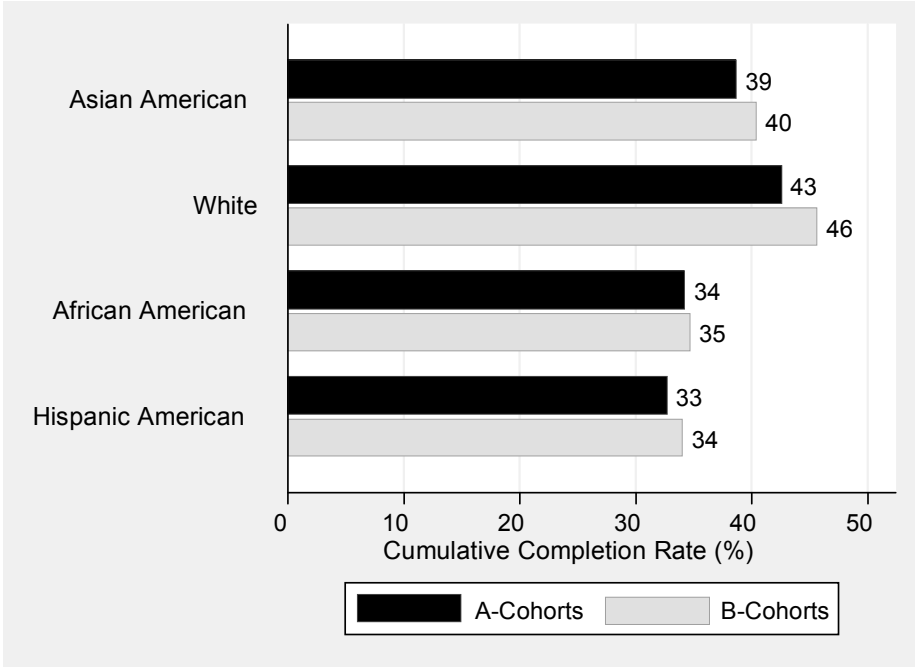


In public institutions, cumulative ten-year completion rates for White students are higher than for Asian Americans and for African Americans. Both differences are statistically significant at the 0.10 level. Asian Americans and Whites have higher cumulative ten-year completion rates at private institutions than at public institutions, and both differences are statistically significant.

Seven-Year Completion Rates for A- and B-Cohorts

A comparison of the cumulative seven-year completion rates for the race/ethnicity groups in the A- and B-Cohorts for all broad fields combined is presented in Figure 6.9. The B-Cohorts have higher completion rates than the A-Cohorts in each of the four U.S. racial/ethnic groups, but these differences range from less than one percentage point to over three percentage points. The only racial/ethnic group for which the difference is statistically significant is White students, where the B-Cohorts complete at a three percentage point higher rate than the earlier cohort.

Figure 6.9 Cumulative Seven-Year Ph.D. Completion Rates for A- versus B-Cohorts by Race/Ethnicity



Summary of Findings

As a subset of the citizenship, race and ethnicity database, the race/ethnicity database contains data for 6,936 students in the A-Cohorts and for 6,256 students in the B-cohorts. Among these students, Whites are the majority and constitute 78% and 76% of all domestic students in the A- and B-Cohorts, respectively. African Americans make up 6% of the total in both cohorts, while Asian Americans make up 8% and 7% and Hispanic Americans 3% and 4% of the A- and B-Cohorts, respectively. At the aggregate level, White students complete at the highest rate (55%), followed by Hispanic Americans (51%), Asian Americans (50%), and African Americans (47%). The differences between Whites and Asian Americans and Whites and African Americans are statistically significant.

White students have higher cumulative ten-year completion rates in both the aggregate SEM and aggregate SSH fields as well as in two of the five broad fields (Engineering and Social Sciences) than any of the other three racial/ethnic groups. White students share the highest completion rate in Life Sciences

with African Americans, trail African Americans slightly in Humanities, and trail both Asian Americans and Hispanic Americans slightly in Mathematics & Physical Sciences. Compared to each of the other three racial/ethnic groups, African Americans have lower completion rates in the SEM fields combined and in Mathematics & Physical Sciences, and these differences are statistically significant. Asian Americans have the lowest completion rate for the aggregate SSH fields and in Social Sciences, but these differences are statistically significant only when compared to Whites.

Across the five broad fields, African Americans' cumulative ten-year completion rates are highest in Life Sciences, are relatively high in Humanities, and are lowest in Mathematics & Physical Sciences. Whites have the highest completion rates in Engineering and Life Sciences, a relatively high rate in Social Sciences, and lower rates in Mathematics & Physical Sciences and in Humanities. Compared to Mathematics & Physical Sciences, African Americans' lead in Life Sciences and in Humanities and Whites' lead in Engineering, in Life Sciences, and in Social Sciences are all statistically significant. Hispanic Americans have completion rates between 53% and 55% in all broad fields except Humanities where the completion rate is 37%, and Asian Americans complete at rates ranging from 53% in Engineering and Mathematics & Physical Sciences to 44% in Humanities.

Students at private institutions generally have higher cumulative ten-year completion rates than those at public institutions. These institution type differences are statistically significant for Asian Americans and Whites. White students complete at higher rates in public institutions than Asian Americans and than African Americans, and these differences are statistically significant. In private institutions, Asian Americans complete at the highest rate among the racial/ethnic groups.

This chapter also compares cumulative seven-year completion rates for the racial/ethnic groups in the A- versus B-Cohorts. The B-Cohorts have higher seven-year completion rates than the A-Cohorts in each of the four U.S. racial/ethnic groups. These differences are statistically significant only for White students.

CHAPTER 7
Summary and Conclusions

Summary

This monograph is the second in a series of publications reporting on baseline data from the Ph.D. Completion Project. It presents an analysis of baseline demographic data submitted by 24 of the 30 universities participating in Phase I of the Ph.D. Completion Project. The data consist of two major databases: the gender database and the citizenship, race and ethnicity database. These databases have 9,000-10,000 students in each of two three-year cohort groups for which completion rates were determined. In the gender database, 36% of the students represented in the A-Cohorts (students entering in 1992-93 to 1994-95) are women, as are 37% of the students represented in the B-Cohorts (students entering in 1995-96 to 1997-98). In the citizenship, race and ethnicity database, international students make up 26% of those represented in the A-Cohorts and 31% of those represented in the B-Cohorts. Of the domestic students represented in the citizenship, race and ethnicity database, approximately 77% are White, 8% Asian American, 6% African American, 4% Hispanic American, and 5% "Other."

When cumulative ten-year completion rates for students in the A-Cohorts are compared across demographic groups, men, international students, and Whites complete at higher rates than women, domestic students, and students from other U.S. racial/ethnic groups, respectively. More specifically, 58% of males, 55% of females, 67% of international students, and 54% of domestic students complete their Ph.D. programs in ten years. Overall, White students complete at a 55% rate at year ten, four percentage points higher than Hispanic Americans, five points higher than Asian Americans, and eight points higher than African Americans. The higher cumulative ten-year completion rates for men than women, for international students than domestic students, and for Whites than Asian Americans and African Americans are statistically significant. However, White students' higher cumulative ten-year completion rate is not statistically significant when compared to Hispanic Americans.

The analysis in this monograph compares cumulative ten-year completion rates for SEM (including the broad fields of Engineering, Life Sciences, and Mathematics & Physical Sciences) versus SSH (including the broad fields

of Social Sciences and Humanities) fields and across broad fields. In the aggregate SEM fields men have a higher completion rate than women, and the difference is statistically significant. In the aggregate SSH fields women have a higher completion rate than men, and the difference is also statistically significant. Men complete at higher rates than women in Engineering, in Life Sciences, and in Mathematics & Physical Sciences. All of these differences are statistically significant. Women complete at higher rates than men in Social Sciences and in Humanities, but these gender differences are not statistically significant.

International students complete at higher rates than domestic students in both SEM and SSH fields and in all broad fields. With the exception of Humanities, all of the differences between completion rates for international and for domestic students are statistically significant.

Among domestic students, Whites have the highest completion rates in both SEM and SSH fields. Their lead over African Americans in SEM fields and their lead over Asian Americans in SSH fields are statistically significant. Whites also hold or share the lead in three of the five broad fields—Engineering, Life Sciences, and Social Sciences. The completion rate differences for White students versus African Americans and Asian Americans in Engineering, versus Asian Americans in Life Sciences, versus African Americans in Mathematics & Physical Sciences, and versus African Americans and Asian Americans in Social Sciences are all statistically significant.

African Americans have the highest completion rate in Humanities when compared with other racial/ethnic groups and share the highest completion rate in Life Sciences with White students. The leads that African Americans have over the other racial/ethnic groups in Life Sciences and Humanities are not statistically significant. Asian Americans and Hispanic Americans have higher cumulative ten-year completion rates than African Americans and Whites in Mathematics & Physical Sciences. These differences are statistically significant for African Americans but not for Whites.

African Americans have a higher cumulative ten-year completion rate in Life Sciences than in the other broad fields. Their second highest completion rate is in Humanities, and their lowest rate is in Mathematics & Physical Sciences. The differences in the rates between Life Sciences and Mathematics & Physical Sciences and between Humanities and Mathematics & Physical Sciences are statistically significant.

White students complete at higher rates in Engineering, in Life Sciences, and in Social Sciences than in Mathematics & Physical Sciences and in Humanities. All of these differences are statistically significant. The highest completion rates for Asian Americans are in Engineering and in Mathematics & Physical Sciences, but these differences are not statistically significant when compared with their completion rates in Life Sciences, in Social Sciences, and in Humanities. Hispanic Americans' completion rates are similar in Engineering, Life Sciences, Mathematics & Physical Sciences, and Social Sciences, with Humanities trailing by several percentage points.

In most cases, completion rates by gender, citizenship, and race/ethnicity are not notably different for public versus private institutions. However, there are a few exceptions. Domestic students, particularly Whites and Asian Americans, at private institutions complete at a higher rate than domestic students at public institutions. Overall among domestic students, Whites have the highest cumulative ten-year completion rate in public institutions while Asian Americans have the highest cumulative ten-year completion rate in private institutions. Whites' lead in cumulative ten-year completion rates in public institutions is statistically significant when compared to Asian Americans and African Americans, but not statistically significant when compared to Hispanic Americans. Asian Americans' lead in the cumulative ten-year completion rates in private institutions is also not statistically significant when compared with any of the other racial/ethnic groups.

Finally, the analysis compares cumulative seven-year completion rates for the A- and B-Cohorts. In most cases, the differences in completion rates between the two cohort groups are small and not statistically significant, with the following exceptions: White students overall and males in Humanities have higher cumulative seven-year completion rates for the B-Cohorts than for the A-Cohorts, and international students have lower completion rates in the B-Cohorts, particularly in Mathematics & Physical Sciences.

An important observation is that women and underrepresented minority students have higher late completion rates (from years eight through ten) than men and White students respectively. There is also some evidence that more women and minority groups complete after year ten than men and White students.

Conclusions

This monograph presents data with very little interpretation. It is intended to present baseline demographic completion data from a group of universities that are implementing a series of institutional changes designed to increase completion rates with special emphasis on underrepresented minority groups and women. Without these baseline data it would not be possible to know whether interventions being implemented by the participating institutions are having a positive impact on completion and attrition.

Some of the completion rates reported in this study are discouraging. However, the study is not about pointing out inadequacies but rather about determining where we are so as to take aggressive action to reach a more successful outcome for all students.

At the same time, some of the results are encouraging and provide incentive for further investigation. For example, what factors contribute to the finding that African American students complete at a higher rate in Life Sciences than in the other broad fields, particularly Engineering, the broad field in which all other racial/ethnic groups have the highest cumulative ten-year completion rate?

The demographic data presented in this monograph, along with the program data presented in the previous CGS publication (CGS, 2008), are intended to better inform institutional policy on doctoral student completion. These data will also assist graduate deans and other senior graduate administrators as they lead the public discussion about issues surrounding Ph.D. completion and attrition.

APPENDIX A
Ph.D. Completion Project Advisory Board Members

CGS appointed an Advisory Board to guide the project. This group comprises individuals in leadership positions in academia, industry and research on graduate education.

Earl Lewis (Chair)
Executive VP for Academic Affairs & Provost
Emory University

John Benbow
Senior Principal Scientist
Pfizer Global R&D

James Duderstadt
President Emeritus / Professor of Science & Engineering
Director of the Millennium Project
University of Michigan

Gertrude Fraser
Vice Provost for Faculty Advancement
University of Virginia

Charlotte Kuh
Deputy Executive Director
The National Research Council

Joan Lorden
Provost
University of North Carolina-Charlotte

Michael Nettles
Senior Vice President
Policy, Evaluation & Research Center
ETS

Suzanne Ortega
Provost and Executive Vice President for Academic Affairs
University of New Mexico

Richard Shavelson
Professor of Education and Psychology
Stanford University

Barbara Williams
Senior Director, PGRD Staffing, Diversity and HR Planning
Pfizer Global R&D

APPENDIX B
Ph.D. Completion Project Phase I Institutions

Among the 46 proposals submitted by universities to participate in Phase I of the Ph.D. Completion Project (2004-2007), 21 universities were selected by an external advisory committee to receive grant funding as Research Partners based on the competitiveness of their proposals. The other 25 universities were included in the project as Project Partners. Many of these Project Partners voluntarily submitted data, and most of them actively participated in CGS sessions and events dedicated to the project and to issues of doctoral completion and attrition.

Research Partners:

Arizona State University *
University of California, Los Angeles *
University of Cincinnati
Cornell University *
Duke University*
University of Florida *
University of Georgia *
Howard University *
University of Illinois at Urbana-Champaign *
University of Louisville *
University of Maryland, Baltimore County*
University of Michigan *
University of Missouri–Columbia *
Université de Montréal *
University of North Carolina at Chapel Hill
North Carolina State University *
University of Notre Dame *
Princeton University *
Purdue University *
Washington University in St. Louis *
Yale University *

Project Partners:

University of California, Berkeley
University of Colorado at Boulder
Florida State University *
Fordham University *
George Washington University
University of Iowa
Jackson State University
University of Kansas
Louisiana State University
Marquette University *
McGill University (Canada)
University of Melbourne (Australia)
Michigan State University
University of Minnesota
New Mexico State University
New York University
North Dakota State University
Pennsylvania State University *
University of Puerto Rico
University of Rhode Island
Rutgers, the State University of New Jersey
University of Southern California
Southern Illinois University Carbondale
Syracuse University
Western Michigan University

* Indicates Research and Project Partners that contributed demographic data used in the gender analysis and/or citizenship and race/ethnicity analysis reported in this publication.

APPENDIX C
Sample Data Template

Completion Template - Aggregate Demographics

Council of Graduate Schools
Ph.D. Completion Project

Name of Institution: _____
Broad Field: Engineering
Gender: Male
Name/e-address/Phone # of Person Completing: _____

				Of those admitted to PhD candidacy*:										
				Number who completed within given number of years after enrolling										
Entering student academic year cohort**	Number of entering doctoral students	Number of students who left program after receving master's degree	Number of students admitted to PhD candidacy*	3 years [≤ 3 Years]	4 years [> 3 ≤ 4 Years]	5 years [> 4 ≤ 5 Years]	6 years [> 5 ≤ 6 Years]	7 years [> 6 ≤ 7 Years]	8 years [> 7 ≤ 8 Years]	9 years [> 8 ≤ 9 Years]	10 years [> 9 ≤ 10 Years]	Number who are still enrolled after 10 years	Check whether # admitted to candidacy is equal to or less than cohort size	Check if # Degrees + Continuing after candidacy is less than or equal to total admitted to candidacy
1992-93													TRUE	TRUE
1993-94													TRUE	TRUE
1994-95													TRUE	TRUE
1995-96													TRUE	TRUE
1996-97													TRUE	TRUE
1997-98													TRUE	TRUE
1998-99													TRUE	TRUE
1999-2000													TRUE	TRUE
2000-01													TRUE	TRUE
2001-02													TRUE	TRUE
2002-03													TRUE	TRUE
2003-04													TRUE	TRUE
Totals	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**TRUE**	**TRUE**

** By cohort, we mean students entering a doctoral program during a given academic year (summer, fall/winter, spring).

If your institution does not distinguish between those seeking a master's and those seeking a Ph.D., please check here: _____

* By candidacy, we mean the successful completion of coursework and qualifying examinations.

If your institution uses a different definition, check one of the following that best identifies candidacy:
_____ A. Successful completion of preliminary examinations and/or defense of the dissertation prospectus
_____ B. Award of the master's degree signifies admission to doctoral candidacy
_____ C. Candidacy is not defined or granted by the institution
_____ D. Other, please explain: _____

Please address questions about this form to Nathan Bell [telephone: (202) 223-3791; email: nbell@cgs.nche.edu];
for all general questions about the Ph.D. Completion Project, please contact: Robert Sowell [telephone: (202) 223-3791; email: rsowell@cgs.nche.edu].

APPENDIX D
Ph.D. Student Enrollment by Demographic Characteristics

Table D.1 Number of Entering Students in Each Demographic Category by Field and Cohort

Field and Cohort	Gender			Citizenship							
						Domestic*					
	Total	Female	Male	Total	Int'l.	Total	African Amer.	Asian Amer.	Hisp. Amer.	White	Other**
A-Cohorts (1992-93 through 1994-95)											
Engineering	1,883	277	1,606	1,868	888	980	38	171	20	710	41
Life Sciences	1,091	489	602	1,023	212	811	25	62	24	671	29
Math & Phys. Sci.	3,043	792	2,251	3,041	941	2,100	85	207	38	1,629	141
Social Sciences	2,015	1,101	914	1,933	278	1,655	157	95	85	1,272	46
Humanities	1,651	782	869	1,504	114	1,390	98	52	41	1,156	43
SEM Fields	6,017	1,558	4,459	5,932	2,041	3,891	148	440	82	3,010	211
SSH Fields	3,666	1,883	1,783	3,437	392	3,045	255	147	126	2,428	89
All A-Cohorts	**9,683**	**3,441**	**6,242**	**9,369**	**2,433**	**6,936**	**403**	**587**	**208**	**5,438**	**300**
B-Cohorts (1995-96 through 1997-98)											
Engineering	1,826	319	1,507	1,812	994	818	35	114	25	596	48
Life Sciences	1,210	583	627	1,149	236	913	40	68	36	727	42
Math & Phys. Sci.	2,960	771	2,189	2,936	1,155	1,781	98	143	48	1,363	129
Social Sciences	1,826	1,018	808	1,754	280	1,474	127	84	104	1,083	76
Humanities	1,574	739	835	1,418	148	1,270	92	59	60	1,013	46
SEM Fields	5,996	1,673	4,323	5,897	2,385	3,512	173	325	109	2,686	219
SSH Fields	3,400	1,757	1,643	3,172	428	2,744	219	143	164	2,096	122
All B-Cohorts	**9,396**	**3,430**	**5,966**	**9,069**	**2,813**	**6,256**	**392**	**468**	**273**	**4,782**	**341**

(continued)

Table D.1 Number of Entering Students in Each Demographic Category by Field and Cohort (continued)

Field and Cohort	Gender			Citizenship							
						Domestic*					
	Total	Female	Male	Total	Int'l.	Total	African Amer.	Asian Amer.	Hisp. Amer.	White	Other**
C-Cohorts (1998-99 through 2000-01)											
SEM Fields	7,105	2,110	4,995	6,996	3,217	3,779	161	515	132	2,701	270
SSH Fields	3,222	1,750	1,472	3,053	473	2,580	244	135	109	1,950	142
All C-Cohorts	**10,327**	**3,860**	**6,467**	**10,049**	**3,690**	**6,359**	**405**	**650**	**241**	**4,651**	**412**
D-Cohorts (2001-02 through 2003-04)											
SEM Fields	8,135	2,618	5,517	7,980	3,629	4,351	222	586	146	3,020	377
SSH Fields	3,476	1,980	1,496	3,291	562	2,729	227	132	156	2,017	197
All D-Cohorts	**11,611**	**4,598**	**7,013**	**11,271**	**4,191**	**7,080**	**449**	**718**	**302**	**5,037**	**574**
All Cohorts (1992-93 through 2003-04)											
SEM Fields	27,253	7,959	19,294	26,805	11,272	15,533	704	1,866	469	11,417	1,077
SSH Fields	13,764	7,370	6,394	12,953	1,855	11,098	945	557	555	8,491	550
All Cohorts	**41,017**	**15,329**	**25,688**	**39,758**	**13,127**	**26,631**	**1,649**	**2,423**	**1,024**	**19,908**	**1,627**

* Includes only U.S. citizens and permanent residents.

** Includes Native Americans.

Table D.2 Percent of Entering Students in Each Demographic Category by Field and Cohort

Field and Cohort	Gender			Citizenship							
							Race/Ethnicity for Domestic Students*				
	Total	Female	Male	Total	Int'l.	Domes-tic*	African Amer.	Asian Amer.	Hisp. Amer.	White	Other**
A-Cohorts (1992-93 through 1994-95)											
Engineering	100%	15%	85%	100%	48%	52%	4%	17%	2%	72%	4%
Life Sciences	100%	45%	55%	100%	21%	79%	3%	8%	3%	83%	4%
Math & Phys. Sci.	100%	26%	74%	100%	31%	69%	4%	10%	2%	78%	7%
Social Sciences	100%	55%	45%	100%	14%	86%	9%	6%	5%	77%	3%
Humanities	100%	47%	53%	100%	8%	92%	7%	4%	3%	83%	3%
SEM Fields	100%	26%	74%	100%	34%	66%	4%	11%	2%	77%	5%
SSH Fields	100%	51%	49%	100%	11%	89%	8%	5%	4%	80%	3%
All A-Cohorts	**100%**	**36%**	**64%**	**100%**	**26%**	**74%**	**6%**	**8%**	**3%**	**78%**	**4%**
B-Cohorts (1995-96 through 1997-98)											
Engineering	100%	17%	83%	100%	55%	45%	4%	14%	3%	73%	6%
Life Sciences	100%	48%	52%	100%	21%	79%	4%	7%	4%	80%	5%
Math & Phys. Sci.	100%	26%	74%	100%	39%	61%	6%	8%	3%	77%	7%
Social Sciences	100%	56%	44%	100%	16%	84%	9%	6%	7%	73%	5%
Humanities	100%	47%	53%	100%	10%	90%	7%	5%	5%	80%	4%
SEM Fields	100%	28%	72%	100%	40%	60%	5%	9%	3%	76%	6%
SSH Fields	100%	52%	48%	100%	13%	87%	8%	5%	6%	76%	4%
All B-Cohorts	**100%**	**37%**	**63%**	**100%**	**31%**	**69%**	**6%**	**7%**	**4%**	**76%**	**5%**

(continued)

Table D.2 Percent of Entering Students in Each Demographic Category by Field and Cohort (continued)

Field and Cohort	Gender			Citizenship							
							Race/Ethnicity for Domestic Students*				
	Total	Female	Male	Total	Int'l.	Domes-tic*	African Amer.	Asian Amer.	Hisp. Amer.	White	Other**
C-Cohorts (1998-99 through 2000-01)											
SEM Fields	100%	30%	70%	100%	46%	54%	4%	14%	3%	71%	7%
SSH Fields	100%	54%	46%	100%	15%	85%	9%	5%	4%	76%	6%
All C-Cohorts	**100%**	**37%**	**63%**	**100%**	**37%**	**63%**	**6%**	**10%**	**4%**	**73%**	**6%**
D-Cohorts (2001-02 through 2003-04)											
SEM Fields	100%	32%	68%	100%	45%	55%	5%	13%	3%	69%	9%
SSH Fields	100%	57%	43%	100%	17%	83%	8%	5%	6%	74%	7%
All D-Cohorts	**100%**	**40%**	**60%**	**100%**	**37%**	**63%**	**6%**	**10%**	**4%**	**71%**	**8%**
All Cohorts (1992-93 through 2003-04)											
SEM Fields	100%	29%	71%	100%	42%	58%	5%	12%	3%	74%	7%
SSH Fields	100%	54%	46%	100%	14%	86%	9%	5%	5%	77%	5%
All Cohorts	**100%**	**37%**	**63%**	**100%**	**33%**	**67%**	**6%**	**9%**	**4%**	**75%**	**6%**

Note: Due to rounding, details may not total to 100%.

* Includes only U.S. citizens and permanent residents.

** Includes Native Americans.

Table D.3 Percent of Entering Students in Each Field by Demographic Category and Cohort

Field and Cohort	Gender			Citizenship							
						Domestic*					
	Total	Female	Male	Total	Int'l.	Total	African Amer.	Asian Amer.	Hisp. Amer.	White	Other**
A-Cohorts (1992-93 through 1994-95)											
Engineering	19%	8%	26%	20%	36%	14%	9%	29%	10%	13%	14%
Life Sciences	11%	14%	10%	11%	9%	12%	6%	11%	12%	12%	10%
Math & Phys. Sci.	31%	23%	36%	32%	39%	30%	21%	35%	18%	30%	47%
Social Sciences	21%	32%	15%	21%	11%	24%	39%	16%	41%	23%	15%
Humanities	17%	23%	14%	16%	5%	20%	24%	9%	20%	21%	14%
SEM Fields	62%	45%	71%	63%	84%	56%	37%	75%	39%	55%	70%
SSH Fields	38%	55%	29%	37%	16%	44%	63%	25%	61%	45%	30%
All A-Cohorts	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
B-Cohorts (1995-96 through 1997-98)											
Engineering	19%	9%	25%	20%	35%	13%	9%	24%	9%	12%	14%
Life Sciences	13%	17%	11%	13%	8%	15%	10%	15%	13%	15%	12%
Math & Phys. Sci.	32%	22%	37%	32%	41%	28%	25%	31%	18%	29%	38%
Social Sciences	19%	30%	14%	19%	10%	24%	32%	18%	38%	23%	22%
Humanities	17%	22%	14%	16%	5%	20%	23%	13%	22%	21%	13%
SEM Fields	64%	49%	72%	65%	85%	56%	44%	69%	40%	56%	64%
SSH Fields	36%	51%	28%	35%	15%	44%	56%	31%	60%	44%	36%
All B-Cohorts	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

(continued)

Table D.3 Percent of Entering Students in Each Field by Demographic Category and Cohort (continued)

Field and Cohort	Gender			Citizenship							
						Domestic*					
	Total	Female	Male	Total	Int'l.	Total	African Amer.	Asian Amer.	Hisp. Amer.	White	Other**
C-Cohorts (1998-99 through 2000-01)											
SEM Fields	69%	55%	77%	70%	87%	59%	40%	79%	55%	58%	66%
SSH Fields	31%	45%	23%	30%	13%	41%	60%	21%	45%	42%	34%
All C-Cohorts	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
D-Cohorts (2001-02 through 2003-04)											
SEM Fields	70%	57%	79%	71%	87%	61%	49%	82%	48%	60%	66%
SSH Fields	30%	43%	21%	29%	13%	39%	51%	18%	52%	40%	34%
All D-Cohorts	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
All Cohorts (1992-93 through 2003-04)											
SEM Fields	66%	52%	75%	67%	86%	58%	43%	77%	46%	57%	66%
SSH Fields	34%	48%	25%	33%	14%	42%	57%	23%	54%	43%	34%
All Cohorts	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: Due to rounding, details may not total to 100%.

* Includes only U.S. citizens and permanent residents.

** Includes Native Americans.

APPENDIX E
Additional Figures on Gender Data

Figure E.1 Cumulative Ph.D. Completion Rates by Gender in Engineering

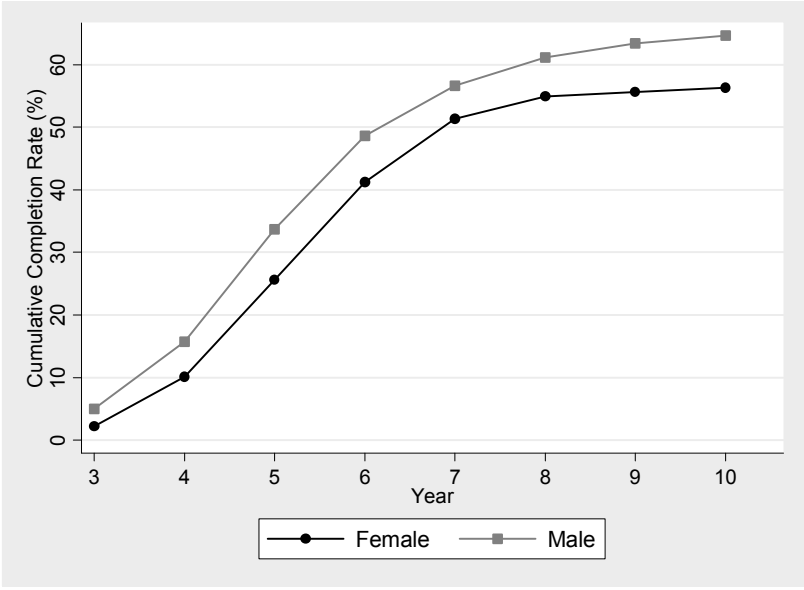


Figure E.2 Annual Ph.D. Completion Rates by Gender in Engineering

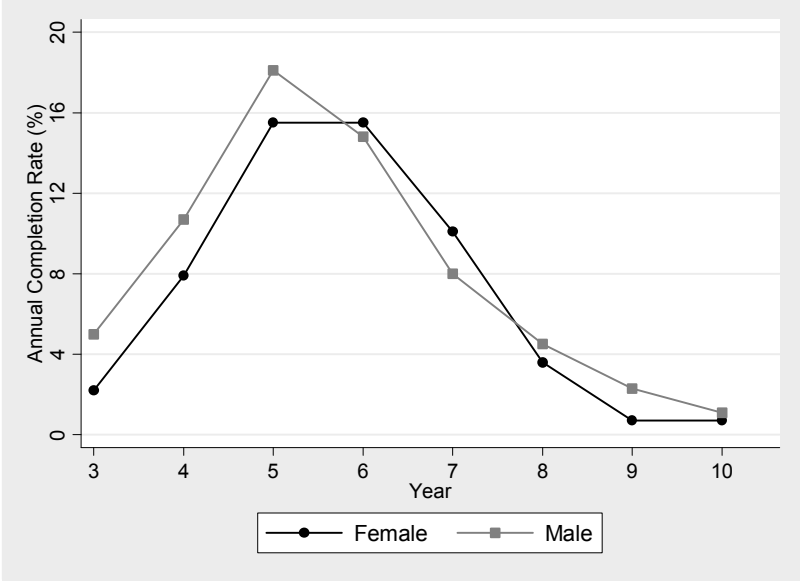


Figure E.3 Cumulative Ph.D. Completion Rates by Gender in Life Sciences

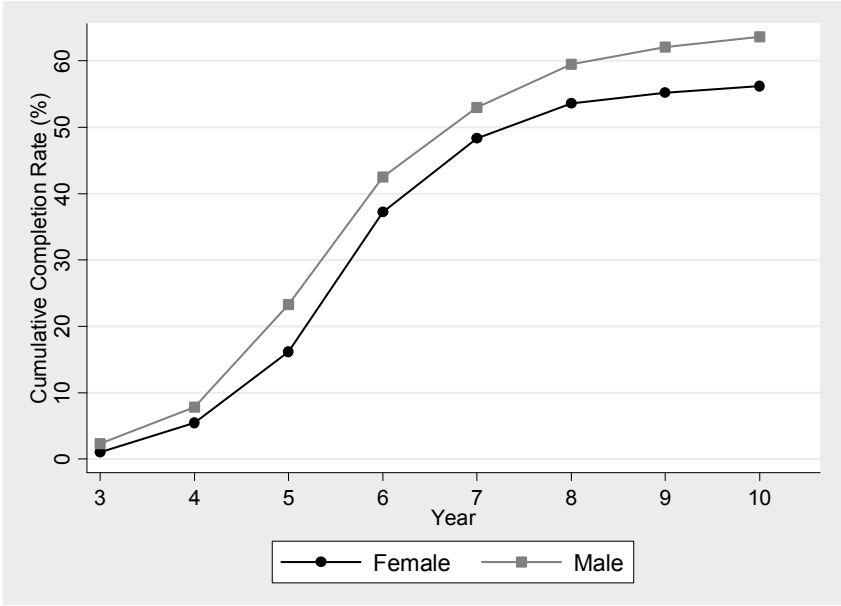


Figure E.4 Annual Ph.D. Completion Rates by Gender in Life Sciences

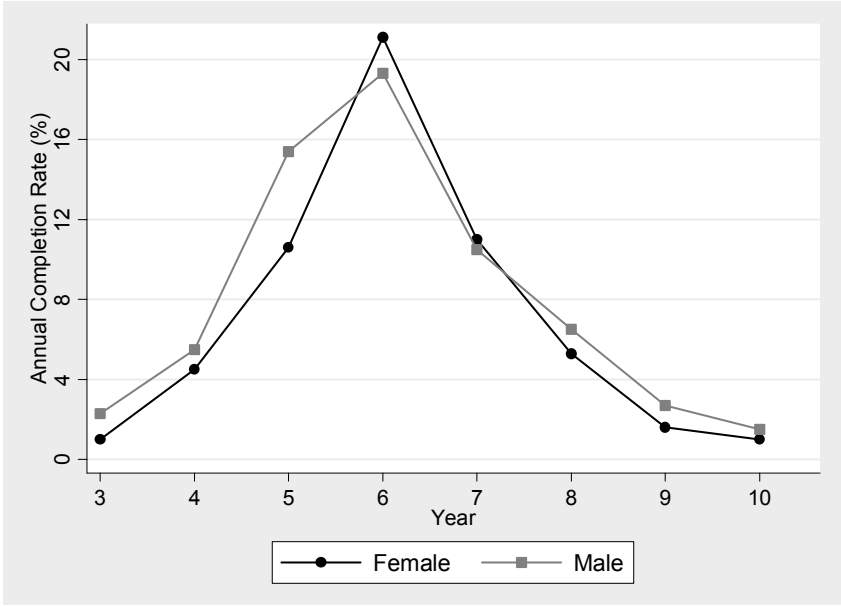


Figure E.5 Cumulative Ph.D. Completion Rates by Gender in Mathematics & Physical Sciences

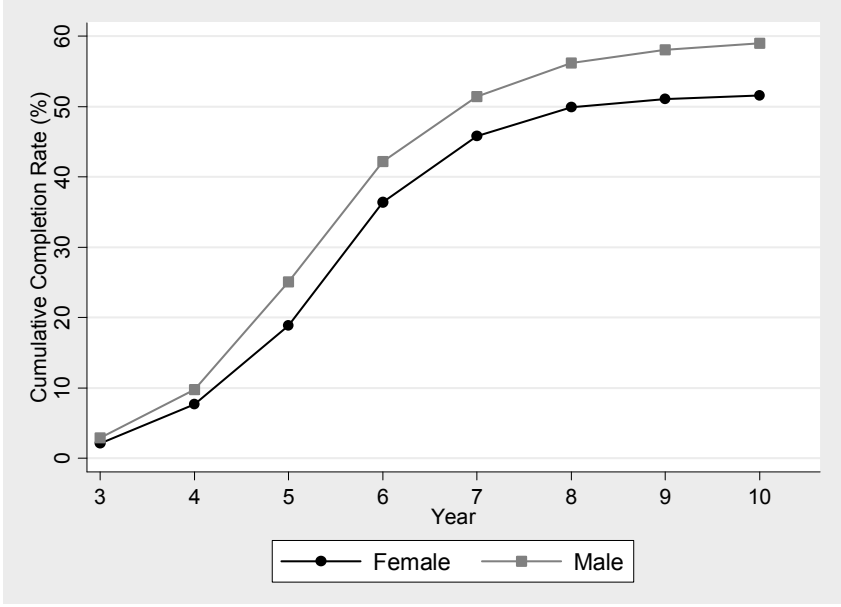


Figure E.6 Annual Ph.D. Completion Rates by Gender in Mathematics & Physical Sciences

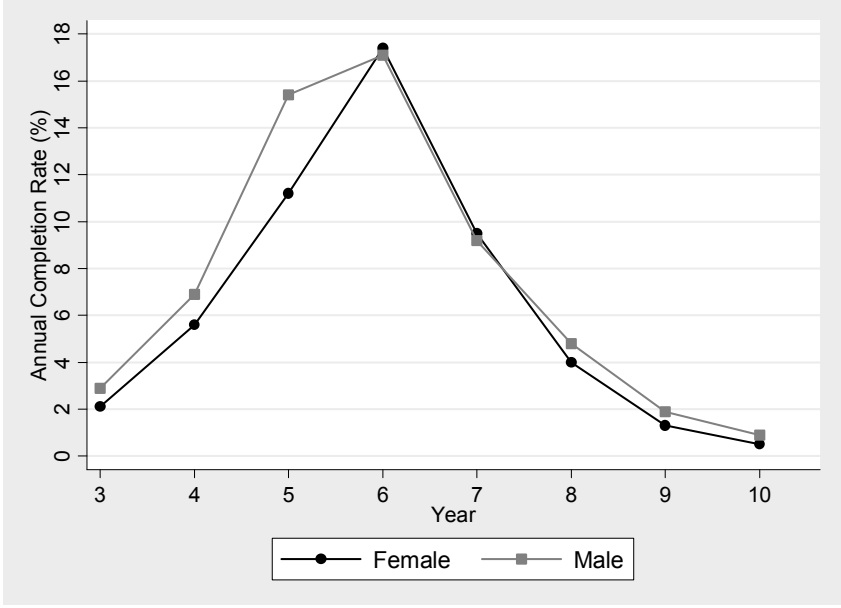


Figure E.7 Cumulative Ph.D. Completion Rates by Gender in Social Sciences

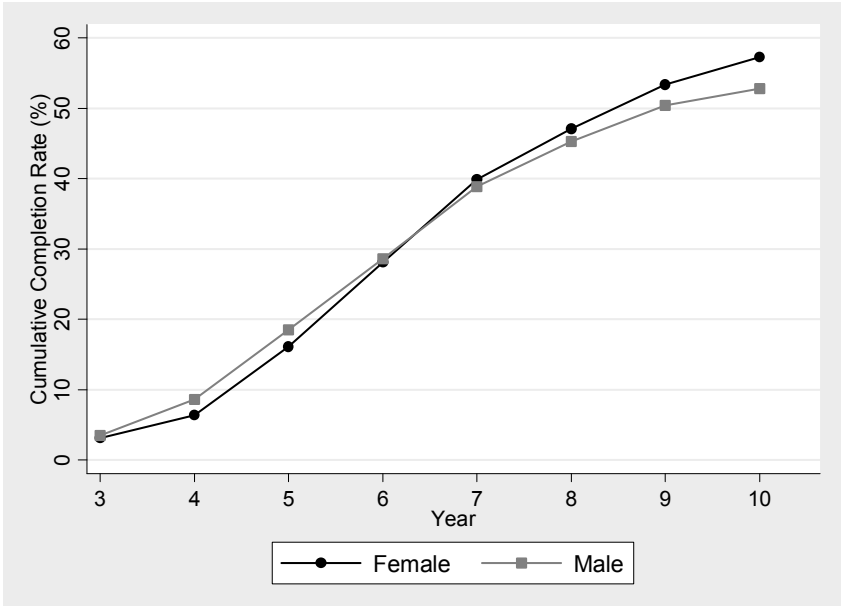


Figure E.8 Annual Ph.D. Completion Rates by Gender in Social Sciences

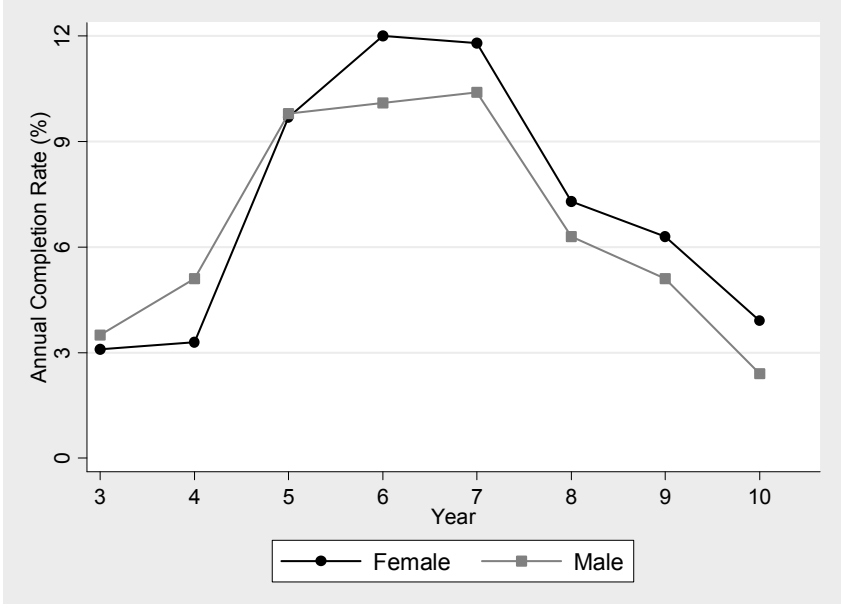


Figure E.9 Cumulative Ph.D. Completion Rates by Gender in Humanities

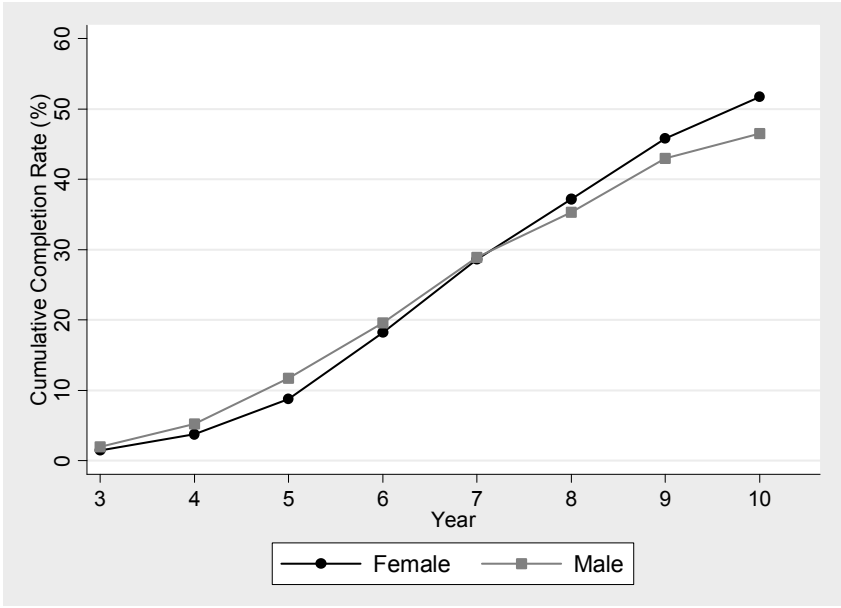


Figure E.10 Annual Ph.D. Completion Rates by Gender in Humanities

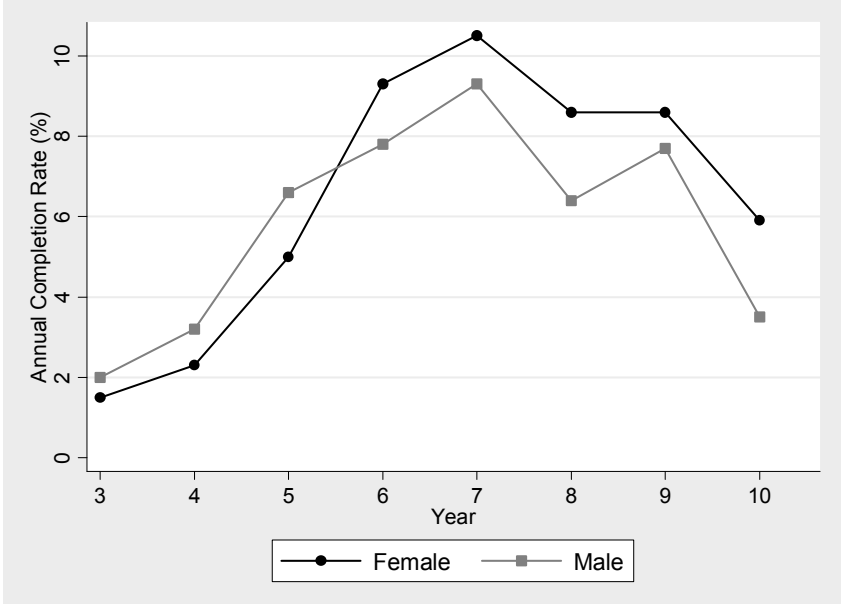


Figure E.11 Cumulative Ph.D. Completion Rates by Broad Field for Female Students

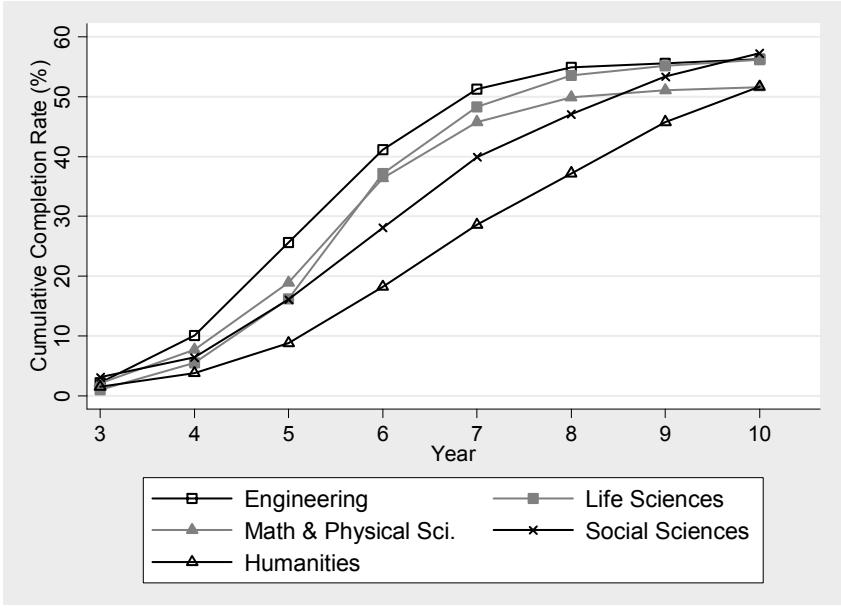
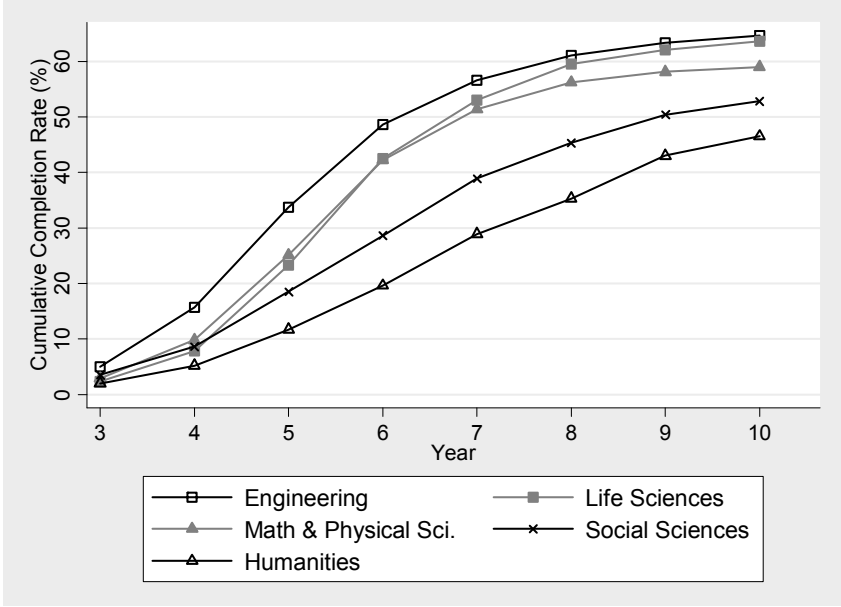


Figure E.12 Cumulative Ph.D. Completion Rates by Broad Field for Male Students



APPENDIX F
Additional Figures on Citizenship Data

Figure F.1 Cumulative Ph.D. Completion Rates by Citizenship in Engineering

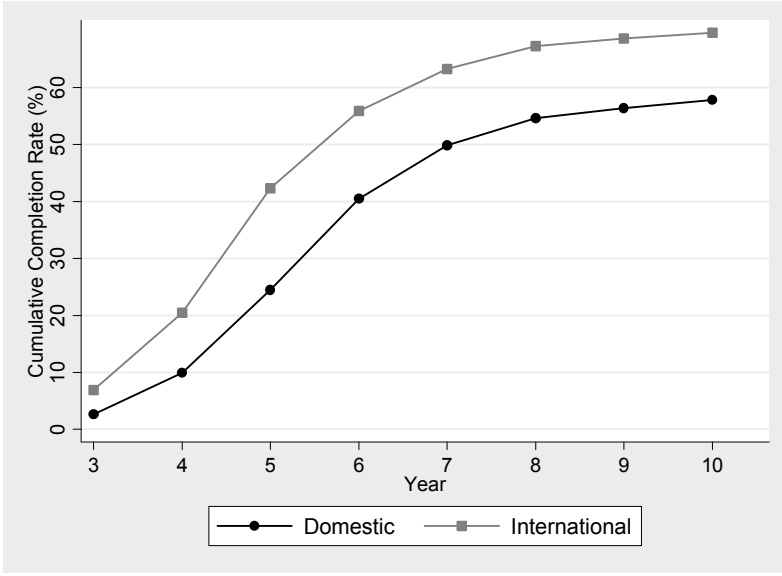


Figure F.2 Annual Ph.D. Completion Rates by Citizenship in Engineering

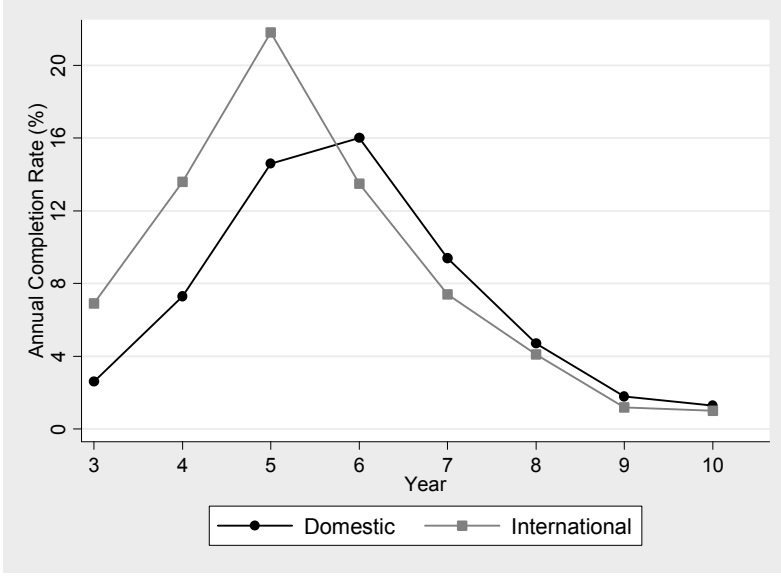


Figure F.3 Cumulative Ph.D. Completion Rates by Citizenship in Life Sciences

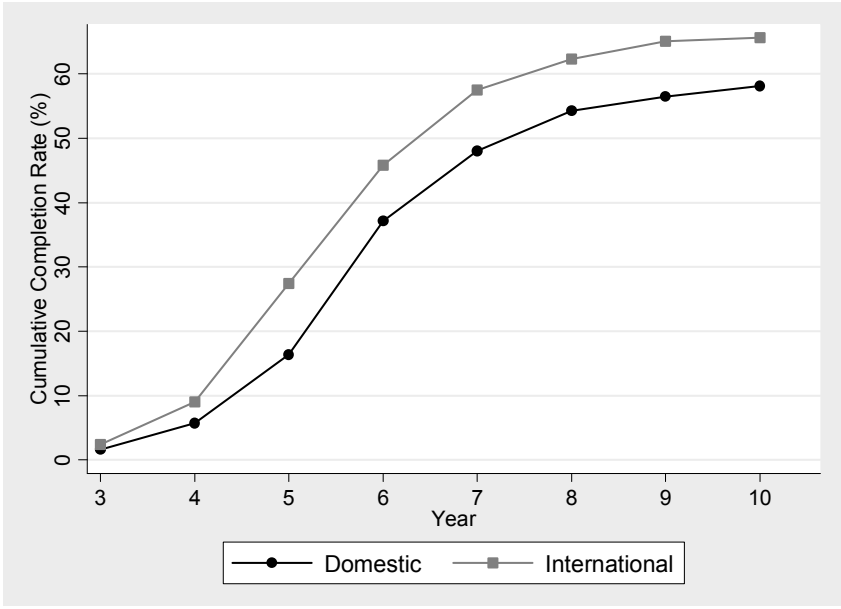


Figure F.4 Annual Ph.D. Completion Rates by Citizenship in Life Sciences

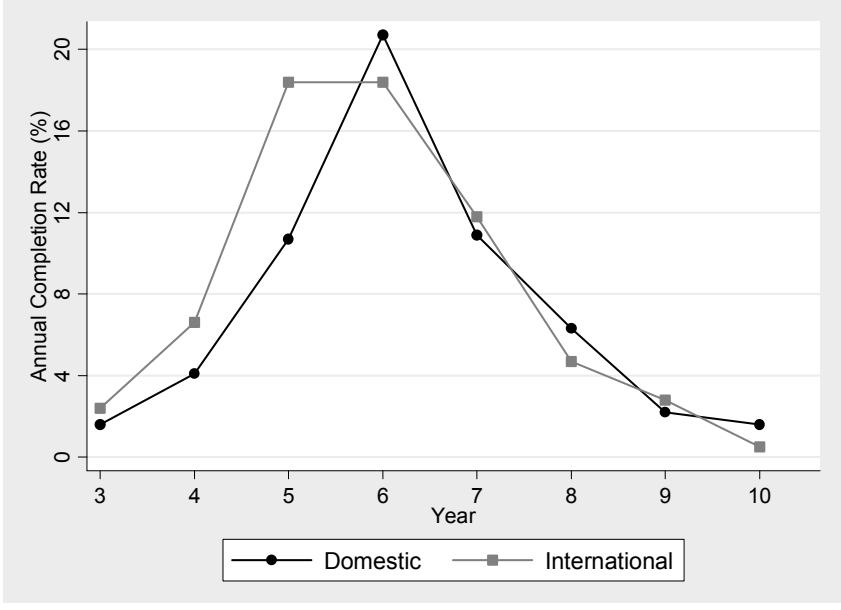


Figure F.5 Cumulative Ph.D. Completion Rates by Citizenship in Mathematics & Physical Sciences

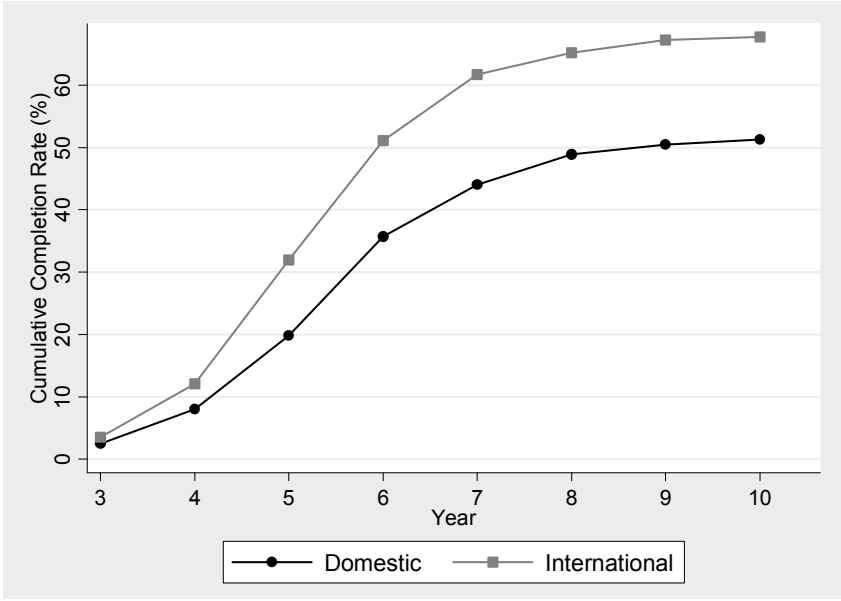


Figure F.6 Annual Ph.D. Completion Rates by Citizenship in Mathematics & Physical Sciences

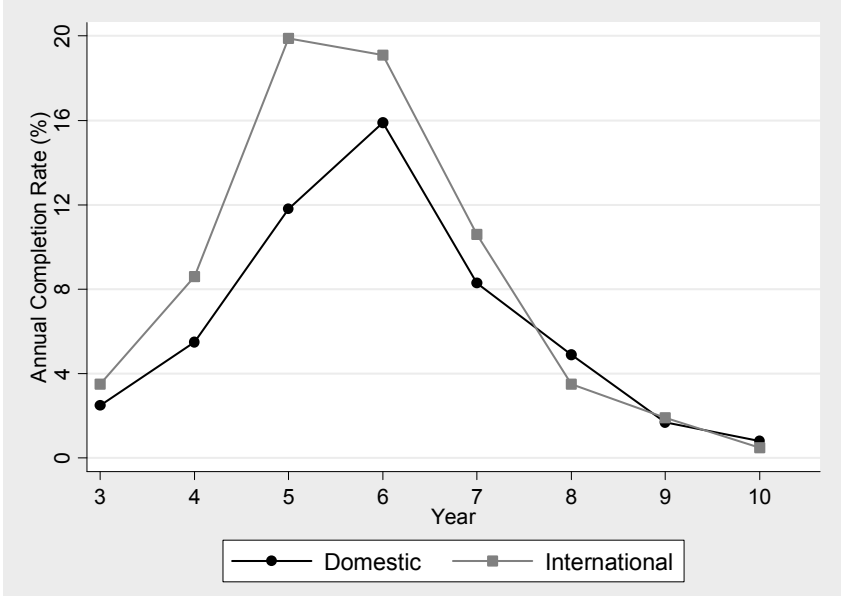


Figure F.7 Cumulative Ph.D. Completion Rates by Citizenship in Social Sciences

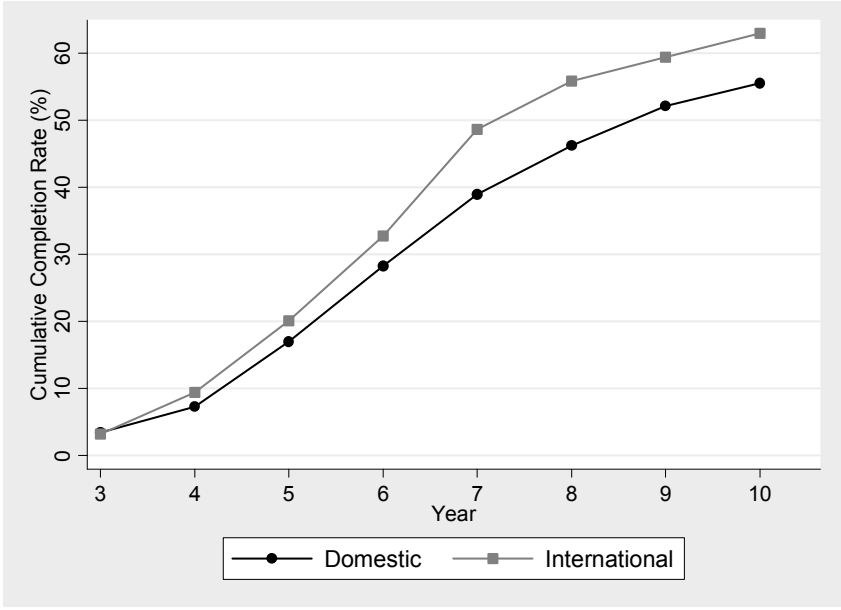


Figure F.8 Annual Ph.D. Completion Rates by Citizenship in Social Sciences

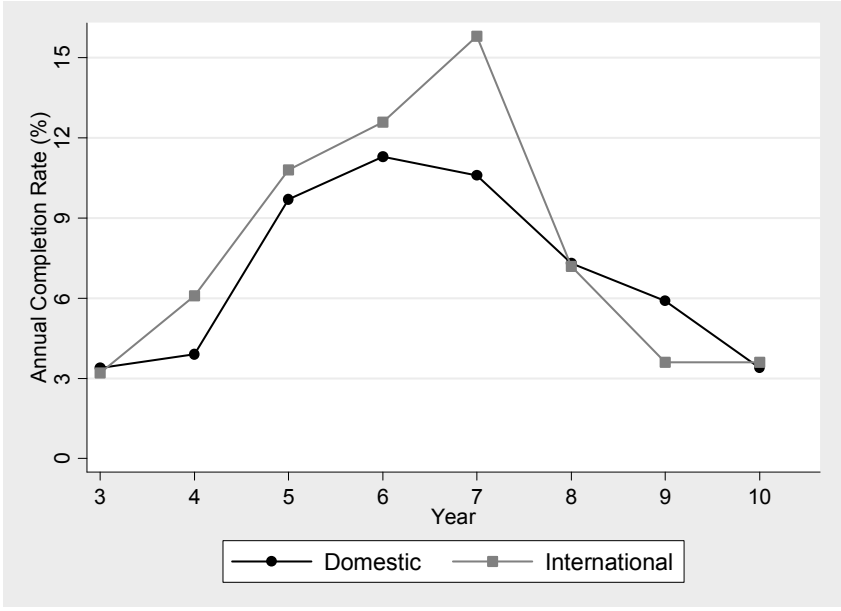


Figure F.9 Cumulative Ph.D. Completion Rates by Citizenship in Humanities

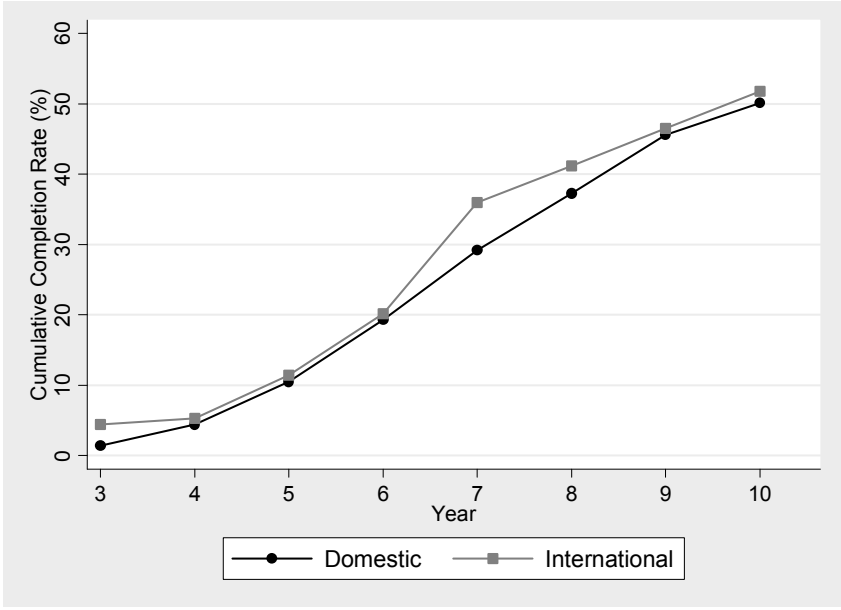


Figure F.10 Annual Ph.D. Completion Rates by Citizenship in Humanities

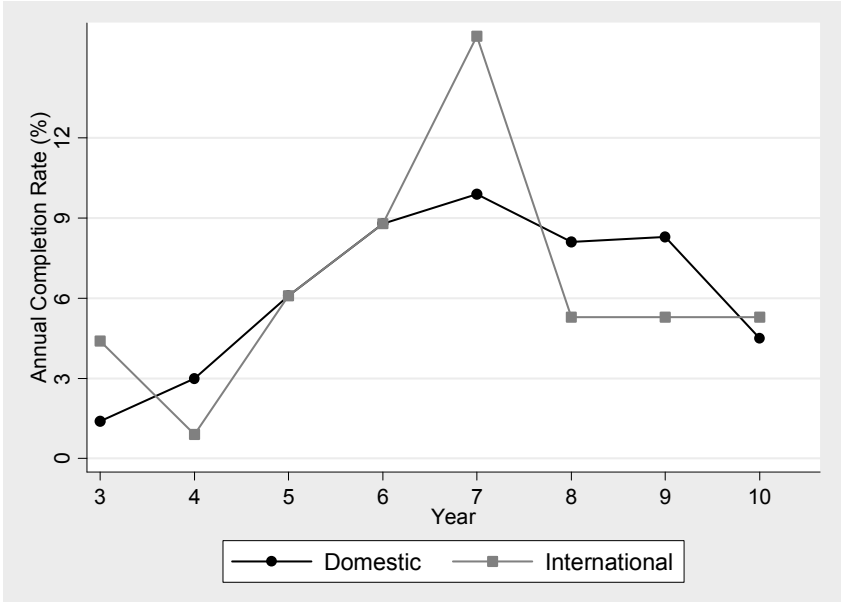


Figure F.11 Cumulative Ph.D. Completion Rates by Broad Field for Domestic Students

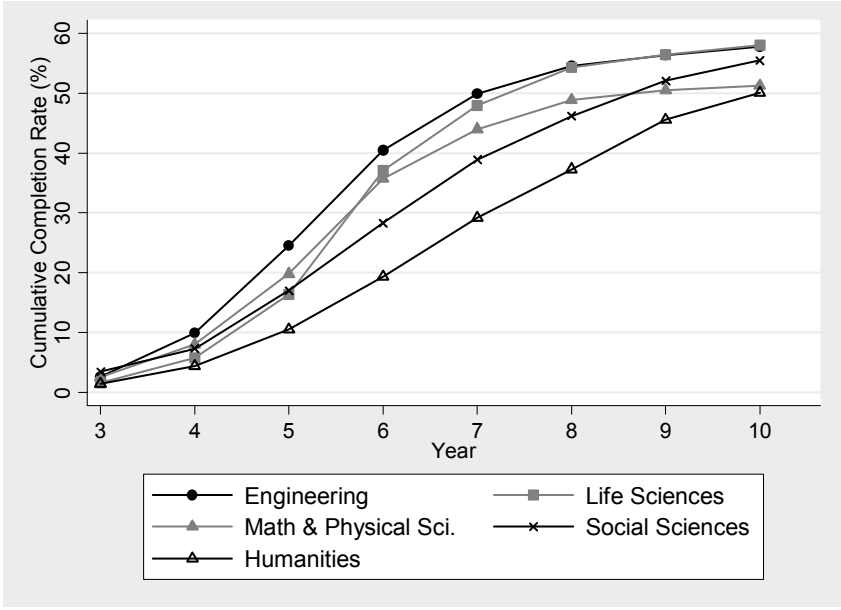
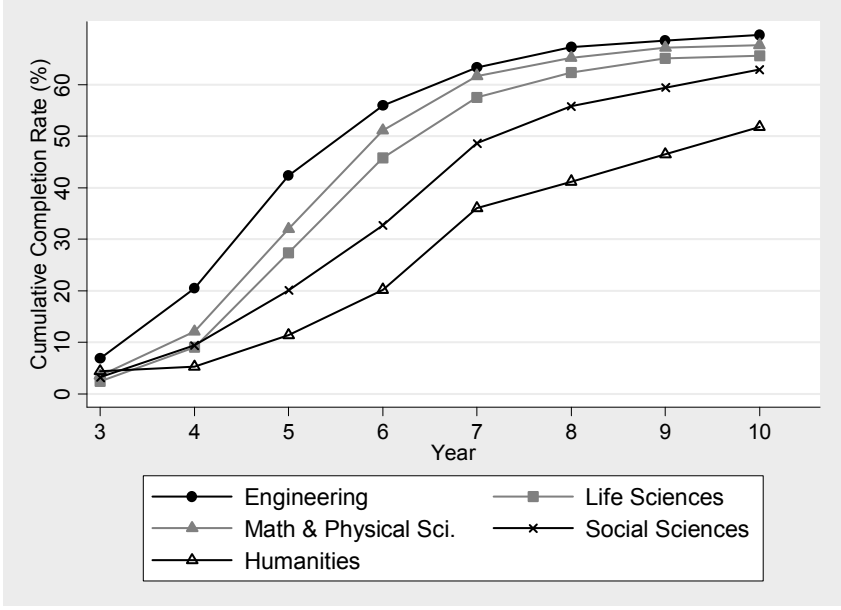


Figure F.12 Cumulative Ph.D. Completion Rates by Broad Field for International Students



APPENDIX G
Additional Figures on Race/Ethnicity Data

Figure G.1 Cumulative Ph.D. Completion Rates by Race/Ethnicity in Engineering

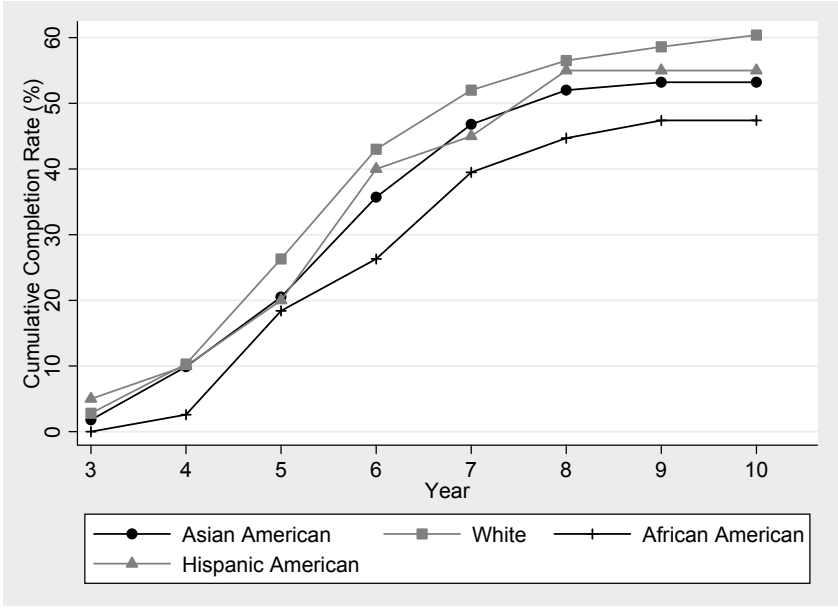


Figure G.2 Annual Ph.D. Completion Rates by Race/Ethnicity in Engineering

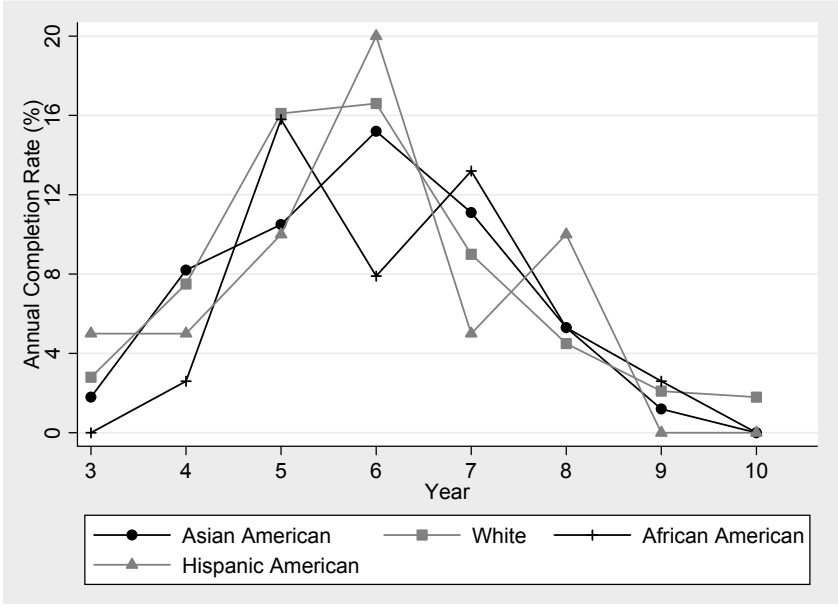


Figure G.3 Cumulative Ph.D. Completion Rates by Race/Ethnicity in Life Sciences

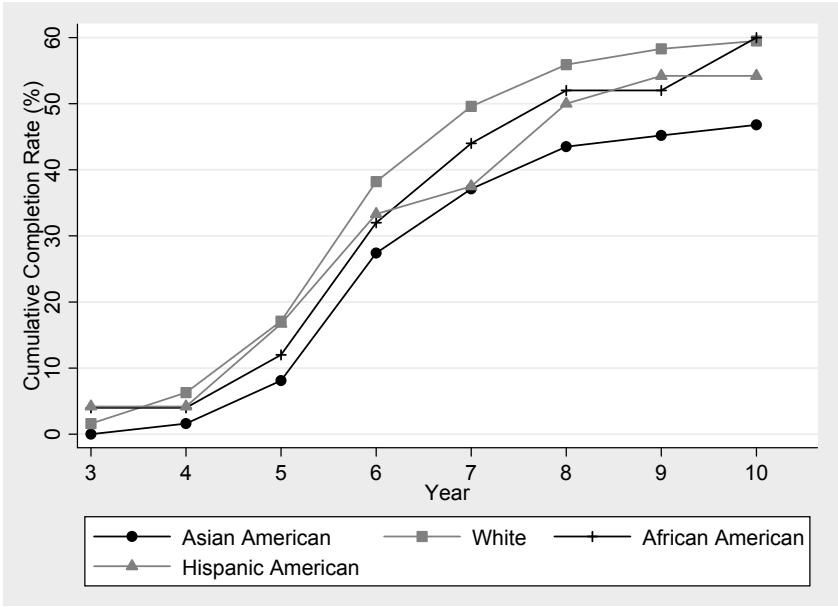


Figure G.4 Annual Ph.D. Completion Rates by Race/Ethnicity in Life Sciences

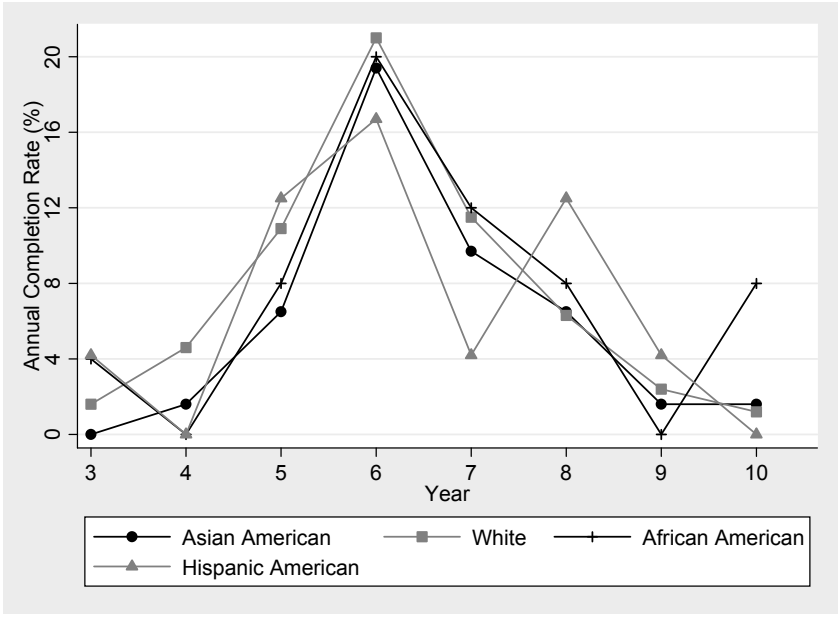


Figure G.5 Cumulative Ph.D. Completion Rates by Race/Ethnicity in Mathematics & Physical Sciences

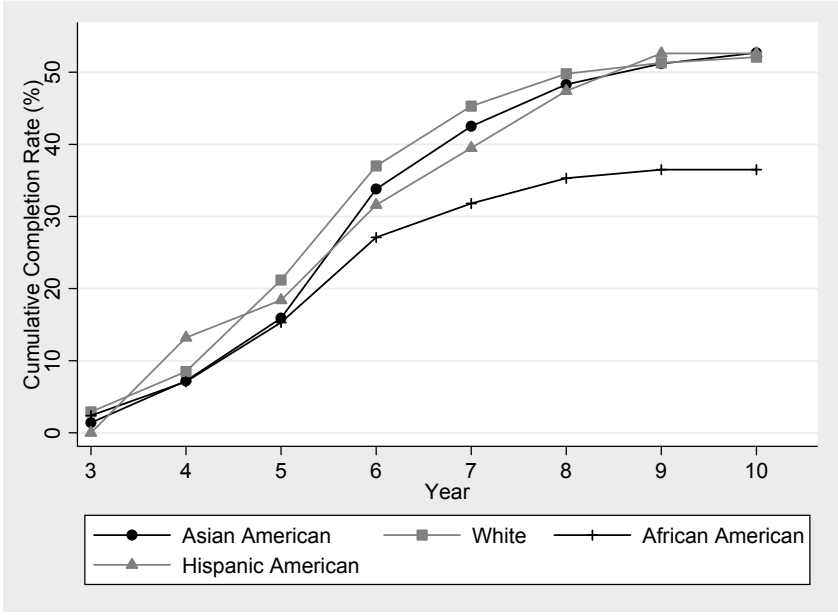


Figure G.6 Annual Ph.D. Completion Rates by Race/Ethnicity in Mathematics & Physical Sciences

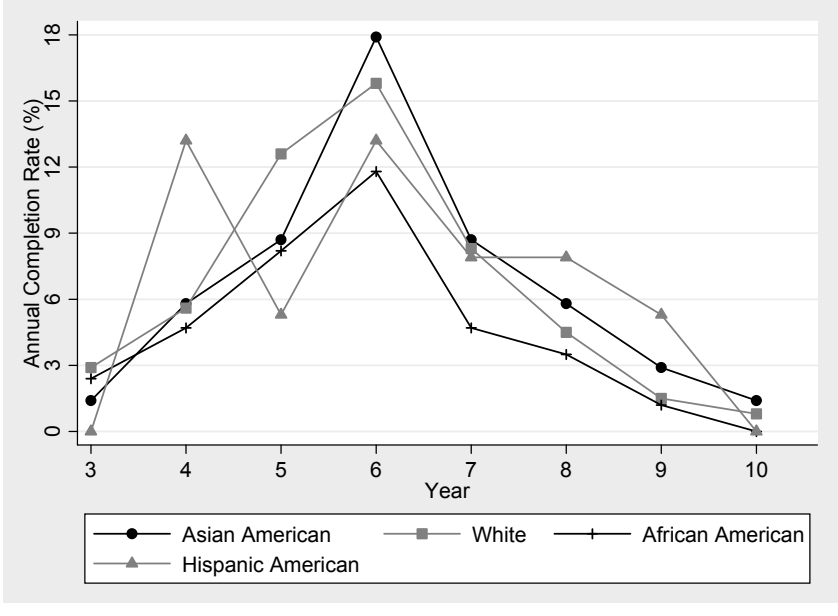


Figure G.7 Cumulative Ph.D. Completion Rates by Race/Ethnicity in Social Sciences

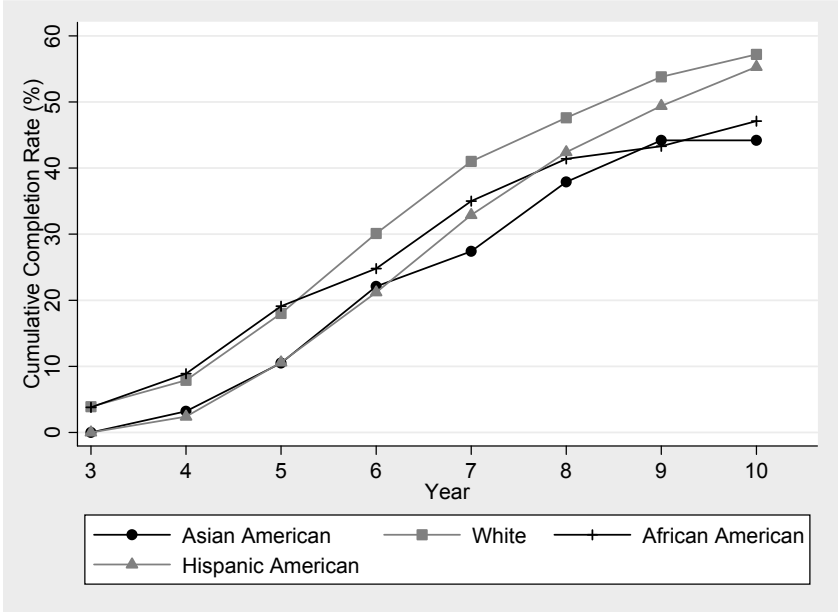


Figure G.8 Annual Ph.D. Completion Rates by Race/Ethnicity in Social Sciences

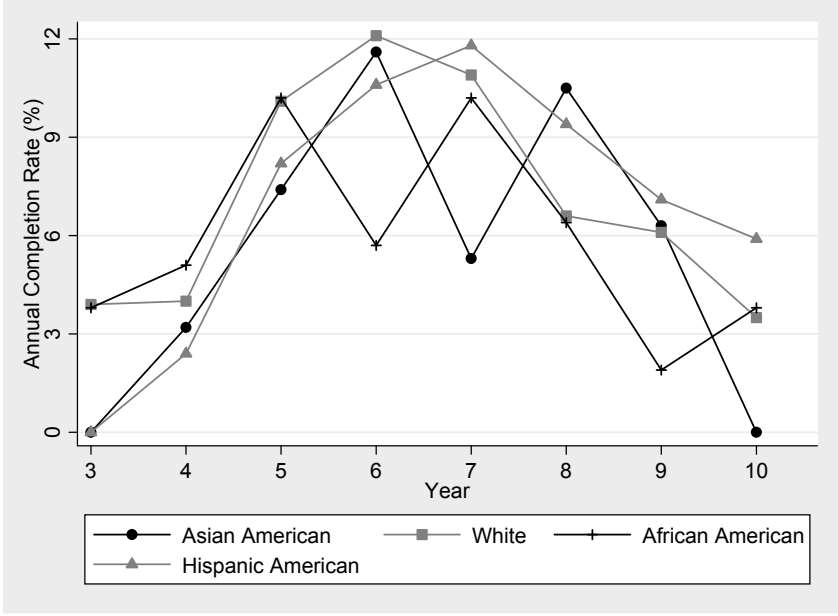


Figure G.9 Cumulative Ph.D. Completion Rates by Race/Ethnicity in Humanities

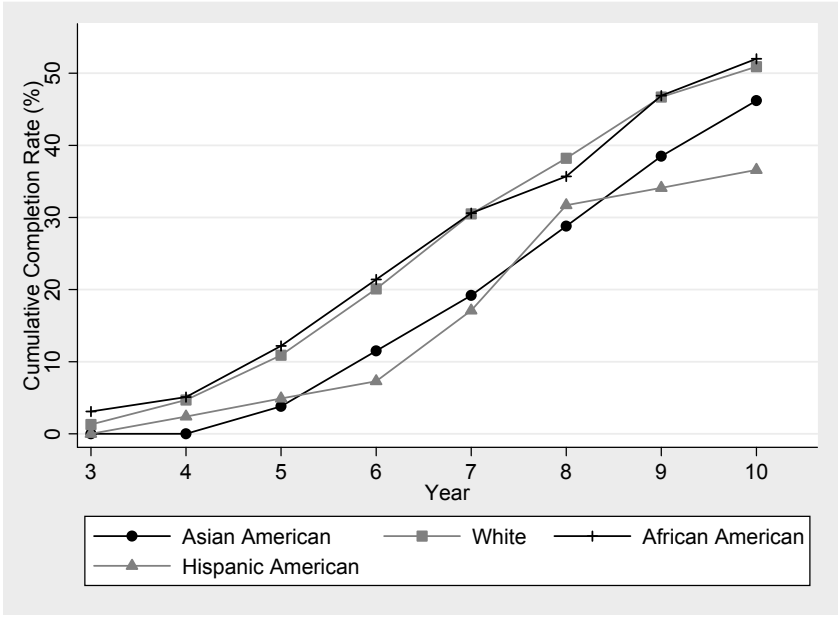


Figure G.10 Annual Ph.D. Completion Rates by Race/Ethnicity in Humanities

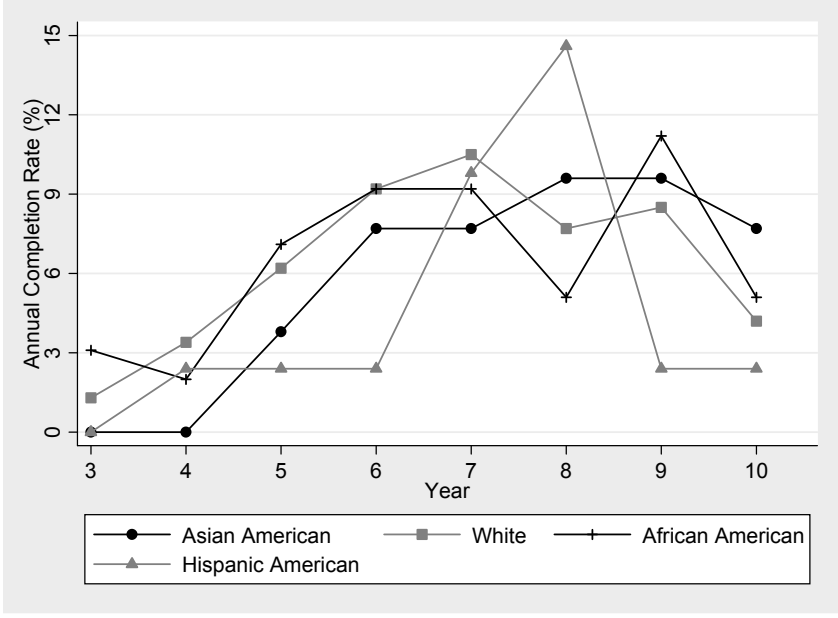


Figure G.11 Cumulative Ph.D. Completion Rates by Broad Field for Asian American Students

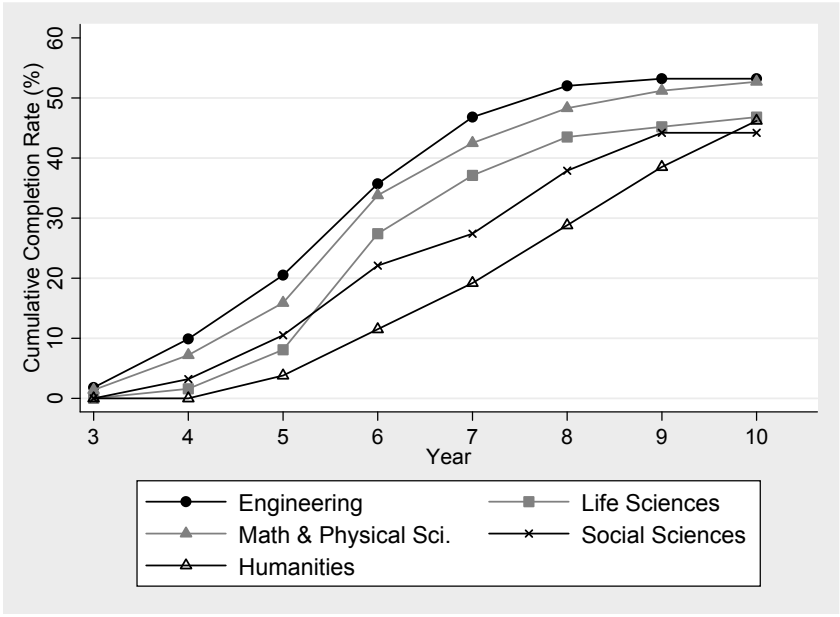


Figure G.12 Cumulative Ph.D. Completion Rates by Broad Field for White Students

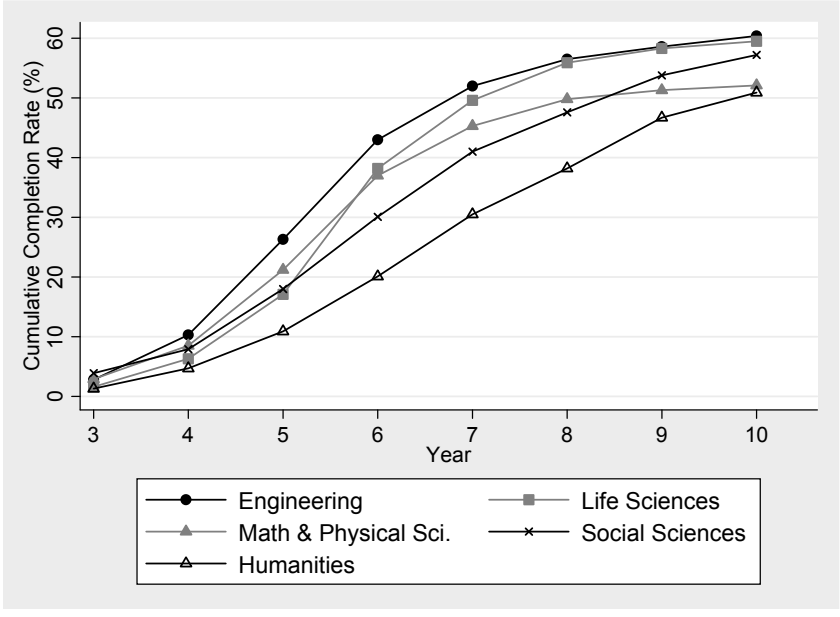


Figure G.13 Cumulative Ph.D. Completion Rates by Broad Field for African American Students

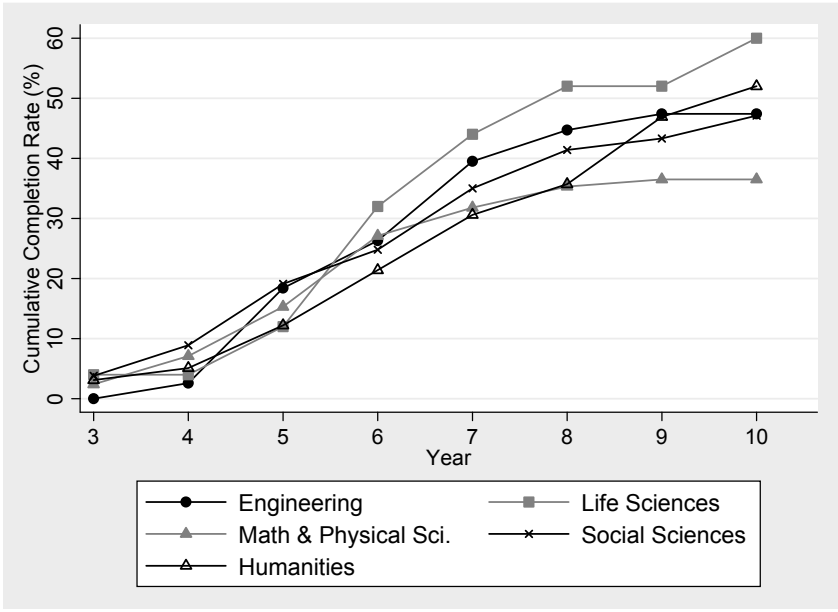
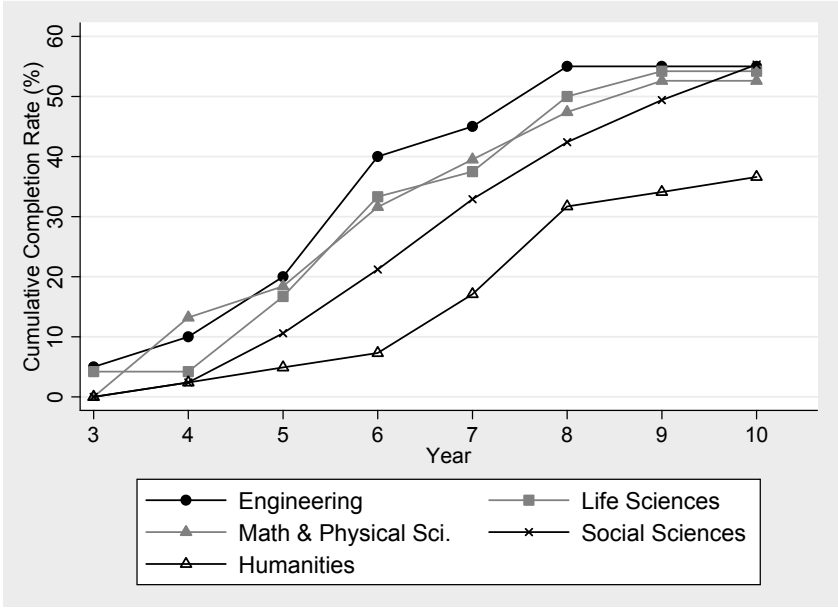


Figure G.14 Cumulative Ph.D. Completion Rates by Broad Field for Hispanic American Students



APPENDIX H
Completion Tables

Table H.1 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	6,242	3	10	24	39	48	53	57	58
Female	3,441	2	6	16	30	41	47	52	55
Total Gender	**9,683**	**3**	**9**	**21**	**36**	**45**	**51**	**55**	**57**
African American	403	3	7	16	25	34	40	44	47
Asian American	587	1	6	15	30	39	46	49	50
Hispanic American	208	1	5	13	24	33	43	48	51
White	5,438	3	8	18	33	43	49	53	55
Other	300	1	3	12	27	35	44	46	49
Total Race/Ethnicity	**6,936**	**2**	**7**	**18**	**32**	**41**	**47**	**51**	**54**
International	2,433	5	14	33	49	59	64	66	67
Total Citizenship and Race/Ethnicity	**9,369**	**3**	**9**	**22**	**36**	**46**	**52**	**55**	**57**

Table H.2 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs in SEM Fields from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	4,459	4	12	28	45	54	58	61	62
Female	1,558	2	7	19	38	48	52	53	54
Total Gender	**6,017**	**3**	**11**	**26**	**43**	**52**	**57**	**59**	**60**
African American	148	2	5	16	28	36	41	42	43
Asian American	440	1	8	17	34	43	49	51	52
Hispanic American	82	2	10	18	34	40	50	54	54
White	3,010	3	8	21. 5	39	48	53	55	56
Other	211	1	4	14	32	40	46	46	48
Total Race/Ethnicity	**3,891**	**2**	**8**	**20**	**37**	**46**	**51**	**53**	**54**
International	2,041	5	15	36	53	62	66	68	68
Total Citizenship and Race/Ethnicity	**5,932**	**3**	**11**	**26**	**43**	**52**	**56**	**58**	**59**

Table H.3 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs in SSH Fields from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	1,783	3	7	15	24	34	40	47	50
Female	1,883	2	5	13	24	35	43	50	55
Total Gender	**3,666**	**3**	**6**	**14**	**24**	**35**	**42**	**49**	**52**
African American	255	4	8	17	24	33	39	45	49
Asian American	147	0	2	8	18	25	35	42	45
Hispanic American	126	0	2	9	17	28	39	44	49
White	2,428	3	6	15	25	36	43	50	54
Other	89	1	1	8	15	21	39	45	52
Total Race/Ethnicity	**3,045**	**3**	**6**	**14**	**24**	**35**	**42**	**49**	**53**
International	392	4	8	18	29	45	52	56	60
Total Citizenship and Race/Ethnicity	**3,437**	**3**	**6**	**14**	**25**	**36**	**43**	**50**	**54**

Table H.4 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs in Engineering from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	1,606	5	16	34	49	57	61	63	65
Female	277	2	10	26	41	51	55	56	56
Total Gender	**1,883**	**5**	**15**	**33**	**48**	**56**	**60**	**62**	**63**
African American	38	0	3	18	26	40	45	47	47
Asian American	171	2	10	21	36	47	52	53	53
Hispanic American	20	5	10	20	40	45	55	55	55
White	710	3	10	26	43	52	57	59	60
Other	41	2	10	17	32	39	42	42	42
Total Race/Ethnicity	**980**	**3**	**10**	**25**	**41**	**50**	**55**	**56**	**58**
International	888	7	21	42	56	63	67	69	70
Total Citizenship and Race/Ethnicity	**1,868**	**5**	**14,9**	**33**	**48**	**56**	**61**	**62**	**63**

Table H.5 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs in Life Sciences from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	602	2	8	23	43	53	60	62	64
Female	489	1	6	16	37	48	54	55	56
Total Gender	**1,091**	**2**	**7**	**20**	**40**	**51**	**57**	**59**	**60**
African American	25	4	4	12	32	44	52	52	60
Asian American	62	0	2	8	27	37	44	45	47
Hispanic American	24	4	4	17	33	38	50	54	54
White	671	2	6	17	38	50	56	58	60
Other	29	0	3	21	41	45	45	45	52
Total Race/Ethnicity	**811**	**2**	**6**	**16**	**37**	**48**	**54**	**57**	**58**
International	212	2	9	27	46	58	62	65	66
Total Citizenship and Race/Ethnicity	**1,023**	**2**	**6**	**19**	**39**	**50**	**56**	**58**	**60**

Table H.6 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs in Mathematics & Physical Sciences from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	2,251	3	10	25	42	51	56	58	59
Female	792	2	8	19	36	46	50	51	52
Total Gender	**3,043**	**3**	**9**	**24**	**41**	**50**	**55**	**56**	**57**
African American	85	2	7	15	27	32	35	37	37
Asian American	207	1	7	16	34	43	48	51	53
Hispanic American	38	0	13	18	32	40	47	53	53
White	1,629	3	9	21	37	45	50	51	52
Other	141	0	2	12	30	40	48	48	49
Total Race/Ethnicity	**2,100**	**3**	**8**	**20**	**36**	**44**	**49**	**51**	**51**
International	941	4	12	32	51	62	65	67	68
Total Citizenship and Race/Ethnicity	**3,041**	**3**	**9**	**24**	**40**	**50**	**54**	**56**	**56**

Table H.7 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs in Social Sciences from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	914	4	9	19	29	39	45	50	53
Female	1,101	3	6	16	28	40	47	53	57
Total Gender	**2,015**	**3**	**7**	**17**	**28**	**40**	**46**	**52**	**55**
African American	157	4	9	19	25	35	41	43	47
Asian American	95	0	3	11	22	27	38	44	44
Hispanic American	85	0	2	11	21	33	42	49	55
White	1,272	4	8	18	30	41	48	54	57
Other	46	0	0	7	15	28	48	57	61
Total Race/Ethnicity	**1,655**	**3**	**7**	**17**	**28**	**39**	**46**	**52**	**56**
International	278	3	9	20	33	49	56	59	63
Total Citizenship and Race/Ethnicity	**1,933**	**3**	**8**	**17**	**29**	**40**	**48**	**53**	**57**

Table H.8 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs in Humanities from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	869	2	5	12	20	29	35	43	47
Female	782	2	4	9	18	29	37	46	52
Total Gender	**1,651**	**2**	**5**	**10**	**19**	**29**	**36**	**44**	**49**
African American	98	3	5	12	21	31	36	47	52
Asian American	52	0	0	4	12	19	29	39	46
Hispanic American	41	0	2	5	7	17	32	34	37
White	1,156	1	5	11	20	31	38	47	51
Other	43	2	2	9	14	14	30	33	42
Total Race/Ethnicity	**1,390**	**1**	**4**	**11**	**19**	**29**	**37**	**46**	**50**
International	114	4	5	11	20	36	41	47	52
Total Citizenship and Race/Ethnicity	**1,504**	**2**	**5**	**11**	**19**	**30**	**38**	**46**	**50**

Table H.9 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs in Private Institutions from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	1,785	2	10	26	41	50	55	59	60
Female	985	1	4	14	32	43	48	53	57
Total Gender	**2,770**	**2**	**8**	**22**	**38**	**47**	**53**	**56**	**59**
African American	190	3	9	20	28	36	41	45	50
Asian American	123	1	11	24	42	52	57	61	61
Hispanic American	49	2	12	20	31	41	49	55	57
White	1,410	1	5	17	34	46	52	56	58
Other	71	0	0	9	27	34	48	56	59
Total Race/Ethnicity	**1,843**	**1**	**6**	**17**	**34**	**45**	**51**	**55**	**58**
International	827	3	12	35	51	58	62	64	66
Total Citizenship and Race/Ethnicity	**2,670**	**2**	**8**	**23**	**39**	**49**	**54**	**58**	**60**

Table H.10 Cumulative Ph.D. Completion Rates for Students Entering Doctoral Programs at Public Institutions from 1992-93 through 1994-95

Demographic Category	Entering Students	Cumulative Completion Rate by Year (%)							
		<=3	4	5	6	7	8	9	10
Male	4,457	4	11	24	38	47	53	56	58
Female	2,456	3	7	17	29	40	47	51	54
Total Gender	**6,913**	**3**	**9**	**21**	**35**	**45**	**51**	**54**	**56**
African American	213	3	5	13	22	32	39	42	44
Asian American	464	1	5	12	27	35	43	46	47
Hispanic American	159	1	3	10	21	30	42	46	49
White	4,028	3	8	19	32	42	47	52	54
Other	229	1	4	14	27	35	43	43	46
Total Race/Ethnicity	**5,093**	**3**	**8**	**18**	**31**	**40**	**46**	**50**	**52**
International	1,606	5	15	32	48	60	64	67	68
Total Citizenship and Race/Ethnicity	**6,699**	**4**	**9**	**21**	**35**	**45**	**51**	**54**	**56**

Table H.11 Cumulative Seven-Year Ph.D. Completion Rates for Students Entering Doctoral Programs from 1992-93 through 1994-95 (A-Cohorts) versus 1995-96 through 1997-98 (B-Cohorts)

Demographic Category	A-Cohorts		B-Cohorts	
	Entering Students	Completion Rate (%)	Entering Students	Completion Rate (%)
Male	6,242	48	5,966	49
Female	3,441	41	3,430	43
Total Gender	**9,683**	**45**	**9,396**	**47**
African American	403	34	392	35
Asian American	587	39	468	40
Hispanic American	208	33	273	34
White	5,438	43	4,782	46
Other	300	35	341	41
Total Race/Ethnicity	**6,936**	**41**	**6,256**	**44**
International	2,433	59	2,813	55
Total Citizenship and Race/Ethnicity	**9,369**	**46**	**9,069**	**47**

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ISBN: 1-933042-18-4