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DISCIPLINES AND DOCTORATES: The Relationships Between Program Characteristics and the Duration of Doctoral Study

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The departmental characteristics associated with the average duration of doctoral study were studied in a national data set collected by the National Research Council. The biological, mathematical and physical sciences, and engineering had relatively short medians and narrow ranges across departments, and the humanities had larger medians and wider ranges. The pattern of results associated with the duration of doctoral study suggested the importance of departmental emphases on scholarly careers and the resources to implement those emphases. The patterns of results varied by general area, and by specific discipline, suggesting the need for detailed analysis within disciplines.

The number of years taken by graduate students to obtain their doctorates has been a perennial concern of faculty, administrators, and "manpower" experts (e.g. Berelson, 1960; Griggs, 1965; Harmon and Soldy, 1963; Hauptman, 1986; Smith, 1985). Recently, the National Research Council (1989) reported that there is new cause for concern in the fact that the median time elapsed between the bachelor's degree and doctorate rose from 8.7 years in 1977 to 10.4 years in 1987. In the same period, the time spent *enrolled* as a graduate student rose from 6.1 to 6.9 years. As Evangelauf (1989) reports, the lengthening of doctoral studies concern campus officials because it "can deter undergraduates from considering doctoral study, can demoralize those already enrolled in graduate school, and represents an inefficient use of campus resources."

Because of these concerns, researchers and commentators on graduate education have periodically analyzed the causes of the duration of doctoral study. Some thirty years ago Berelson (1960) examined the reasons behind duration and found that a third of the recent recipients of doctorates and

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graduate faculty and 40% of the graduate deans agreed that "Major professors often exploit doctoral candidates by keeping them as research assistants too long, by subordinating their interest to departmental or the professor's interest in research programs, etc." About a third of the recent recipients also believed that "Doctoral candidates get too little direct attention, supervision, and guidance on their dissertations from their major professors, and that makes for unnecessary prolonging of the period of doctoral study." However, the major reason given for delays by the recent recipients was the lack of support. Berelson commented:

> Doctoral candidates who must support themselves—and as often as not these days, support a family as well—cannot complete the requirements in one period of uninterrupted work and have to do the best they can while serving as a teaching assistant, research assistant, tutor, and after the comprehensive examination, a full-time teacher. The more support a field has, in the form of fellowships or research assistantships that contribute to the dissertation, the faster its students complete their degrees.

Interestingly, when recent recipients were asked why some students drop out of graduate school, they tended to emphasize proper motivation and physical and emotional stamina.

Probably the most thorough study of the duration of doctoral study was that of Wilson (1965) who found, along with the usual disciplinary differences (mathematical and physical sciences relatively short duration, humanities relatively long), that students who held jobs outside the university, studied part-time, and switched major fields tended to take longer to obtain their degrees. About 20 years ago Heiss (1970) found that graduate students believed that the stress of passing hurdles and the faculty's lack of interest in students were key factors leading students to consider dropping out of their Ph.D. programs, and recommended more systematically thorough orientation programs, both formal and informal. Although Heiss did not ask directly about the reasons for the duration of doctoral study, these factors probably pay a role.

Likewise, while Brenneman (1975) did not deal directly with the duration of doctoral study, his comprehensive analysis of the effects of contracting levels of support for graduate schools and their students suggested that it was becoming more difficult for a student to make an expeditious path through graduate school. Solmon (1976), at about the same time, found that the duration of doctoral study was longer for students attending private universities and larger universities, and shorter for students attending institutions that awarded more aid per student. He also reviewed some other research that suggested that retention was related to the availability and amount of financial aid. Snyder (1985), in his chapter in a volume titled *The State of Graduate Education,* reported that the median registered time to the doctorate had risen from 5.7 years in 1973 to 6.2 years in 1983. Snyder also reported that in 1983,

engineering students completed their degrees in 5.6 years, physical and environmental sciences students in 5.8 years, biological sciences students in 6.1 years, mathematical sciences students in 6.2 years, and social and psychological sciences students in 6.9 years. In addition, students in the highest rated tenth of departments averaged about half a year faster than students in the lowest half of departments.

Most recently, Tuchman, Coyle, and Bae (1989) reported similar differences among fields with an even higher median registered time to doctorate of 7.0 years in 1987. Tuchman and colleagues found similar differences among disciplines. Interestingly, they also found that the time between the bachelors and entry to graduate school had *declined,* as had the time spent not enrolled. Thus, the main reason for the increase in the duration of doctoral study was due to increases in time registered at the university. Similar results have been found by other researchers using smaller samples. However, with the exception of Solmon, none of these studies have examined *program* characteristics that are associated with the duration of study—characteristics that can potentially be modified by academic actions to shorten students' time in graduate school.

The research question is whether there are program characteristics that contribute to the duration of doctoral study, and whether those characteristics are different for different disciplines. For example, one might conjecture that small departments, with the closer attention to individual students they may allow, would have shorter times to the doctorate. Obviously, programs rated by their disciplinary peers as effective would be expected to be more efficient in the rapid production of Ph.D.'s. Departments with more research funding, because of their greater capacity to support students through graduate research assistantships, might be hypothesized to have shorter times to the doctorate.

The study reported here used a broad data set, an *Assessment of Research-Doctorate Programs in the United States* (Jones, Lindsey, and Coggeshell, 1982) to attempt to address this question. This data set has the advantage of including information about most arts and science and engineering disciplines, and is based on virtually all doctoral-granting institutions within disciplines. Thus it is a very useful data set for conducting analyses comparing disciplines. The data include a measure of the median number of years between the program's graduates' first enrollment to receipt of the doctorate based on data collected over a five-year period. This variable was coded so that a *shorter* time to Ph.D. was assigned a higher score and thus might be called "efficiency" of doctoral production. The data also include measures of variables that may affect the duration of doctoral education as well as measures suggestive of the outcomes of the programs for students.

METHOD

The data come from the study sponsored by the Conference Board of Associated Research Councils, including the American Council of Learned Societies, American Council on Education, National Research Council, and the Social Science Research Council. The data were based on surveys sent to each institution, the National Research Council's Survey of Earned Doctorates, reputational surveys of faculty, data from the Association of Research Libraries, and publication information compiled by the Institute for Scientific Information. The survey and data compilation methods are described in detail in Jones, Lindsey, and Coggeshell (1982). The data were compiled for research-doctorate programs in 32 disciplines from 228 universities. The variables studied included the following.

Available for All Disciplines

Program Size (based on surveys of institutions)

1. Reported number of faculty members in the program, December 1980.
2. Reported number of program graduates in the last five years (July 1975 through June 1980).
3. Reported total number of full-time and part-time graduate students enrolled in the program who intend to earn doctorates, December 1980.

Characteristics of Graduates (based on NRC's survey of earned doctorates)

4. Fractions of federal year 1975–79 program graduates who had received some national fellowship or training grant support during their graduate education.
5. Median number of years from first enrollment in graduate school to receipt of the doctorate—federal year 1975–79 program graduates.
6. Fraction of federal year 1975–79 program graduates who at the time they completed requirements for the doctorate reported that they had made definite commitments for postgraduate employment.
7. Fraction of federal year 1975–79 program graduates who at the time they completed requirements for the doctorate reported that they had made definite commitments for postgraduation employment in Ph.D.-granting universities.

Reputational Survey Results (based on surveys of faculty, questions virtually identical to those used by Roose and Andersen [1970]).

8. Mean rating of the scholarly quality of program faculty.
9. Mean rating of the effectiveness of the program in educating research scholar/scientists.
10. Mean rating of the improvement in program quality in the last five years.
11. Mean rating of the evaluators' familiarity with the work of the program's faculty.

University Library Size (based on data from the Association of Research Libraries)

12. Composite index describing the library size in the university in which the program is located, 1979–80.

Available for All Disciplines Except Humanities

Research Support (based on institutional surveys)

13. Fraction of program faculty members holding research grants from the National Science Foundation, National Institutes of Health, or the Alcohol, Drug Abuse, and Mental Health Administration at any time during the federal year 1975–79.
14. Total expenditures (in thousands of dollars) reported by the university for research and development activities in a specific field, federal year 1979.

Publication Record (based on data from the Institute for Scientific Information)

15. Number of published articles attributed to the program 1978–79 (in the case of social sciences, 1978–80.)

Available for Engineering, Biological Sciences, and Mathematical and Physical Sciences

16. Estimated "overall influence" of published articles attributed to the program, 1978–79, based on weightings of journals according to the citation rate.

These measures were tabulated and standardized for programs in disciplines in five areas: biological sciences, engineering, humanities, mathematical and physical sciences, and social and behavioral sciences. The unstandardized and standardized data for each department in each discipline are presented in Jones, Lindsey, and Coggeshell (1982), along with a correlation table of the

intercorrelations of the variables for each discipline. Extensive details about each of these measures are provided in Jones, Lindsey, and Coggeshell.

It should be noted that there is a considerable degree of collinearity in the matrices in many disciplines. For example, and for obvious reasons, the correlations among the three size measures tend to be high; the correlations among the reputational ratings also tend to be high; and the correlations between university expenditures in the discipline were indirectly correlated with library size.

STATISTICAL TREATMENT

Using the discipline as the unit of analysis, the mean and range of publications as well as the correlations were tabulated, using techniques of exploratory data analysis (Hoaglin, Mosteller, and Tukey, 1983). This analysis provided information about the median correlation and also explored systematic differences among the correlations among the disciplines. In addition, regression analyses were conducted for each discipline, using time to the doctorate as the dependent variable.

RESULTS

As is shown in Table 1 the variation in disciplines found in other studies was also found here, with the biological sciences having relatively low averages of years to doctorate, closely followed by engineering, and the mathematical and physical sciences. The humanities had the highest averages. The "fastest" fields were chemistry (5.9 years), chemical engineering (5.9), and biochemistry (6.0). The "slowest" were music (10.0), art history (9.3), French (9.2), and history (9.2). Disciplines also varied in the *range* of departmental averages. Looking at the difference between the fastest 10% and the slowest 10% of departments in each discipline revealed a relatively narrow range in the biological sciences and the mathematical and physical sciences, and a relatively wide range in the humanities. The disciplines with the narrowest range were cellular and molecular biology (1.6 years), biochemistry (1.7), microbiology (1.7), and chemistry (1.7). The disciplines with the widest range were music (5.5), classics (4.9), French (4.4), and German (4.3).

The reasons for the range of averages are not immediately clear. A close examination of the data suggest that in *many* disciplines students in one department took 4 or more years longer than students in another. For example, in German, students at Minnesota averaged 11.8 years, students at Vanderbilt 7.0 years. In sociology, students at Columbia averaged 10.4 years, students at

TABLE 1. Variation in Time to Doctorate Within Disciplines

Discipline	Mean	Slowest Tenth	Fastest Tenth	Range Slowest–Fastest
Biochemistry	6.0	6.9	5.2	1.7
Botany	6.5	7.5	5.5	2.0
Cellular/Mol. Biology	6.1	7.0	5.4	1.6
Microbiology	6.1	7.0	5.3	1.7
Physiology	6.2	7.2	5.2	2.0
Zoology	7.1	8.3	6.0	2.3
Chemical Engineering	5.9	7.2	5.0	2.2
Civil Engineering	6.9	8.8	5.7	3.1
Electrical Engineering	6.7	8.5	5.3	3.2
Mechanical Engineering	7.0	8.6	5.5	3.1
Chemistry	5.9	6.8	5.1	1.7
Computer Science	6.5	8.0	5.3	2.7
Geosciences	7.0	8.3	5.9	2.4
Mathematics	6.6	8.0	5.3	2.7
Physics	7.1	8.8	5.9	2.9
Statistics	6.7	8.2	5.5	2.7
Anthropology	8.3	9.7	6.9	2.8
Economics	7.3	9.1	5.8	3.3
Geography	8.7	11.0	7.0	4.0
History	9.2	11.3	7.5	3.8
Political Science	8.3	10.2	6.5	3.7
Psychology	6.2	7.4	5.3	2.1
Sociology	8.2	10.3	6.5	3.8
Art History	9.3	10.9	8.0	2.9
Classics	7.7	10.9	6.0	4.9
English	9.1	11.1	7.3	3.8
French	9.2	11.5	7.1	4.4
German	8.9	11.3	7.0	4.3
Linguistics	7.9	9.5	6.1	3.4
Music	10.0	12.8	7.3	5.5
Philosophy	7.9	10.0	6.2	3.8
Spanish	9.0	11.0	7.0	4.0

Duke 6.3 years. In physics, students at American University averaged 9.8 years, students at Kansas State 5.3 years.

The departmental characteristics associated with the duration of doctoral study across disciplines are shown in Table 2. In these tables, B indicates a biological science (biochemistry, botany, cellular or molecular biology, microbiology, physiology, or zoology); E indicates an engineering discipline

TABLE 2. Distribution of Correlations Between Program "Efficiency" in Doctoral Production and Other Variables

	Number of Faculty	Number of Graduates	Number of Students	% Students Natl. Fellowships	% Grads. Commitment Empl.	% Grads. Commitment Ph.D. Univ.
96–100						
91–95						
86–90						
81–85						
76–80						
71–75						
66–70				H		
61–65						S
56–60						
51–55					H M	
46–50						B H H H M
41–45					B	B M M S
36–40		M	E	S		B
31–35	B	E M M	M S	S	B M S	B H H S S S S
26–30		M S	B M	B H H	B S	E M M
21–25	M M	B H	M	E H M S	B E	B B E H H S
16–20	E S S S	B B E E E S S	B E H M	E H H	B B E M S	H
11–15	M	H		B B M M M	H M M	
06–10	E E E H H M	H S S	B E H	B H S S	H M S	E
00–05	B B H S	B B H M S	B B S	B E M S	B S	E H
−01–05	H M	H H	E H H M M	H H	H	
−06–10	B H M S S	M	B B E H S S	B S	H	
−11–15	B	B S	H S	E M	S	
−16–20	B S		H		H	
−21–25	H	H (Art H)			E H S	
−26–30	H H	H (Span)			E M	
−31–35		H (Ling)	H (Ling)			
−36–40	H (Span)					
			−43 S			
			−58 H (Sp)			

TABLE 2. ***(Continued)***

	Ratings of Faculty	Ratings of Program Effectiveness	Ratings of Improvement	Rater Familiarity	Library Size	% Faculty Fed. Res. Grants
96–100						
91–95						
86–90						
81–85						
76–80						
71–75						
66–70						
61–65						
56–60	M	M				
51–55		M		M		
46–50	H M M	M		H H M		
41–45	E M	B E H M S		E M	B	S
36–40	B B E H H S	B H H H	S	B H M	B	B M M M S
31–35	H M S	E S S	B	B E H M S	H	E
26–30	B S	E H M		H H S S	H M	B M S
21–25	E E H H H	B B G H S	B E E H H M S	B E E H S S	E M M M	E E M
16–20	H H S S	H H M S S	B B	B H	H H H M	B S S
11–15	B M S	B H S	H H M S	B H S S	B S	B E M
06–10	B S		H S	M	S S S	S
00–05			B M S S		B H	B
−01–05			E H		B E E S S	
−06–10			E M S		E S	
−11–15	B (Phys)		B H		B H	
−16–20		B (Phys)	H	B (Phys)	M	B (Phys)
−21–25						
−26–30					H (Clas) H (Ling)	

(Continued)

TABLE 2. ***(Continued)***

	Univ. Funds Res. in Disc.	Number of Publications	"Influence" of Publications
96–100			
91–95			
86–90			
81–85			
76–80			
71–75			
66–50			
61–65			
56–60			
51–55			
46–50			
41–45			M
36–40		M M M S	M M M
31–35	M M	S	M
26–30		M M B E	B E
21–25	B S	E S	
16–20	E M	B	B B
11–15	B E	S B	B E
06–10	B S	E S S	E
00–05	B B E S	B B E	
−01–05	E M	S	B E M
−06–10		M (Comp Sci)	
−11–15	S	B (Phys)	B (Phys)
−16–20	B		
−21–25	M (Comp Sci)		
−26–30			
−31–35			
−36–40			

Note: See text for explanation.

(chemical engineering, civil engineering, electrical engineering, or mechanical engineering); H indicates one of the humanities (art history, classics, English, French, German, linguistics, music, philosophy, or Spanish); P indicates a physical or mathematical science (chemistry, computer science, geosciences, mathematics, physics, or statistics); and S indicates a social or behavioral science (anthropology, economics, geography, history, political science, psychology, or sociology). Each letter indicates the correlation for the discipline. For example, the first B in the table of results for the correlation between duration of doctoral study and the number of departmental faculty, in this case zoology, was between .31 and .35.

Simple size of program did not seem especially related to the length of study; the median correlations across all disciplines were .03 with number of faculty, .10 with number of graduates, and .00 with number of students. However, number of graduates was slightly related in the mathematics and physical sciences (median correlations of .27 and .20, respectively, and negatively in the humanities ($-.05$ and $-.04$). In the area of student characteristics, the fraction of students with some national fellowship was correlated .14, on the average, the percent of graduates with definite employment commitments .18, and the percent with commitments from Ph.D.-granting universities .33. The latter two were highest in the biological sciences (median correlations of .26 and .37, respectively). Employment commitments had the lowest correlations in the humanities ($-.10$) and commitments from Ph.D. universities had the lowest correlations in engineering (.16).

The reputational ratings of faculty scholarship were related to duration of doctoral study (.27) as were ratings of program effectiveness (.28) and the rater's familiarity with the program (.28). These ratings were especially related in the mathematical and physical sciences (.45, .45, and .40, respectively) and less related in the biological sciences (.20, .26, and .20).

The only "resource" that was consistently related to the length of doctoral study was the percentage of faculty holding federal grants (.22), especially in the mathematical and physical sciences (.33), but less so in the biological sciences (.15). Library size was correlated only .08 on the average with duration of study, although the relationship was stronger in the mathematical and physical sciences (.25) and humanities (.18) and weaker in engineering ($-.04$). Likewise, university expenditures for research in the discipline were correlated only .08 with duration, overall, with little variation across disciplines.

The number of publications attributed to departmental faculty was correlated .17 with the duration of doctoral study, and the citations to these publications were correlated .19. These figures were higher in the mathematical and physical sciences (.33 and .38, respectively) and lower in the biological sciences (.03 and .10).

Certain disciplines had unusual patterns of results. Physiology had unusually

high correlations with all the reputational ratings, the level of federal and university support for research, and the publication variables. Mathematics had a fairly similar pattern. Civil engineering, in contrast, had unusually low correlations with reputational ratings, the fraction of students with grants, and students' commitments from employers or Ph.D. universities. Linguistics had a relatively high correlation with commitments from employers, and low correlations with numbers of graduates, number of faculty, and library size.

The results for the multiple regression analyses are shown in Table 3. Overall, the multiple correlations were not high, with R^2 values ranging between .05 and .56, with a typical value of about .21. However, there were several results across disciplines worth noting. The most commonly appearing variables were the percentage of graduates with commitments from Ph.D.-granting universities and the rating of the quality of the program.

DISCUSSION

The differences in the mean duration of doctoral study across disciplines, taken with the differences in the range of means within disciplines, suggest a rough correspondence to the clarity of the central paradigms within disciplines and the degree of agreement about those paradigms. For example, chemistry and biochemistry probably have relatively clear and agreed upon bodies of knowledge and procedures; disciplines such as French literature and art history may thrive on differences in definitions of content and interpretation. These represent differences between what have been called *problem-solving* disciplines and *problem-finding* disciplines. It seems plausible that the greater the diversity and reliance on interpretation and problem finding, the more time will be required for students to comprehend and demonstrate mastery of a discipline.

An alternate interpretation, based on demographics, would suggest that the differences among disciplines in time to degree are due to the percentage of women in the disciplines. Since women are more likely to interrupt their graduate studies, this difference might account for differences in duration (Centra, 1974; Solmon, 1976). In addition, some disciplines attract older students than others. Since older students tend to have more life responsibilities than younger students, those disciplines with more older students should have longer average times to degree. Another explanation is that the "faster" disciplines have more assistantships and research opportunities, accounting for differences in duration.

Another possible demographic reason for differences among and within disciplines is shifts in student talent. Although the evidence for a "brain drain" from some disciplines to others is mixed (Hartnett, 1987), some test data suggest that the talent pool in certain disciplines has declined in quality

TABLE 3. Results of Multiple Regression Analyses with Time to Doctorate as the Dependent Variable

	Biochemistry	Botany	Cell./Mol. Biol.	Microbiology	Physiology	Zoology	Chemical Eng.	Civil Eng.	Electrical Eng.	Mechanical Eng.	Chemistry	Computer Sci.	Geoscience	Mathematics	Physics	Statistics	Anthropology	Economics	Geography	History	Political Sci.	Psychology	Sociology
1. Number of Faculty					.54	.34				−.31							.25	.16					
2. Number of Graduates			−.25																				
3. Number of Students																		−.11					−.42
4. % Students Nat. Fel.					.53											.23				.27			
5. % Grads. Comt. Empl.						.23							.51										
6. % Grads. Com. Ph.D. U.	.31		.51	.44					.23		.15	.52	.20			.47		.62		.25		.42	.25
7. Ratings of Faculty																							
8. Ratings of Programs	.26	.17	.59				.22		.32		.43			.52	.58								.33
9. Ratings of Improvt.			.28																		.18		
10. Rater Familiarity					−.59		.20							.06					.19				
11. Library Size			.34					.30		−.38		−.52											
12. % Fac. Fed. Grants								.24				.42							.42				
13. Univ. Funds. Res.																							
14. Number Publications		−.19									.16												
R^2	.12	.12	.56	.18	.26	.17	.21	.13	.15	.35	.24	.44	.26	.32	.20	.26	.08	.41	.23	.20	.05	.14	.28

(Adelman, 1985). Likewise, one possible explanation for differences within disciplines may be the different academic ability of students in different departments. Unfortunately, there is no way to test these interpretations in the data set used in this study.

All these interpretations are possible, especially since the criterion used in this study, date of entry to date of degree, includes the time students were not enrolled, or were "enrolled," but were not actively pursuing their degrees. However, this measure seems quite serviceable as an indicator of the total years of students' lives spent pursuing their doctorates, as comparative data about departments *within* disciplines.

When we turn to the overall correlates of the duration of doctoral study, the results suggest that departments' emphasis on careers in academe and research play a significant role. That is, the interpretation of the correlation between duration and the fraction of graduates with commitments from Ph.D. universities, as at least partly due to departments' emphases on scholarly careers, is consistent with a similar interpretation of the correlations with the number of faculty publications and the number of citations. Since reputational ratings of faculty quality, program effectiveness, and familiarity are probably largely dependent on the scholarly emphasis of the department, the correlations of these variables with the duration of doctoral study is also consistent with this interpretation. Finally, duration of study is related to having either the personal financial resources to pursue doctoral study, as suggested by the correlation with the fraction of students with national fellowships, or having the departmental research funds that would help students complete their dissertation research, as suggested by the correlation with the fraction of faculty with federal research grants. Thus, the emphasis on scholarship and the resources to pursue scholarly activities appear to play an important part in the duration of doctoral study across disciplines.

Perhaps one way to put the results of this study into context is to reinterpret them in light of the results of studies of individual student variables on duration as well as to examine some of the emerging thinking of graduate educators concerned with shortening the time to the doctorate (Nerad and Cerny, 1989; Duggan, 1989; Baird, in press) as two sets of advice to students and to departments. First, what studies suggest as advice to new or prospective graduate students who would like to keep their time in graduate school to a minimum would include the following:

Don't take a full time job;
Go to graduate school immediately after college;
Attend full time;
Enter the same discipline as your undergraduate major;
Attend the same institution as your undergraduate college;

If you can't get a fellowship, try to find a job as a research assistant;
Complete your required coursework and qualifying examinations as soon as possible;
Find a conscientious advisor;
And finally, if you must get married, for goodness sake, don't have children.

The summary advice to graduate departments and graduate faculty would include these recommendations:

Try to obtain funds from the university or as part of projects that will allow as many graduate students as possible to have assistantships;
Have a coherent, well-explained program;
Be sure that each student has an advisor very early in the program;
Be sure your faculty know the program and the graduate school's policies;
Reexamine your requirements to be sure they promote the scholarly progress of your students rather than serve as barriers;
Study the factors that seem to slow the progress or even lead to the withdrawal of students;
Be sure there are opportunities for informal interaction among students and between faculty and students.

In addition, this study also reveals some patterns that distinguish among disciplinary areas. An interesting contrast is between the mathematical and physical sciences, where the numbers of graduates and students, reputational ratings, research support, and publications were relatively important, and the biological sciences, where reputational ratings, resources, and publications were relatively unimportant, and the fraction of students with postgraduate commitments was relatively important. In addition, specific disciplines (e.g., linguistics, civil engineering, and physiology) have results that set them apart from other disciplines in their areas. The reasons for the pattern of results within each discipline or area need and deserve further research.

These results also suggest that the general strategy of examining departmental influences on the duration of doctoral study, as well as the characteristics of individual students, is worth pursing. That is, most previous studies of the duration of doctoral study have concentrated on the educational histories and personal situations of students. This study suggests that an equally plausible source of spurs and hindrances to the completion of doctoral study is to be found in departmental policies and practices.

In summary, consistent with many earlier studies, the mean time to doctorate varies greatly by discipline. However, this study reveals that this mean can vary greatly across departments within disciplines. The factors most strongly associated with the variation in the duration of doctoral study suggest the

importance of an emphasis on scholarship and the resources to implement that emphasis.

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