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AN ANALYSIS OF THE OBSTACLES PERCEIVED BY GRADUATE STUDENTS AS DELAYING THEIR PROGRESS TOWARD THE DOCTORATE

by
Paul Edward Darlington

A dissertation submitted in partial fulfillment
of the requirements for the degree of
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Doctoral Committee:

Professor James I. Doi, Chairman
Associate Dean Byron L. Groesbeck
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ABSTRACT

AN ANALYSIS OF THE OBSTACLES PERCEIVED BY GRADUATE STUDENTS AS DELAYING THEIR PROGRESS TOWARD THE DOCTORATE

by
Paul Edward Darlington

Chairman: James I. Doi

This study is concerned with the duration of doctoral study--presently eight years on the average from baccalaureate to doctorate--and the factors responsible for delaying the completion of the doctorate. Information on delaying factors or obstacles was obtained from a national sample of 3,380 graduate students at all stages of Ph.D. preparation. The students, drawn from 23 fields of study and 63 institutions, responded to an Office of Education questionnaire distributed in the spring of 1965. The questionnaire included an open-ended question concerning the obstacles that had delayed the progress of these students. Responses to the question were coded and the information was analyzed against the other demographic data provided.

The following classes of obstacles were reported by the percentages of the sample indicated: financial, 30.0%; academic requirements, 10.1%; institutional policies and procedures, 9.8%; institutional personnel, 5.1%; personal, 13.8%; other (external to the student and graduate school), 12.9%; stated no obstacle had delayed progress, 9.6%; not ascertained, 29.6%.

In the analyses that were undertaken reported obstacles were treated as dependent variables and approximately 25 student characteristics and conditions served as independent variables. Chi-square was used to test whether the relationships obtained between student characteristics and reported obstacles could be attributed to chance.

Some of the major findings were as follows: financial obstacles, which were clearly indicated in this study as the most significant delaying factor, were found to be statistically associated with the student's major source of income (i.e., students supported by scholarships and fellowships, teaching and research assistantships are far less likely to encounter financial obstacles than students supported by faculty appointments or other employment). Because certain fields, particularly in the physical and biological sciences, characteristically provide more support of the former type to students, field of study was also associated with the reporting of financial obstacles. In fact, it was concluded that for a variety of reasons a student's choice of field of study is the most important factor--even more than academic ability--in determining the rapidity with which he will complete the doctorate.

Financial obstacles were found to increase with age and with the addition of dependents but not with the addition of a spouse. They remain relatively level throughout successive academic stages and do not vary significantly according to the size, control (public vs. private), quality, or location of the institution.

Academic ability, measured in terms of undergraduate grade point average, was found to be the most important predictor of reported academic obstacles (of which the foreign language requirement was indicated most frequently). However, research assistants, a highly able group, reported academic obstacles more frequently than any other source of income group, presumably because they sought to combine a full-time academic load with heavy assistantship responsibilities.

The other classes of obstacles were found generally to increase in frequency with increasing student age and with the time the respondents had spent in graduate school. Interestingly enough, lack of personal attention by faculty and inadequate undergraduate preparation were found to be more serious obstacles in the physical and biological sciences than in other fields of study.

Growing out of the analyses were a number of recommendations concerning the means by which delays in doctorate completion might be reduced. It was concluded that a dual approach to the problem of duration of doctoral study is needed, combining some changes in the ways graduate students are supported with a tighter, more specific definition (both in substance and in time) of the requirements for the Ph.D. degree.

PREFACE

The initial investigation of the subject of this thesis was prompted by a conversation with Mr. Theodore H. Drews, Chief of the Higher Education Studies Branch of the Office of Education. Mr. Drews indicated that a survey conducted for his office had yielded data on the obstacles that delayed the progress of graduate students toward advanced degrees and that the data could be made available for analysis.

A review of the literature on the subject revealed that the average time elapsed between the baccalaureate and doctorate degrees was slightly over eight years. Clearly this protraction of doctoral preparation constituted a serious problem for higher education. Further, the dearth of studies on the causes of doctoral delay suggested that deeper and more comprehensive analyses would be required before an effective attack on the problem could be mounted. In the belief that the data obtained by the Office of Education could be used effectively in one such analysis, the present study was undertaken.

I am deeply indebted to Mr. Drews, Mr. J. Scott Hunter, and the staff of the Higher Education Studies Branch for providing me with the questionnaires and data employed in this study. In the coding and check-coding process I received invaluable assistance from Mrs. Joan M. Scheffler, Head of the Coding Section of the Institute for Social Research at The University of Michigan, and from Mr. D. Anthony Butterfield, Mr. Steven C. Iman, and Mrs. Sally B. Iman also of the Institute.

I should like to express my appreciation to the members of my dissertation committee for their patience, encouragement, and guidance. Particular thanks are due to my Chairman, Professor James I. Doi, for the role he played in the initiation and organization of this study and to Professor M. Clemens Johnson who provided invaluable assistance in the computer assisted analyses that were undertaken.

I am grateful beyond words to Mrs. Janet K. Bushouse who typed the dissertation and constructed the tables and graphs. The appearance of the dissertation attests to her typographic skill. For the past three years I have had the priviledge of working with Dr. A. Geoffrey Norman, Vice-President for Research at the University. His interest and support greatly facilitated the production of this work. Another great source of encouragement was, and has always been, my parents. To them I am eternally indebted on any number of counts.

And finally, I want to express my deepest thanks to my wife, Gretchen. During the time I was researching and writing this thesis, she was engaged in the preparation of a dissertation of her own. In spite of a very demanding schedule, she somehow found the time and energy to assist me at nearly every stage and to provide me with the inspiration and support that only a loved and loving one can. To her I dedicate this work.

To my wife, Gretchen

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CHAPTER I

INTRODUCTION

The Problem: Duration of Doctoral Study

Statistics on Duration: Past and Present

One of the most appalling statistics in all of higher education has to do with the time required for the average student to complete the doctoral degree after graduation from college. The most recent figures available indicate that for students who received their doctorates in 1966, the median baccalaureate-to-doctorate time lapse was 8.2 calendar years.[1]

The time required to complete the doctorate has continued to increase ever since data was first collected on the subject--at least until very recently. Berelson reports that a study of doctorates from 16 universities in the period 1883 to 1904 yielded a median B.A.-to-Ph.D. time of five years and a mean of about five and a half.[2] Figure 1 shows the changes in mean B.A.-to-Ph.D. time lapse in five broad areas of study during the period

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[1] National Academy of Sciences, Doctorate Recipients from United States Universities, 1958-1966 (Washington, D.C.: National Academy of Sciences, 1967), p. 41.

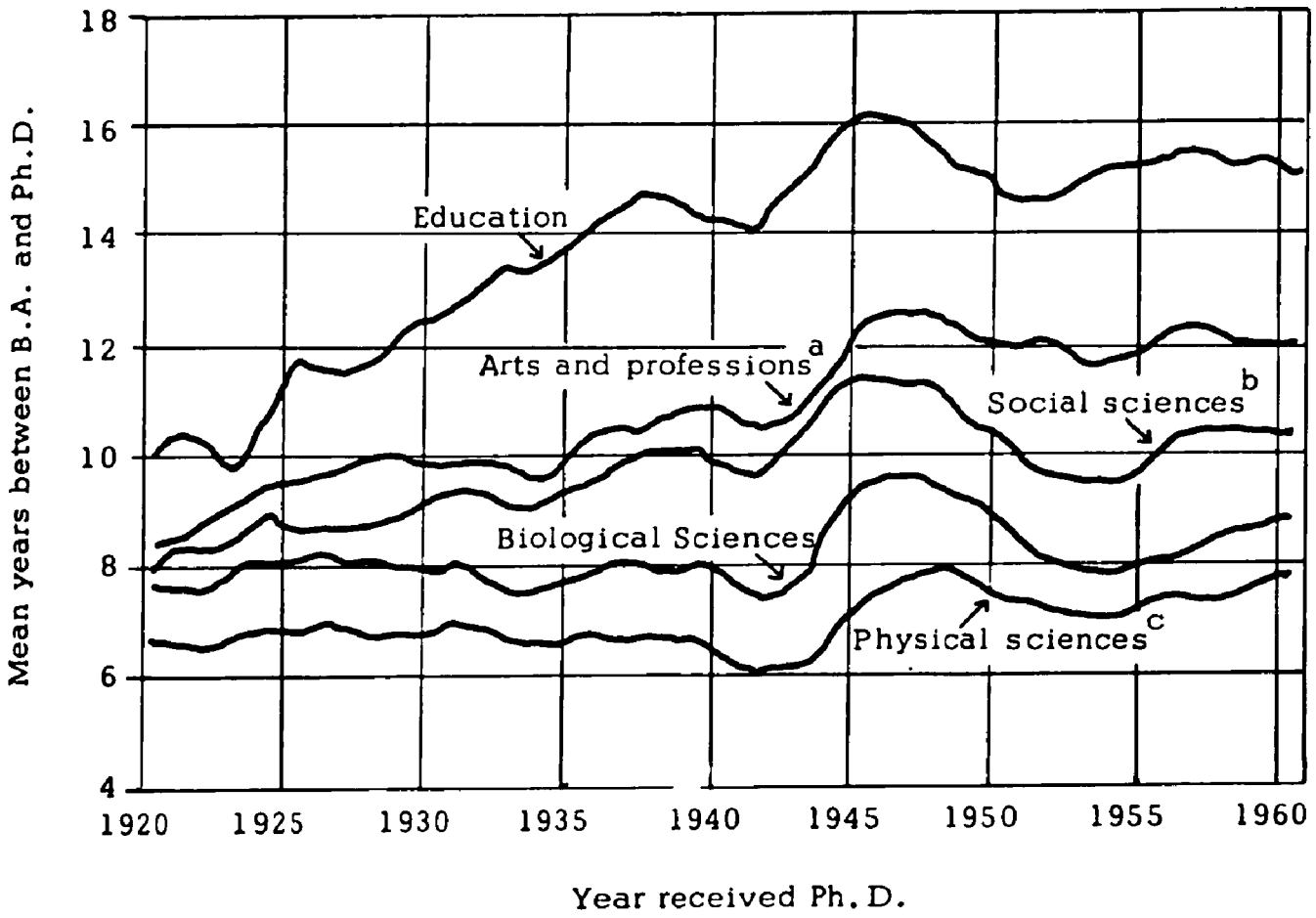
[2] Bernard Berelson, Graduate Education in the United States (New York: McGraw-Hill, 1960), p. 158.

from 1920 to 1960. It may be seen that there was an irregular but overall increase in the time lapse for each of the areas over that span of years. Most interesting, however, is the amplification through time of the differences among the several areas.

A closer look needs to be taken at the trends in baccalaureate-to-doctorate time lapse over the past decade. Although the data in Table 1.1 illustrate micro-trends only, they give some indication that recent efforts directed toward shortening the duration of doctoral study may be paying off. The median baccalaureate-to-doctorate time lapse for all areas of study combined appears to have reached its all-time high (excluding the war years) among the 1961-63 recipients of the doctorate. Since that time, the time lapse for most areas has decreased. And it may be significant that in every area in Table 1.1 the median time lapse was shorter among the 1964-66 recipients than among those who completed their degrees between 1958 and 1960.

It will be noted that in Table 1.1 and in most recent studies of doctoral duration, the median rather than the mean has been employed as the measure of time lapse. This is because in every field a few recipients take a very long time to complete their degrees. As a result, the time lapse curves are skewed in the direction of longer duration and the means are always greater than the medians. But the median is the more representative and, hence, more appropriate statistic for describing the length of doctoral study for a sample of students.

FIG. 1.1.--Mean B.A.-to-Ph.D. time lapse of doctorate recipients, 1920-1960; by broad area of study (two-year moving average)



[a]Comprises languages, fine and applied arts, philosophy, business administration, and religion.

[b]Includes psychology and history.

[c]Includes earth sciences and engineering.

Source: National Academy of Sciences--National Research Council, Doctorate Production in United States Universities, 1920-1962 (Washington, D.C.: National Academy of Sciences--National Research Council, 1963), p. 41.

TABLE 1.1.--Median baccalaureate-to-doctorate time lapse of doctorate recipients, 1958-1966; by broad areas of study

Broad areas of study	Median baccalaureate-to-doctorate time lapse (in years) of students who received doctorates in		
	1958-60	1961-63	1964-66
Physical sciences and engineering	6.6	6.6	6.3
(Engineering)	(7.2)	(7.0)	(6.9)
Biological sciences	7.7	7.8	7.3
Social sciences[a]	8.7	8.9	8.0
Humanities[b]	9.9	10.1	9.5
Professional fields[c]	11.3	10.8	10.8
Education	14.0	13.0	13.8
All areas	8.6	8.8	8.2

[a]Includes psychology.

[b]Comprises languages, fine and applied arts, philosophy, and history.

[c]Includes business administration and religion.

Source: National Academy of Sciences, 1967, op. cit.,pp 66-68.

Measures of Duration

However, some caution must be exercised in any statistical description of the duration of doctoral study because it can be measured and interpreted in at least four different ways:

1) the elapsed time (in calendar years) between the baccalaureate and the doctorate.
2) the elapsed time (in calendar years) from entry upon graduate study to receipt of the doctorate.
3) the total time (in years) the student was officially registered and working on his graduate program (no distinction is made in this measure between full-time and part-time study).
4) the number of full-time equivalent years required to complete the doctorate (i.e., the actual amount of time spent working on the degree itself).

These various measures of duration are summarized for the broad areas of study in Table 1.2. It should be noted that the NAS figures were derived from all persons who received a doctor's degree between 1964 and 1966. Berelson's data were obtained from a sample of 1957 doctorate recipients. However, because there have been only minor changes in elapsed time from baccalaureate to doctorate between 1957 and 1964-66, all the figures in Table 1.2 should be roughly comparable.

Table 1.2 shows that as the measure used to describe the length of doctoral study comes to reflect more accurately the actual time required for completion, the duration becomes correspondingly smaller. The compressing effect that the various measures of duration have is shown most strikingly in the case of education. Ranking dead last in terms of total elapsed time from baccalaureate to doctorate, education appears to

TABLE 1. 2.--Measures of duration of doctoral study, by broad areas of study

Broad areas of study	Measures of duration (in median years)			
	(1) Elapsed time from baccalaureate to doctorate	(2) Elapsed time from graduate school entry to doctorate	(3) Total registered time in graduate program	(4) Full-time-equivalent (FTE) years in graduate program
Physical sciences[a]	6.3	5.8	5.1	3.5
(Engineering)	(6.9)	(6.1)	(5.1)	(3.1)
Biological sciences	7.3	6.3	5.3	3.3
Social sciences	8.0	7.0	5.3	3.7
Humanities	9.5	8.4	5.7	3.3
Professional fields	10.8	9.2	6.0	2.9
Education	13.8	11.8	6.8	2.8
All areas	8.2	7.2	5.4	3.2

[a]Engineering is included in the Physical sciences in the NAS data.

Sources: Columns (1) and (3)--National Academy of Sciences, 1967, op. cit., pp. 69-70.
Column (2)--Ibid., p. 98 (only United States citizens were included in this tabulation).
Column (4)--Bernard Berelson, op. cit., p. 159.

require less full-time-equivalent degree work than any of the other areas. It will be noted that the FTE measure (Column 4) tends to equalize the duration of doctoral study for the several areas. In fact this measure shows that the actual time required by students of all areas to complete the doctorate is within the optimal range recommended by most writers on the subject.

Thus, as Kenneth Wilson has noted, the problem of "'duration' of doctoral study is not the amount of time students spend within the formal preparation system...but the amount of time spent outside the system."[1] And for the individual student concerned with attaining the doctorate, the first measure of duration--elapsed years between baccalaureate and doctorate--is the critical one. Encompassing delays encountered both within and without the system, it is the measure on which the attention of this study will be focused.

The Affected Parties

Doctoral study has been described as the "most protracted period of preparation in any profession."[2] It is the basic assumption of this study that such preparation should be completed as rapidly as possible.

---

[1] Kenneth M. Wilson, Of Time and the Doctorate (Atlanta, Georgia: Southern Regional Education Board), p. 161.

[2] George Stigler, quoted in Berelson, op. cit., p. 156.

Obviously if students are spending 8.2 years in a program that could be completed in slightly over three, the preparation is being considerably delayed. The fact that it is works to the disadvantage of the student himself, the institution responsible for his preparation, and the society that he ultimately serves.

The Student

The party most immediately affected by protraction of doctoral study is the student. Table 1.3 shows the age at receipt of the doctorate of students from the several broad areas of study who were awarded the degree in 1966. A caveat must be entered here regarding the interpretation of the differences that appear among the various areas. It is recognized that in some areas of study (viz., certain arts and humanities, professional, and education fields) students are encouraged to obtain professional experience

TABLE 1.3.--Age of students at receipt of doctorate, by broad areas of study

Broad areas of study	Age at doctorate (in years)		
	Q_1*	Q_2 (median)	Q_3
Physical sciences[a]	27.4	29.3	32.4
(Engineering)	(28.0)	(30.2)	(33.5)
Biological sciences	28.4	31.1	34.9
Social sciences	28.6	32.0	36.6
Humanities	29.7	33.6	38.3

TABLE 1.3.--Continued

Broad areas of study	Age at doctorate (in years)		
	Q_1*	Q_2 (median)	Q_3
Professional fields	30.8	34.5	39.2
Education	34.2	38.4	43.5
All areas (n = 17,865)	28.5	31.0	37.0

*Q_1 (first quartile): one quarter received the doctorate at this age or younger; Q_2 (second quartile): one half received the doctorate at this age or younger; Q_3 (third quartile): three fourths received the doctorate at this age or younger.

[a]Includes Engineering.

Source: National Academy of Science, 1967, op. cit., pp. 10-11.

either before or during their doctoral studies. How valuable or necessary this experience is, is a moot question. Nonetheless, it adds appreciably to the time required to obtain the doctorate and to the age of the student at receipt of the degree. Thus, the comments that follow may be regarded as applying--albeit in varying degrees--to all areas of study.

Span of productive life.--Why should it cause us concern that the median age of recent doctorate recipients is nearly 32 years and as high as 38 years in some fields? For several related reasons--the first of which has been defined by Leonard B. Beach in terms of the need to "lengthen the span of

the scholar's productive life."[1] Clearly the person who attains his doctorate at the age of 25 may look forward to a longer "productive life" of scholarship or practice than the person who receives his degree at 35 or 40. However, it has been argued, but seldom documented, that the student engaged in pursuit of the doctorate is as productive in the scholarly sense as he will be after the degree is completed. This may be so in some cases and, perhaps, more in some fields than in others. Yet consider the student whose energies and responsibilities are divided between productive scholarship on the one hand and coursework, foreign language requirements, preliminary examinations, and the whole raft of income-generating but non-scholarly activities in which so many students engage on the other. Can this student be expected to produce the same quality and quantity of work as the person who has completed his degree and thrusts himself wholeheartedly into the scholarly life? Probably not.

Most productive age.--The next consideration relates to the age at which scholars are most productive. Speaking of the careers of physical scientists, H. R. Snyder has said, "...science is for the most part a game for relatively young minds. By the time he reaches the age of fifty or so, even a pretty good scientist may find that he can make his maximum contribution by filling a vacancy in a dean's office rather than occupying a bench in a laboratory!"[2]

---

[1]Leonard B. Beach, "The Graduate Student," in Graduate Education Today, ed. by Everett Walters (Washington, D.C.: American Council on Education, 1965), p. 124.

[2]H. R. Snyder, a contributor to a panel discussion on "A Model Time Schedule for Completing the Ph.D.," in Proceedings of the Second Annual Meeting of the Council of Graduate Schools in the United States (Dallas, Texas: The Council, 1962), p. 43.

Several investigators have attempted to determine the period in a person's life span when the maximum or most significant scholarly and creative contributions are made. The two whose works are particularly relevant to the problem at hand are Sidney L. Pressey and Harvey C. Lehman. Both contend that the potential for individual creativeness is highest in the young adult years. Pressey bases his argument chiefly on data showing that the prime of life in terms of physical health, strength, vigor of interests, and general intellectual ability is reached on the average no later than 30.[1]

In a comprehensive study entitled Age and Achievement, Lehman attempted to show the ages at which the outstanding thinkers from over 50 fields of endeavor made (or first published) their momentous creative contributions and the ages at which leaders have most often attained important positions of leadership.[2] His study was based on assessments made by experts in each field of the major figures in the field and their most notable creative works. In each field listed--a selected sample of his total--the maximum average rate of highly superior production was found to occur not later than during the specified range of ages.

---

[1]Sidney L. Pressey, Educational Acceleration: Appraisals and Basic Problems (Columbus, Ohio: Bureau of Educational Research, Ohio State University, 1949).

[2]Harvey C. Lehman, Age and Achievement (Princeton, New Jersey: Princeton University Press, 1953).

Sciences	Arts and Humanities
1. Chemistry, 26-30	1. Instrumental Selections, 25-29
2. Mathematics, 30-34	2. Symphonies, 30-34
3. Physics, 30-34	3. Grand Opera, 35-39
4. Electronics, 30-34	4. Narrative Poetry, 25-29
5. Geology, 35-39	5. Short Stories, 30-34
6. Botany, 30-34	6. Tragedies, 34-38
7. Entomology, 30-39	7. Novels, 40-44
8. Physiology, 35-39	8. Oil Paintings, 32-36
9. Psychology, 30-39	9. Architecture, 40-44
10. Economics and Political Science, 30-39	10. Logic, Philosophy, 35-39
11. Educational Theory and Practice, 35-39	11. Metaphysics, 40-44

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In contrast to these findings on creative productivity, Lehman determined that the capacity for leadership (in terms of leadership positions attained) appeared to reach its maximum considerably later in the life span.

Because of obvious and frequently criticized shortcomings in his research design and the overall looseness of this kind of study, one hesitates to place much stock in Lehman's particular findings. Yet his overall conclusion--"Superior creativity rises relatively rapidly to a maximum which occurs usually in the thirties and then falls off slowly"[1]--has never been disproved.

---

[1]Lehman, op. cit., p. 330.

Thus, protracting doctoral study through the 30's and into the 40's, may be seen to have serious consequences on an individual's creative production. Pressey has summarized the problem as follows:

> "To enter upon a career when one is physically best able to initiate it with unremitting work and youthful enthusiasm might be an advantage...; a scientist or an author or an artist may continue effective work into old age, but his most original and notable work is usually done early in his career... To let education extend very far into this period may do more than delay, and so shorten, a career; the individual's highest potential may never be realized."[1]

Intellectual and creative drive.--One other important, but less easily documented, effect of undue prolongation of doctoral study on the indivdual needs to be mentioned. The effect concerns the intellectual and creative drive a person possesses when he finally graduates. The obstacles students encounter en route to the doctorate frequently lead to a seemingly endless succession of interruptions or delays in progress. If endured over a considerable time span, these problems may result in a student who is bewildered, anxious, frustrated, or even severely traumatized. In the words of an Association of Graduate Schools' Committee he may "emerge from the ordeal spiritually dried up."[2] The Committee's description of the effects of this ordeal on the student is well worth repeating.

---

[1]Sidney L. Pressey, "Age and the Doctorate--Then and Now," Journal of Higher Education, Volume 33 (March, 1969), pp. 155-156.

[2]Report of the Committee on Policies in Graduate Education, "Doctors and Masters--Good and Bad!" in Journal of Proceedings and Addresses of the Fifty-Eighth Annual Conference of the Association of American Universities and the Ninth Annual Conference of the Association of Graduate Schools (Princeton, New Jersey: October 22 and 23, 1957), p. 37.

> "The desire for finding out what had not before been known, the imaginative urge to reinterpret--these the tired and weary student has gradually lost. He has been wrung dry, and, knowlingly or not, he often finishes his thesis with the firm resolve to have no more to do with 'scholarship.' The drive--almost the poetic drive--which first excited him and sent him on from college to graduate school is now run out."[1]

If the objective of graduate education is to produce a person who is not only capable of, but enthusiastic about, creative scholarship, but the actual product emerges as described above, then the individual so described might as well have spent his graduate years in some other endeavor.

The Society

Another party affected by protracted periods of graduate study is the society into which the student emerges. Inasmuch as education serves to effect changes in behavior, or to move a person from one point in the learned continuum to another, the actual degree awarded is irrelevant. An individual should be able to "graduate" from the process after any one of several stages and begin to serve society to a degree or at a level commensurate with the capabilities he has developed. The variety of "intermediate" degrees now being awarded (e.g., the Candidate in Philosophy, Master of Philosophy, Doctor of Arts, etc.) together with the traditional master's degree are designed, in part, to facilitate this process. Yet the yardstick society now employs to indicate whether an individual possesses

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[1] Ibid.

the skills necessary to undertake its higher intellectual tasks is the doctorate degree. Stated simply, society demands Ph.D.'s; and at the post-baccalaureate level of training it often discriminates solely on the basis of the presence or absence of the letters Ph.D. after a person's name.

Most recent manpower projections imply that the nation's graduate schools will be hard pressed to supply sufficient numbers of highly trained individuals to meet the needs of our technologically dynamic and growing economy of the 1970's.[1] These projections show a greater need for professional and technical workers in the next decade than for any other occupational group.

Unfortunately, precise matchings of the projected demand and anticipated supply of individuals in particular professional and technical occupations are not easily made--or agreed upon once made. One example relates to the adequacy of the supply of college teachers in the 1970's. This area is germane to a discussion of doctorate production since about three-fifths of all Ph.D.'s are employed by colleges and universities.[2]

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[1] See United States Department of Labor, Manpower Report of the President (Washington, D.C.: U.S. Government Printing Office, January 1969), pp. 62-68; and
Leonard A. Lecht, Manpower Needs for National Goals in the 1970's (New York: Frederick A. Praeger, 1969).

[2] National Academy of Sciences, Careers of Ph.D's: Academic versus Nonacademic (Washington, D.C.: National Academy of Sciences, 1968), p. 5.

On the basis of projections made by the U.S. Office of Education and the Department of Labor, Leonard A. Lecht has concluded that the estimated supply of 355,000 college teachers in the mid-1970's will be 83,000 less than the estimate of 438,000 needed to meet the nation's education goal.[1] Allan Cartter, on the other hand, has estimated that "by 1977 every new (college) teacher hired could have the doctorate and still the academic world could not provide employment for more than 45 per cent of the new degree holders."[2] As Lecht has pointed out, estimates such as the above will differ because of different assumptions about average class size, the replacement rate for teachers, and mobility into and out of the teaching profession.

What is becoming more apparent is that the demand for Ph.D.'s in the 1970's will not be the same in all fields of study. Recent reports from professional associations indicate that there is an easing of demand for Ph.D.'s in several areas of the humanities and a balance of supply and demand in the social sciences. However, in the most recent analysis of the subject the National Science Foundation concluded that through 1980 "present and projected trends in Ph.D. production rates are not likely

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[1] Lecht, op. cit., p. 33.

[2] Allan M. Cartter, "Future Faculty Needs and Resources," Improving College Teaching (Washington, D.C.: American Council on Education, 1967), p. 122.

[3] Lecht, op. cit., p. 80.

to produce an 'over-supply' of doctorates."[1] The NSF study included physical, life, and social scientists (excluding historians), mathematicians and engineers. Their analysis pointed to the fact that "significant numbers of Ph.D.'s are likely to be engaged in activities which are markedly different from those practiced by most present doctorate holders."[2] The report emphasized the important role non-research careers will play in both national and scientific affairs.

In summary, then, it will be assumed that in the future society will continue to need Ph.D.'s, and in large numbers. In the Ph.D. supply and demand equation a critical factor (over a given time period) is the speed at which students complete their doctoral programs. Rapid completion of the doctorate insures not only a greater quantity of Ph.D.'s but a higher quality as well. For reasons given in the previous section, the individual who completes his degree at an early age is likely to be more productive; and increased individual productivity certainly redounds to the advantage of society. But in addition, in view of the rate at which knowledge is expanding and disciplines are advancing, the student who completes his doctoral training into a relatively short period of time (in contrast to the student who has been considerably delayed) is able to bring to bear on the problems of society the most modern knowledge, concepts, and techniques of his field.

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[1] National Science Foundation, Science and Engineering Doctorate Supply and Utilization, 1968-80 (Washington, D.C.: National Science Foundation, 1969), p. 3.

[2] Ibid.

The Institution

One other party needs to be considered as being adversely affected by the "Ph.D. stretch-out." That is the graduate school and the institution in which the student takes his degree. The effects of prolongation in this case are both economic and psychological. With regard to the former, Berelson has noted that "if the work is done more speedily (in terms of elapsed time), more consecutively, and more locally...it will mean support at a lower cost per capita since the ABD's and similar 'over-age' candidates will be fewer: the lower the age of training, the less the average cost."[1] Rosenhaupt has estimated that "If the time taken for the Ph.D. can be curtailed, graduate schools may be able to produce 10 or 20 or even 50 per cent more Ph.D.'s every year without increasing library or laboratory facilities, and without markedly enlarging the teaching staff."[2]

Estimates, such as the two above, of the cost to the institution of prolonged doctoral study are based on an understanding of the process of graduate education and the cost factors associated with it. These estimates may be arrived at logically and rationally, and would probably be supported by anyone who considers the problem of delay. Yet hard data to confirm such estimates have been lacking and will not be readily available until program budgeting becomes the financial modus operandi of institutions of higher education. Only at that time will the precise costs of educating a student in a given field over a given period of time be known.

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[1] Berelson, op. cit., pp. 234-5.

[2] Hans Rosenhaupt, Graduate Students: Experience at Columbia University, 1940-1956, (New York: Columbia University Press, 1958).

One study that attempted to identify program costs at the doctoral level in a number of broad areas was performed at a major western university. Table 1.4 shows that the average cost to the university of educating a Ph.D. candidate in arts and letters is, as expected, less than in the physical and biological sciences. However, the average cost per candidate through the entire period of doctoral study is more nearly equivalent among the several areas (in terms of percentage differences) when the factor of years required to complete the degree is introduced. Then when the effects of part-time study, discontinuities, and other delay factors are taken into consideration, the total program costs per degree awarded are shown to be about twice as great in the

TABLE 1.4.--Doctoral program costs at a major western university, by selected areas of study

Area of study	Average annual cost per Ph.D. candidate	Average number of (registered) years required to complete doctorate	Average cost per candidate to complete doctorate	Total Ph.D. program cost per degree awarded
Letters	$2,180	4.6	$10,028	$58,242
Arts	1,510	4.7	7,097	43,291
Physical sciences	2,527	4.0	10,108	21,195
Biological sciences	2,930	4.1	12,013	24,867

arts and letters as in the physical and biological sciences. If these results are verified by studies elsewhere, the case for shortening the elapsed time of doctoral programs will become financially, if not idealogically, clear to graduate institutions.

The undesirable psychological effects of prolonged doctoral study on graduate school faculty and administration, although less easily documented, need also to be considered. To the faculty member concerned with his own productivity in terms of Ph.D. degrees awarded, the student who requires over six calendar years to get the job done--and nearly half of them do--must be a source of considerable exasperation. Adding to this is the fact that even though the student may be part time or in absentia he nevertheless requires general advising and dissertation assistance from a faculty member, who necessarily views his student load in terms of head counts and not full-time-equivalents. And for the graduate school administration, the costs and efforts associated with carrying large numbers of part-time students on the rolls over long periods of time, enforcing the various and sundry regulations concerning duration, and attending to the whole gamut of doctoral delay problems need not be recounted here.

Causes of the Problem

The preceding pages have set forth the general problem of duration of doctoral study. It was argued that prolonging the period between the baccalaureate and doctorate degrees has an undesirable effect on the

student himself, the society at large, and the institution and graduate school responsible for his training. These observations lead us to consider a number of important questions: Why does it, in fact, require 8.2 years for the average student to obtain the doctorate degree after graduation from college? That is, what are the factors responsible for delay in a student's progress toward the doctorate? When did this "problem" come to be regarded as such, and by whom? And what are the results of the studies that have been designed to shed some light on the problem? These questions form the framework of the discussion in the present section.

History of Concern about Duration of Doctoral Study

In reviewing the literature on the subject one is left with the impression that prior to the mid-1950's the duration of doctoral study was not considered to be a problem. This in spite of the fact that average duration had risen to nearly the present levels by the early 1940's (see Figure 1.1). Early proceedings of the Association of American Universities indicate that the presidents and deans of member institutions were rather more concerned with setting minimum requirements of time and substance in order to insure the respectability of the degree[1] and, in Berelson's words, to consolidate and standardize the degree.[2]

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[1] See Journal of Proceedings and Addresses of the First and Second Annual Conferences of the Association of American Universities (Chicago, Ill.: February 27-28, 1900 and February 26-28, 1901), p. 23 et passim.

[2] Berelson, op. cit., pp. 16-24.

Through the tremendous growth of graduate education prior to World War II virtually no attention was payed to the problems arising from the increasing protraction of doctoral study. It is significant that in his landmark study of 1945 on Ph.D. programs, Ernest V. Hollis devoted not a word to this topic.[1]

It was not, in fact, until the early 1950's that voices were heard crying in the wilderness about the length of doctoral programs. One of the earliest voices recorded belonged to Dean Theodore C. Blegen of the Graduate School at the University of Minnesota. In 1951 Dean Blegen urged the Association of American Universities and the Association of Graduate Schools to "look a little at the possibility of acceleration in the graduate schools themselves."[2] Noting that the traditional three-year doctoral program was taking students seven years on the average to complete, the Dean asked rhetorically "What are we doing in the graduate schools to occasion a prolongation of training that we thought of in the bracket of three or perhaps four years?" He then suggested that "We might ask ourselves some critical questions as to why that situation exists and whether or not we, as graduate schools, could do something about it." Although Dean Blegen's urgings fell at first on deaf ears, he continued to

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[1] Ernest V. Hollis, Toward Improving Ph.D. Programs, (Washington, D.C.: American Council on Education, 1945).

[2] Journal of Proceedings and Addresses of the Fifty-Second Annual Meeting of the Association of Graduate Schools and the Third Annual Meeting of the Association of Graduate Schools, (New Haven, Conn.: October 23-25, 1951), pp. 63-4.

press the matter for several years until, in 1956, the AAU-AGS Committee on Policies in Graduate Education undertook a study of the factors tending to prolong the process of degree completion. It was shortly after this that the duration issue blossomed into a cause célèbre that was to receive major attention in graduate education circles through the mid-1960's.

Several factors serve to explain the sudden emergence of this issue after nearly a quarter century of dormancy. A major one has been emphasized by Charles M. Grigg:

> "As a result of the pressure for more graduates with the Ph.D., concern was expressed over the length of time it took the average graduate student to complete his doctorate...it was suggested that additional ways and means to support graduate education be found, and that new curriculums and other ways to minimize the length of time be devised. There was a tremendous pressure to speed up operation in the production of Ph.D.'s to supply the need for college teachers as well as for research workers and scientists."[1]

No doubt the appearance of Sputnik in the fall of 1957 gave added impetus to this concern, particularly in the physical sciences and engineering.

A second factor was a wave of introspection that swept over graduate schools in the second half of the 1950's. This review of policies and procedures was stimulated in large part by the now famous tocsin of the Committee of Fifteen, whose report on the Graduate School Today and Tommorrow was published in 1955.[2] Although the report was concerned primarily with

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[1] Charles M. Grigg, Graduate Education, (New York: The Center for Applied Research in Education, 1965), p. 19.

[2] Friedrick W. Strothman for the Committee of Fifteen, The Graduate School Today and Tomorrow: Reflections for the Profession's Consideration, (New York: Fund for the Advancement of Education, 1965).

the training of teachers, the underlying theme stressed the need for graduate schools and organizations to critically re-evaluate the "nearly century old methods" employed to educate graduate students.

One group that, if not directly influenced by the report, appeared to take the message seriously was the AAU-AGS Committee on Policies in Graduate Education, mentioned earlier in this section. In 1957 this Committee issued a report to the parent organization summarizing its investigations into Ph.D. programs. The following statement of the Committee outlines the problem of doctoral duration as seen at that time and sets the stage for the investigations described in the next section:

> "Current pressure forces us to examine our myth-enveloped Ph.D. with candor. What we see makes us look away with shock: for compare our Ph.D. programs with the professional programs in law, medicine, or business. We must ruefully conclude that the Ph.D. is tortuously slow and riddled with needless uncertainties; that it is inefficient and traumatically disagreeable to the bewildered and frustrated candidate. The basic flaw is: we have never clearly defined this protean degree."[1]

Research and Writings on Duration of Doctoral Study

In the years following the issuance of this report the fact that "the Ph.D. is tortuously slow" came to be widely recognized and accepted. But why was it so? To answer this question, to identify the causes of

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[1] Report of the Committee on Policies in Graduate Education, "Doctors and Masters--Good and Bad," op. cit., p. 37.

or reasons for delay in the attainment of the doctorate a considerable number of investigations were undertaken. The approaches to the problem have followed several different lines.

a.) Persons associated with graduate education--administrators, faculty, and students--either in groups or individually have reflected on their own experience with the problem of delay. With varying degrees of sophistication, these experiences have been analyzed and reported. Although lacking in hard data, these idiographic investigations provide valuable insights into the process of doctoral study and the factors responsible for delay.

b.) Studies have been undertaken using students (present or past) of an institution or group of institutions as the referent population.

c.) Studies have been made of particular disciplines or broad areas of study to determine what peculiar difficulties are encountered.

d.) A very few studies have attemped to sample a broad range of students in a more comprehensive analysis of the factors delaying progress to the doctorate.

From these investigations have emerged a number of factors that appear to be of significance in delaying the progress of students to the doctorate. Recognizing that there are overlaps and interactions among the several sources of delay, the factors, variables or "obstacles" to progress that have been identified appear to fall into four distinct groups. They are:

a.) Financial--obstacles encountered by the student in attempting to finance his graduate education.

b.) Institutional--obstacles associated with the policies, procedures, or people of the graduate school or institution the student is attending.

c.) Personal--obstacles resulting from the student's personal attitudes, decisions, situations, or problems.

d.) Other--a miscellaneous grouping of obstacles that are external to the graduate institution and not directly under the student's personal control.

Interestingly enough, one of the first "research" studies of the problem of doctoral duration identified obstacles in all four of these groupings. In 1956 the aforementioned Committee on Policies in Graduate Education conducted a study of 30 member institutions of the AAU to determine, among other things, "What factors tend to prolong the process of completing the degree requirements."[1] Presumably, responses to this query were provided by graduate school administrative officers. Although no data were presented on the results of this survey, the report indicated that the obstacles cited by the respondents could be ordered as follows, according to frequency of mention:

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[1] "Report of the Committee on Policies in Graduate Education," Journal of Proceedings and Addresses of the Fifty-Seventh Annual Conference of the Association of American Universities and the Eighth Annual Conference of the Association of Graduate School, (Chicago, Illinois, October 24 and 25, 1956), p. 9.

1.) Financing of the degree program (Financial).

2.) Planning, researching, and writing the thesis (Institutional).

3.) Poor preparation and/or inadequate prerequisites for graduate school (Other).

4.) Foreign language requirement (Institutional).

5.) Dalliance and dilettantism (Personal).

In the investigations that were to follow this initial survey, all four of the groupings mentioned above received some support. Yet there were substantial differences among the studies either in the data obtained or the interpretation of these data with regard to the importance or significance attached to each of the obstacle groupings as a factor in delay. The major sources of evidence that emphasize the respective obstacle groupings will be described in the remainder of this Chapter.

Financial Obstacles

Davis: student finances and delay

The first major study to reveal the impact of finances on progress toward the doctorate was performed by the National Opinion Research Center in the fall of 1958. The study was the first national sampling of arts and science graduate students and was designed to measure the financial circumstances of American graduate students. A questionnaire survey was made of 2,842 students enrolled for the master's or Ph.D. degree. The students were selected randomly from a stratified sample

of 25 graduate institutions. Data obtained from this survey were tabulated and analyzed by the NORC and were reported by James A. Davis in a publication entitled Stipends and Spouses.[1]

Noting the fact that 91 per cent of the students in the sample expected to get through the 1958-59 academic year without borrowing, Davis reported that "To a surprising degree, graduate students appear to be able to balance their books each year."[2] At the same time, although 61 per cent of the students reported receiving stipend support, only one-third received any money, above and beyond tuition, for which they did not have to work. Of course to "balance the books" (i.e., to remain solvent) without borrowing and without receiving a total subsidy, the students must pay a price. And the data from this survey suggest that the price graduate students pay for their money is with time, either through interruptions in their studies or light course loads.

The inevitable consequence of interruptions of study and light course loads is a protraction of doctoral study. Davis's conclusions along these lines are worth quoting here:

> "With expensive families, low subsidies, and tempting job opportunities, and an apparent aversion to debt, it would appear that the students take as many courses as they literally can afford, and no more.

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[1] James A. Davis, Stipends and Spouses: the Finances of American Arts and Science Graduate Students, (Chicago, Illinois: The University of Chicago Press, 1962).

[2] Ibid., p. 48.

> "The financial solvency of American graduate students comes at the price of much less formal education in a given year than the catalogues would have one believe. Or, to paraphrase the poet, the motto of graduate education may well be:
>
> 'Ah, take the Cash and let the Credits go,
> Nor heed the rumble of a distant dean.'"[1]

Berelson: reasons behind duration

In 1959 Bernard Berelson conducted what was, and probably still remains, the most comprehensive questionnaire survey of graduate education ever attempted. Questionnaires covering a wide range of topics were distributed to 92 graduate deans, 4,440 members of graduate faculties, 3,843 recipients of the doctorate in 1957, 865 presidents of all liberal arts colleges and teachers colleges, and 191 industrial concerns. The results of this survey, together with Berelson's conclusions and recommendations are included in the land-mark publication entitled Graduate Education in the United States.[2]

One of the focal points of Berelson's study was the duration of doctoral study, which he described as the third major issue of graduate education (behind the preparation of college teachers and the national distribution of graduate study). The recent recipients of the doctorate in the sample were asked, first, how much elapsed and actual (full-time-equivalent) time they had taken to progress from the baccalaureate to the

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[1] Ibid., p. 57.

[2] Berelson, op. cit.

doctorate. Then they were asked to indicate whether these lengths of time were too long, too short, or about right, and what was a reasonable duration for both measures. Finally, if the student's own duration had exceeded that which he estimated as "reasonable," he was asked to check which of the following factors contributed to that extension:

	Elapsed time	Actual time
Inadequate undergraduate preparation	_____	_____
Family obligations, other work, money problems	_____	_____
Dissertation	_____	_____
Foreign language requirement	_____	_____
Unrealistic standards imposed by faculty	_____	_____
Unrealistic standards imposed by myself	_____	_____
Other (specify)	_____	_____

Any question involving a check list such as this one is only as revealing and valid as the items that it comprises. And there are some shortcomings in this list--noteably, the paucity of items from which the student is to select, and the inclusion of what may be several unrelated factors (family obligations, other work, and finances) in the second item. Nonetheless, it will be noted that the four major groupings of obstacles to progress--financial, institutional, personal, and other--are represented on the list.

Unfortunately Berelson does not report the raw data obtained from this check list. Rather he combines the information derived from this with responses to other related items on the questionnaire in order to

ascertain the reasons behind duration. He concludes that a) a very few students (the "professional" doctoral condidates) simply don't want to finish sooner; b) some cannot because they have difficulty meeting the requirements (in particular, the dissertation was listed as one of the two major stumbling blocks by the recent recipients); and c) some are not encouraged or even allowed to finish because they are needed as teaching or research assistants. But the major reason given for delay in completing the degree by the recent recipients themselves is that they "cannot afford to finish sooner, i.e., they cannot spend full-time on their studies because of lack of support."[1]

Berelson spends little time analyzing the causes of financial problems except to note that the speed with which students from different fields of study complete their degrees is related to the support a field can offer in the form of fellowships or research assistantships that contribute to the dissertation. He also points out that "The more support the individual has, the faster he finishes too; but that relation needs to be qualified by the fact that the better students (who would finish sooner anyway) get more support."[2]

Interestingly enough, Berelson discovered that it was the Graduate Deans and not the faculty or recent recipients who were most concerned with the duration of doctoral study. His findings on this subject are shown in Table 1.5. In addition Berelson found that graduate faculty and recipients

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[1] Ibid., p. 163.

[2] Ibid.

TABLE 1.5.--Appropriateness of present duration of doctoral study; by deans, faculty, and recent recipients

Appropriateness of present duration	Elapsed Time		
	Graduate deans	Graduate faculty	Recent recipients
Too long	68%	34%	48%
About right	26%	59%	51%
Actual time			
Too long	23%	14%	16%
About right	74%	72%	80%

Source: Berelson, op. cit., p. 160.

in the social sciences and humanities were more concerned about expediting the degree than natural scientists, engineers, and persons in professional fields.

Rosenhaupt: finanical support and doctoral delay at Columbia University

In an attempt to gain some facts and understanding about graduate students, Hans Rosenhaupt , then Graduate Dean of Columbia University, undertook a two-year study (1956-58) of the experience of graduate students at that institution between the years of 1940 and 1956.[1] The records of

[1]Rosenhaupt, op. cit.

23,498 students were examined and data were compiled on a great variety of individual characteristics, behaviors, and outcomes. This was not a questionnaire survey and no direct evidence was available to indicate what factors were responsible for delaying the progress of this group of students to the doctorate. Yet it was clear that Rosenhaupt was concerned with the matter of delay. The data he brought to bear on the matter and the conclusions drawn from them are relevent to the present study.

Rosenhaupt's data show that success in obtaining an advanced degree is related to full-time, as opposed to part-time study; to lesser age at entry; and to certain traits or advantages such as enough money to attend full time, high motivation, confidence in themselves, and a high rating in college. To determine the effect of financial support on the time taken for the Ph.D., Rosenhaupt compared duration of degree study and degree attainment of two groups, Second World War veterans and non-veteran men. Because the veterans were subsidized by the so-called G.I. Bills without regard for their academic standing, such a comparison in effect controls for academic ability.

Of the 5,763 Second World War veterans who had entered Columbia University between 1940 and 1951, 3,159 or 54.8 per cent had received an advanced degree (M.A. or Ph.D.) by 1956. Among the male non-veterans of the same period only 45 per cent (2,706 of 6,070) had completed a degree. Further, nearly twice as many veterans as non-veterans had completed 40 points (credits) toward advanced degrees by 1956. With regard

to duration of doctoral study the average time taken for the Ph.D. by non-veteran men in Columbia's Faculty of Political Science (primarily the social sciences) was 9.6 years, but it was only 7.4 years for veterans. In the Faculty of Philosophy (arts and humanities) an average of 9.8 years was taken by non-veterans, but only 7.5 years by veterans; and in the Faculty of Pure (natural and physical) Science 6.1 years was taken by non-veterans, and 5.3 years by veterans.[1]

Noting that veterans differed from non-veterans in respects other than that of being supported, Rosenhaupt conceded that the case for financial support of graduate students was not fully clinched by these tabulations. But of all the factors that differentiated between the two groups, financial support would appear to be the one contributing most directly to rapid progress.

Other evidence linking financial support to decreased delay

Arlt: NDEA fellowships.--A number of independent studies have been conducted that substantiate the case for financial support as a prime factor in accelerating progress toward the doctorate. Gustave Arlt reports on the experience of the first two groups of graduate students who were awarded fellowships in new or expanded Ph.D. programs under Title IV of the National Defense Education Act.[2]

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[1] Ibid., pp. 61-65.

[2] Gustave Arlt, "The First Ph.D.'s under Title IV," Journal of Higher Education, Vol. 34, No. 5, May 1963, pp. 241-249.

In September, 1959, one thousand students who had been awarded three-year NDEA fellowships began their graduate studies. In September, 1960, an additional 96 students who had already completed one year of graduate study were awarded two-year fellowships under the same auspices. In May of 1962 the U. S. Office of Education asked the 755 students who remained of the original 1,096 when they expected to receive the Ph.D. degree. One hundred and two replied that they would receive the degree in June, 1962--less than three calendar years after they had begun graduate study.

In Arlt's words:

> "it can scarcely be regarded as an impressive performance when only 14 per cent of an entering class of graduate students complete their doctoral requirements in three consecutive years. By practical standards, however, it is not only highly impressive but virtually phenomenal."[1]

The relevant standards against which this performance might be measured include the following: Among all Ph.D. recipients in the years 1958-60 the median time lapse from baccalaureate to doctorate was 8.6 years[2] (75 per cent of the NDEA Title IV Fellows studies by Arlt had received their bachelor's degrees in June of 1959); in recent years only two per cent of all graduate students have been able to complete the doctorate in three years or less following graduation from college, and only one in nine (roughly 11 per cent) has obtained the degree in four years or less.

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[1] Ibid., p. 241.

[2] National Research Council, Doctoral Recipients from United States Universities, 1958-1966, op. cit., p. 66 .

In order to ascertain whether any factors, aside from substantial fellowship stipends, contributed to the rapid completion of the doctorate by the 102 NDEA Title IV Fellows, Arlt undertook a questionnaire survey of this group. His data indicate that these students did not differ from any other large group of graduate students except that they were assured of financial support for three years, and three years only. But according to Arlt, one other factor that may have contributed to the success of these students was the fact that because they were part of the "new or expanded programs" required by the NDEA, these students may have received more personal or preferential treatment than their colleagues.

Beach: Woodrow Wilson Foundation Fellowships.--In a discussion of a model time schedule for the completion of the doctorate Leonard Beach reports on the accelerating effects of Woodrow Wilson Foundation fellowships.[1] Data collected by the Foundation indicate that of all the Woodrow Wilson Fellows who had taken the Ph.D. from 1945 to 1962, 65 per cent accomplished the goal in five years or less and a sizeable proportion managed to take the degree in four or even three years.

As Beach points out, "This record is the more remarkable in light of the fact that most of these degrees are in the humanities."[2] Yet what he fails to note is that the Woodrow Wilson Fellows are a group

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[1] Leonard Beach, Chairman, in the Proceedings of the Second Annual Meeting of the Council of Graduate Schools in the United States, (Dallas, Texas, December 13-15, 1962), p. 39.

[2] Ibid.

carefully selected on the basis of their academic ability, motivation, and career objectives. These factors, all of which could contribute to rate of progress independent of financial support, undoubtedly contaminate the findings.

Harmon: AEC Fellowships.--In order to control for at least one of these factors, Lindsey R. Harmon conducted a study of 555 men who had applied to the Atomic Energy Commission in 1949 for fellowships in science.[1] All candidates, both awardees and those not granted fellowships, were sorted into groups relatively homogenous as to initial level of ability and initial level of academic attainment. In 1958 a follow-up study was made to determine which ones had completed doctorate-level training, and when.

The results of Harmon's study show that when verbal and quantitative ability and initial academic status are controlled, the award of a fellowship is significantly associated with earlier completion of the Ph.D. degree. The Fellows, on the average, completed their degrees more than a year earlier than did the Non-Fellows. Also, a significantly larger number of Fellows attained the Ph.D. degree by the end of nine years.

Creager: NSF fellowships.--Essentially similar results were obtained in a study by John A. Creager based on male candidates for the 1952 National Science Foundation Fellowships.[2] However, more data on the

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[1] Lindsey R. Harmon, The Effects of Fellowships on Acceleration of Ph.D. Attainment, Technical Report No. 14, (Washington, D.C.: Office of Scientific Personnel, NAS-NRC, January 15, 1959).

[2] John A. Creager, A Study of Graduate Fellowship Applicants in Terms of Ph.D. Attainment, Technical Report No. 18, (Washington, D.C.: Office of Scientific Personnel, NAS-NRC, March 22, 1961).

applicants were available to Creager, and his study employed somewhat more adequate controls. It was found that of the 522 candidates awarded NSF fellowships in 1952, 85 per cent had received the Ph.D. by 1959; in contrast, only 64 per cent of the 1,674 non-awardees had attained the doctorate in the same period. Moreover, NSF Fellows completed their degree requirements nearly a year sooner than non-awardees.

Creager reports that differences in aptitude and achievement as measured by the Graduate Record Examination account for about a third of this time difference, leaving a residual difference of about seven months. It was also found that awardees receiving multiple awards were more likely to complete a Ph.D. than those receiving single awards.

Wilson and Heard: a Southern study

To date the only comprehensive study directed primarily at the problem of doctoral delay was conducted by Kenneth M. Wilson of the Southern Regional Education Board. The results of this survey were published in a summary and commentary by Alexander Heard entitled The Lost Years in Graduate Education (1963)[1] and in a more thorough analysis by Wilson entitled Of Time and the Doctorate (1965).[2]

Data for this study were obtained by means of a 12-page questionnaire completed by 1,929 persons who had received the Ph.D. degree between 1950 and 1958. The sample was drawn from 23 Southern institu-

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[1]Alexander Heard, The Lost Years in Graduate Education, (Atlanta, Georgia: Southern Regional Education Board, 1963).

[2]Wilson, op. cit.

tions and represented 15 major fields of study. In addition, 25 graduate deans and 100 departmental representatives provided written responses to several general questions regarding the duration issue.

Wilson reports that "Graduate deans and graduate faculty, with some differences in emphasis, tended to stress the following in their comments on factors affecting duration:

(1) continuity of study and amount of time devoted to study

(2) the dissertation and research

(3) student attributes

(4) the foreign language requirement

(5) adequacy of undergraduate preparation

(6) particular requirements or pattern of requirements

(7) departmental expectations and faculty attitudes."[1]

In the "continuity of study" factor--first in total frequency of mention--emphasis centered on the type and nature of financial assistance available to students and the relative attractiveness of job opportunities for those with less preparation than the doctorate.

The question asked of recent recipients that related most directly to the problem of delay read as follows:

> "18. To what extent was the amount of time it took you to get a doctorate affected by each of the following factors? Rate each factor according to the following code:

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[1] Wilson. op. cit., p. 43.

1 = Lengthened time considerably
2 = Lengthened time somewhat
3 = Did not lengthen time
4 = The conditions or circumstances implied by this item were not present in my case"

The factors that the degree recipients were to check are indicated in the Table below. Although the factors are arranged in Table 1.6 according to the percentage of students attributing some lengthening influence, their order on the questionnaire is indicated by the small letter preceding each factor.

TABLE 1.6.--Factors reported by a sample of doctoral recipients as having lengthened their doctoral programs

Designated factors	Percentage distribution of responses		
	Lengthened time considerably	Lengthened time somewhat	Some lengthening influence (total)
(b) Discontinuity of graduate attendance	17.1	14.9	32.0
(l) Work as teaching assistant	6.9	25.0	31.9
(j) Nature of the dissertation subject, per se	9.8	20.6	30.4
(n) Financial problems	11.0	16.3	27.3
(i) Writing dissertation off-campus while engaged in full-time employment	13.9	13.3	27.2
(j) Inadequate preparation in foreign languages prior to beginning graduate work	4.0	23.2	27.2

TABLE 1.6.--Continued

Designated factors	Percentage distribution of responses		
	Lengthened time considerably	Lengthened time somewhat	Some lengthening influence (total)
(a) Lack of coordination between beginning and advanced stages of graduate work	5.6	18.6	24.2
(m) Family obligations	7.4	15.6	23.0
(c) Inadequate undergraduate preparation in graduate field of specialization	3.3	19.5	22.8
(d) Transferring from one graduate institution to another	5.8	16.5	22.3
(g) Change(s) in dissertation topic after some work already completed	4.1	10.3	14.4
(e) Change(s) in field of specialization during graduate study	2.9	8.9	11.8
(k) Work as a research assistant	1.8	9.0	10.8
(h) Changes in membership of dissertation committee	1.6	4.6	6.2
(o) Health problems	0.9	3.3	4.2

Source: Wilson, op. cit., p. 47.

Earlier in this Chapter it was noted that the factors that have been identified as principal causes of doctoral delay fall into four distinct groups: financial, institutional, personal, and other. In Table 1.6, however, it may be seen that some of the designated factors--and particularly the first one, "Discontinuity of graduate attendance"--do not fit into any of the major groups. This fact at once makes it difficult to interpret the results obtained here and points out the major shortcoming of this item in Wilson's questionnaire. That is, that among the 15 designated factors the students were asked to check, the basic causes of delay and the immediate effects of those causes are mixed. For example, it is clear that discontinuous attendance in graduate school would lengthen the time required to complete the doctorate. Yet a number of other factors on the list, including financial or health problems, family obligations, or writing the dissertation off-campus, could well be the underlying causes of discontinuous attendance.

Fortunately, Wilson obtained information on and analyzed the factors responsible for discontinuous attendance. These factors were associated with 1) a delay of six months or more in beginning graduate work after receiving the bachelor's degree, and 2) a similar delay in proceeding into the doctoral phase of graduate study after earning the master's degree. The factors responsible for delay at these two points are shown on the next page:

Factor	Percentage of those delaying entrance[a] checking factor
Inability to finance adequately a desired program of graduate study	43.8
Period of military service	38.2
General uncertainty regarding career goals	32.7
Career plans at the time did not include graduate study	25.6
Desire for "practical experience" before beginning graduate work	17.6
Family obligations	15.9
Uncertainty regarding a graduate field of specialization	9.3
Change in occupational plans	4.0
Other factors	9.0

([a]34.0 per cent of the sample indicated a delay of entry of six months or more)

Factor	Percentage of those interrupting study[b] checking factor
Inability to finance further graduate study at the time	53.3
At the time, master's degree was considered terminal; had not thought seriously of working toward a doctorate	31.3
Family obligations	22.9
Period of military service	19.0
Uncertainty regarding choice of doctoral institution	15.7

Factor	Percentage of those interrupting study[b] checking factor
Additional practical experience needed or desired	9.2
Uncertainty regarding a doctoral field of specialization	9.2
Lack of satisfaction with master's program	6.3
Period of full-time employment	5.3
Tired of academic routine	2.1
Other factors	10.6

([b]34.9 per cent of the sample indicated a post-master's delay of entrance into doctoral sequence of six months or more)

Wilson obtained one other piece of evidence bearing on the problem of duration. Recent recipients were asked, "...what do you think could be done to reduce the amount of time taken to earn the doctorate degree in your field within the framework of existing requirements and without reducing the 'quality' of the degree?" The responses to this open-ended question were classified as follows:

Suggestion related to	Percentage offering suggestions[a]
Financial aid	35.4
Advisement, counseling and program planning	30.1
Dissertation and research	25.0
Organization of courses and curricula	24.7

Suggestion related to	Percentage offering suggestions[a]
Foreign languages	24.4
Policies, procedures, and requirements	13.5
Undergraduate preparation	12.5
Miscellaneous	3.5

([a]63.6 per cent of the students in the sample offered at least one suggestion)

To analyze the personal and situational factors relating to the duration of doctoral study Wilson divided the individuals in each of the 15 fields in his sample into two groups defined in terms of B.A. to Ph.D. time lapse; namely, a "faster" group (characterized by a B.A.-Ph.D. time lapse less than the field median) and a "slower" group (characterized by time lapse greater than the field median). He found that the group of individuals who attained the Ph.D. in better than average time was characterized by:

(1) lower incidence and average amount of predoctoral employment

(2) less total time in attendance and less part-time attendance

(3) lower incidence of delayed entry into graduate study and of interruptions thereafter

(4) earlier development of interest in the doctoral field

(5) earlier development of plans for graduate study

(6) earlier development of decision to work toward a Ph.D.

(7) higher incidence of direct pursuit of Ph.D.

(8) greater continuity of major field--undergraduate to graduate

(9) higher incidence of undergraduate and Ph.D. work at the same institution

(10) a broader base of financial support--less reliance on personal savings, and employment unrelated to the graduate program

(11) higher incidence of research-related graduate appointments

(12) earlier completion of preliminary examinations

(13) earlier approval of dissertation topic and more expeditious completion of dissertation

(14) lower incidence of need for special preparation in order to meet the foreign language requirement (German)

(15) higher incidence of research or research-related duties in post-doctoral employment

(16) fewer dependents at all stages of graduate program--at entry, beginning of Ph.D. phase and degree conferral

(17) higher incidence of agreement between initial expectation and subsequent reality in respect to time taken to attain the doctorate.[1]

Taking all these results into account, I would conclude that of the four groups of factors responsible for doctoral delay, the financial group ranks as the most important in Wilson's study (hence the inclusion of the

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[1]Ibid., pp. 145-6.

of the study in this section). This conclusion is based on (a) the responses of the graduate deans and graduate faculty to a question concerning delaying factors; (b) the high ranking of "financial problems" in Table 1.6; (c) the possible relevance of other important factors in that table to "financial problems" (viz., "work as a teaching assistant," "writing dissertation off-campus while engaged in full-time employment," and "family obligations"); (d) the reports of the recent recipients of the doctorate that financial matters were primarily responsible for "discontinuity of graduate attendance," the highest-ranked factor in Table 1.6; and (e) the suggestion of the recipients that increased financial aid would be the most important consideration in speeding up the degree.

However, it should be mentioned that after examining the same data Alexander Heard reached a somewhat different conclusion about the importance of these factors. He states

> "Among the conditions found, three are of special importance in slowing the speed at which many students move toward the Ph.D. degree:
>
> First, lack of clarity of purpose prior to entering graduate study and after entering it;
>
> Second, lack of coordination and continuity in the content of degree programs;
>
> Third, lack of financial help that does not interfere with progress toward the degree."[1]

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[1] Heard, op. cit., pp. 6-7.

Wilson himself refused to order the importance of the factors involved in protraction of doctoral study. Rather he emphasized the need for a total or pluralistic approach to the problem. "In essence," he stated,

> "the amount of time involved in doctoral preparation can be reduced, our respondents indicate, only through concerted effort on a variety of fronts. Solutions predicated on a monistic conception of the problem will not prove to be satisfactory and no approach to 'time reduction' stressing only one line of attack, e.g., increased financial support, improved practices, etc., will be sufficient, however necessary it may be to an overall solution."[1]

Women and graduate study

Some recent findings concerning the obstacles encountered by women en route to the doctorate are germane to the present discussion. Between 1961 and 1964 the National Opinion Research Center conducted a longitudinal study of 1961 college graduates.[2] The study was based on a probability sample of 41,000 college seniors ~~polled in~~ 135 colleges and universities in 1961. Follow-up surveys were conducted in 1962, 1963, and 1964. Questionnaires were sent to the entire sample of college graduates but only those women who responded in all four years of the study were included in the data to be reported.

In 1964, 40 per cent of the 1961 women college graduates who had indicated a desire to go to graduate school in the future were not enrolled in a graduate school. Some of these women had been enrolled in graduate

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[1] Wilson, op. cit., p. 159.

[2] Special Report on Women and Graduate Study, Resources for Medical Research, Report No. 13, National Institute of Health, Department of Health, Education, and Welfare (Washington, D.C.: U.S. Government Printing Office, June, 1968).

school previously and some had not. The major obstacles given by these women for not being enrolled were financial obstacles (42 per cent), family responsibilities (41 per cent), no graduate school available (16 per cent), lack of qualifications (13 per cent), disapproval of husband (3 per cent). The major factors that played a role in the women's decision to enter graduate school are shown in Table 1.7.

TABLE 1.7.--Conditions affecting women's decision to attend graduate school

Condition	Percentage of women reporting effect		
	Essential to going	Helpful, but not essential	No effect
Excellent child care facilities available	57	21	22
Ability to matriculate as a part-time student	52	31	17
Strong approval of husband	52	35	13
At least half the courses offered in the evening	43	32	25
Receipt of stipend that covers all school expenses	20	54	26

Source: Special Report on Women and Graduate Study, op. cit. p. 9.

Wright: success or failure in earning graduate degrees

In 1961 personal interviews were conducted with a random sample of 189 graduate students during their first semester of enrollment at a major university.[1] Ten years later information was obtained on which students of the original sample had actually obtained degrees. It was hypothesized that students possessing certain characteristics of academic and personal background, motivation, accommodation to graduate school, and non-academic statuses would be more likely to succeed than others.

It was found, however, that few of the 63 variables studied proved to be associated with success or failure in earning the M.A. or Ph.D. With regard to finances, it was shown that lack of financial problems was associated with a significantly better chance for earning the M.A. Sixty-seven per cent of the master's candidates who said they were getting along comfortably earned degrees in contrast with 44 per cent who earned degrees but were "struggling or managing" with financial difficulties. The comparable figures for doctoral candidates were 47 and 41 per cent.

Tucker: factors related to attrition

A study of attrition among graduate students is relevant to the study of obstacles to the doctorate inasmuch as many of the factors responsible for attrition also result in delays in progress. Allan Tucker

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[1] Charles R. Wright, "Success or Failure in Earning Graduate Degrees," Sociology of Education, Vol. 38, No. 1, fall, 1964, pp. 73-97.

has made perhaps the most comprehensive study of the factors related to attrition among doctoral students.[1] Tucker's sample consisted of all students (n=23,000) enrolled in work beyond the master's degree, in the traditional arts and science fields at 24 selected universities between 1950 and 1953. Those who had not completed the requirements for the doctorate by December 1962 were considered drop-outs.

According to Tucker, "most of the respondents made it clear that their attrition from doctoral programs was primarily due to non-academic or personal reasons."[2] The factor indicated by the greatest percentage (48.7 per cent) of drop-outs as contributing to their failure to attain a degree was "lack of sufficient finances to properly support myself (or family)." Moreover, when asked to identify the single most important personal reason why they had not yet received the degree, the largest proportion of the respondents (19 per cent) identified lack of sufficient finances.

However, in viewing the overall picture that emerged from the data collected, Tucker was led to place greater emphasis on personality factors--motivation in particular--as the key to completion of the doctorate. Because less than 20 per cent of the respondents indicated that finances were the major problem, he deduced that "the remaining

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[1]Allen Tucker, et al., Factors Related to Attrition Among Graduate Students, Comparative Research Project No. 1146, (East Lansing, Michigan: Michigan State University, 1964).

[2]Ibid., p. 252.

80 per cent could have coped with their financial problems had they wanted to continue with their doctoral programs."[1] Thus Tucker concluded that "most of the students who dropped out of Ph.D. programs did not complete the requirements for the degree mainly because they lacked sufficient motivation."[2] More will be said about this conclusion in the section on personal obstacles to the doctorate.

Other opinions on financial obstacles

Caswell.--Without referring to any specific data, a number of other writers have called attention to the effects of financial factors on progress toward the doctorate. Discussing the problems of graduate students in education--the field of study notorious for its poor record in terms of B.A. to Ph.D. time lapse--Hollis L. Caswell has stated

> "Large numbers of very able teachers simply cannot finance programs of full-time study for the doctorate out of their earnings. Those who do so generally make substantial sacrifices. This fact accounts for many, although by no means all, of the weaknesses in advanced programs in education."[3]

He then calls for the major extension of scholarship and fellowship aid to permit advanced students in education to undertake full-time study.

Dure.--The same call has been issued by a number of graduate students writing on the subject of doctoral study. One of them, Leon S. Dure, a Ph.D. candidate in plant physiology, has noted that "graduate living

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[1] Ibid., p. 280.

[2] Ibid.

[3] Hollis L. Caswell, "Problems of Doctoral Study in Education," School and Society, Vol. 88, October 22, 1960, p. 373.

is principally a hand-to-mouth operation."[1] Dure opines that a graduate student should probably make as much as a hod carrier and recommends the granting of more rewarding assistantships and fellowships to induce more people into Ph.D. level study.

National Science Board.--In a recent publication entitled Graduate Education: Parameters for Public Policy, the National Science Board has advised that "Clearly it is in the public interest, as well as that of the student, that this (doctoral) phase of his education be completed as expeditiously as possible."[2] The Board notes two factors that cause fields of study to differ with respect to average completion time: a) the opportunity of the student to proceed without interruption to the completion of his doctoral work and b) the degree sequence followed by the recipient of the doctorate. Regarding the first of these factors the Board states that "A major contributor to such interruption is lack of adequate financial support for the individual."[3]

Prior.--Virtually the same phrase has been used by Moody Prior in discussing the problem of duration of doctoral study: "A major reason for delay in completing the work for the Ph.D. degree is financial."[4]

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[1]Leon S. Dure, 3rd., "More Graduate Students Are Key to Nation's Search for Scientists," American Mercury, Vol. 90, April 1960, p. 114.

[2]The National Science Board, Graduate Education: Parameters for Public Policy, (Washington, D.C.: U.S. Government Printing Office, 1969), p. 23.

[3]Ibid.

[4]Moody E. Prior, "The Doctor of Philosophy Degree," in Graduate Education Today, ed. by Everett Walters, (Washington, D.C.: American Council on Education, 1965), p. 51.

Prior notes that the average Ph.D. comes from a less affluent socio-economic group than the lawyer or physician; and since he often goes into a less lucrative profession, he is less likely to continue his education by means of loans. Further, he is likely to support himself by "practicing his profession," i.e., teaching, either as a full-time instructor or as a teaching assistant. Either of these activities, of itself, prevents a full-time degree program.

Institutional Obstacles

We turn, now, from the student's financial problems to an examination of the evidence supporting the notion that institutional obstacles are primarily responsible for the duration of doctoral study. In this context institutional obstacles will be thought of as the problems the student encounters as a result of, or related to, the policies and procedures, rules and regulations, structure and function, and the personnel of the graduate school.

Carmichael: a critique of graduate education

In a 1961 publication entitled Graduate Education: a Critique and a Program, Oliver C. Carmichael levelled his now famous blast at the graduate school, which he described as "the division of the university that has been relatively unaffected by what has occurred since 1920."[1]

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[1]Oliver C. Carmichael, Graduate Education: a Critique and a Program (New York: Harper & Brothers, 1961), p. 30.

In search of the facts about graduate education, Carmichael visited "some forty institutions" over a two-year period and talked with the presidents and deans plus a number of undergraduate deans, department heads, registrars, and other members of the teaching staff. However, there is no evidence that the "facts" obtained from these talks were collected, tabulated, or analyzed in any scientific manner. Nor does it appear that these facts have been marshalled in support of Carmichael's conclusions or recommendations.

One of his major concerns in this publication was with the "great lag between the B.A. and the Ph.D." This concern grew out of the shortage of highly trained personnel which, according to Carmichael "has been more keenly felt during the past decade than during any period in American history. The needs of colleges and universities for men and women to man classrooms and laboratories have been so great as to constitute a crisis."[1] In projecting this crisis into the future, Carmichael differed from Berelson, who had concluded that there was no unusual need for doctorates.[2]

These two authors also parted company on the subject of the reasons underlying the long lapse of time between the B.A. and the Ph.D. Carmichael noted that three major reasons are usually assigned for the inordinate time lapse:

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[1]Ibid., p. 132.

[2]Berelson, op. cit., p. 79.

"(1) students have to work to finance advanced study;

(2) they need teaching experience before coming up for the Ph.D.;

(3) since special research ability is required for the advanced degree, it is impossible to say with certainty that even a carefully selected student has what it takes."[1]

Carmichael rejects all three of these reasons. The financial one is dismissed with the following argument: "More fellowship funds are available for graduate than for medical students, the cost of the course per year is far less, and the number of years required is three rather than four."[2] Yet the average duration for graduate students far exceeds that for medical students.

According to Carmichael the "real reasons" for doctoral delay are as follows:

"(1) that the goals and purposes of graduate study have not been clarified;

(2) the steps by which the student may prepare himself for the foreign language and qualifying examinations have not been clearly stated;

(3) the selection of the dissertation topic is often delayed;

(4) individual faculty members may delay unduly the approval of the topic and the dissertation itself; and

(5) there is a general laxness in pushing the candidate on to the completion of his work."[3]

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[1]Carmichael, op. cit., p. 147.

[2]Ibid.

[3]Ibid., pp. 147-8.

Clearly, Carmichael has laid the blame for protraction of doctoral study on the graduate school, its objectives, procedures, and personnel. Thus his recommendations for decreasing the B.A. to Ph.D. time lapse focus on tightening the organization and method of preparation of graduate schools. To wit,

> "More rigorous demands, more clearly defined procedures, more definite and explicit instruction as to expectations should replace the usual uncertainties that surround the novice. In short what is needed is a more efficient operation."[1]

And brushing aside, once again, the problem of finances, Carmichael declares that "Shortage of funds...could be overcome more easily if the student could be given some assurance as to how long it would take to finish the work required for the degree."[2]

Elder: factors in doctoral delay at Harvard

Perhaps the best supporting data for the point of view advanced by Carmichael were obtained by J. P. Elder in a study of Harvard and Radcliffe Ph.D. recipients.[3] In the spring of 1956 Elder distributed a questionnaire to 1,482 men and 135 women who had taken their doctorates at Harvard and Radcliffe between 1950 and 1954. One of the objectives of the study was to determine "what factors (outside of military service)

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[1] Ibid., p. 180.

[2] Ibid.

[3] J. P. Elder, A Criticism of the Graduate School of Arts and Sciences in Harvard University and Radcliffe College (Cambridge, Massachusetts: Harvard University, 1958).

contribute to the long time commonly spent between the B.A. and Ph.D." The graduates were asked to indicate "To what extent did any of the following factors affect the length of time it took you to get the Ph.D.?" by checking the factors shown in Table 1.8 according to a five-point scale:

a. lengthened time considerably
b. lengthened time a bit
c. did not lengthen the time
d. actually shortened the time
e. not applicable

The responses to this question are shown in Table 1.8. Although the factors are arranged in Table 1.8 according to their total frequency of mention, their order on the questionnaire is indicated by the small letters in the left column.

TABLE 1.8.--Factors affecting the time required to obtain the doctorate, as reported by a sample of Harvard and Radcliffe Ph.D. recipients

Designated factors	Percentage of respondents attributing some lengthening influence to factor		
	Natural sciences (n = 452)	Social sciences (n = 500)	Humanities (n = 213)
(k) Research for and writing of thesis	65	66	66
(j) Preparation for preliminary (or general) exams	23	31	57
(d) Employed as teaching fellow or tutor	43	25	38
(a) Inadequate preparation before Harvard	23	26	32

TABLE 1.8.--Continued

Designated factors	Percentage of respondents attributing some lengthening influence to factor		
	Natural sciences (n = 452)	Social sciences (n = 500)	Humanities (n = 213)
(e) Family obligations	16	24	30
(c) Passing language requirements	16	20	27
(f) Obligated to work outside while studying at Harvard	11	17	14
(h) Financially obliged to leave Harvard in mid-course and work to earn money	7	16	19
(b) Repeating at Harvard work already done elsewhere	10	12	9
(l) Employed as research assistant	13	5	2
(g) Lack of financial pressure to finish speedily; owing to continued G.I. benefits	5	6	7

Source: Elder, op. cit., p. 31.

It is clear from Table 1.8 that the Harvard and Radcliffe Ph.D.'s found their doctoral preparation lengthened primarily by factors associated with the institution (academic hurdles and teaching fellow or tutor employment). It should be noted that although financial considerations may be

involved in "employment as a teaching fellow or tutor" or in "obligations to work outside," the factor most directly related to financial problems ("financially obliged to leave Harvard in mid-course and work") appears far down the list. In this connection it is probably important to point out that Harvard makes financial assistance of some sort available to a large proportion of its students. This assistance may or may not be causally related to the fact that among Elder's sample the Ph.D. was obtained within four calendar years by 62 per cent of the natural science graduates, 35 per cent of those in the social sciences, and 23 per cent in the humanities.

Wilson and Heard: a reprise

The search for some "hard data" in support of Carmichael's position on the causes of doctoral delay leads us to take a second look at the data collected by Wilson in his Southern study and discussed earlier in this Chapter. As noted previously, the respondents to his questionnaire ranked "discontinuity of graduate attendance," "work as teaching assistant," and "nature of the dissertation subject, per se" as the three most important factors having some lengthening influence on their doctoral programs (see Table 1.6). Disregarding the "discontinuity" factor because it fails to identify a cause, we see that the next two important factors correspond to the first and third factors mentioned by Elder's sample. And both these factors are related to obstacles associated with the institution.

Moreover, it will be remembered that in reviewing the Southern study data, Heard concluded that "lack of clarity of purpose prior to entering graduate study and after entering it" and "lack of coordination and continuity in the content of degree programs" were two of the three important conditions that slow the speed of doctoral students. Heard emphasizes that graduate departments must play the major role in clarifying the expectations of graduate students, so as to allieviate these two conditions.[1]

Institutional factors causing delay

The studies of Elder and Wilson furnish data that can be interpreted as supportive of the Carmichael position on the factors responsible for delaying progress toward the doctorate. Beyond these studies, of course, may be cited the innumerable opinions expressed from both within and without graduate school walls relating to the undesirable effects that graduate school policies, procedures, programs, and personnel have on students. As might be expected most of the commentary on this subject is concerned with the quality of degree programs rather than the speed with which they are completed. Yet these comments are relevant to the problem of duration to the extent that inferior quality of graduate education causes a student to delay or prolong his studies or to drop out completely. The following paragraphs illustrate the variety of ways institutional factors may militate against rapid completion of the doctorate.

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[1]Heard, op. cit., pp. 31-35.

General requirements and structure.--Christopher Jencks and David Riesman note that the numerous and inflexible curricular requirements of graduate schools "threaten or initiate prospective students, some of whom decide a Ph.D. is just not worth it."[1] Further, rigid disciplinary and departmental boundaries may prevent a student from pursuing a multidisciplinary problem that holds great interest for him. And regarding the substantive nature of graduate training, Jencks and Riesman point out that "graduate schools are full of gifted students dying of boredom, primarily because they have not been able to link up the professional skills they are supposed to acquire with any genuine personal or social commitment."[2] This criticism has been echoed by a graduate student of English, David F. Thorburn:

> "I do not know a single serious graduate student who is not profoundly dissatisfied with graduate school. The real dissatisfaction is rooted in the academic program...the impulse to what I would call narrow professionalism is the core of the problem."[3]

Courses.--Moving from these general comments to specifics, virtually every academic hurdle in doctoral programs has come under fire for its contribution to delay. Noting the rapid growth in the sheer bulk of available knowledge and the proliferation of courses to encompass that

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[1]Christopher Jencks and David Riesman, "Where Graduate Schools Fail," The Atlantic Monthly, April, 1968, p. 51.

[2]Ibid.

[3]David F. Thorburn, quoted by Richard L. Predmore, in "The Graduate Student in the Humanities," Proceedings of the Fifth Annual Meeting of the Council of Graduate Schools of the United States (Washington, D.C.: December 2-4, 1965), p. 7.

knowledge, Moody Prior has stated that "the student is at a loss sometimes when to terminate his formal course of study because he is not sure just how much he will be expected to know."[1] In terms of particular courses, another graduate student, Ian Braley, has attacked both the requirements for, and teaching of, graduate level courses.[2] He suggests, in fact, that most of the good people who drop out of graduate school do so, not because of money problems, but because of dissatisfaction with the course requirements, methods, and materials.

Foreign language requirement.--A great deal has been written and said about the foreign language requirement, its rationale, relevance, forms and complications. But Prior has described its particular impact on students as well as anyone:

> "It is true that for many students the language requirement becomes a formidable or at best anirritating hazard. Their previous training in languages has often been meager... For the majority of graduate students, any proficiency once acquired is atrophied through disuse, the temptation is to defer the test in the hopes of getting ready for it; and so the moment when the student must prepare for it arrives just as he has begun to gain momentum in his studies and to focus on his research. Educationally, nothing could be worse. And where the student has been given no assignment that can be properly completed only by using a foreign language...he approaches the task of refreshing his memory or, more difficult still, of learning a new language from the start, with practically no motivation."[3]

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[1] Prior, op. cit., p. 52.

[2] Ian Braley, "View from the Underside," Liberal Education, Vol. 46, No. 4, December 1960, pp. 499-503.

[3] Prior, op. cit., pp. 55-6.

General examinations.--The preliminary or general examination for the doctorate certainly represents one of the most critical stages in a graduate student's progress because it is often the major obstacle to departmental acceptance. In her survey of doctoral students at Berkeley, Ann Heiss discovered that the oral qualifying (preliminary) examination was listed by students in all divisions as the most stressful experience in the doctoral program. According to Heiss,

> "There were implications...that the normal stress aspects of this experience were accentuated by the fact that many students approached the orals with little knowledge of their structure, the scope of the examination, the standards for test performance, or without previous formal experience in the oral defense of their knowledge or points of view. The aura of mystery which surrounded this examination impelled many students to overprepare."[1]

David Mechanic also identified this stage as the primary academic source of stress and conducted a study on the coping and adaptive behaviors of students in a selected department taking the exam.[2] He noted that the exam presents not only an academic challenge, but also a challenge to self-esteem, to the role of husband and father, and to the future role as a professional.

Research and dissertation.--But it is in the final degree stage--research for and writing of the dissertation--that the real stretch-out occurs. Rosenhaupt's study of the duration of doctoral study at Columbia University

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[1]Ann M. Heiss, Berkeley Doctoral Students Appraise Their Academic Programs, mimeo. (Berkeley, California: Center for the Study of Higher Education, April 1964), p. 28.

[2]David Mechanic, Students Under Stress: a Study in the Social Psychology of Adaptation, (New York: The Free Press of Glencoe, 1962).

revealed that "Students who needed many years lost much of their time between their last registration and the award of the degree--in other words, research and the writing of the dissertation accounted for most of the long delays."[1] Correspondingly, Wilson's data show that it is in respect to duration of the post-master's phase of the predoctoral period that major differences among the fields become apparent.[2] In his study the median entry-to-master's time interval for the entire sample was 1.7 years with a range of only four-tenths of a calendar year in the medians over fields. Whereas field medians for M.A.-to-Ph.D. time lapse ranged from slightly over three years to just under eight years, around a total sample median of 4.5 years.

The reasons for delay at the dissertation stage are related both to the very nature of the dissertation and to practical exigencies. Often because of financial pressures, students--particularly in non-science areas--have opted to work on their dissertations off-campus. Such work is frequently undertaken while the student is employed, part or full time. This practice inevitably delays the completion of the degree and is in large part responsible for the vast number of ABD's (students who have completed all requirements for the degree but the dissertation).

The decision to undertake the dissertation in absentia is also related to the inherent nature of the dissertation--its open-endedness and unpredictability. These factors by themselves interfere with a uniform

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[1] Rosenhaupt, op. cit., p. 75.

[2] Wilson, op. cit., p. 25.

and fixed time schedule for completion of the Ph.D. But in addition, the requirement that the dissertation represent an original contribution of weighty importance certainly has a lengthening effect in those places where the requirement is rigidly enforced. With this in mind Grayson Kirk has recommended rather than an original contribution the dissertation should represent a man's ability to do research correctly and effectively. If this were so "the whole process of doctoral study could be shortened and it would be made an exciting experience, rather than a test of endurance, financial and physical."[1]

Student-faculty relationships.--Mixed in among these academic hurdles are all the delaying complications arising from the relationships between students and faculty members. From her study of doctoral students at Berkeley, Ann Heiss has concluded that

> "The quality and character of the relationship between the doctoral student and his major professor is unequivocally the most sensitive and crucial element in the doctoral experience, since it not only influences the graduate student's scholarly development but also has far-reaching after-effects."[2]

The students in Heiss's sample saw their major adviser in many roles. But over 80 per cent said that the ideal adviser was one who briefed them on the hurdles they would encounter in the program and on the strategy by which the hurdles could be vaulted successfully.

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[1] Grayson Kirk, "It Takes a Person Too Long to Get an Advanced Degree," Nation's Schools, Vol. 64, No. 1, July, 1959, p. 50.

[2] Heiss, op. cit., p. 39.

A psychological interpretation of the relationship between the student and his major professor was recently made by Peter Loewenberg.[1] Professor Loewenberg, an historian, notes that the concern of graduate deans over the inordinate time involved in graduate work had led to numerous surveys of graduate schools and their students. The recommendations of these studies for "tightened" doctoral programs, shorter dissertations, more generous student support, and flexible requirements, according to Loewenberg, miss their mark. He suggests rather "that a large portion of student dissatisfaction lies less with the pedagogical content of the curriculum that with the psychological conditions of infantilization to which the student, often a pater- or mater-familias is subjected."[2]

The student is infantilized through the student-faculty relationship which is described as one of submission and domination. Loewenberg's characterization of this relationship is based on the Freudian concept of transference--"the experiencing of emotions and feelings toward a person in the present which are inappropriate to that person and are a repetition, a displacement, of reactions from some significant persons of childhood."[3] Because the professor combines the transference authority of the father with the actual power and institutional authority of a director of graduate studies, the student is seen as being in the almost totally impotent position of dependent child.

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[1]Peter Loewenberg, "Emotional Problems of Graduate Education," Journal of Higher Education, Vol. XL, No. 8, November 1969, pp. 610-623.

[2]Ibid., p. 613.

[3]Ibid., p. 612.

The question, according to Loewenberg, is whether the transference identification will demoralize and cripple the student or liberate him. The question is resolved as the student confronts the five crises of graduate study: 1) a feeling of helplessness in his initial contact with graduate school, 2) dangerous rivalries with other students, 3) fear of incorporation of his professor's qualities, 4) examinations, and 5) final separation anxiety. The favorable emergence from these crises is problematic and frequently in doubt because of the almost completely unconscious role played at the controlling end by the faculty. Instead of abetting independence, Loewenberg says, the faculty "all too often act out fantasies of omnipotence and sadism, utilizing and encouraging the willing accomplices to be found in their students because of their unconscious need to be tyrannized."[1]

In the teaching relationship, for example, the professor is the subject of direct, rapt attention. The teacher's own narcissism is fed by the infantile adoration of the students. As a result,

> "The 'love' relationship, based on the student's idealized omnipotent fantasies, which feeds the instructor's narcissistic fantasies, can lead to a protraction of graduate studies in which the student continues to bask masochistically in the glow of the professor's protection while the teacher sadistically perpetuates the duration of graduate work by being impossible to satisfy."[2]

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[1] Ibid., p. 619.

[2] Ibid., p. 620.

Personal Obstacles

The third group of factors that may contribute to delaying a student's progress toward the doctorate involve his own personal characteristics and decisions. In particular, the factors relate to the student's intellectual or cognitive abilities, his general physical and psychological health, particular physical traits such as sex and race, personal interests, and less easily identifiable personality attributes including motivation and maturity.

In addition, the decisions a student makes about his graduate education certainly affect the duration of his doctoral studies. Those that stem from his own attitudes and interests and from an awareness of the personal characteristics mentioned above are appropriately classified as personal factors. It must be recognized, however, that many (if not most) of a student's decisions in graduate school are influenced or directed by financial, institutional, and other non-personal considerations. These latter kinds of decisions should not be considered as personal factors in influencing the duration of doctoral study.

Arlt and Predmore: maturity

A number of writers have suggested that maturity is the most important factor in determining the length of time required to complete the doctorate. According to Gustave Arlt, students entering graduate

schools in the humanities usually are less mature, less confident, and less independent than those in the sciences of prefessional fields.[1] These differences, Arlt feels, explain why it takes students in the humanities far longer than the others to earn their Ph.D.'s. He notes that while the student in the sciences is vocationally oriented, the student in the humanities is subject oriented. The latter, who has pursued pre-graduate studies in a wide-ranging, free-wheeling style simply for the love of them, is rudely awakened to the realities of graduation.

> "He is disturbed that the subject which until now has been his pleasant companion is becoming his stern taskmaster. The broad field of his interests disintegrates into a mass of minutiae."[2]

Precisely the same observation has been made by Richard L. Predmore who, in speaking of graduate students in the humanities, said, "their frustrations and complaints in graduate school stem from this need to discover and prepare for a vocation, where originally there was only interest and pleasure."[3]

Tucker: motivation

Allan Tucker's study of The Factors Related to Attrition Among Doctoral Students was mentioned earlier in this Chapter. Having analyzed all the reasons given by students for dropping out of Ph.D. programs,

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[1] Gustave Arlt, in a speech to the Association of Departments of English, reported in The Chronicle of Higher Education, Vol. III, No. 15, January 13, 1969, p. 3.

[2] Ibid.

[3] Predmore, op. cit., p. 6.

Tucker concluded that "most of the students who dropped out of Ph.D. programs did not complete the requirements for the degree because they lacked sufficient motivation."[1] And he recommended that if graduate schools, in addition to evaluating academic ability, "could also evaluate personality characteristics of applicants such as their desire to achieve or be successful, predictions concerning their performance in a Ph.D. program would be improved."[2] If one regards part-time study or other interruptions in progress as "temporary attrition," then the same conclusions reached by Tucker with regard to attrition can be said to apply to the larger problem of duration.

Davis, Wilson, and Heard:
decisions to delay

Motivation, in its broadest sense, may be the principal factor in a student's decisions to delay graduate school entry or to proceed at a less than full-time rate after he has begun his graduate studies. That is, his decisions may turn on the degree to which he is personally motivated to pursue an advanced degree. Any decision to suspend full-time study tends, of course, to increase the B.A.-to-Ph.D. time lapse.

In studying the life histories of the students in his sample (described earlier in this Chapter), Davis discovered that over 40 per cent were out of college a year or more before they began graduate work.[3]

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[1] Tucker, op. cit., p. 280.

[2] Ibid.

[3] Davis, op. cit., p. 28.

His data indicated that the student with such a gap in his formal academic training is not typically one who was prevented from getting in to graduate school, but one who had not yet been attracted by it. From this Davis concludes that among great numbers of students there is a late development of motivation for graduate studies.

The data collected by Wilson in his Southern study revealed that only about 30 per cent of his sample of Ph.D. recipients had the definite personal goal of "working toward a doctorate" when they received the bachelor's degree.[1] For more than one-fourth of the sample even the general goal of "pursuit of graduate study" had not become established by that time. It was noted that disciplinary interests were established earlier in the physical sciences than in other fields. From these data Wilson concludes that "pursuit of the doctorate" is an emergent goal, crystallizing for many individuals only after entry into graduate school.

Alexander Heard relates this phenomenon of "emerging goals" more directly to personal decision-making as he lists "lack of clarity of purpose" prior to and after entering graduate school first among the factors responsible for slowing progress to the doctorate.[2] To support this contention Heard points to the following facts that emerged from Wilson's comparison of faster and slower groups: a) pursuit of graduate study became an objective only after the senior year in college for 38

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[1] Wilson, op. cit., p. 62.

[2] Heard, op. cit., p. 6.

per cent of the slow group versus 15 per cent of the fast group; b) the doctorate degree was seen as a definite personal goal before college graduation by 20 per cent of the slow group and 38 per cent of the fast group, and as a goal by the end of the first graduate year by 65 per cent of the slow and 87 per cent of the fast group; c) 72 per cent of the slow group became interested in their Ph.D. field while undergraduates as compared with 84 per cent of the fast group, and 50 per cent of the slow group held to their same field throughout their graduate studies versus 70 per cent of the fast group. This last comparison illustrates the effect of a decision to change fields on progress toward the doctorate.

Davis: academic ability

In his discussion of the factors most predictive of speed or quality of student performance in Ph.D. study, Wilson lamented the fact that very little is known regarding the role that "functional abilities" (including academic ability) play in determining "successful performance."[1] Unfortunately that state of affairs still obtains. One study that might be mentioned in this connection, however, is that of Davis on the finances of graduate students.[2] Davis discovered that one year after his initial survey had been conducted, 34 per cent of the students in the sample had dropped out. In his analysis of the factors associated with dropping out,

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[1] Wilson, op. cit., p. 146.

[2] Davis, op. cit., p. 107.

Davis found that academic ability was the most important variable. Morale, personal adjustment, criticism of the graduate school, and financial worries, he notes, were not related. Again, because the unavoidable consequence of "dropping out" is a delay in progress toward the doctorate, it might be said that in this study academic ability was shown to be associated with rate of progress.

Wright: social adjustment and integration

A number of studies have been conducted in recent years concerning the socialization process in graduate school, the development of the graduate student's role relations in that process, and the impact of stressful situations on the student. The degree to which the student is satisfactorily socialized and the success he has in dealing with stress can obviously affect his rate of progress toward the doctorate. The student's abilities in the broad area of socialization are personal attributes which are appropriately included in this section. In the study of Charles R. Wright, mentioned earlier, it will be remembered that few of the 63 variables examined proved to the associated with success of failure in earning advanced degrees.[1] The two factors that were most consistently related to success at the doctoral level were social adjustment and integreation into the graduate community. These factors were measures in terms of the student's participation in various activities of the graduate school "community," his interaction with members of the "community," and his use of leisure time.

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[1]Wright, op. cit., pp. 91-2.

Family responsibilities

Three of the studies reviewed in this Chapter indicated that family responsibilities influence the length of time required to complete the doctorate. In Elder's survey of Harvard and Radcliffe Ph.D.'s 22 per cent of the sample reported that family obligations had some lengthening influence.[1] Wilson's respondents ranked family obligations as the sixth most important factor responsible for delaying entrance to graduate school and the third most important in interrupting graduate study.[2] In addition, Wilson found that the faster group of Ph.D. recipients was characterized by fewer dependents than the slower group at all stages of the graduate program. As might be expected, family responsibilities are of great significance for women as an obstacle to progress. In the study on women and graduate study described earlier, 41 per cent of the female respondents indicated that family responsibilities had served as a major obstacle to being enrolled. This factor ranked a close second to financial obstacles, which was reported by 42 per cent of the respondents.

Clearly, family obligations and responsibilities may entail financial problems. Yet in most studies that have been conducted, an attempt has been made to separate these two factors. It is assumed that decisions to enter into marriage and raise a family are consciously made by students

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[1]Elder, op. cit., p. 31.

[2]Wilson, op. cit., pp. 69 and 71.

with full awareness of the additional responsibilities that are required by the marriage and family. Because these responsibilities arise out of personal decisions they may be considerd as personal factors, in the same way as would be the decision to delay progress by undertaking any other kind of non-academic responsibilities.

Other Obstacles

Progress toward the doctorate may be delayed by a number of factors that are not related to finances, institutional variables, or personal characteristics and decisions. They include such considerations as the draft, the preparation a student has received as an undergraduate, the distance he lives from graduate school, or the difficulties a foreign student has with the English language. These factors have received little attention in the literature of higher education simply because they arise external to the student and institution with which most writers are concerned.

Inadequate preparation

The one other factor that has gained some support as an obstacle is that of inadequate undergraduate preparation. In Wilson's study 27.2 per cent of the respondents reported that inadequate preparation in foreign languages had lengthened their doctoral programs; another 22.8 per cent

attributed some lengthening influence to inadequate preparation in their graduate field of specialization.[1] Inadequate preparation before coming to Harvard was reported as having a lengthening influence on graduate study by 26 per cent of the graduates in Elder's study, ranking this factor fourth on his list of obstacles.[2]

In his writings of graduate education, Carmichael has approached the problem of preparation by stressing the need for greater articulation between undergraduate and graduate curricula.[3, 4] One of his recommendations in the book discussed earlier is for a three-year master's degree, beginning with the junior year in college. This articulation of undergraduate and graduate programs, would assure the student of a relatively smooth transition between college and graduate school, thereby eliminating most of the problems of preparation.

Military service

The only data available concerning the effect of military service on the duration of doctoral programs appear in Wilson's study.[5] Of the respondents who had delayed entry into graduate school, 38.2 per cent indicated that military service was responsible for the delay. Another 19.0 per cent

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[1]Wilson, op. cit., p. 71.

[2]Elder, op. cit., p. 31.

[3]Carmichael, op. cit.

[4]Oliver C. Carmichael, "Some Basic Problems of Graduate Education," Liberal Education, Vol. 49, No. 1, March, 1963, pp. 81-5.

[5]Wilson, op. cit., pp. 69 and 71.

reported that a period of military service was a factor in interrupting graduate study following receipt of the master's degree. The military service factor thus ranked second and fourth on the respective measures.

Summary and Consequences

The preceding pages are devoted to a discussion of the general problem of duration of doctoral study. The impacts of this problem on the student, the society and the institutions of graduate education are described. Following a brief recounting of the history of concern over the subject, the literature dealing with the factors responsible for prolonging doctoral study is reviewed. The factors or obstacles that delay students' progress toward the doctorate are classified into four major groups: financial, institutional, personal, and other. Evidence is presented to the effect that factors in each of the four groups play a role in protracting doctoral study. However, there appears to be no consensus among the authors cited regarding the principal causes of delay. Financial, institutional, and personal factors are singled out, respectively, by different writers as the chief obstacles to rapid completion of the doctorate.

These contradictions indicate that further study is required to determine which obstacles are the most significant, and for which students, and at what times. Presumably the answers to these questions are best supplied by those persons most directly concerned with the problem, i.e., the students themselves. Yet in the three major studies that approached the problem of doctoral delay directly--those of Berelson, Elder, and Wilson, cited earlier in this Chapter--the respondents queried were

recipients of the Ph.D. This approach has some significant drawbacks. As Heiss has noted, much of the data collected in these studies must be interpreted as indicative of past history rather than of current trends, since respondents were obliged to react retrospectively to experiences dating back three to fifteen years.[1] In addition the fact that data were collected from "survivors" of the system may bias the results obtained. It is suggested, therefore, that a more accurate and representative description of the obstacles encountered en route to the doctorate might be provided by those engaged in the process, i.e., currently enrolled students.

Furthermore, in the Berelson, Elder, and Wilson questionnaires the questions concerning delaying factors were of the fixed-alternative type. That is, the respondents were presented with a list of factors that they were asked to check. The advantages of this type of question are that it forces the respondent to consider all the possibilities on the list and simplifies the coding process. But on the other hand, by establishing the list of factors to be considered the investigator confines, or at least sets the frame of reference of, the respondent; in a sense, he leads the witness. In addition the fixed-alternative type of question introduces a "complaint factor" that various investigators have estimated ranges between 15 and 20 per cent.[2, 3]

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[1] Heiss, op. cit. p. 3.

[2] Elder, op. cit., p. 3.

[3] Heiss, op. cit., p. 2.

On the following pages a study of the problem of doctoral delay is undertaken that presumes to avoid some of the shortcomings of previous studies on the subject. A national sample was drawn of graduate students at all stages of Ph.D. preparation. The questionnaire employed in this study included an open-ended question concerning the obstacles that had delayed the progress of these students toward the doctorate. Responses to this question were coded and the information obtained was analyzed against the other demographic data provided. The study, therefore, attempts a deeper analysis of obstacles to the doctorate and provides a slightly different prospective on the problem than the studies previously performed.

CHAPTER II

OBTAINING THE DATA

The Office of Education Sample

In the spring of 1965 the Office of Education, with the assistance of the National Opinion Research Center, conducted a questionnaire survey of a national sample of graduate students in the arts and sciences. The objective of the survey was to obtain information concerning the academic and financial status of students representing 23 fields of study. The fields were chosen such that each student in the sample would fall into one and only one of the fields. Those fields selected for the sample and the broad areas into which they were grouped for this study are shown in Appendix A.

The universe of students from which the Office of Education sample was selected consisted of all students enrolled in programs leading to a degree beyond the bachelor's. Not included were students seeking professional degrees in fields such as law, medicine, or dentistry. Respondents were drawn from this universe by a multi-stage cluster sampling procedure. In the first stage, all institutions that award advanced degrees were stratified by size of graduate enrollment. The eight largest of these

institutions were included in the sample with certainty. Of the remaining institutions, 60 were chosen with probability proportionate to the size of graduate enrollment. The institutions selected are shown in Appendix B.

Students in these 68 institutions were listed by academic field, and samples were selected randomly from each field. The desired sample size for most fields was set at about 860 cases in order to permit reliable comparisons to be made between fields.

Questionnaires were mailed to this sample of students during April 1965; two follow-up mailings were made to non-respondents at three-week intervals. Of the 20,140 questionnaires mailed out, a total of 15,710 useable questionnaires, or 78 per cent of the sample, were returned. The respondents represented about three per cent of all students enrolled for advanced degrees in the spring of 1965.

The Questionnaire

The questionnaire used in the survey is shown in Appendix C. The six-page form comprised six major sections:

A) general demographic information

B) degrees held and sought, academic field, and stage of progress

C) future employment aspirations

D) prior employment

E) present academic activity

F) current finances--income and expenditures

The great majority of items on the questionnaire were of the fixed-alternative or simple fill-in variety. However, the final question was open-ended and was phrased as follows:

> "Indicate in your own words the most serious obstacles that delayed your progress toward an advanced degree. What do you think can be done to speed up graduate education? Please make any other general comments that you wish to make."

This final question elicited the information that serves as the basis of this study.

Selection of the Study Sample

In order to reduce the Office of Education sample of 15,710 to manageable proportions, the sample for this study was selected by including only those respondents who indicated in question B-2 that the "Next degree you expect to receive" was the doctorate. This procedure reduced the study sample to 3,380 respondents. Although this method of "group selection" within a sample avoided some of the complications arising from double sampling, it tended to reduce drastically the sample within certain fields of study where few students aspire to the doctorate (see Appendix A).

Coding of the Questionnaire

The questionnaires filled out by the 3,380 respondents in the study sample were supplied to me by the Office of Education.[1] The coding process

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[1] Excepted from the questionnaires provided were those in which the open-ended question was left blank. These were not forwarded simply because there was no need to see them. With regard to the question on obstacles, questionnaires not sent by the Office of Education were coded as "no response."

undertaken in this study involved categorizing the responses to the open-ended question on obstacles. Although this question had been coded (along with the remainder of the questionnaire) by Office of Education personnel, the OE study directors agreed that a more thorough content analysis of the free responses would be required for a study that was to be based on these responses.

Primary Coding

The designation of the codes to be used in categorizing the free responses and the primary coding of all the questionnaires were undertaken by the writer. The procedure employed was as follows: a 20 per cent sample of the questionnaires was examined; on the basis of the responses in this sample, eight general classes and varying numbers of categories within the classes were established into which all the obstacles described by the respondents might be placed. The several classes and categories were set forth and defined in a preliminary coding manual which was prepared to assist the primary coder and check coders (the final coding manual that evolved is shown in Appendix D).

It is worth noting that the obstacles mentioned by the respondents formed themselves into the four major groups described in Chapter I: financial, institutional, personal, and other. In this study the institutional group has been divided into three classes (academic, organizational, and personnel) to reflect the particular kinds of institutional obstacles described by the students.

Having established the basic class and category codes, the primary coder examined the entire group of questionnaires and assigned class and category code numbers to each response. The stated obstacles were coded in order of mention, up to four in number. It was discovered in the primary coding that several kinds of responses were made that did not "fit" into the categories originally established. These were placed into one of the "other" categories in the several classes. As a rule of thumb, if a dozen or more responses of one type came to rest in one of the "other" categories, a new category for that kind of response was established in the appropriate class. Correspondingly, at the end, if an original category contained fewer than 12 responses, the responses were placed in the "other" category of the respective class.

Check Coding

Because all the primary coding had been accomplished by one person (the writer), it was necessary to employ a thorough check coding procedure. The purpose of check coding was to test the reliability of the primary coding and to determine the level of differential interpretation that might be found among different coders. The procedure of check coding recommended by the Coding Section of The University of Michigan's Institute for Social Research and adopted in this study was as follows:

1.) Using the coding manual shown in Appendix D, three check coders each coded a different 10 per cent of the responses.

2.) If the check coder disagreed with the primary coder regarding any code(s) assigned to a given response it was counted as a difference. For example, if a response contained four obstacles and there was disagreement on just one, there was considered to be a difference of opinion on the response. The number of differences that appeared after the initial examination of the responses by the check coders is shown in column a of Table 2.1

3.) Then the primary coder discussed each of the differences with the respective check coders. If either coder had made an error in transcription or, after the discussion, saw that his coding had been in error, the code was changed. It will be noted in column b of Table 2.1 that, as a result of this re-examination, the check coders changed 11.1 per cent of their original decisions on the class codes and 13.7 per cent of the category codes. The primary coder's changes amounted to 4.3 per cent and 5.6 per cent respectively (see column c).

4.) If an initial disagreement over a particular response could not be resolved, it was counted as an unresolved difference. These differences amounted to 3.5 per cent for the class codes and 4.4 per cent for the category codes.

The following conclusions might be drawn from the check coding operation: First, the primary coder, through errors of transcription or judgment, incorrectly coded approximately five per cent of the responses (or at least parts thereof). These errors were, of course, changed in the 30 per cent of the responses that were check coded, but presumably remain in the rest. And second, approximately four per cent of the responses were worded in such a manner that, given the codes established for this study, different interpretations could be made by different readers.

TABLE 2.1.--Analysis of check coding differences

Check coders	Number of questionnaires examined	a Number of differences with primary coder after first examination of questionnaires by check coders		Differences resolved after disscusion					
				b Change made by check coder		c Change made by primary coder		d Unresolved differences	
		Class codes	Category codes	Class codes	Category codes	Class codes	Category codes	Class codes	Category codes
A	338	61 (18.0%)*	69 (20.4%)	37 (10.9%)	45 (13.3%)	17 (5.0%)	19 (6.6%)	9 (2.7%)	10 (3.0%)
B	338	58 (17.2%)	70 (20.7%)	38 (11.2%)	45 (13.3%)	10 (3.0%)	14 (4.1%)	13 (3.8%)	16 (4.7%)
C	338	63 (18.6%)	83 (24.6%)	38 (11.2%)	49 (14.5%)	17 (5.0%)	24 (7.1%)	13 (3.8%)	19 (5.6%)
Combined	1014	182 (17.9%)	222 (21.9%)	113 (11.1%)	139 (13.7%)	44 (4.3%)	57 (5.6%)	35 (3.5%)	45 (4.4%)

*Per cent of the number of questionnaires examined.

Arrangement of the Data for Analysis

To facilitate computer processing, the data pertaining to each individual in the sample were placed on a single 80-column IBM card. Two fields were devoted to information derived from coding the open-ended question on obstacles; one for class codes and one for category codes. By this means the data concerning obstacles could be analyzed either by class or by category. The remainder of the card was filled with data obtained from other sections of the questionnaire. These data were provided by the Office of Education on a single magnetic tape. The tape contained 480 characters for each of the 15,710 respondents in the OE sample. Selected data for the 3,380 individuals in this study sample were transferred from the tape to the IBM cards. In some cases the data in the OE fields were compressed or combined so as to permit maximum utilization of space on the card without neglecting any significant information.

CHAPTER III

OVERVIEW OF REPORTED OBSTACLES

The responses of the total sample of students concerning obstacles that delayed their progress toward the doctorate are summarized in this Chapter. Such an overview permits some general observations to be made about the prevalence and significance of different kinds of obstacles, and sets the stage for the analyses that follow.

Of the 3,380 students in the sample, 682 (20.2%) made no response at all to the question on obstacles. Another 319 (9.4%) responded, but in such a way that it was impossible to ascertain what, if any, obstacle was being described. Because neither of these categories of response conveyed any useful information concerning obstacles encountered by the respondent, they were lumped together under the class "not ascertained" and excluded from further analysis.

A total of 323 students (9.6%) stated in some positive fashion that no obstacles had delayed their progress toward the doctorate degree. The characteristics and conditions of these students, whose progress had apparently been optimal, will be examined in some detail in following chapters.

The remaining 2,056 students (60.8% of the total sample) specified one or more delaying factors. As noted earlier the obstacles were coded in order of mention, up to four in number. However, because so few students (657) reported more than one obstacle and because there was little evidence that the students had ranked their responses, all reported obstacles were given equal weight and added together for analysis.

Table 3.1 indicates the distribution of responses in the various classes and categories. The reader is referred to Appendix C for definitions of the respective categories. If a respondent indicated more than one obstacle category within the same class, the class obstacle was counted but once for that respondent.

It is evident in Table 3.1 that financial problems delayed the progress of more students than any other single obstacle. Nearly one-third of the total sample (30.0%) related obstacles which were coded as financial. Perhaps another five to ten per cent described obstacles associated with employment or the family that had financial implications but were not coded as such. These data alone tend to confirm the conclusions of Berelson and others presented in Chapter I that the support problem is chiefly responsible for delaying students' progress toward the doctorate.

However, those whose studies point to the shortcomings or inadequacies of graduate schools and their doctoral programs as the chief cause of delay (see Carmichael, Elder, et al. in Chapter I) also gain some measure of support from the data. It was found that 725 students or 21.4 per cent of the sample reported at least one of the obstacles in the three

TABLE 3.1.--Obstacles reported by graduate students as delaying their progress toward the doctorate

CLASS Category	Number of students reporting obstacle	Percentage of total sample
FINANCIAL	1015	30.0
financial	1015	30.0
INSTITUTIONAL--ACADEMIC		
REQUIREMENTS	340[a]	10.1[a]
coursework and course requirements	85[b]	2.5[b]
major examinations	33	1.0
foreign language	179	5.3
research and the dissertation	78	2.3
other institutional--academic	19	0.6
INSTITUTIONAL--ORGANIZATION,		
PROCEDURES, GENERAL		
REQUIREMENTS	331	9.8
admission or transfer	33	1.0
lack of desired program	34	1.0
physical facilities or services	48	1.4
teaching assistantship, research assistantship, or other university employment	92	2.7
general requirements and regulations	95	2.8
other institutional--organization	54	1.6
INSTITUTIONAL--PERSONNEL	185	5.1
teaching	21	0.6
personal attention	135	4.0
other institutional--personnel	45	1.3

TABLE 3.1.--Continued

CLASS Category	Number of students reporting obstacle	Percentage of total sample
PERSONAL	467	13.8
mental ability and motivation	68	2.0
indecision or uncertainty	54	1.6
shift in field, program, or institution	56	1.7
diverse competing interests	52	1.5
physical illness or disability	17	0.5
physical characteristics	14	0.4
marriage or the family	172	5.1
other personal problems, attitudes, decisions	88	2.6
OTHER (EXTERNAL)	437	12.9
inadequate preparation	92	2.7
military service	59	1.7
physical factors	23	0.7
lack of time	23	0.7
other employment	189	5.6
English as a foreign language	23	0.7
miscellaneous other	61	1.8
STATED NO OBSTACLE	323	9.6
stated no obstacle	323	9.6
NOT ASCERTAINED	1001	29.6
no response	682	20.2
not ascertained	319	9.4

[a]Numbers and per cents of students reporting obstacles within that class.

[b]Numbers and per cents of students reporting obstacles within those categories.

The sum of the numbers and per cents of obstacles in the several categories will not necessarily equal the totals for the class because of multiple responses within a class.

institutional classes (academic, organization, personnel). Thus, non-financial problems associated with the graduate school and doctoral program are not to be disregarded as important causes of delay.

The two other major classes of obstacles, "personal" and "other" also were indicated by enough students to be taken seriously. However, the writers who have attributed delay primarily to personal and other factors have generally dwelt on particular personal characteristics or factors (e.g., Arlt and Predmore on maturity, Tucker on motivation, Wilson and Heard on decisions to delay progress, and Wright on social adjustment and integration). These particular factors would be represented in this study by the obstacle categories in the "personal" and "other" classes. It may be seen in Table 3.1 that none of the factors considered most important by these writers has attracted any significant measure of support from the students in this sample.

Thus, in terms of the total sample, it would appear that financial problems represent the most serious and prevalent obstacle to rapid progress toward the doctorate. Obstacles associated with, or related to, the institution in which the student is enrolled rank second in importance. And third and fourth in importance are, respectively, personal and other obstacles.

CHAPTER IV

GENERAL FRAMEWORK FOR ANALYSIS

Although the data presented in the previous chapter are of some general interest in and of themselves, they are not particularly helpful in terms of providing new insights into the problem of doctoral duration, nor in terms of directing our attention toward specific measures that might be employed in order to reduce the amount of time presently required to complete the doctorate. In sum, these data paint the picture of obstacles to the doctorate in only the broadest strokes.

It might be argued, in fact, that because every student's problems and delays are unique, no amount of nomothetic data will provide answers that will be generally applicable. As Rosenhaupt has said, "no single image of the graduate student can be drawn".[1] Yet somewhere between these extremes of generalization and specificity, particular kinds of obstacles can be identified that delay the progress of particular groups of students. The objective of this study, then, is to identify the major sources of delay and to determine:

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[1] Rosenhaupt, op.cit., p. 12

a) what types or groups of students are impeded by specific obstacles,

b) what characteristics or conditions of a student render him statistically more susceptible to certain obstacles,

c) and at what time during a student's academic career or life-span are these delays most likely to occur.

Answers to these questions will permit graduate schools and other agencies to allocate their human and financial resources more effectively so as to obviate or alleviate obstacles for the greatest numbers of students.

In the analyses that follow, it is assumed that reported obstacles are associated with, related to, or caused by certain characteristics and conditions of the students. Thus, reported obstacles are treated as dependent variables and student characteristics and conditions as independent variables. For each of the major classes, and in some cases categories, of obstacles, the following factors are examined to determine if there is any statistical association between these independent variables and reported obstacles.

A) Personal variables
   1) sex
   2) age
   3) race
   4) marital and dependent status
   5) citizenship status

B) Academic ability variables
   1) undergraduate grade point average
   2) graduate grade point average

C) Financial variables
   1) parental income
   2) annual earnings prior to entering graduate study
   3) present major source of income
   4) duty hours per week required for stipend

D) Institutional variables
   1) control of institution (public, private, religious)
   2) size of institution (graduate enrollment)

E) Academic progress variables
   1) years elapsed between bachelor's degree and start of graduate study
   2) year first began graduate study
   3) years of academic study beyond baccalaureate completed
   4) year received master's degree
   5) highest degree now held
   6) present enrollment status (part- or full-time)
   7) degree requirements presently working on
      a) courses or seminars
      b) comprehensive or "qualifying" exams
      c) lanquage examinations
      d) research for and preparation of thesis
   8) stage of thesis

F) Field of study variables
   1) field of study

Chi-square is used to test whether or not the relationships obtained between student characteristics and obstacles can be attributed to chance. In these comparisons the null hypothesis is rejected at the one per cent level of significance unless otherwise indicated. Because nominal scales have been used to classify so many of the variables, correlation techniques will be employed to describe relationships among variables in only a few instances. The results of the chi-square tests of association are summarized in Appendix E.

General Assumptions

Certain of the general assumptions that underlie the analyses that follow need to be set forth here. First it will be assumed in this study that the obstacles listed were in fact serious and real if perceived so by

the respondents. A related assumption is that graduate students are concerned with completing their degree programs as rapidly as possible. The legendary career graduate student, living off the fat of the graduate school and unconcerned about his progress or even unwilling to complete his program, simply was not in evidence in this survey. My personal experience is that his numbers are negligible.

One final assumption is concerned with the temporal nature of the responses. Because the question on obstacles is stated in the past tense a student might be expected to list problems encountered at any time during his graduate experience. Thus by mere accretion older students and especially students further along in their degree programs should relate more obstacles and at a greater frequency than younger or beginning students. However, some evidence will be presented that indicates that students responded largely in terms of their present conditions or situations. That is, their psychological frame of reference was the present, at least to a great enough degree to permit meaningful analyses to be made relating obstacles to present characteristics or conditions.

CHAPTER V

THE FINANCIAL OBSTACLE AND RELATED VARIABLES

Summary of Major Findings

Financial obstacles were reported by 30.0 per cent of the students in this sample, thus making financial problems the most frequently mentioned cause of delay. Hence, financial obstacles receive primary attention in the analyses of this study. The class of responses coded as "stated no obstacle" is examined concurrently with the financial class. Because these two classes appear to be inversely related across a number of critical variables, it is concluded that if a student's financial problems are reduced or eliminated the likelihood of his perceiving no serious delays in his progress is greatly enhanced.

A. The Financial Obstacle Syndrome

The diagram on the following page illustrates the major causes of, and variables associated with, reported financial obstacles.

1. Principal causes of financial problems

As shown in Figure 5.1 a financial problem and, hence, a reported

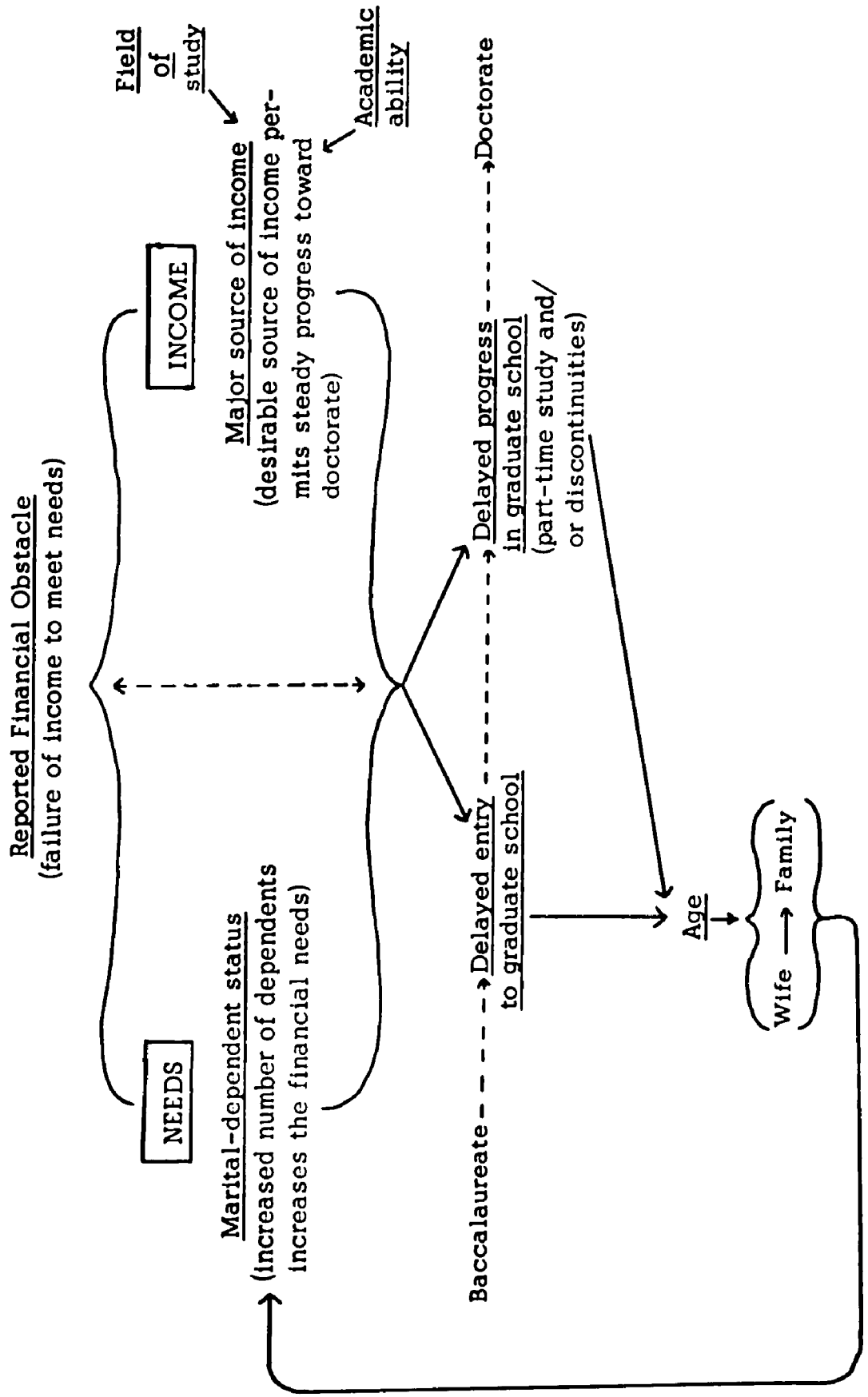


Fig. 5.1.--The financial obstacle syndrome

financial obstacle, arises from the failure of a student's income to meet his financial needs.

a. Variables related to income

In this study five variables were examined that were statistically associated with reported financial obstacles and appeared to be causally related to the student's income.

1) Major source of income.--It was found that students whose present major source of income was derived from scholarships or fellowships, teaching assistantships, and research assistantships were characterized by lower than average reporting of financial obstacles. Students whose present support came from faculty appointments, other employment, and spouse's employment reported financial obstacles at a percentage higher than average.

2) Field of study.--Financial obstacles were higher among students in education, the humanities, and some social science fields than among those in engineering, the life sciences, and the physical sciences. It was shown that a ranking of broad areas of study according to financial obstacles reported by students in those areas corresponded exactly to a ranking by elapsed time from baccalaureate to doctorate. Differences among the several fields of study with respect to financial obstacles reported were attributed to differential financial support patterns within the fields.

3) Academic ability.--Students with higher academic ability (defined in terms of undergraduate grade point average) reported significantly fewer financial obstacles than students with lower academic ability. This difference was shown to be related to the fact that the better students were able to obtain more desirable sources of support. However, the academically more able students were found not to be concentrated in the fields that provide the more favorable forms of financial assistance.

4) Parental income.--It appeared that as the income level of the student's parents increases, the percentage of reported financial obstacles decreases. This relationship, however, was found to be a spurious one, influenced strongly by the factor of age (discussed later).

5) Previous annual earnings.--The data on this variable indicated that in general reported financial obstacles increase among students whose incomes prior to graduate school entry were in the higher ranges. But again, the factor of age coupled with the advantages derived from direct entry into graduate school influenced this relationship.

b. Variables related to financial needs

In the income-needs relationship shown in Figure 5.1, the variable most directly associated with financial needs concerns the marital and dependent status of the student.

1) Marital-dependent status.--It was shown that there was no significant difference in the reporting of financial obstacles between single students with no dependents and married students with no dependents. However, when either single or married students acquire dependents, financial obstacles increase markedly. The differential financial needs of these four groups were shown to stem from living expenses rather than academic expenses. Thus, the critical factor in relation to financial obstacles appeared to be the additional living expenses incurred not with the acquisition of a spouse but of dependents.

2. Primary outcomes of a needs-income imbalance

Returning again to Figure 5.1 it may be seen that the failure of income to meet financial needs leads not only to the direct reporting of a financial obstacle, but also to a number of behavioral outcomes. These manifestations, in the form of delays either prior to or during graduate study, arise simply because the student cannot afford to attend graduate school full time or perhaps even part time. Thus, delays and reported financial obstacles are viewed as concomitant effects of the same cause (i.e., an imbalance of needs and income). Hence the variables related to delay would be expected to vary in association with reported financial obstacles, and they did.

a. Variables related to delayed entry

1) Years elapsed between bachelor's degree and graduate school entry.--It was found that reported financial obstacles increase

as the undergraduate-graduate hiatus lengthens. A comparison of those students who did not delay entrance into graduate school with those who did, revealed that the former had significantly better undergraduate grade point averages, possessed the more desirable forms of financial assistance, and were found primarily in those fields characterized by greater financial support.

b. Variables related to delayed progress in graduate school

Delays in graduate school take the form of part-time (as opposed to full-time) study or a complete cessation of academic effort. It was not possible to measure the latter effect directly because the sample included only students who were enrolled. Moreover, the data on these students were not longitudinal. However, some indirect measures of the prolonging effect of periods of inactivity were employed.

1) Enrollment status.--Students who were enrolled part-time reported financial obstacles at a significantly higher percentage than those who were studying full-time. Again, full-time students, in contrast with their part-time colleagues, were characterized by the same variables relating to academic ability, financial support, and field of study that characterized students who had entered graduate school directly.

2) Year first began graduate study and

3) Year received master's degree.-- Both these variables provide an indirect measure of the effects of delays and discontinuities

since delays tend to push both of these events further into the past. It was found that as the number of years elapsed between the present and the start of graduate study or receipt of the master's degree increased, reported financial obstacles increased.

4) Years of academic study beyond the bachelor's degree completed.--This variable differs from the previous two because it is a measure of the actual (full-time-equivalent) time spent working on the degree. Major interruptions or discontinuities in graduate study should not influence the values obtained. The data revealed that while reported financial obstacles increased through the first two years of study, they tended to taper off after that point. It was shown, however, that these trends were related not to anything inherent in the academic program but to the changing composition of the several "years of study completed" groups. That is, as higher percentages of students in the groups were supported by scholarships and smaller percentages by other employment income, the reported financial obstacles were less, and vice versa. Thus, what this variable was really reflecting was changing support patterns. In addition, because different support patterns were associated with the several fields of study, it was found that financial obstacles reported by students in different "years of study completed" groups changed according

to the composition of the groups by field of study.

3. Secondary outcomes of a needs-income imbalance

It was noted earlier that the primary outcome of the failure of a student's income to meet his needs was a delay or interruption in his progress toward the doctorate. The inevitable result of any kind of delay (i.e., the secondary outcome) is that the student grows older, without making any appreciable progress toward the degree. The age variable was in fact correlated with all the measures of delay previously discussed.

a. Age

Perhaps because of the cumulative or additive effects of the various kinds of delay on age, this variable was more highly associated with reported financial obstacles than any other. Financial obstacles increased regularly in successive age groups in all fields of study.

b. Other outcomes

In the sense that a student's age at completion of the Ph.D. increases as a result of delays in his progress, age may be regarded as a dependent variable. But as shown in Figure 1.5, age can also serve as an independent variable (in relation to financial obstacles) in the following way. As a student ages, the statistical likelihood of his being married and increasing the size of his family increases. A growing family, of course, increases his financial obligations or needs. And increased needs tend to upset the needs-income balance shown in Figure 1.5, starting the cycle all over again. In this particular

relationship of age with financial obstacles, the family financial obligations serve as the intervening variable.

B. Stages of Academic Progress

Two kinds of measures were used to assess the student's academic progress toward the doctorate: the particular degree requirement(s) he was working on, and the dissertation stage that he had reached.

1. Degree requirements presently pursued and
2. Stage of dissertation.--For both of these variables it appeared that reported financial obstacles decreased through successive stages of academic progress. However, this apparent relationship was shown again to be due to the more basic variable of changes in financial support patterns through time. The percentage of students holding scholarships or fellowships and research assistantships increased through successive stages while the percentage supported by other employment decreased. And because the former, well-supported group of students reported fewer financial obstacles than the latter, it appeared that financial obstacles decreased over time.

Similarly, it was found that the fields whose students report financial obstacles least frequently (i.e., the fields characterized by high levels of desirable financial support) have a relatively smaller percentage of students engaged in the early stages of progress (coursework) and a relatively larger percentage in the later stages (dissertation). In order to control for this factor of differential composition

of academic progress groups,the "high supporting" (low financial obstacle) fields were analyzed separately from the "low supporting" (high financial obstacle) fields. When this was done, it was found that for each of the two groups and within individual fields there were no significant differences in the reporting of financial obstacles through successive stages of progress. Rather, the level of reported financial obstacles was constantly higher throughout for students of "low supporting" fields than for students of "high supporting" fields.

It was also shown that while there were not significant differences in the number of years students from low and high supporting fields had completed beyond the baccalaureate, there were considerable differences in the academic progress students from the two groups had made. Namely, over twice as many students in "high supporting" fields had reached the active dissertation stages as had students from "low supporting" fields. Thus, it was concluded that the ability of students in "high supporting" fields (primarily the physical and biological sciences) to move quickly into full-scale dissertation work, plays a major role in enabling them to complete their degrees at a faster rate.

C. Other variables

A number of other variables that were expected to show some relationship with reported financial obstacles were examined.

1. Institutional variables

   a. Size of graduate school

   b. Control of institution and

   c. Other institutional variables.--It was found that neither the size of the graduate school (under vs. over 2,000), the control of the institution (public, private, religious), nor any other grouping of institutions studied was statistically associated with the reporting of financial obstacles. Thus, it was concluded that financial problems delay the progress of doctoral students irrespective of the kind of institution they attend.

2. Personal variables

   a. Sex.--No significant difference was found between men and women in the reporting of financial obstacles.

   b. Race.--In this sample Negroes reported financial obstacles at a frequency twice that of Orientals, with whites falling between the two at about the total sample frequency. The difference between the two minority races was attributed to the Orientals' higher undergraduate grade point average, and their concentration in those fields that made available to students the more desirable forms of financial support.

Analysis of the Financial Obstacle and Related Variables

In this study 30.0 per cent of the respondents reported that financial problems had delayed their progress toward the doctorate. As shown in Table 3.1, this level of response ranked finances as the most important source of delay. Hence financial obstacles will be analyzed first. This obstacle and the class of responses labelled as "stated no obstacle" will be examined simultaneously because of the interesting relationship the two exhibit. It will be seen that among those groups or types of students reporting financial obstacles at a disproportionately high rate, the response rate for "stated no obstacle" is disproportionarely low, and vice versa. In other words, across a given parameter such as age, academic ability, major source of income, marital-dependent status, etc., the financial and "stated no obstacle" classes appear to be inversely related. This particular relationship does not obtain between the "stated no obstacle" class and any other obstacle class.

Thus, in an indirect way, the "stated no obstacle" class provides further evidence of the preponderance of financial obstacles. It will be used to demonstrate the veracity of the hypothesis that if a student's financial problems are reduced or eliminated the likelihood of his perceiving no serious delays in his progress is greatly enhanced.

In discussing financial obstacles it would seem desirable to have some objective assessment of each student's financial condition. With this information we might be able to determine whether a reported financial obstacle should, in relation to the financial condition of other graduate

students, constitute a serious problem. It is known, for example, that in fiscal year 1965-65 average living expenses[1] for students in this sample were $5,064,27. Average academic expenses[2] for the students amounted to $883.70. A given student's income and expense might then be compared with each other and with these and other averages in order to evaluate his financial state.

However, there are two problems associated with making such objective assessments. The first is the problem of relativity. What might seem to be adequate income for one student might be inadequate for another because of differential factors such as cost of living in the area, size and financial demands of family, other financial commitments, and accustomed level of affluence. The equation for relating all the factors of income and expense to an objective standard is highly complex and of questionable value. Moreover, the data requirements for such an equation are beyond the scope of this study.

The second problem relates to the matter of perception. Even if we were to determine objectively whether a given student was in good or bad financial shape, what difference would it make? For a student, a perceived financial obstacle is a real one, regardless of what is indicated by objective criteria. And if students base their decisions about delaying or proceeding with graduate study on their perception of their financial condition, it seems all the more reason to base our analyses on those

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[1]Including housing, food, clothing, personal maintenance, entertainment, taxes, insurance, car and other.

[2]Including tuition, fees, texts, reference books, supplies, instruments, equipment, thesis costs, dollar value of waived tuition, etc.

same perceptions. In sum, then, we will regard the student as the best judge of his own financial condition and accept his assessment of what constitutes a financial obstacle as totally valid.

The Financial Obstacle Syndrome

A student's financial condition is of course a relative matter, depending of the delicate balance of his total income or assets and his total financial needs or liabilities. A financial problem arises when a student perceives that his income is not sufficient to cover his needs. If a financial problem is serious enough to cause the student to delay his progress toward the doctorate, it is considered to be a financial obstacle. The relationship between needs and income and the outcomes of an imbalance between the two (the Financial Obstacle Syndrome) are diagrammed in Figure 5.1.

Variables Related to Income

In this study the most critical variables associated with reported financial obstacles are concerned with the student's income and needs. Those related to income include his present major source of support, field of study, academic ability, parental income, and previous annual earnings. The relationships of these variables--statistical and/or causal--to reported financial obstacles are discussed in the following five sections.

Major Source of Income

Raw data from the questionnaire reveal the amount and sources of each student's income during fiscal year 1964-65. In order to determine the level of reported financial obstacles associated with each of the sources listed on the questionnaire, it was necessary to identify each student with a particular source. If each student had received all his income from a single source the problem would have been simplified. However, it was discovered that less than 40 per cent of the sample was supported by a single source. And in order to perform analyses on each source, larger numbers were needed than would have been provided by this 100 per cent support criterion.

On the other hand if the criterion for assignment to a given source had been 50 per cent or more of a student's income from that source, an equally undesirable factor would have been introduced. Because of the tendency of students to obtain support from multiple sources, most students represent a mixture of sources. If it is not clear that a student depends to a large extent on a single source for his support, then it may not be concluded that his comments about financial obstacles are a function of a particular source of support. That is, if a student receives 60 per cent of his income from one source and 40 per cent from another, the delay he attributed to financial problems may in fact be related to the 40 per cent source; whereas, using the 50 per cent criterion the student would have been identified with the 60 per cent source.

Thus, as a compromise between the Scylla of numbers and the Charybdis of mixed sources, a figure of 75 per cent was set as the criterion for major

source of income. If a particular source constituted 75 per cent or more of a student's total income for the year, it was considered a "major source of income."

Table 5.1 shows the distribution of major sources of income among the students in the sample and the reporting of financial obstacles and no obstacles by those students. One of the more interesting financial facts of life revealed by these data is that even with the 75 per cent criterion nearly half the students in the sample (46.7%) report no single major source of income. Presumably these students are forced to combine the incomes from at least two sources (none of which provides as much as 75 per cent of their total income) in order to make financial ends meet. Of these "multiple-source" students the percentage reporting financial obstacles (31.5%) is only slightly above the percentage for all students in the sample (30.0%).

Each of the last three sources on Table 5.1--withdrawal from savings, gifts, and other (including loans)--constitutes a major source of income for only one per cent or less of the sample. The sources which appear to be important to a substantial number of students (the first six categories in Table 5.1) may be divided into two groups according to financial obstacles reported. The first group, characterized by lower than average reporting of financial obstacles, comprises those major source--scholarship or fellowship, teaching assistantship, research assistantship--which are generally regarded as the more desirable means of supporting graduate

TABLE 5.1.--Financial obstacles and no obstacles reported by students, by major source of income

Major source of income (75% or more from this source)	Students within each source group	Students reporting financial obstacle	Students reporting no obstacle
Scholarship or fellowship	435 (12.9%)[a]	65 (14.9%)[b]	72 (16.6%)[b]
Teaching assistantship	232 (6.9%)	50 (21.6%)	29 (12.5%)
Research assistantship	245 (7.2%)	33 (13.5%)	20 (8.2%)
Faculty appointment	174 (5.1%)	79 (45.4%)	7 (4.0%)
Other employment	527 (15.6%)	231 (43.8%)	24 (4.6%)
Spouse's employment	101 (3.0%)	39 (38.6%)	9 (8.9%)
Withdrawals from savings	35 (1.0%)	9 (25.7%)	1 (2.9%)
Gifts	28 (0.8%)	6 (21.4%)	3 (10.7%)
Other	25 (0.7%)	6 (24.0%)	0 (0.0%)
No single major source	1578 (46.7%)	497 (31.5%)	158 (10.0%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 164.36$ $p = .01$	$X^2 = 54.90$ $p = .01$

[a]In this and following tables figures in parentheses in the first data column express the number of students within each category as a percentage of the total students in the sample.

[b]Parenthetic figures in the obstacles reported columns indicate the number of students within each category reporting the obstacles as a percentage of the total students in that category.

study. The second group--including faculty appointment, other employment, and spouse's employment--shows a higher than average percentage of students reporting financial obstacles. The reason for this differential reporting of financial obstacles by students in the two groups will become clearer after further analyses. For the present it should be noted that scholarships and fellowships, teaching and research assistantships, while supporting the student at an adequate level, permit him to make continuous if not full-time progress toward his degree. If any duties are required for the stipend they are usually closely related to the student's degree program or his professional interests.

Table 5.1 also demonstrates the relationship between the reporting of financial obstacles and the reporting of no obstacles. Students in the first three categories (the more favorable support group) report encountering no obstacles at a rate higher than the average frequency of all the students in the sample. Whereas students in the other important support categories report no obstacles at a rate lower than average, with one notable exception. Students who derive their major source of support from research assistantships are shown to be below average in reporting no obstacles, although they report financial obstacles less frequently than any other group. This exceptional response pattern is related to the fact that research assistants rank the highest among all categories in reporting academic obstacles. It appears that for this one support group academic obstacles have replaced financial obstacles as the principal

cause of delay to such a degree that, although the frequency of reporting financial obstacles is depressed, there is no corresponding increase in the reporting of no obstacles. This interesting phenomenon associated with research assistants will be examined more closely in the section on academic obstacles.

Field of Study

As noted in Chapter II, the Office of Education sample of graduate students was intended to be an efficient sample of the different fields of study. Thus, in each of the major fields enough students were sampled (in most cases 860) to permit statistically significant comparisons to be made. In Table 5.2, the numbers of students within some fields are low, presumably because few of the students in these fields aspire to the doctorate degree. Undergraduate grade point average is included in this table for the purpose of a comparison which will be discussed later. These data, in the right column may be ignored at this point.

In Table 5.2 the 23 fields are grouped into seven broad areas of study; these areas are ranked according to the percentage of students in the area reporting financial obstacles. It is interesting to note the correspondence between a ranking of areas by financial obstacles reported and ranking by elapsed time from baccalaureate to doctorate (see Table 5.3).

TABLE 5.2.--Financial obstacles reported by students, by field of study and undergraduate grade point average

Field of study	Students within each field	Students reporting financial obstacle	Undergraduate GPA of students
ENGINEERING	151 (4.5%)	30 (19.9%)	1.841[b] (8)[c]
LIFE SCIENCES	760 (22.5%)	152 (20.0%)	2.053
Biological science	385 (11.4%)	73 (19.0%)	2.052 (16)
Agriculture and forestry	234 (6.9%)	46 (19.7%)	2.077 (17)
Health professions	141 (4.2%)	33 (23.4%)	2.014 (15)
PHYSICAL SCIENCES	448 (13.3%)	101 (22.5%)	1.893
Physical science	254 (7.5%)	49 (19.3%)	1.972 (12)
Mathematics and statistics	194 (5.7%)	52 (26.8%)	1.789 (7)
SOCIAL SCIENCES	662 (19.6%)	209 (31.6%)	1.952
Psychology	219 (6.5%)	52 (23.7%)	1.986 (13)
Other social	197 (5.8%)	64 (32.5%)	1.970 (11)
History	196 (5.8%)	73 (37.2%)	1.883 (9)
Business and commerce	38 (1.1%)	15 (39.5%)	2.079 (18)
Social work administration	12 (0.4%)	5 (41.7%)	1.750 (4)
HUMANITIES	795 (23.5%)	263 (33.1%)	1.771
Philosophy	210 (6.2%)	51 (24.3%)	1.729 (3)
Foreign languages	232 (6.9%)	74 (31.9%)	1.716 (1)

TABLE 5.2.--Continued

Field of Study	Students within each field	Students reporting financial obstacle	Undergraduate GPA of students
Religion	87 (2.6%)	28 (32.2%)	1.782 (6)
English and journalism	159 (4.7%)	62 (39.0%)	1.755 (5)
Fine and applied arts	107 (3.2%)	48 (44.9%)	1.991 (14)
MISCELLANEOUS	161 (4.8%)	72 (44.7%)	2.068
Library science	20 (0.6%)	10 (50.0%)	1.900 (10)
Miscellaneous[a]	141 (4.2%)	62 (44.0%)	2.092 (19)
EDUCATION	403 (11.9%)	188 (46.7%)	2.238
Elementary education	18 (0.5%)	6 (33.3%)	1.722 (2)
Counseling and guidance	95 (2.8%)	44 (46.3%)	2.368 (23)
All other education	74 (2.2%)	35 (47.3%)	2.203 (20)
Educational administration	150 (4.4%)	71 (47.3%)	2.227 (21)
Secondary education	66 (2.0%)	32 (48.5%)	2.258 (22)
Totals	3380 (100%)	1015 (30.0%)	mean GPA = 1.959
		$X^2 = 164.36$ $p = .01$	

[a]Includes architecture, geography, home economics, information science, law, all others.

[b]The grade of A or A- equals 1, B+ or B equals 2, and B- or less equals 3.

[c]Rank by field of study in order of the highest undergraduate grade point average.

TABLE 5.3.--Comparative ranking of broad areas of study, by financial obstacles reported and duration between bachelor's and doctor's degrees

National Research Council data[a]		Office of Education Sample	
Median years B.A. - Ph.D. of those who received the doctorate degree in 1964-66	Field of Doctorate	Broad areas of study	Percentage of students reporting financial obstacle
6.3	Physical sciences and engineering	Life (Biological) sciences	20.0%
7.3	Biological sciences	Physical sciences and engineering	21.9%
8.0	Social sciences	Social sciences	31.6%
9.5	Humanities	Humanities	33.1%
13.8	Education	Education	46.7%
8.2	average of all areas		30.0%

[a]Source: National Academy of Sciences, 1967, op. cit., pp. 66-68.

These data in Table 5.3 show that there are significant differences among the broad areas of study according to the time required to complete the doctorate and that these differences appear to be related to financial obstacles encountered by students in the respective areas.

What is it, then, about the various areas that gives rise to a differential reporting of financial obstacles? The most obvious factor is the kind of financial support made available by the fields of study. Table 5.1 showed that in terms of students reporting financial obstacles the most desirable major sources of support are scholarships and fellowships, teaching assistantships, and research assistantships. Taken as a group these four sources of support provide the major income for 27.0 per cent of the total sample. The least desirable sources are faculty appointments and other employment which together provide the major source of income for 20.7 per cent of the sample.

On the basis of support offered, the fields of study may be divided into two major groups: Group A, fields in which a greater than average percentage of students receive their major support from the more desirable sources of support and a smaller than average percentage receive their support from the less desirable sources; Group B, fields in which a greater than average percentage of students receive less favorable support and a smaller than average percentage receive more favorable support. Table 5.4 shows that the students in all the fields in Group A report financial obstacles less frequently than the average for the total sample; whereas students in all the Group B fields report financial obstacles more frequently than average.

TABLE 5.4.--Major sources of support and financial obstacles reported, by field of study

Field of study	Percentage of students supported by		Percentage of students reporting financial obstacle
	scholarships, fellowships, T.A.'s and R.A.'s	faculty appointment and other employment	
Group A (fields with more desirable sources of support)			
Biological science	44.7	4.2	19.0
Agriculture and forestry	41.5	9.8	19.7
Health professions	41.1	14.9	23.4
Physical science	36.2	9.8	19.3
Philosophy	27.1	11.9	24.3
Group B (fields with less desirable sources of support)			
Education (combined)	6.2	51.9	46.7
Fine and applied arts	7.5	24.3	44.9
Business and commerce	10.5	26.3	39.5
Library science	15.0	30.0	50.0
Social work administration	16.7	33.3	41.7
Miscellaneous	19.9	34.0	44.0
Religion	24.1	33.3	32.2
All fields	27.0	20.7	30.0

In summary, the following conclusions may be drawn from the preceding series of tables:

1.) students in certain fields of study (viz., the physical and life sciences) complete their doctorates faster on the average than students in other fields (viz., humanities and education).

2.) students in this sample indicate that financial problems are the chief factor in delaying their progress toward the doctorate.

3.) certain forms of support (viz., scholarships and fellowships, teaching assistantships, and research assistantships) tend to decrease the likelihood that a student so supported will encounter a financial obstacle and thus promote faster progress.

4.) the fields which are able to provide a substantial proportion of students with favorable forms of support endow those students with a selective advantage in their pursuit of the doctorate and thus insure a higher proportion of completed degrees over a given period of time.

Academic Ability

Another characteristic which might be expected to influence the reporting of financial obstacles is the student's academic ability. For this study academic ability is defined in terms of an academic performance measure--namely, the student's undergraduate grade point average. Table 5.5 shows the reporting of financial obstacles and no obstacles by students of different levels of ability.

TABLE 5.5.--Financial obstacles and no obstacles reported by students, by undergraduate grade point average

Undergraduate grade point average	Students within each category	Students reporting financial obstacle	Students reporting no obstalce
A or A-	1035 (30.6%)	275 (26.6%)	131 (12.7%)
B+ or B	1449 (42.9%)	433 (29.9%)	131 (9.0%)
B- or less	896 (26.5%)	307 (34.3%)	61 (6.8%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 13.55$ $p = .01$	$X^2 = 19.79$ $p = .01$

It might be noted parenthetically, that the overall undergraduate grade point average of the students in this sample is not as high as would be expected. That one quarter of those students whose immediate degree objective is the doctorate--presumably the cream of the graduate crop--should have undergraduate averages of B- or less is somewhat surprising.

The data in Table 5.5 indicate a slight but significant tendency for students of higher academic ability to report financial obstacles less frequently and no obstacles more frequently than students of lower academic ability. We would expect that the intervening variable in this relationship would be the ability of the "brighter" students to obtain the more desirable sources of financial support. And, indeed, Table 5.6 shows that scholarships and fellowships, teaching assistantships, and

research assistantships are held by students considerably above the sample average in academic ability. Faculty appointments, on the other hand, seem to fall to average students, whereas other employment provides the major source of income for a less able group.

TABLE 5.6.--Major source of student's income by undergraduate grade point average

Major source of income	Students in each source of income group with undergraduate grade point average of			
	A or A-	B+ or B	B- or less	Totals
Scholarship or fellowship	197 (45.3%)	179 (41.1%)	59 (13.7%)	435 (100%)
Teaching assistantship	78 (33.6%)	107 (46.1%)	47 (20.3%)	232 (100%)
Research assistantship	85 (34.7%)	104 (42.4%)	56 (22.9%)	245 (100%)
Faculty appointment	46 (26.4%)	85 (48.9%)	43 (24.7%)	174 (100%)
Other employment	84 (15.9%)	224 (42.5%)	219 (41.6%)	527 (100%)

This association between academically more able students and the more desirable sources of support, coupled with the earlier observation that certain fields are associated with more desirable sources of support would lead one to assume that the abler students are concentrated in those fields that offer better financial support. The data in Table 5.2, however, belie this assumption. It will be noted that of the first ten

fields in this academic ability ranking only one, philosphy, is among the group in Table 5.4 characterized by more desirable sources of support.

Along these same lines, if one compares the 23 fields ranked according to financial support made available (i.e., the percentage of students in the field whose major source of income is derived from scholarships or fellowships, teaching and research assistantships) with a ranking of the fields by financial obstacles reported (i.e., the field with the smallest percentage of students reporting financial obstacles ranked first etc.) one finds an extremely high rank-difference correlation coefficient (rho = .89). However, there is no significant correlation between a ranking by financial obstacles reported and one by academic ability of the students in the field (rho = .34).

Table 5.7 is presented to illustrate the practical consequences of the relationships described in the preceding sections. Note that the academic ability of the students in the first three fields is higher than that of the students in the second group. But the lower level of financial support which characterizes the first three fields results in an increased reporting of financial obstacles and, hence, a protracted period of doctoral study.

TABLE 5.7.--A comparison of selected fields of study by academic ability, financial support, and obstacles reported

Field of study	Undergraduate GPA[a] of students in the field	Percentage of students with desirable support[b]	Percentage of students reporting financial obstacle
English and journalism	1.755	23.3	39.0
History	1.883	23.0	37.2
Fine and applied arts	1.991	7.5	44.9
Health professions	2.014	41.1	23.4
Biological science	2.052	44.7	19.0
Agriculture and forestry	2.077	41.5	19.7

[a]The grade of A or A- equals 1, B+ or B equals 2, and B- or less equals 3.

[b]Desirable support includes scholarships or fellowships, teaching assistantships, and research assistantships.

In summary, of the independent variables examined so far, major source of income appears to be the most direct determiner and, consequently, the best predictor of reported financial obstacles. Field of study is also an effective predictor because of the association of the more productive kinds of financial support with particular fields. The limited utility of academic ability as a predictor of financial difficulty derives

not from any association of abler students with more munificient fields, but from the fact that within each field, regardless of the support pattern, the most academically able students generally get the best kinds of support.

Pre-graduate school financial condition

Inasmuch as the graduate student's present source of financial support is such an important factor in the financial obstacle equation, perhaps the financial condition of the student before he enters graduate school also has an effect upon the financing and duration of graduate education. Two kinds of data obtained in the survey are useful in assessing the student's earlier financial state.

Parental income.--In one question the respondent was asked to indicate the "Income category of parents at time of your graduation from secondary school." Table 5.8 shows the distribution of parental income among the respondents and the financial obstacles reported by students in the several categories.

It was indicated in an earlier section that gifts and loans from relatives served as the major source of income for less than one per cent of the total sample. Furthermore, only 18.8 per cent of the respondents received any financial assistance at all from relatives (excluding the spouse). Table 5.8 suggests that one reason for this low incidence of support is the economic status of the parents. Note that the income

TABLE 5.8.--Financial obstacles and no obstacles reported by students, by parental income

Parental income	Students within each category	Students reporting financial obstacle	Students reporting no obstacle
Less than $5,000 per year	1063 (31.4%)	409 (38.5%)	68 (6.4%)
$5,000 to $7,499	838 (24.8%)	262 (31.3%)	82 (9.8%)
$7,500 to $9,999	506 (15.0%)	132 (26.1%)	52 (10.3%)
$10,000 to $14,999	396 (11.7%)	87 (22.0%)	65 (16.4%)
$15,000 to $19,999	127 (3.8%)	21 (16.5%)	16 (12.6%)
$20,000 and over	150 (4.4%)	28 (18.7%)	13 (8.7%)
Do not know	150 (8.9%)	76 (25.3%)	27 (9.0%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 71.99$ $p = .01$	$X^2 = 35.49$ $p = .01$

of the parents of over half the students in the sample amounted to less than $7,500 per year and for nearly a third it was less than $5,000 per year. Moreover, nearly half the students in the sample were over 30 years of age, too old by present-day societal standards to be receiving substantial financial support from their parents.

Table 5.8 indicates that, with the exception of the highest income category, as the parental income increases, the percentage of reported financial obstacles decreases. These data, taken by themselves, would make it appear that parents do play a role in financing the graduate education of their children. However, this observation must be tempered by the following consideration: Ages of students in the sample range from under 20 to over 60. For the older students, the income of their parents at the time the students graduated from secondary school would be less on the average than the income of the parents of younger students simply because of inflation. Data taken in this survey clearly indicate, in fact, that older students are highly overrepresented in the low parental income categories and younger students are overrepresented in the higher parental income categories. Thus the apparent relationship between parental income and financial obstacles is probably a spurious one, produced by the introduction of the factor of age--which, as we shall see greatly influences the reporting of financial obstacles for a variety of other reasons.

Previous annual earnings. A second question relating to the student's pre-graduate school condition inquired: "what were the annual earnings before taxes of the highest paid regular full-time job you held before entering graduate study?" One might predict, before seeing the data, that higher previous annual earnings would be associated with a lower level of financial obstacles reported because the students who earned more could have accumulated a more substantial financial cushion to carry them through their graduate studies. The data in Table 5.9, however, do not confirm this hypothesis.

TABLE 5.9.--Financial obstacles and no obstacles reported by students, by previous annual income

Previous annual earnings	Students within each category	Students reporting financial obstacle	Students reporting no obstacle
none	830 (24.6%)	120 (14.5%)	132 (15.9%)
$1 to $1,999	305 (9.0%)	83 (27.2%)	33 (10.8%)
$2,000 to $2,999	187 (5.5%)	49 (26.2%)	12 (6.4%)
$3,000 to $3,999	270 (8.0%)	90 (33.3%)	23 (8.5%)
$4,000 to $4,999	379 (11.2%)	128 (33.8%)	24 (6.3%)
$5,000 to $5,999	420 (12.4%)	153 (36.4%)	30 (7.1%)
$6,000 to $6,999	349 (10.3%)	147 (42.1%)	27 (7.7%)
$7,000 to $7,999	227 (6.7%)	87 (38.3%)	6 (2.6%)
$8,000 to $8,999	151 (4.5%)	54 (35.8%)	12 (7.9%)
$9,000 and over	262 (7.8%)	104 (39.7%)	24 (9.2%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 156.08$ $p = .01$	$X^2 = 63.50$ $p = .01$

These data are best understood by distinguishing the category of no previous earnings from the others. It will be noted that the students who report no previous income--the modal number in this table--also show the smallest percentage reporting financial obstacles and the largest reporting no obstacles. Presumably this group comprises students who went directly into graduate school after college, and did so because they were set on a course of study and were able to obtain adequate financial support.

Among those students who reported an income prior to entering graduate study, the percentage reporting financial obstacles increases (though somewhat irregularly) as the level of income increases. Again this unexpected finding may be explained by considering the role of age in the relationship. As in the case of parental income, we find that age is associated to a high degree ($X^2 = 909.73$, $df = 45$) with previous annual earnings. The older a person becomes, the more he is likely to earn, and the higher will be his reported annual income. Thus it appears that age and direct entrance into graduate school are the "hidden" variables influencing the relationships in Table 5.9.

All in all, the two measures of previous financial condition, although providing some interesting information about the sample, are not very satisfactory, in and of themselves, as predictors of graduate school financial difficulty. That is, neither parental income nor previous annual earnings is an important basic cause of the effect we are examining

(reported financial obstacles). Rather, both are seen as dependent variables, varying in association with other variables (particularly age) which appear to have a more direct effect on the reporting of financial obstacles.

Variables Related to Financial Needs

The variables discussed in the preceding sections related to the income side of the income-needs balance diagrammed in Figure 5.1. In this study the variable that is most helpful in describing the financial needs of a student concerns his marital and dependent status. This variable is an absolute one in the sense that increased family obligations are expected to increase the student's financial needs regardless of the financial level at which he is operating.

Marital-Dependent Status

It is usually assumed that the natural, and often immediate, consequence of marriage is a sharp increase in the number of dependents to be supported. This reasoning leads one to conclude that the married graduate student--because of an increased number of dependents and, hence, financial obligations--would be more likely to encounter financial obstacles than the unmarried one. Table 5.10 indicates why such an inference may be erroneous.

TABLE 5.10--Financial obstacles and no obstacles reported by students, by marital-dependent status

Marital-dependent status	Students within each category	Students reporting financial obstacle	Students reporting no obstacle
Single, with no dependents	1144 (33.8%)	252 (22.0%)	138 (12.1%)
Single, with or more dependents	92 (2.7%)	42 (45.7%)	3 (3.3%)
Married, with no dependents	703 (20.8%)	161 (22.9%)	81 (11.5%)
Married, with one or more dependents	1441 (42.6%)	560 (38.9%)	101 (7.0%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 116.04$ $p = .01$	$X^2 = 26.50$ $p = .01$

Note that among the two categories of students with no dependents, the percentage reporting financial obstacles is virtually the same, regardless of marital status. However, when either single or married students acquire dependents, financial obstacles markedly increase. Thus, the critical factor in relation to financial obstacles appears to be the addition not of a spouse but of dependents.

The figures in Table 5.11 demonstrate the nature of the financial burden incurred by those students supporting dependents. It will be noted that academic expenses and living expenses are inversely related.

Presumably, students whose living expenses are not relatively high are able to enroll for more credit hours and are consequently faced with higher academic costs.

TABLE 5.11.--Average academic expenses for self and living expenses for self and dependents, by marital-dependent status

Marital-dependent status	Average academic expenses for self[a]	Average living expenses for self and dependents[b]
Single, with no dependents	$1,016.70	$3,319.79
Single, with one or more dependents	940.40	5,659.76
Married, with no dependents	912.36	5,085.85
Married, with one or more dependents	760.51	6,400.90
Total sample	$ 883.70	$5,064.27

[a]Including tuition fees, texts, reference books, supplies, instruments, equipment, thesis costs, dollar value of vaived tuition, etc.

[b]Including housing, food, clothing, personal maintenance, entertainment, taxes, insurance, car and other

Although about the same percentage of single and married students without dependents report delays resulting from financial problems, there are great differences in the way the two groups support themselves, as shown in Table 5.12. Nearly half the single students with no dependents receive their major support from one of the four sources regarded as most

TABLE 5.12.--Marital and dependent status of students, by major source of income

Major source of income	Percentage of students supported by each major source of income				
	Single, no dependents	Single, with dependents	Married, no dependents	Married, with dependents	All students
Scholarship, fellowship or T.A., or R.A.	47.6	22.8	14.2	17.1	27.0
Faculty appointment, other employment	13.8	37.0	10.2	30.3	20.7
Spouse's employment	- 0 -	- 0 -	6.7	3.7	3.0
No single major source of income	34.4	32.6	67.1	47.4	46.7

desirable. These sources provide the major income for only 14.2 per cent of the married students with no dependents. No other single source of income, including a working spouse, can make up the difference for this group. Consequently, nearly two-thirds of the married students with no dependents report having no single major source of income. Although this proportion is far greater than for any of the other three groups, it has not affected these students adversely in the sense of creating financial obstacles for them. Perhaps we must conclude that the married student who has not started a family has a greater degree of financial flexibility, i.e., can survive by drawing on a greater number and variety of sources than his colleague with family responsibilities.

Predictors of Delay Caused by Financial Problems

All the variables discussed so far bear directly on the student's financial situation. Because of their relationship to needs and income they turn out to be closely associated with financial obstacles perceived by the student. Consequently, these variables--major source of income, field of study, academic ability, and marital-dependent status--are the best predictors of delays the student is likely to encounter because of financial problems.

Primary Outcomes of a Needs-Income Imbalance

If, for any of the reasons cited above, the student finds that he can no longer afford to continue in school full-time, he may choose to to reduce his course load or drop out of school. Either of these actions,

of course, delays the progress of the student toward his degree. Thus, a delay in progress is regarded as the primary outcome of an imbalance of income and needs (see Figure 5.1). In this sense the several measures of delay may be regarded as dependent variables--dependent on the factors that relate to a student's financial status. In fact, the students in this survey who reported financial obstacles (30.0 per cent of the sample) did so because their progress had been delayed by financial problems. We should expect, therefore, that the variables used to measure delays would be associated with reported financial obstacles and with the variables that cause the balance of needs and income to shift.

The following sections examine some of the measures of delay and their association with other variables in the Financial Obstacle Syndrome. As noted in Figure 5.1 there are two chief points between the baccalaureate and the doctorate where delays may occur--prior to graduate school entry or after graduate studies have begun. Each of these points will be considered in turn.

Variables Related to Delayed Entry

In this study receipt of the bachelor's degree is considered to be the starting point of the journey to the doctorate. The first delay, therefore, can occur if the student's entry into graduate school is deferred for some period of time. Table 5.13 shows the association of this kind of delay with the reporting of financial obstacles.

TABLE 5.13.--Financial obstacles and no obstacles reported by students, by years elapsed between bachelor's degree and start of graduate studies

Calendar years elapsed	Students within each group	Students reporting financial obstacle	Students reporting no obstacle
Less than 1	2088 (61.8%)	556 (26.6%)	232 (11.1%)
1	373 (11.0%)	128 (34.3%)	26 (7.0%)
2	246 (7.3%)	86 (35.0%)	18 (7.3%)
3 - 4	311 (9.2%)	113 (36.3%)	20 (6.4%)
5 - 9	229 (6.8%)	78 (34.1%)	17 (7.4%)
10 or more	133 (3.9%)	54 (40.6%)	10 (7.5%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 34.14$ $p = .01$	$X^2 = 17.89$ $p = .01$

It will be noted that, with the exception of the five-to-nine years group, reported financial obstacles increase as the undergraduate-graduate hiatus lengthens. The most significant comparison, however, is between the less than one year group (most of whom undoubtedly went directly into graduate school) and those students who delayed matriculating for a period of ten years or more.

Although there may be as many specific reasons for delaying the start of graduate study as there are students who do so, a number of general causes might be suggested. First, personal considerations totally apart from anything academic may influence the decision. Second, it is thought that for some fields (e.g., education and many of the professional fields, some of the humanities, etc.) a certain amount of experience or "maturing" in the field is desirable, or at least not detrimental. This is, of course, not true today in the scientific fields. Here most disciplines are advancing so rapidly that if a student is out of touch with new developments for a period of four or five years, he returns to find himself at a discouraging distance from the field's frontiers. Third, with the competition for places in graduate school becoming more vigorous, a student with a mediocre academic record may find he is simply not able to gain admission to a program of his choice. Finally, a problem that may or may not be related to the previous one is that of finances. As noted earlier, desirable forms of financial assistance are not rife in many fields. Among those in which they are, the assistance may not be sufficient to meet more than the students own barest needs. In any case the financial "plums" generally fall to those best qualified academically.

And so, in contrasting those students who do not delay entrance into graduate school with those who do, we see that the former have significantly better undergraduate grade point averages, do possess

the more desirable forms of financial assistance, and are found primarily in those fields which make available greater financial support (see Tables 1, 2, and 3 in Appendix F). Perhaps it is a happy coincidence, perhaps a necessary one, that most scientific fields--those in which students would be disadvantaged by delaying entry to graduate school--do make it financially possible for students to continue their education uninterrupted through more generous support programs.

Variables Related to Delayed Progress in Graduate School

The second point where a student's progress toward the doctorate may be delayed is after he has actually begun graduate study. A delay of this sort is reflected in part-time as opposed to full-time study or a complete cessation of academic effort for a shorter or longer period of time. A major drawback of this survey is that there was no sampling of students whose progress was delayed to the extent that they were not enrolled when the sample was taken. Moreover, because the data were not obtained longitudinally there are no direct measures of graduate study delays over a period of time. There is, however, a measure of the student's enrollment status at one point in time and an indirect method of assessing the extent and impact of periods of academic inactivity.

Enrollment Status

The first of these measures is concerned with the current enrollment status of the sample. As Table 5.14 shows, approximately 30 per cent of the students were engaged in part-time study. These students report financial obstacles at a significantly higher percentage than those who were studying full time.

TABLE 5.14.--Financial obstacles and no obstacles reported by students, by enrollment status

Enrollment status	Students within each category	Students reporting financial obstacle	Students reporting no obstacle
Full-time	2639 (70.1%)	275 (26.2%)	263 (11.1%)
Part-time	1011 (29.9%)	395 (39.1%)	60 (5.9%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 56.11$ $p = .01$	$X^2 = 21.89$ $p = .01$

Unfortunately, the definitions of part-time and full-time used in the survey leave something to be desired. A student was coded as full-time if he was enrolled for over nine credit hours during the term in which the sample was taken; or if the number of hours for which he was enrolled was less than nine but constituted 75 per cent or more of what was considered (by the student) to be a full-time load at his institution. But a student was also coded as full-time, regardless of the credit hours taken,

if he indicated in response to the question on stage of thesis that he was collecting data, analyzing data, or writing his thesis. Students in these three categories constitute 35.3 per cent of the total sample. Clearly, the assumption that every student at one of these three stages is engaged in full-time pursuit of his degree is erroneous and leads to an inflated number of full-time students. A student, for example, who is employed full time and analyzing data or writing only in his spare moments but who, at the same time, is registered for two or three hours in order to use the library, computer, or other campus facilities, could hardly be described as a full-time student.

It must be remembered, then, that in this study students who are in the latter stages of their dissertation work are excluded from the group described as part-time students. The factors which lead part-time students to report financial obstacles at an increased level are similar to those that influence the student to delay his entry into graduate school. Tables 4, 5, and 6, in Appendix F indicate that part-time students, in contrast with their full-time collegues, have lower undergraduate grade point averages, depend on the less desirable sources of support, and show the heaviest concentrations in those fields which have the poorest record of financial support and duration of doctoral study.

Year First Began Graduate Study

The effect of part-time study and interruptions is to increase the time required to complete the degree. National Research Council data presented in Table 5.3 showed the average duration of doctoral study for

all fields to be eight years. Although a comparable figure for total duration could not be deduced for this pre-doctoral sample, data was obtained on the number of years elapsed since the students began graduate study. Table 5.15 shows that as the elapsed time between entering graduate

TABLE 5.15.--Financial obstacles and no obstacles reported by students, by year first began graduate study

Year began graduate study	Students within each group	Students reporting financial obstacle	Students reporting no obstacle
1964 or 1965	257 (7.6%)	44 (17.1%)	50 (19.5%)
1963	385 (11.4%)	85 (22.1%)	81 (21.0%)
1962	510 (15.1%)	119 (23.3%)	62 (12.2%)
1961	496 (14.7%)	123 (24.8%)	50 (10.1%)
1960	432 (12.8%)	124 (28.7%)	24 (5.6%)
1958 or 1959	485 (14.3%)	160 (33.0%)	26 (5.4%)
1955 to 1957	370 (10.9%)	152 (41.1%)	14 (3.8%)
1945 to 1954	376 (11.1%)	175 (46.5%)	15 (4.0%)
Before 1945	69 (2.0%)	33 (47.8%)	1 (1.5%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 131.43$ $p = .01$	$X^2 = 142.75$ $p = .01$

study and present increases, the financial obstacles reported increase. It should be pointed out that over half the sample (51.1%) had begun graduate study in 1960 or earlier; that is, over half had been at it--part-time or full-time, in school or out--for five years or more when this sample was taken.

Year Received Master's Degree

One further measure of the magnitude of delay, in this case for the more advanced students, is the year the student received his master's degree. Table 5.16 reveals, first, that three quarters of the sample (73.3%) possess a master's degree. Because so many in the sample do have this degree, the increase in financial obstacles with years elapsed since the master's degree was received parallels the association in Table 5.15.

TABLE 5.16.--Financial obstacles and no obstacles reported by students, by year received master's degree

Year received master's degree	Students within each group	Students reporting financial obstacle	Students reporting no obstacle
No master's degree received	901 (26.7%)	192 (21.3%)	135 (15.0%)
1964 or 1965	604 (17.9%)	151 (25.0%)	71 (11.8%)
1963	435 (12.9%)	135 (31.0%)	42 (9.7%)
1962	325 (9.6%)	99 (30.5%)	21 (6.5%)

TABLE 5.16.--Continued

Year received master's degree	Students within each group	Students reporting financial obstacle	Students reporting no obstacle
1961	266 (7.9%)	84 (31.6%)	17 (6.4%)
1960	188 (5.6%)	64 (34.0%)	10 (5.3%)
1955 to 1959	419 (12.4%)	175 (41.8%)	16 (3.8%)
Before 1955	242 (7.2%)	115 (47.5%)	11 (4.5%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 59.27$ $p = .01$	$X^2 = 32.87$ $p = .01$

Years of Academic Study Beyond the Bachelor's Degree Completed

One final measure of delay during graduate study related to the number of years of study the student has completed beyond the bachelor's degree. Because the student was asked to indicate the "years of academic study or equivalent beyond the baccalaureate" completed, this variable is a measure of the actual or full-time-equivalent time spent working on the degree. Major interruptions or discontinuities in graduate study should not

influence the values obtained. In this respect the variable differs from the two previously examined. Differences were also found in the behavior of this variable with respect to financial obstacles (see Table 5.17). Although

TABLE 5.17.--Financial obstacles and no obstacles reported by students, by years of academic study beyond bachelor's degree

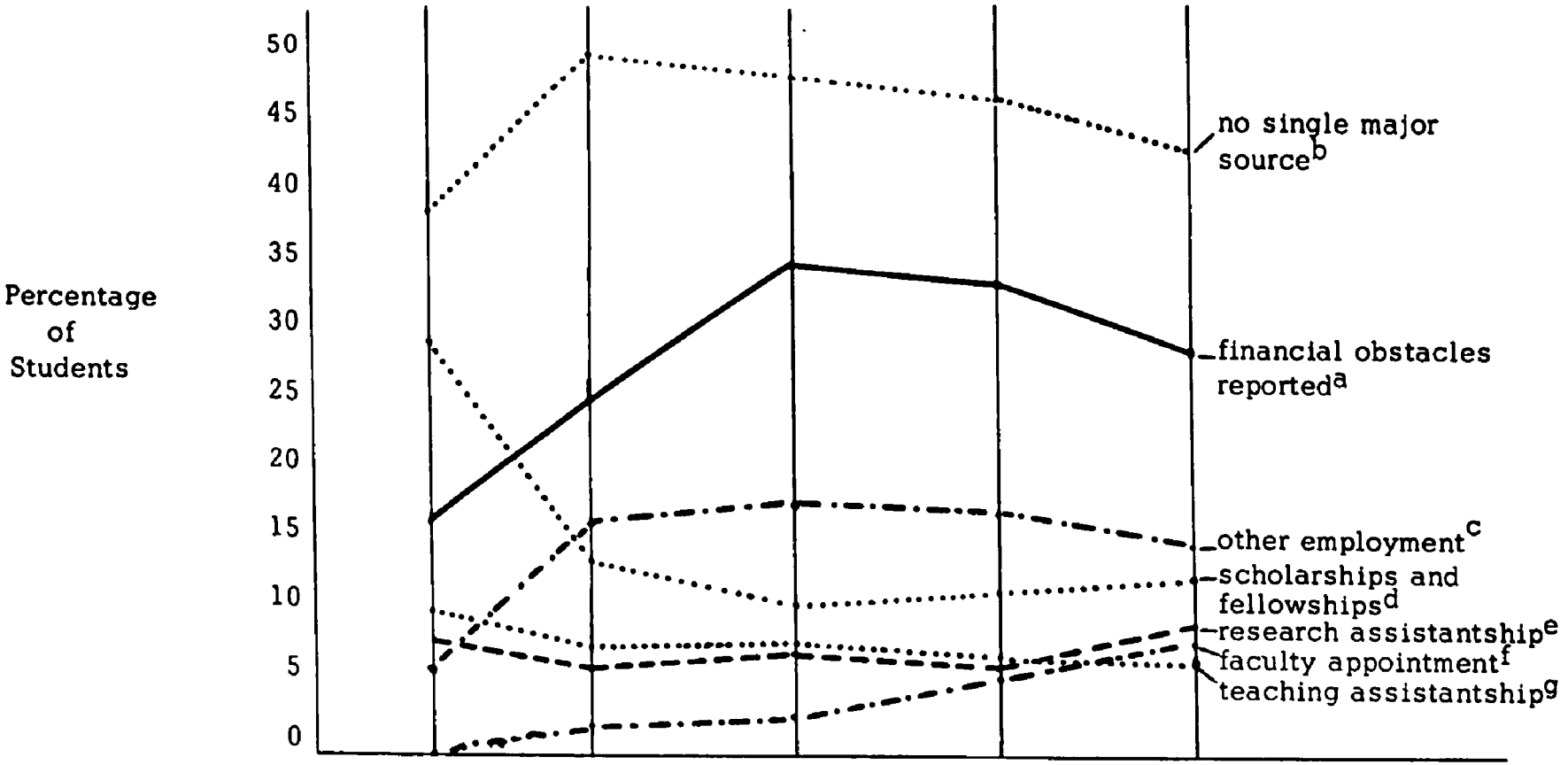
Years of study completed	Students within each group	Students reporting financial obstacle	Students reporting no obstacle
Less than one	173 (5.1%)	28 (16.2%)	40 (23.1%)
At least one but less than two	394 (11.7%)	100 (25.4%)	65 (16.5%)
At least two but less than three	802 (23.7%)	276 (34.4%)	73 (9.1%)
At least three but less than four	721 (21.3%)	243 (33.7%)	63 (8.7%)
Four or more	1272 (37.6%)	363 (28.5%)	80 (6.3%)
Other	18 (.5%)	5 (27.8%)	2 (11.1%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 33.14$ $p = .01$	$X^2 = 75.31$ $p = .01$

reported financial obstacles increase through the first two years, they tend to taper off after that point. The reasons for this decline after two years are related to the composition of the several "years of study completed" groups.

First, it should be noted that there is no significant difference in academic ability (undergraduate grade point average) among the students according to the number of years of academic study completed. There are, however, substantial differences according to the sources that provide the major income to students in successive years of study groups. Figure 5.2 illustrates graphically the tendency for reported financial obstacles to decrease slightly after two years of academic study. Against this line are shown the changes in major sources of support in successive years. It may be seen that faculty appointments increase and teaching assistantships decrease regularly throughout, while research assistantships (as a major source of income) are most prevalent in the first year and after the fourth. None of these sources, however, affects enough students to have a significant impact on the reporting of financial obstacles by the total sample. On the other hand, scholarships and fellowships and other employment serve as major sources of income for a considerably greater number and exhibit interesting relationships with reported financial obstacles.

It will be remembered that students whose major source of income was other employment reported financial obstacles more frequently than students of any other source group and students with scholarships and fellowships reported financial obstacles at next to the lowest frequency (see Table 5.1). We should expect, then, that the relative contributions of these two sources of income to the support of students in a given group

FIG. 5.2.--Financial obstacles reported and major sources of income, by years of academic study beyond baccalaureate completed



years of study	less than one	one to less than two	two to less than three	three to less than four	four or more	other	total
number of students in each group	173	394	802	721	1272	18	3380
percentage of total sample in each group	5.1%	11.7%	23.7%	21.3%	37.6%	0.5%	100%

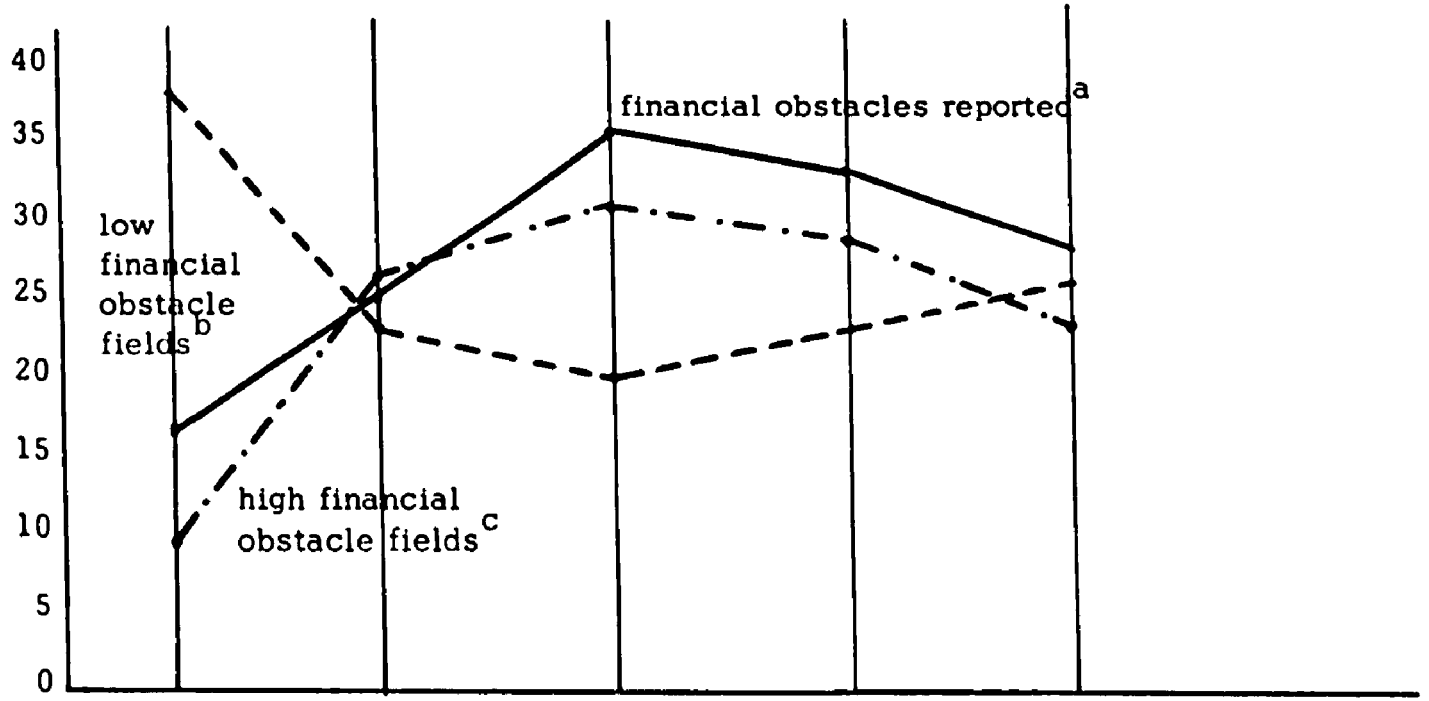
[a]Percentage of students in total sample reporting financial obstacles.

[b-g]Percentage of students in each years of study group whose major income was derived from the sources indicated.

would have considerable bearing on the reporting of financial obstacles by students in that group. And, indeed, in Figure 5.2 we see that as the proportion of students holding scholarships and fellowships decreases and the proportion relying on other employment increases, the percentage of students reporting financial obstacles increases. Thus, it appears that the kind of support pattern associated with successive years of study plays a most direct role in influencing the reporting of financial obstacles by students in those groups.

Another related, but equally revealing, way to view the changes in reported financial obstacles through successive years of study is by the distribution of students in various fields of study in the years of study groups. Earlier it was noted that students from different fields of study reported encountering financial obstacles at widely varying frequencies--from less than 20 per cent up to 50 per cent. This variation was attributed largely, though not entirely, to differences in the source of support patterns characteristic of the several fields. Because the source of support patterns varied significantly among the years of study groups (see Figure 5.2), it might be expected, therefore, that different fields of study would also be represented in different proportions in successive years of study. In Figure 5.3, the fields of study whose students reported financial obstacles at the lowest and highest frequencies are plotted according to the percentages of students in each years of study group from the low and high financial obstacle fields.

FIG. 5.3.--Financial obstacles reported and major field of study groups, by years of study beyond baccalaureate completed



years of study	less than one	one to less than two	two to less than three	three to less than four	four or more	other	total
number of students in each group	173	394	802	721	1272	18	3380
percentage of total sample in each group	5.1%	11.7%	23.7%	21.3%	37.6%	0.5%	100%

a———— Percentage of students in total sample reporting financial obstacles.

b------- Percentage of students in each years of study group from low financial obstacle fields (biological sciences, physical sciences, agriculture and forestry; n = 873).

c—·—·— Percentage of students in each years of study group from high financial obstacles fields (library science, secondary education, education administration, other education, education counseling, fine and applied arts, miscellaneous, social work administration, business and commerce, English and journalism; n = 862).

It will be noted that a nearly identical pattern obtains as that seen in Figure 5.2. That is, the "financial obstacles reported" line moves practically parallel to the line showing the percentages of students from high financial obstacle fields at each level (cp., the "other employment" line in Figure 5.2). Similarly the percentages of students from low financial obstacle fields are inversely proportional to the percentages reporting financial obstacles (cp., the "scholarship and fellowship" line in Figure 5.2).

In sum, then, the changes in financial obstacles reported through successive years of study may be attributed to changes in composition of the reporting groups: high concentrations of well-supported students (students from "low financial obstacle" fields) coupled with low concentrations of poorly-supported students (in "high financial obstacle" fields) leads to a low level reporting of financial obstacles, and vice versa. Some evidence will be presented in the section on academic progress to indicate that, in fact, the level of financial obstacles reported by students of similar sources of income and fields of study remains relatively constant throughout the entire course of progress toward the doctorate.

Secondary Outcomes of a Needs-Income Imbalance

The primary outcome of the failure of a student's income to meet his needs has been defined in terms of delays in his progress. The inevitable consequence of any kind of delay is that the student grows

older. This effect is confirmed in Figure 5.4 which shows the relationships and correlations between age and the variables related to delay. Age is therefore regarded as a secondary outcome of the needs-income imbalance.

Age

Perhaps as a result of the additive or cumulative effects of all the different kinds of delay on age, the age variable in this study was more highly associated with reported financial obstacles than any other variable. As shown in Table 5.18 there is an increase, often a marked one, of the

TABLE 5.18.--Financial obstacles and no obstacles reported by students by age

Age	Students within each age group	Students reporting financial obstacle	Students reporting no obstacle
22 and under	47 (1.4%)	6 (12.8%)	12 (25.5%)
23 to 25	677 (20.0%)	107 (15.8%)	130 (19.2%)
26 to 29	1081 (32.0%)	257 (23.8%)	101 (9.3%)
30 to 49	1507 (44.6%)	616 (40.9%)	79 (5.2%)
50 and over	68 (2.0%)	29 (42.6%)	1 (1.5%)
Totals	3380 (100%)	1015 (30.0%)	323 (9.6%)
		$X^2 = 181.68$ $p = .01$	$X^2 = 125.86$ $p = .01$

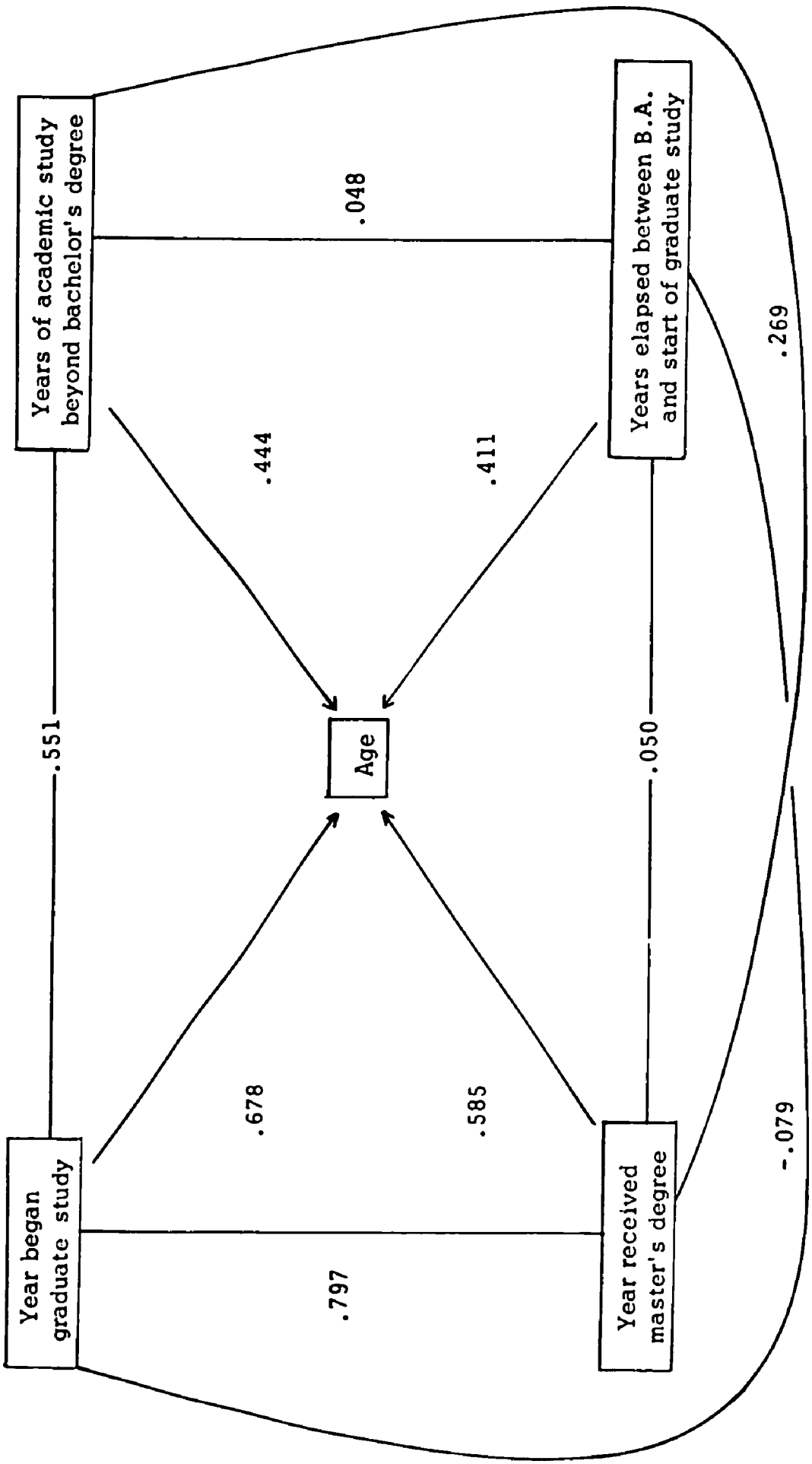


FIG. 5.4.--Diagram of relationships among age and variables related to delay

(The correlation coefficients between pairs of variables were computed by the product moment method.)

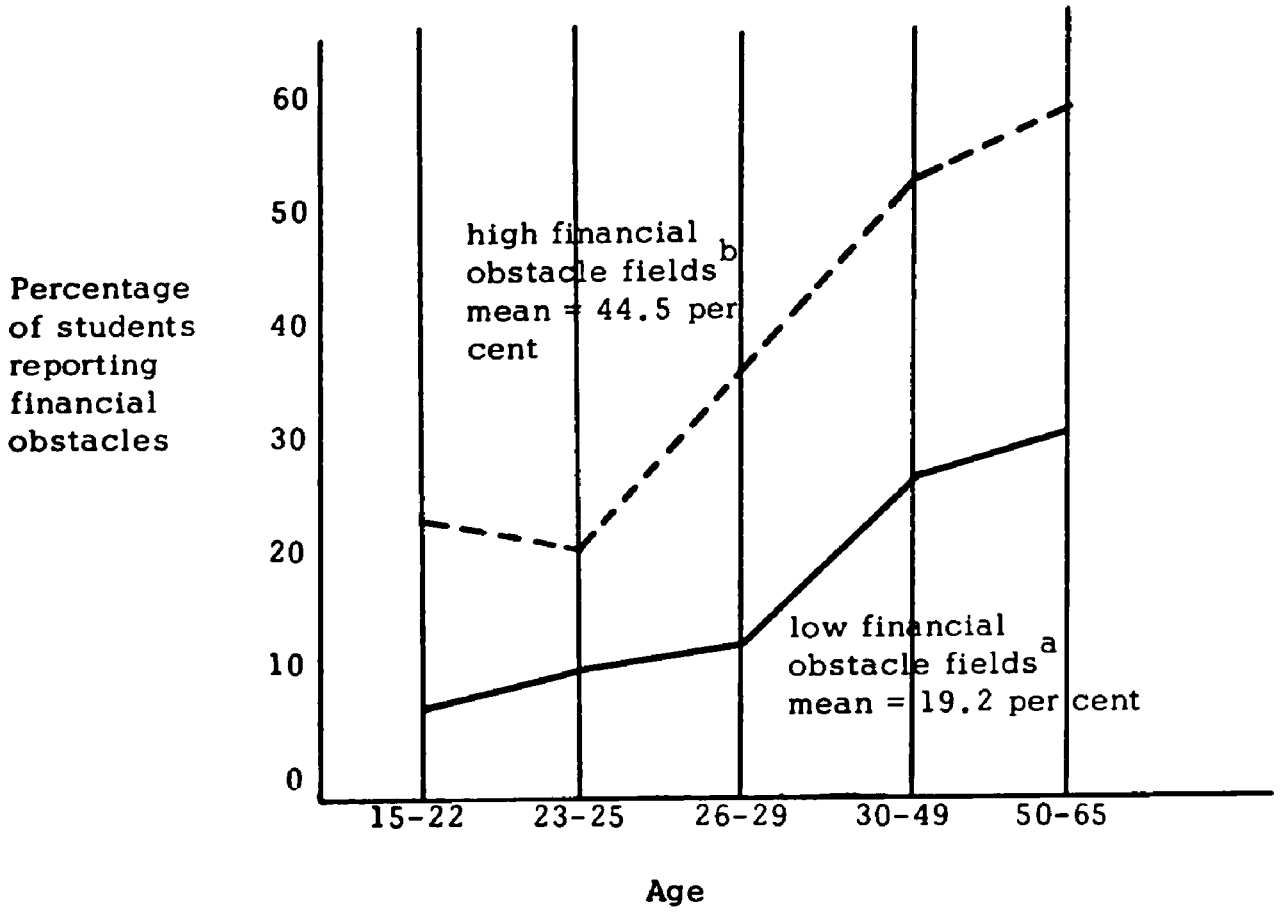
financial obstacles reported in each successive age group. It will be noted that nearly half the sample is over 30 years of age. Among this large group, over 40 per cent of the students report encountering financial obstacles. A note should be made again of the corresponding decrease in no obstacles reported by students of the older age groups.

The tremendous influence of the variables concerning major source of income and field of study on reported financial obstacles has been demonstrated in previous analyses. It was shown, for example, that changes in reported financial obstacles according to years of study completed were influenced primarily by the relative numbers of students from high or low supporting fields in each of the years of study groups. However, Figure 5.5 indicates that age exerts an influence on reported financial obstacles independent of field of study. That is, students from both high and low financial obstacle fields report financial obstacles at an increasing rate as they grow older.

Other outcomes

As an outcome of particular financial probelms--and more directly of delay--age would be regarded as a dependent variable, varying in association with reported financial obstacles since both variables are effects of the same financial causes. However, the strong association of age with financial obstacles also stems from the fact that age may serve as an

FIG. 5.5--Financial obstacles reported by students of high and low financial obstacle fields by age group



[a]See Figure 5.3 for low financial obstacle fields; n = 873; X^2 = 32.65, p = .01.

[b]See Sigure 5.3 for high financial obstacle fields; n = 862; X^2 = 31.81, p = .01.

independent variable in causing financial obstacles to be reported. This latter relationship is diagrammed in Figure 5.1 and described in the following paragraph.

As the student grows older, the statistical likelihood of his being married and having a family increases. A growing family, as shown earlier, presents the students with increased financial obligations (needs). These

obligations may in fact be of such a magnitude that the forms of financial aid which he might once have depended upon (e.g., teaching and research assistantships) will no longer suffice. Because of this, the student will need to seek more lucrative employment, often in a position unrelated to his academic program. The full-time or near full-time nature of this employment precludes regular progress toward the degree. While he is thus diverted from his academic objective, he continues to age, his financial obligations increase rather than diminish, and the circle becomes more vicious. Of course, there are numerous exceptions to this paradigm. A student may, for instance, break into or out of the circle at any number of points. However, the data obtained in this survey substantiate the general relationships outlined above and in Figure 5.1.

Stages of Academic Progress

Another variable concerning progress to the doctorate but, in a sense, unrelated to major interruptions or delays is the academic progress of the student. Two items on the questionnaire dealt with the distribution of students in various stages of their degree programs. In the first the student was asked to indicate what degree requirements he was working on in that term, and the second, what stage he had reached in the preparation of his dissertation.

Degree Requirements Presently Pursued

Table 5.19 shows the reporting of financial obstacles by students working on the four major degree requirements.

TABLE 5.19--Financial obstacles and no obstacles reported by students, by degree requirements presently pursued

Degree requirements	Students at each stage	Students reporting financial obstacle	Students reporting no obstacle
Courses or seminars	2065 (61.0%)	670 (32.4%)	213 (10.3%)
Comprehensive or qualifying exams	820 (24.3%)	238 (29.0%)	85 (10.4%)
Language examinations	785 (23.2%)	220 (28.0%)	78 (9.9%)
Research for and preparation of thesis	1702 (50.4%)	439 (25.8%)	160 (9.4%)
Other	178 (5.3%)	49 (27.5%)	16 (9.0%)

For only two of the requirement stages is there a significant difference in the reporting of financial obstacles depending on whether or not the student was working on the particular requirements. Responses by students in these two stages--courses or seminars and the dissertation--are shown in the following two tables (5.20 and 5.21). If we assume that coursework precedes the dissertation chronologically--although there is often some mixing of the two stages--then it appears that financial obstacles decrease somewhat during the course of the degree program.

TABLE 5.20.--Financial obstacles reported by students engaged in courses or seminars

Taking courses or seminars	Students within each category	Students reporting financial obstacle
Yes	2065 (61.0%)	670 (32.4%)
No	1315 (39.0%)	345 (26.2%)
Totals	3380 (100%)	1015 (30.0%)

$X^2 = 14.74$
$p = .01$

TABLE 5.21.--Financial obstacles reported by students working on the dissertation

Working on dissertation	Students within each category	Students reporting financial obstacle
Yes	1702 (50.4%)	439 (25.8%)
No	1678 (49.6%)	576 (34.3%)
Totals	3380 (100%)	1015 (30.0%)

$X^2 = 29.28$
$p = .01$

Stage of Dissertation

The findings of the previous sections are confirmed by the data in Table 5.22 which indicate that reported financial obstacles decrease irregularly through successive stages of the dissertation. The relation-

TABLE 5.22.--Financial obstacles reported by students, by stage of dissertation

Stage of dissertation	Students in each stage	Students reporting financial obstacle
No topic selected	1204 (35.6%)	413 (34.3%)
Topic selected	676 (20.0%)	221 (32.7%)
Have outline	182 (5.4%)	47 (25.8%)
Collecting data	638 (18.9%)	170 (26.6%)
Analyzing data	184 (5.4%)	42 (22.8%)
Writing	373 (11.0%)	93 (24.9%)
Completed	123 (3.6%)	29 (23.6%)
Totals	3380 (100%)	1015 (30.0%)
		$X^2 = 29.34$ $p = .01$

ship of stage of dissertation with reported financial obstacles apparently runs counter to that obtaining between age and financial obstacles. Although age and academic progress are highly associated with one another in the expected manner,[1] reported financial obstacles increase with age while they

[1] A chi-square test of association between the variables age and stage of thesis yields a X^2 of 173.68 which is significant at the one per cent level of confidence.

decrease, albeit less dramatically, with academic progress. To determine the causative factors underlying the behavior of these variables, we need to examine in some detail the characteristics of students in the respective stages of progress.

As in the case of the "years of study beyond baccalaureate" variable we should first look at the influence of academic ability on these relationships. For if students of lesser academic ability report financial obstacles at an elevated rate--which they do--and if there is significant attrition of the less able students at each stage of progress, then it may be the increasing percentage of abler students which causes the reporting of financial obstacles to decrease. The data, however, do not support this proposition. Although the academic ability of students not enrolled in courses or seminars is slightly, but significantly, higher than those who are (see Table 7 in Appendix F), there is no significant difference in academic ability between students engaged or not engaged in dissertation work or among those at different stages of their dissertations.

Another factor to be considered is the kind of financial support students receive at different stages of progress. In Table 5.23 the most striking change in the support pattern is the decreasing reliance by students on other employment as the major source of income. In the early stages of their programs when students have not yet developed a thesis topic, one quarter of the students in this sample derive the major portion of their income from other employment. At the "collecting and analyzing data" stage this fraction has dropped to less than one-twelfth. The

TABLE 5.23.--Students in successive stages of dissertation, by major source of income

Major source of income	Stage of dissertation			
	No topic defined	Have topic or outline	Collecting or analyzing data	Writing
Scholarship or fellowship	150 (12.5%)	89 (10.4%)	116 (14.1%)	60 (16.1%)
Teaching assistantship	95 (7.9%)	70 (8.2%)	45 (5.5%)	14 (3.8%)
Research assistantship	49 (4.0%)	51 (5.9%)	98 (11.9%)	41 (11.0%)
Faculty appointment	47 (3.9%)	51 (5.9%)	27 (3.3%)	31 (8.3%)
Other employment	298 (24.8%)	113 (13.2%)	64 (7.8%)	35 (9.4%)
Spouse's employment	45 (3.7%)	26 (3.0%)	11 (1.3%)	16 (4.3%)
All other major sources	42 (3.5%)	21 (2.4%)	12 (1.5%)	11 (2.9%)
No single major source	478 (39.7%)	437 (50.9%)	449 (54.6%)	165 (44.2%)
Totals	1204 (100%)	858 (100%)	822 (100%)	373 (100%)

$X^2 = 321.10$ for ungrouped data
$p = .01$

difference is made up largely by increases in the proportions of students supported by scholarships, fellowships, and research assistantships and by a sizeable increase in the percentage of students reporting no single

major source of income. It will be remembered that other employment was shown to be the least desirable and scholarships, fellowships, and research assistantships the most desirable means of support vis à vis reported financial obstacles. Thus, changes in patterns of support--as was the case in the "years of study" variable--would appear to be responsible for the decrease in reported financial obstacles in successive stages of progress.

And finally, the distribution of students from different fields of study at the various stages, along with the impact of that distribution on the reporting of financial obstacles, will be examined. In fact considerable attention will be paid to this analysis because it brings into sharp focus the question of duration of doctoral study by students of different fields.

The rankings in Table 5.24 reveal some interesting characteristics of the various fields of study. It should be noted that the fields whose students report financial obstacles least frequently have the smallest percentage of students engaged in coursework and the largest percentage working on the thesis. In fact, the first seven fields in the ranking by reported financial obstacles (Column 1, top) are the same seven fields ranking highest according to percentage working on thesis (Column 3, bottom). Therefore, it appears that the decrease in reported obstacles from coursework to thesis is related to the concentration of students from "low-obstacle" (i.e., high-supporting) fields in the latter stages of progress and the concentration of students from "high-obstacle" fields in the early stages.

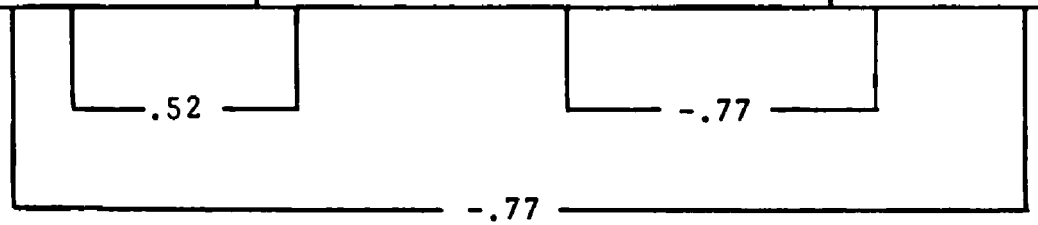
TABLE 5.24.--Ranking of fields of study by reported financial obstacles and degree requirements

Ranking by percentage of students reporting financial obstacle	Ranking by percentage of students taking courses or seminars	Ranking by percentage of students working on thesis
Biological sci. (19.0)	History (49.5)	Secondary educ. (24.2)
Physical science (19.3)	Health professions (51.1)	Elementary educ. (27.8)
Agric. and for. (19.7)	Physical science (52.8)	Educ. admin. (28.7)
Engineering (19.9)	Philosophy (54.8)	English and journ. (32.7)
Health professions (23.4)	Library science (55.0)	Miscellaneous (33.3)
Psychology (23.7)	Biological sci. (57.1)	Fine and appl. arts (33.6)
Philosophy (24.3)	Agric. and for. (59.8)	Bus. and comm. (34.2)
Math. and stat. (26.8)	Math. and stat. (60.3)	Religion (34.5)
Foreign langs. (31.9)	Bus. and comm. (60.5)	Educ. counseling (38.9)
Religion (32.2)	Other social sci. (61.4)	Other educ. (39.2)
Other social sci. (32.5)	Foreign langs. (62.5)	Foreign langs. (39.7)
Elementary educ. (33.3)	Psychology (63.5)	Social work admin. (41.7)
History (37.2)	Religion (65.5)	Other social sci. (43.1)
English and journ. (39.0)	Other educ. (66.2)	Library science (45.0)
Bus. and comm. (39.5)	English and journ. (66.7)	Math.and stat. (46.4)
Social work admin. (41.7)	Social work admin. (66.7)	History (47.4)
Miscellaneous (44.0)	Educ. counseling (67.4)	Philosophy (50.0)

TABLE 5.24.--Continued

Ranking by percentage of students reporting financial obstacle	Ranking by percentage of students taking courses or seminars	Ranking by percentage of students working on thesis
Fine and appl. arts (44.9)	Engineering (67.5)	Engineering (50.3)
Educ. counseling (46.3)	Miscellaneous (68.1)	Psychology (54.3)
Other educ. (47.3)	Fine and appl. arts (71.0)	Health professions (63.1)
Educ. admin. (47.3)	Educ. admin. (71.3)	Physical science (70.1)
Secondary educ. (48.5)	Secondary educ. (77.3)	Biological sci. (70.9)
Library science (50.0)	Elementary educ. (83.3)	Agric. and for. (76.9)

Rank difference correlation coefficients (rho)



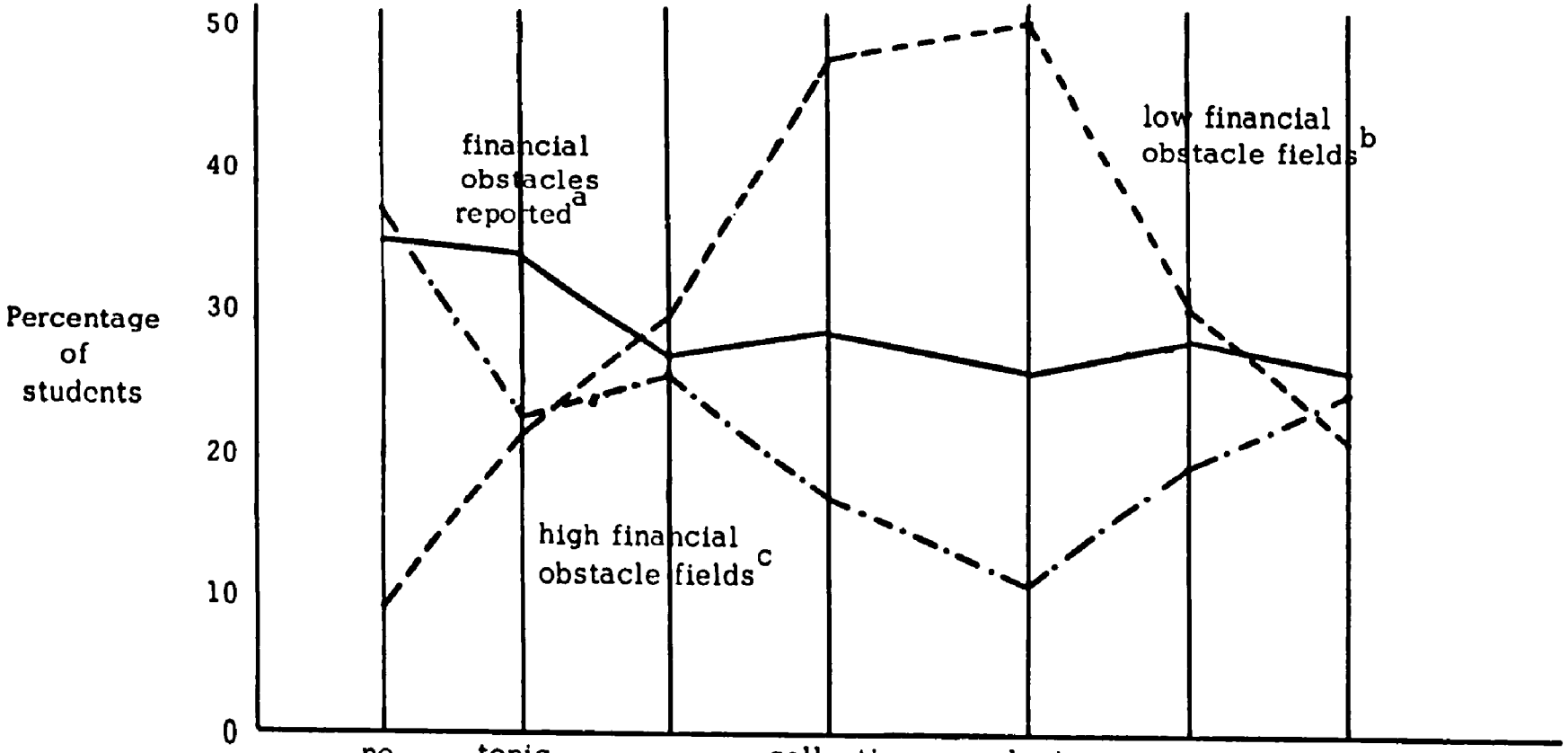
(all are significant at the .01 level)

This tendency is borne out when the progress of students on the dissertation is examined. Figure 5.6 shows the proportion of students at each stage from high financial obstacle fields and the proportion from low obstacle fields. It is to be noted that at the stage in which reported financial obstacles are the highest ("no topic selected") the percentage of students in high obstacle fields is nearly three times as great as the percentage from low obstacle fields. Conversely, at the stage where reported financial obstacles are the lowest ("analyzing data") the percentage of students in low obstacle fields is four times greater than the percentage in high obstacle fields.

Thus, although the relationship between the reporting of financial obstacles and the composition of the reporting group is not as direct as it was shown to be in the case of the "years study beyond baccalaureate" variable (Figure 5.3), it is clear that the apparent decrease in the reporting of financial obstacles in successive stages of progress is greatly influenced by changes in the percentages of students from high and low obstacle fields (and major source of income groups) at the various stages.

To properly assess the relationship between academic progress and reported financial obstacles, it is necessary to examine the various stages independent of fields of study, that is, holding field of study constant. Using the same groupings of "low" and "high" financial obstacle fields that have been employed previously, we find in Figure 5.7 that in both groupings the reported financial obstacles remained constant throughout the various stages of progress. Moreover, it should be added that none of

FIG. 5.6.--Financial obstacles reported and major field of study groups, by stage of dissertation



stage of thesis	no topic	topic selected	outline	collecting data	analyzing data	writing	completed	total
number of students at each stage	1204	676	182	638	184	373	123	3380
percentage of total sample at each stage	35.6%	20.0%	5.4%	18.9%	5.4%	11.0%	3.6%	100%

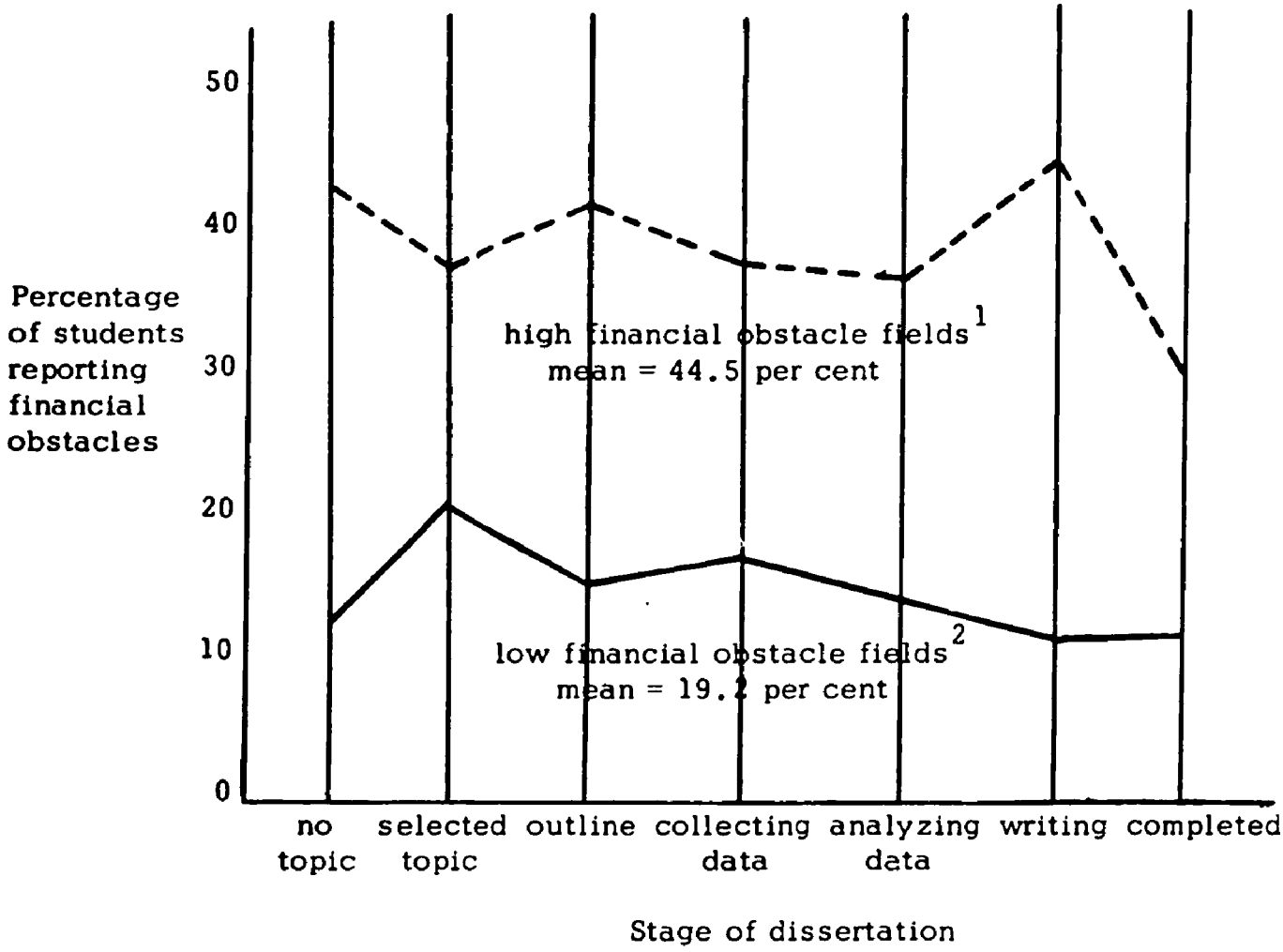
a——— Percentage of students in total sample reporting financial obstacles.

b------ Percentage of students at each stage from low financial obstacle fields (biological sciences, physical sciences, agriculture and forestry; n = 873).

c—·—· Percentage of students at each stage from high financial obstacle fields (library science, secondary education, education administration, other education, education counseling, fine and applied arts, miscellaneous, social work administration, business and commerce, English and journalism; n = 862).

the 23 fields in the study examined independently showed any significant and regular increase or decrease in the reporting of financial obstacles by students at different dissertation stages.

FIG. 5.7.--Financial obstacles reported by students of high and low financial obstacle fields at different stages of the dissertation



[1]See Figure 5.6 for the component high financial obstacle fields ($X^2 = 5.41$, not significant at .20 level).

[2]See Figure 5.6 for the component low financial obstacle fields ($X^2 = 4.40$, not significant at .20 level).

Figure 5.7 supports the notion that there is nothing inherent in the nature of academic progress that produces more financial obstacles at one stage than another. Rather, reported financial obstacles are seen to be relatively high or low throughout the entire degree program for students of selected fields. And as we have seen, it is the amount and kind of financial support provided by these fields which accounts for the difference.

In addition, Figure 5.7 provides solid evidence that in responding to the question on obstacles, the students' frame of reference was the present rather than the past. For if the students had recalled financial obstacles from their entire graduate experience, the effect would be cumulative at each stage. That is, the reported financial obstacles would increase at each stage rather than remain relatively constant as they are shown to do.

Comparative progress toward the degree. One further look needs to be taken in this section at the progress toward the doctorate made by students of different fields in terms of the years of study they have completed and the stages through which they have advanced. Figure 5.3 and 5.6, it will be remembered, were constructed to indicate the composition of the groups of students at different times or stages. Figures 5.8 and 5.9, on the other hand show how the students of two field groupings are distributed throughout the various times and stages of their academic programs. It

FIG. 5.8.--Years study beyond baccalaureate, by students of high and low financial obstacle fields

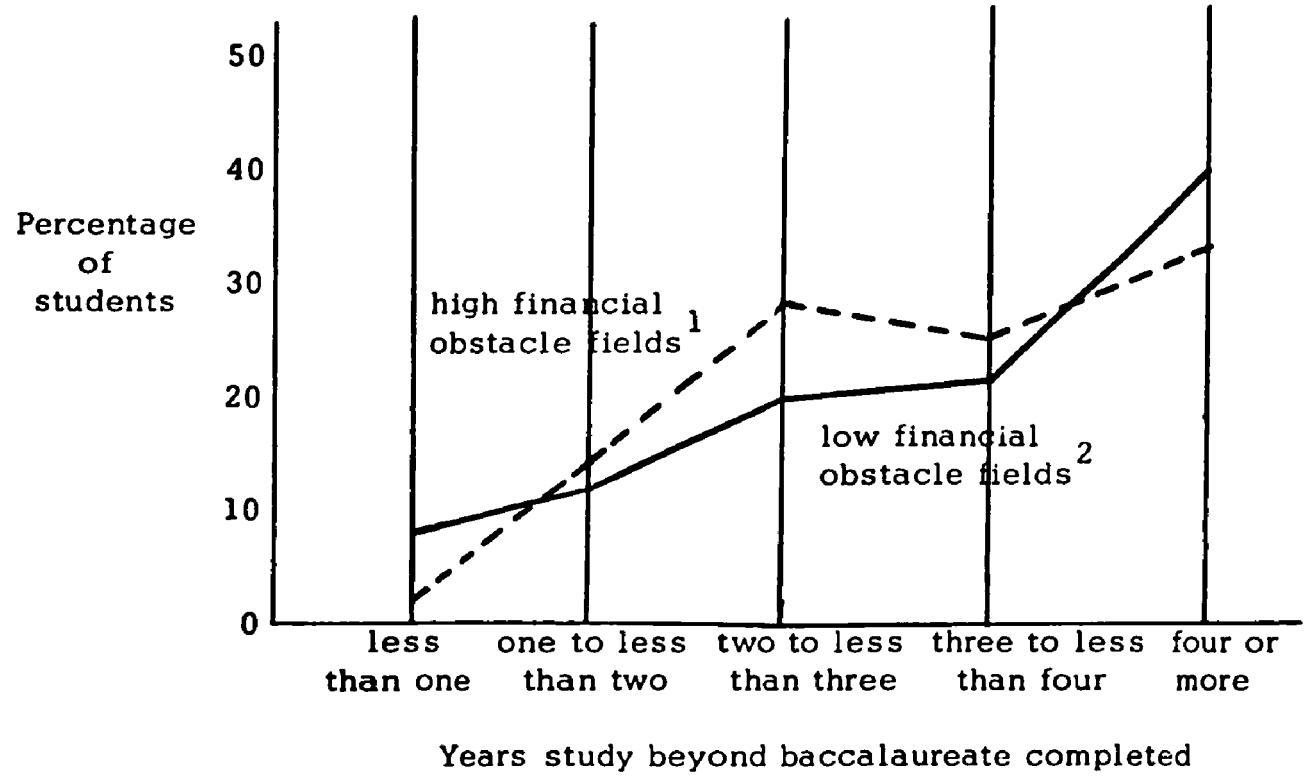
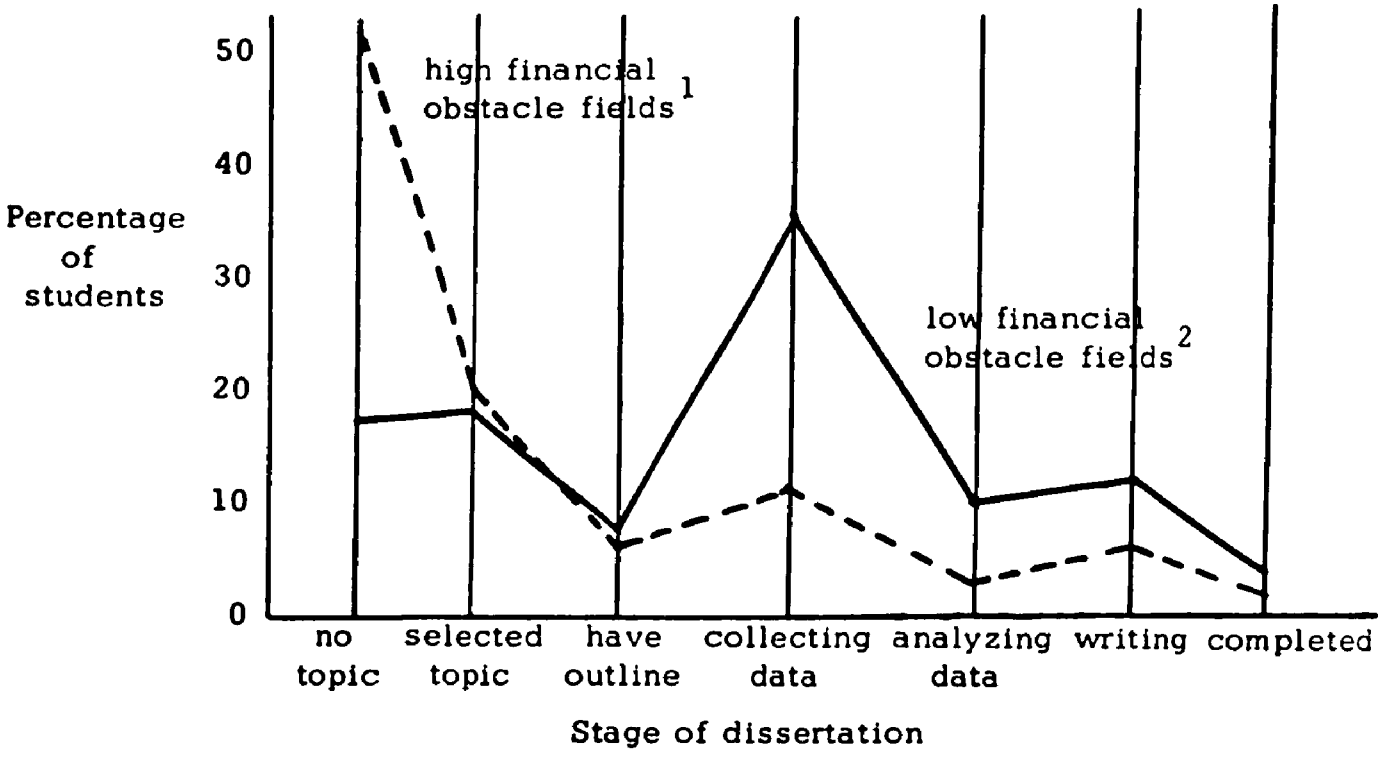


FIG. 5.9.--Stage of dissertation, by students of high and low financial obstacle fields



[1], [2] See Figure 5.6 for the component high and low financial obstacle fields.

will be noted in Figure 5.8 that there are not great differences in the number of years the students from high and low financial obstacle fields have completed beyond the baccalaureate. There are, however, considerable differences in the academic progress students from the two groups have made. In particular, fewer than half the students from high obstacle fields have even progressed to the stage of developing a thesis topic, whereas in the low obstacle fields 83.5 per cent of the students have reached this stage. As a result, far more students from low obstacle fields are engaged in the "active" dissertation stages (collecting and analyzing data and writing) than students from high obstacle fields--the percentages are 57.0 and 21.3 respectively. These figures would be of little significance if it were shown that the "active" dissertation stages require considerably less time and effort on the part of students from high obstacle fields (education and some social sciences and humanities) than students from the physical and biological sciences. But there is no evidence that this is the case. Thus, it must be concluded that the ability of students from the physical and biological sciences to move quickly into full-scale dissertation work plays a major role in enabling them to complete their degrees at a faster rate. This data in this Chapter indicate that this progress is highly dependent on the amount and kind of financial support that is made available to the students.

The findings concerning comparative progress toward the degree are difficult to reconcile with those of Wilson on the same subject. His data indicate that there was very little variation among fields with respect to

duration of the pre-master's phase of the predoctoral period, but major differences in the post-master's phase.[1] It is often assumed that the primary attention of students in the pre-master's stage is on coursework and not on the dissertation. However, it is probably the case that in the physical and biological sciences the thesis topic is developed far earlier than in the non-sciences (viz., during the pre-master's period). If this were the case it would explain the differences between Wilson's findings and those of this study. That is, although students of the sciences and non-sciences attain the master's in about the same amount of time, the former group has begun preliminary dissertation work during the pre-master's period while the latter group has not.

Other Variables

A number of other variables expected to have some bearing on reported financial obstacles are examined in this section. These include some measures related to the institution attended by the student and to the student's personal characteristics.

Institutional Variables

Does the type of institution the student attends make any difference in the reporting of financial obstacles? This question is difficult to answer because of the nature of the sampling procedure. It will be remembered

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[1] Wilson, op. cit., p. 25.

that the sample was not intended to be an efficient sample of graduate schools as such, but of the different fields. Because different sampling rates were used for each field, individual school analyses are possible only if fields are weighted. Moreover, the fact that the sample of 3,380 in this study is actually a group within a sample introduces another variable and results in a numerical base for each institution that is too small to permit reliable comparisons to be made.

Size of Institution

However, certain institutional characteristics can be examined profitable across the whole range of 63 graduate schools in the sample.[1] For example 67.7 per cent of the students were found to be enrolled in large institutions, defined as ones with graduate enrollments of over 2,000. No significant differences were found ($X^2 = 0.55$) in the reporting of financial obstacles by students of large, as opposed to students of small, institutions.

Control of Institution

In terms of institutional control, 65.5 per cent of the students were attending institutions designated as public, 32.0 per cent were at independent, non-profit (private) institutions, and 4.5 per cent were at institutions with

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[1] Although 68 institutions were included in the original OE sample, the students in this study (i.e., those who expected to received the doctorate as their next degree) were enrolled in only 63 of the schools.

religion (chiefly Roman Catholic) affiliations. This dimension also proved not to be associated in any significant way with the reporting of financial obstacles ($X^2 = 5.34$).

Other Institutional Variables

Turning, for the moment, from these hard facts to some (statistically) soft ones, the institutions were grouped according to quality or prestige,[1] geographical location, and even athletic conference. The reporting of obstacles by students in the grouped institutions failed to differentiate substantially among any of the groupings. However, the groupings themselves obscured (by averaging) wide variations among the component institutions. As an illustration, students of the four Ivy League schools in the sample report encountering financial obstacles at a combined rate of 24.7 per cent. Yet at one institution (n = 139) the rate was 41.7 per cent and at another (n = 136) the rate was 14.0 per cent. Interestingly enough, the fields sampled in the greatest numbers at the former institution were (in order) philosophy, foreign languages, miscellaneous fields, all other education, all other social sciences, and history. At the latter institution the fields most heavily sampled were agriculture and forestry, physical science, all other social sciences, biological science, philosophy, and health professions. Notice that for the most part the fields at the latter institution are those characterized by a high level of student financial

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[1]Based on rankings in Allan M. Cartter, An Assessment of Quality In Graduate Education (Washington, D.C.: American Council on Education, 1966).

support, whereas those at the former are conspicuous in their lack of support (see Table 5.4). This example makes clear the difficulty of isolating purely "institutional" characteristics or variables from other variables, field of study in particular.

From the limited evidence brought to bear on the institutional variable, it would appear that financial problems delay the progress of graduate students irrespective of the kind of institution they attend--big or small, public or private, established or emerging. Thus, our efforts will be best spent in studying other variables associated more clearly and directly with the reporting of financial obstacles.

Personal Variables

The two final variables examined in this Chapter relate to the student's sex and race.

Sex

Much has been written and said about the difficulties encountered by women in graduate school, particularly those who try to combine their education with family responsibilities. However, the data in this study indicate that with respect to financial obstacles, women are no better or worse off than men. Of the 602 women in the sample, 32.1% reported financial obstacles as compared with 29.6% of the men. A test of the relationship between sex and financial obstacles yielded a chi-square of 1.44 which was not significant at the .20 level of probability.

Race

Financial obstacles reported by students of different races are indicated in Table 5.25. Two interesting facts are brought to light by these data. First is the paucity of Negroes in the sample (2 per cent as compared with 12 per cent in the general United States population in 1965). Second is the disparity in the reporting of financial obstacles by the two minority groups, Negroes and Orientals.

TABLE 5.25.--Financial obstacles reported by students, by race

Race	Students in each race	Students reporting financial obstacle
White	3067 (90.7%)	928 (30.3%)
Negro	69 (2.0%)	35 (50.7%)
Oriental	196 (5.8%)	196 (22.4%)
Other	48 (1.4%)	8 (16.7%)
Totals	3380 (100%)	1015 (30.0%)
		$X^2 = 23.58$ $p = .01$

There appear to be two factors primarily responsible for the fact that Negroes report financial obstacles at a rate twice that of Orientals: Orientals have a considerably higher undergraduate grade point average,

and are concentrated in those fields which make available to students the more desirable forms of financial support (see Table 8 and 9 in Appendix F). As noted earlier both these factors increase the likelihood that a student will be adeuqately supported and, hence, less likely to report a financial obstacle. Why Negroes and Orientals have such differing undergraduate grade point averages and are attracted to different fields are interesting psycho-sociological questions but ones that go beyond the scope of this study.

CHAPTER VI

INSTITUTIONAL OBSTACLES AND RELATED VARIABLES

Summary of Major Findings

Three classes of institutional obstacles were examined. They include 1.) academic obstacles--those related to specific academic requirements or the general academic nature of the graduate program; 2.) organizational obstacles--those resulting from the organization, administration, policies and procedures of the graduate school; and 3.) personnel obstacles--those attributed to particular people (faculty, administrators, students) within the institution. A total of 726 students (21.4 per cent of the total sample) reported that their progress had been delayed by at least one institutional obstacle.

A. Institutional--Academic Obstacles

In this study 10.1 per cent of the students reported that their progress toward the doctorate had been delayed by at least one of the four major academic requirements. The specific requirements were mentioned by the following percentages of students: coursework or requirements, 2.5%; major examinations, 1.0%; foreign language requirements, 5.3%; research and the dissertation, 2.3%. The class

comprising all these requirements was analyzed as a whole. However, because of its predominance, the foreign language category was largely responsible for the results obtained. The following factors or independent variables were shown to be associated with the reporting of financial obstacles.

1. Academic Ability

   It was found that the higher a student's academic ability--defined in terms of his undergraduate grade point average--the less likely he was to report an academic obstacle. It was shown, in fact, that the apparent association of a number of other variables (viz., sex, institutional type, and field of study) with reported academic obstacles was influenced by differences in academic ability among the respective groups. There was found to be no relationship, however, between graduate grade point average and reported academic obstacles, in spite of the fact that graduate and undergraduate grade point averages were associated in the expected manner.

2. Major Source of Income: the special case of the research assistant.

   It was shown that research assistants reported academic obstacles at a higher percentage than any other source of income group. In fact, for R.A.'s academic obstacles replaced

financial obstacles as the major source of delay. It was suggested that the R.A.'s full-time enrollment status (full academic load) combined with his assistantship responsibilities would work a particular academic hardship on the R.A. The evidence was as follows:

a. Enrollment Status

A significantly greater percentage of students enrolled full time reported academic obstacles than did part-time students. Approximately 87 per cent of the R.A.'s were enrolled full time.

b. Duty Hours per Week

Students required to work 15 hours or more per week for their stipend reported academic obstacles at twice the frequency of students who worked less than 15 hours. Two-thirds of the R.A.'s in this sample said they were required to work 20 hours or more a week.

3. Stage of Progress

It was shown in a number of measures of academic progress (degree requirements pursued, stage of thesis, and years of study completed) that academic obstacles were reported more frequently as students advanced through the several doctoral stages. It was impossible to determine whether this rise was

due to increasing difficulty of the requirements or to cumulative reporting of obstacles. However, evidence was presented in the previous Chapter to indicate that situational, rather than cumulative, reporting was the rule.

B. Institutional--Organization Obstacles

Although nearly 10 per cent of the students in this sample reported obstacles associated with the organization of the institution, it was difficult to relate particular obstacles in this class to certain kinds or characteristics of students. In general, organizational obstacles appeared to increase with years of academic study completed and with the number of duty hours per week required of the student. There was also a tendency (though in this study not a statistically significant one) for certain of the categories of organizational obstacles to be associated with particular fields of study.

C. Institutional--Personnel Obstacles

Obstacles relating to personnel within the institutions were indicated by 5.5 per cent of the respondents. The most frequently cited obstacle category was lack of personal attention, mentioned by 4.0 per cent of the sample. It was found that this obstacle became an increasingly significant source of delay as the students passed through successive academic stages. The lack of personal attention was also shown to be a greater problem in the physical and biological sciences than

in the social sciences and humanities. And finally, foreign students (non-U.S. citizens) reported this obstacle significantly less frequently than U.S. citizens.

Analysis of Institutional Obstacles and Related Variables

The next major group of obstacles to be considered are those associated with the graduate school itself. Three classes of these institutional obstacles have been identified. They include 1.) academic obstacles--those related to specific academic requirements or the general academic nature of the graduate program; 2.) organizational obstacles--those resulting from the organization, administration, policies or procedures of the graduate school; and 3.) personnel obstacles--those attributed to particular people (faculty, administrators, students) within the institution.

In all, 726 students (21.4 per cent of the total sample) reported that their progress had been delayed by at least one institutional obstacle. The responses of these students are shown in Table 6.1. It should be noted that the total number of obstacles reported exceeds 726 because of multiple responses. The fact that over 20 per cent of the students indicated an institutionally related obstacle would, by itself, give cause for concern--even though the overall magnitude of the problem does not approach that of the financial problem. However, in examining Table 6.1 it is clear that the responses are distributed across a wide range of

TABLE 6.1.--Institutional obstacles reported by graduate students as delaying their progress toward the doctorate

CLASS Category	Number of students reporting obstacle	Percentage of total sample
INSTITUTIONAL--ACADEMIC		
REQUIREMENTS	340	10.1
Coursework and course requirements	85	2.5
Major examinations	33	1.0
Foreign language	179	5.3
Research and the dissertation	78	2.3
Other institutional--academic	19	0.6
INSTITUTIONAL--ORGANIZATION, PROCEDURES, GENERAL		
REQUIREMENTS	331	9.8
Admission or transfer	33	1.0
Lack of desired program	34	1.0
Physical facilities or services	48	1.4
Teaching assistant, research assistantship, or other university employment	92	2.7
General requirements and regulations	95	2.8
Other institutional--organization	54	1.6
INSTITUTIONAL--PERSONNEL	185	5.5
Teaching	21	0.6
Personal attention	135	4.0
Other institutional--personnel	45	1.3

categories, only one of which delayed the progress of more than five per cent of the sample. Thus, in attempting to analyze these obstacles we are faced with something of a dilemma. It is meaningless, on the one hand, to lump all institutional obstacles together and analyze the aggregate because of the great variety among the categories. On the other hand, if each category is treated separately, the numbers are too small to permit significant analyses (i.e., in only a very few cases are correlations between the obstacle categories and independent variables statistically significant).

To complicate the picture even further one might question whether the institutional problems are substantial enough to merit any analysis. Should we concern ourselves very deeply with particular obstacles cited by only one or two per cent of the sample (as most of the institutional categories were)? Perhaps such a basal level of reporting is inevitable, resulting from the normal distribution of idiosyncracies throughout a population of students or institutions. In the analyses that follow, a middle course will be struck by examining whole classes of institutional obstacles where that is appropriate (i.e., where the categories are similar or related) and particular categories where the magnitude of the responses (and, hence, the problem) is substantial enough to warrant special attention.

Institutional--Academic Obstacles

As indicated in Table 6.1, 10.1 per cent of the respondents stated that their progress toward the doctorate had been delayed by academic obstacles. The four major academic hurdles cited were coursework (2.5%), major examinations (1.0%), foreign language (5.3%),and research and the dissertation (2.3%). It should be noted that in the coding of these responses no attempt was made to distinguish problems caused by the academic difficulty of the requirements from complaints about requirements themselves. In some cases, for example, it was clear that although the requirement had not been difficult academically, the student felt the requirement (e.g., for a foreign language) itself was irrelevant. Thus, in meeting the requirement the student's attention was diverted from other matters and his progress delayed. For the most part, however, it was impossible to tell whether a student was directing his comments toward the requirements, their academic difficulty, or a combination of the two. So to avoid the risk of erroneous and misleading interpretation the academic responses were grouped together. Some of the analyses that follow will make it appear that by and large the responses reflected academic difficulties.

Academic Ability

The independent variable expected to influence the reporting of academic obstacles most directly is the student's academic ability. Table 6.2 shows that, indeed, students with lower undergraduate grade point

TABLE 6.2.--Academic obstacles reported by students, by undergraduate grade point average

Academic obstacle	Undergraduate grade point average			
	A or A-	B+ or B	B- or less	Totals
Coursework and course requirements	27 (2.6%)[1]	34 (2.3%)	24 (2.7%)	85 (2.5%)
Major examinations	9 (0.9%)	16 (1.1%)	8 (0.8%)	33 (1.0%)
Foreign language	34 (3.3%)	73 (5.0%)	72 (8.0%)	179 (5.3%)
Research and dissertation	28 (2.7%)	31 (2.1%)	19 (2.1%)	78 (2.3%)
Other	7 (0.7%)	10 (0.7%)	2 (0.2%)	19 (0.6%)
All academic obstacles[2]	90 (8.7%)	138 (9.5%)	112 (12.5%)	340 (10.1%)
Total students in sample	1035	1449	896	3380

[1]Percentages are with respect to total student figures at bottom. Column figures for academic obstacle categories do not add up to "all academic obstacles" totals because of multiple responses.

[2]X^2 for "all academic obstacles" equals 8.49; $p = .02$.

averages reported academic obstacles more frequently than those with higher averages. On the fact of it this result would seem to indicate that the reporting of academic obstacles stemmed from the difficulty of the requirements rather than the requirements themselves. For if the require-

ments, per se, are objectionable, they should be so to students regardless of academic ability; whereas academic difficulty would be expected to differentiate between students of high and low academic ability.

It should be noted that in Table 6.2, only foreign language of the four major hurdles varied significantly according to the academic ability of the reporting students. The variation of this particular obstacle, coupled with the sizeable number of students reporting it, largely accounted for the reporting pattern seen when all academic obstacles were included (bottom line, Table 6.2). In the following analyses the several academic obstacle categories will be considered as a group. It must be remembered, however, that foreign language is the predominant obstacle and for the most part controls the class results.

Sex

The influence of academic ability on the reporting of academic obstacles is manifest in a number of other variables. Considering sex for example, it was found that 10.8 per cent of the males in the sample reported academic obstacles as compared with 6.5 per cent of the females--a difference significant at the .01 level of confidence. This difference may be attributed to the significantly higher academic ability of the females in the sample (see Table 10, Appendix F).

Institutional Type

Another variable that appears to influence the reporting of academic obstacles is the control of the institutions in the sample. According to the data in Table 6.3, academic obstacles are encountered more frequently by students attending public institutions than by those in private or Roman Catholic-controlled institutions. Again it is suggested that academic ability--lower among students in public than in non-public institutions--is the underlying factor in this relationship (see Table 11, Appendix F).

TABLE 6.3.--Academic obstacles reported by students, by control of institution

Control of institution	Students within each institutional type	Students reporting academic obstacle
Public	2146 (63.5%)	253 (11.8%)
Private	1081 (32.0%)	79 (7.3%)
Roman Catholic	152 (4.5%)	8 (5.3%)
Other	1 (0.0%)	0 (0.0%)
Totals	3380 (100%)	340 (10.1%)
		$X^2 = 20.12$ $p = .01$

Field of Study

In Table 6.4 the 23 fields of study are ranked according to the undergraduate grade point average of students in the respective fields and the academic obstacles reported by them. It will be remembered that there was no significant correlation between a ranking of fields by the students' academic ability and financial obstacles reported (rho = .34). The rankings in Table 6.4 also show no significant correlation (rho = .38). However, a visual inspection of Table 6.4 reveals that, in contrast to the academic ability-financial obstacles rankings, only the education fields occupy drastically different positions in the two columns. In fact, if the five education fields are removed from consideration, the rankings by academic ability and academic obstacles reported show a correlation of .71, significant at the .01 level of confidence.

These data may be interpreted as follows: It was shown earlier that the academic ability of students within a given field of study had little effect on the reporting of financial obstacles. This was due to the fact that other variables associated with the several fields of study (primarily financial support made available) outweighed academic ability in importance. In the case of academic obstacles, however, the field per se does little to attenuate or modify the effect of academic ability on the reporting of academic obstacles. It might be said, then, that the academic difficulty of the several fields--primarily in terms of the foreign language requirement, inasmuch as that was the predominant

TABLE 6.4.--Ranking of fields of study by reported academic obstacles and undergraduate grade point average

Ranking by undergraduate grade point average of students[1]	Ranking by percentage of students reporting academic obstacle
Foreign languages (1.716)	Social work admin. 0.0%
Elementary education (1.722)	Education admin. 1.3%
Philosophy (1.729)	Religion 3.4%
Social work admin. (1.750)	Foreign languages 4.7%
English and journalism (1.755)	Elementary education 5.6%
Religion (1.782)	Philosophy 5.7%
Math. and statistics (1.789)	English and journalism 6.3%
Engineering (1.841)	Other education 6.8%
History (1.883)	Math. and statistics 7.2%
Library science (1.900)	Fine and applied arts 7.5%
Other social science (1.970)	Secondary education 7.6%
Physical science (1.972)	Education counseling 8.4%
Psychology (1.986)	Miscellaneous 8.5%
Fine and applied arts (1.991)	Other social science 8.6%
Health professions (2.014)	Physical science 9.8%
Biological science (2.052)	Health professions 9.9%
Agric. and forestry (2.077)	Library science 10.0%
Business and commerce (2.079)	History 11.2%
Miscellaneous (2.092)	Engineering 13.2%
Other education (2.203)	Biological science 14.3%
Education admin. (2.227)	Business and commerce 15.8%
Secondary education (2.258)	Psychology 16.4%
Education counseling (2.368)	Agric. and forestry 22.2%

Rank difference correlation coefficient (rho) = .38 (not significant at .05 level of confidence)

[1]A or A- = 1, B+ or B = 2, B- or less = 3.

academic obstacle mentioned--is approximately equal. The education fields appear to be an exception to this generalization. Perhaps this derives from the absense of the foreign language requirement in some Ed.D. programs. Or one might speculate that doctoral programs in education are academically less difficult overall.

Graduate Grade Point Average

There was found to be no relationship between the reporting of academic obstacles and the student's graduate grade point average. This finding is puzzling in that while graduate g.p.a. was not related to the reporting of academic obstacles, undergraduate g.p.a. was; yet the two g.p.a.'s are statistically associated in the expected manner.

Major Source of Income

It was noted earlier that students who receive the major portion of their income from research assistantships report encountering financial obstacles at a lower frequency than students of any other source group. Yet a lower than average number of R.A.'s indicated that there had been no delays in their progress. The reason that financial obstacles and no reported obstacles are not correlated for R.A.'s as they are for other source groups is evident in Table 6.5. It may be seen that academic obstacles pose a more serious problem for R.A.'s than for any other group, and have, in fact, replaced financial obstacles as the principal source of delay for these students.

TABLE 6.5.--Academic obstacles reported by students, by major source of income

Major source of income	Students within each source group	Students reporting academic obstacle
Scholarship or fellowship	435 (12.8%)	39 (9.0%)
Teaching assistantship	232 (6.9%)	21 (9.1%)
Research assistantship	245 (7.2%)	48 (19.6%)
Faculty appointment	174 (5.1%)	18 (10.3%)
Other employment	527 (15.6%)	23 (4.4%)
Other major sources	189 (5.6%)	16 (8.5%)
No single major sources	1578 (46.7%)	175 (11.1%)
Totals	3380 (100%)	340 (10.1%)
		$X^2 = 51.26$ $p = .01$

The difficulties R.A.'s report encountering with academic requirements apparently do not stem from their lack of academic ability. The mean undergraduate grade point average of R.A.'s was 1.882, a shade higher than the undergraduate g.p.a. of the total sample (1.959).[1] Rather,

[1] A or A- = 1, B+ or B = 2, B- or less = 3.

it would seem that the duties required of R.A.'s for their stipends are diverting their efforts (if not their interests) from academic requirements, thus increasing the relative difficulty of the requirements. The evidence for this proposition--though by no means incontrovertible--is as follows:

Enrollment Status

First, as shown in Table 6.6, a greater percentage of students enrolled full-time report academic obstacles than do part-time students. This result is just the reverse of the case when financial obstacles were considered (see Table 5.14). Presumably, full-time students possess the financial means to engage in full-time study. But a full-time academic load presents to these students the kinds of academic difficulties not encountered by part-time students taking only one or two courses.

TABLE 6.6.--Academic obstacles reported by students, by enrollment status

Enrollment status	Students within each category	Students reporting academic obstacle
Full-time	2369 (70.1%)	276 (11.7%)
Part-time	1011 (29.9%)	64 (6.3%)
Totals	3380 (100%)	340 (10.1%)
		$X^2 = 22.17$ $p = .01$

The percentages of students in the various major source of income groups engaged in full-time study are as follows:

Scholarship or fellowship	90.3%
Research assistantship	86.9%
Teaching assistantship	75.4%
Faculty appointment	37.9%
Other employment	27.9%
Other major sources	75.1%
No single source	78.1%
All students	70.1%

Duty Hours Per Week

Bearing in mind, then, that R.A.'s rank second only to holders of scholarships or fellowships in percentage engaged in full-time study, we next examine the major single factor which would tend to interfere with the studies and, hence, the progress of these full-time students. This factor is the number of hours per week they spend in duties required for their stipends.

Table 6.7 demonstrates the effect of increased duty hours per week on the reporting of academic obstacles by the three major full-time groups. The bottom (total) line of this table shows that students required to work 15 hours or more per week report academic obstacles at twice the frequency of students who work less than 15 hours. (The aberration from this pattern

TABLE 6.7.--Academic obstacles reported by recipients of stipends, by duty hours per week

Major source of income		Hours per week in duties required for stipend							
		none	1-9	10-14	15-19	20-24	25-39	40 and over	Total
Scholarship or fellowship	number of students	341	22	14	3	11	7	37	435
	# reporting acad. obsts.	29	2	1	1	1	1	4	39
	% reporting acad. obsts.	(8.5)	(9.1)	(7.1)	(33.3)	(9.1)	(14.3)	(10.8)	(9.0)
Teaching assistantship	number of students	14	33	45	33	71	17	19	232
	# reporting acad. obsts.	1	1	4	2	9	1	3	21
	% reporting acad. obsts.	(7.1)	(3.0)	(8.9)	(6.1)	(12.7)	(5.9)	(15.8)	(9.1)
Research assistantship	number of students	48	2	9	21	88	38	39	245
	# reporting acad. obsts.	12	0	1	6	15	8	6	48
	% reporting acad. obsts.	(25.0)	(0)	(11.1)	(28.6)	(17.1)	(21.1)	(15.4)	(19.6)
Total stipend sources	number of students	403	57	68	57	170	62	95	912
	# reporting acad. obsts.	42	3	6	9	25	10	13	108
	% reporting acad. obsts.	(10.4)	(5.3)	(8.8)	(15.8)	(14.7)	(16.1)	(13.7)	(11.8)

by students who indicate they had no required duties may be due to an interpretation by the students of what constitutes required duties. It is difficult to imagine a holder of a research assistantship not being required to perform any duties for his stipend.) The percentage of R.A.'s working 20 hours or more a week amounted to 67.3 per cent. The comparable figure for holders of scholarships and fellowships was 12.6 per cent; and for teaching assistants, 46.1 per cent.

Thus, it would seem that the duty hours required of R.A.'s are considerably greater than those of holders of other stipends, to the apparent detriment of the R.A.'s academic endeavors. Unfortunately, the data in Table 6.7 do not lend themselves to a more convincing interpretation, due to the paucity of cases in each row and the higher than anticipated reporting of no duty hours by R.A.'s.

Stage of Progress

One final set of variables to be examined with regard to reported academic obstacles deals with the academic progress of the students.

Degree Requirements Presently Pursued

At the outset it would be expected that students at a particular stage of progress (courses, foreign language, thesis, etc.) would report encountering academic obstacles that were associated with the requirement they were meeting. The data in Table 6.8 generally support this proposition

TABLE 6.8.--Academic obstacles reported by students, by degree requirements presently pursued

Degree requirements presently pursued	Students engaged in requirement	Academic obstacles reported					
		Coursework	Major exams	Foreign languages	Research and dissertation	Other academic obstacles	Totals[a]
Coursework	2065 (61.0%)	55 (2.7%)	13 (0.6%)	92 (4.5%)	31 (1.5%)	9 (0.4%)	167 (8.1%)
Major exams	820 (24.3%)	20 (2.4%)	9 (1.1%)	42 (5.1%)	19 (2.3%)	7 (0.9%)	87 (10.6%)
Foreign language	785 (23.2%)	23 (2.9%)	2 (0.3%)	76 (9.7%)	17 (2.2%)	3 (0.4%)	104 (13.2%)
Thesis	1702 (50.4%)	46 (2.7%)	18 (1.1%)	124 (7.3%)	62 (3.6%)	14 (0.8%)	232 (13.6%)

[a]Multiple responses not included in this column.

but not very convincingly; first, because the numbers are so small and, second, because there is bound to be some mixing of the stages or requirements as noted earlier.

The tentative conclusions that may be drawn from Table 6.8 are as follows: a) As an academic obstacle, the foreign language requirement predominates at every stage of progress; b) the level of reporting coursework and major exams as academic obstacles remains relatively constant throughout, while the dissertation progressively becomes a more significant obstacle as expected; c) as a result of these trends, and perhaps because of some cumulative reporting of previously experienced obstacles, it would appear that academic obstacles taken together increase during a student's progress toward the doctorate.

Stage of Thesis

The same tendency is noted when the student's progress through the dissertation is examined. It will be noted in Table 6.9 that reported academic obstacles increase regularly throughout the active stages of preparing a thesis. The slight tailing off at the writing stage is due primarily to a substantial drop in the reporting of foreign languages as an obstacle. Although the foreign language obstacle is still the predominant one at the writing stage, the student's perception of its importance as a delaying factor is diminished, presumably because these students are the furthest removed from the problem in time.

TABLE 6.9.--Academic obstacles reported by students, by stage of thesis

Stage of thesis	Students at each stage	Students reporting academic obstacle
Topic developed	676 (20.0%)[a]	63 (9.3%)
Outline prepared	182 (5.4%)	19 (10.4%)
Collecting data	638 (18.9%)	86 (13.5%)
Analyzing data	184 (5.4%)	33 (17.9%)
Writing	373 (11.0%)	50 (13.4%)
		$X^2 = 46.91$ $p = .01$

[a]Per cent of students in total sample (i.e., 3380).

Years of Academic Study Completed

One final piece of evidence supports the notion that in general academic obstacles as a class increase with the duration of study. The data in Table 6.10 indicate that as the years of academic study beyond the baccalaureate increase, academic obstacles grow more prevalent. In this example it is assumed that with each year of study the student progresses steadily toward the doctorate. It should be noted that academic ability is not associated statistically or meaningfully with any of the measures of academic progress.

TABLE 6.10.--Academic obstacles reported by students, by years of academic study beyond bachelor's degree

Years of study completed	Students within each category	Students reporting academic obstacle
Less than one	173 (5.1%)	8 (4.6%)
At least one but less than two	394 (11.7%)	29 (7.4%)
At least two but less than three	802 (23.7%)	67 (8.4%)
At least three but less than four	721 (21.3%)	77 (10.7%)
Four or more	1272 (37.6%)	157 (12.3%)
Other	18 (0.5%)	2 (11.1%)
Totals	3380 (100%)	340 (10.1%)
		$X^2 = 19.04$ $p = .01$

Institutional--Organizational Obstacles

We turn next to a consideration of obstacles associated with the institution and the graduate school--its organization and administration, policies and procedures, and general requirements. It will be noted in Table 6.11 that these were the kinds of obstacles deemed by Carmichael, Elder, and others as the most significant in delaying students' progress toward the doctorate.

TABLE 6.11.--Institutional--Organizational obstacles reported by students

Obstacle categories	Number of students reporting obstacle	Percentage of total sample
Admission or transfer	33	1.0
Lack of desired program	34	1.0
Physical facilities or services	48	1.4
Teaching assistantship, research assistantship, or other university employment	92	2.7
General requirements and regulations	95	2.8
Other institutional--organizational	54	1.6
Totals for class	331[a]	9.8[a]

[a]Columns do not add to total for class because of multiple responses.

In all, 331 students (9.8 per cent of the total sample) reported that their progress had been hindered by at least one obstacle of the organizational class. A problem of this sort, affecting nearly one student in ten, certainly warrants further study. However, analysis of the problem is hampered by the same factors mentioned earlier--the variety of particular obstacles described by the students and the small number of students reporting each obstacle category.

Because of these two factors, the number of independent variables that were found to be associated with organizational obstacles as a class was reduced to three. And these variables (year first began graduate study, years of academic study beyond the baccalaureate, and duty hours per week) were only significant at the five per cent level of confidence.

Year First Began Graduate Study

Interestingly enough, the reporting of organizational obstacles with respect to the year in which the student began graduate study was lowest among the two extreme groups--those who had entered graduate school in the year the survey was taken (4.7%) and those who started graduate work prior to 1945 (4.4%). Between these two starting points the reporting of organizational obstacles ranged from nine to 12 per cent with no significant patterns or trends detectable.

Year of Academic Study Completed

A more meaningful tendency is seen when the variable concerning years of study beyond the baccalaureate is examined. In Table 6.12, it will be noted that reported organizational obstacles increase, albeit irregularly, from 4.6 per cent to 11.4 per cent as years of study increase from less than one to four or more. Presumably, this tendency is due to progressive contact by students with a greater number of obstacles in the organizational class. However, this conjecture cannot be verified because the number of responses in this class is too small to permit analyses by category.

TABLE 6.12.--Organizational obstacles reported by students, by years of academic study beyond the bachelor's degree

Years of study completed	Students within each category	Students reporting organizational obstacle
Less than one	173 (5.1%)	8 (4.6%)
At least one but less than two	394 (11.7%)	34 (8.6%)
At least two but less than three	802 (23.7%)	79 (9.9%)
At least three but less than four	721 (21.3%)	63 (8.7%)
Four or more	1272 (37.6%)	145 (11.4%)
Other	18 (0.5%)	2 (11.1%)
Totals	3380 (100%)	331 (9.8%)
		$X^2 = 10.47$ $p = .05$

Duty Hours Per Week

The third significant variable relates to the number of duty hours per week required of the student. With one inexplicable exception, the data in Table 6.13 indicate that organizational obstacles become increasingly significant as more duty hours are required of the student. It is not clear from an examination of the categories that comprise this class why

TABLE 6.13.--Organizational obstacles reported by students, by required duty hours per week

Required duty hours per week	Students within each category	Students reporting organizational obstacle
None	1895 (56.1%)	167 (8.8%)
Fewer than 10	216 (6.4%)	20 (9.3%)
10 to 14	216 (6.4%)	20 (9.3%)
15 to 19	162 (4.8%)	17 (10.5%)
20 to 24	496 (14.7%)	64 (12.9%)
25 to 39	150 (4.4%)	8 (5.3%)
40 and over	245 (7.2%)	35 (14.3%)
Totals	3380 (100%)	331 (9.8%)
		$X^2 = 18.36$ $p = .05$

these results should have been obtained. Perhaps the only category that is relevant to duty hours per week is the one dealing with assistantships or other university employment. Reported obstacles relating to these positions do in fact show significant increases as greater numbers of duty hours are required of the students holding stipends.

Field of Study

There was no significant difference in the reporting of organizational obstacles (as a class) by students of the 23 fields of study. However, the particular (category) obstacles reported by students of different fields show some interesting tendencies. First, problems associated with inadequate physical facilities were reported most frequently by students of those fields which make extensive use of specialized equipment and facilities (viz., the physical and biological sciences). On the other hand, delays occasioned by general doctoral requirements were characteristic of students in the social sciences, humanities, and education fields.

Obstacles related to teaching and research assistantships or other university employment were encountered most frequently in the biological and physical sciences--where this kind of support is common--and, inexplicably, by students in history and fine arts. Problems associated with the remaining two obstacle categories, admission or transfer and lack of desired program, were not peculiar to any field or group of fields. Although these tendencies are for the most part what would be expected, a study in greater depth and with a larger sample would be necessary to confirm them statistically.

Institutional--Personnel Obstacles

The last class of institutional obstacles to be examined consists of those obstacles that relate specifically to personnel within the institution--students, faculty or administrators. As shown in Table 6.14, 5.5 per

TABLE 6.14.--Institutional--Personnel obstacles reported by students

Obstacle categories	Number of students reporting obstacle	Percentage of total sample
Teaching	21	0.6
Personal attention	135	4.0
Other institutional--personnel	45	1.3
Totals for class	185[a]	5.5[a]

[a]Columns do not add to totals for class because of multiple responses.

cent of the sample indicated that their progress had been delayed by at least one of the three categories in this class. In view of the concern expressed in recent years about the quality of teaching in higher education, it is interesting to note that only 21 of the 3380 students in the sample reported that either the teaching process or the faculty's instructional ability impeded their progress. This result does not necessarily mean that teaching on the graduate level is beyond reproach. It says only that teaching is not so inadequate as to be an important factor in delaying progress toward the doctorate.

Seen another way, the didactic function does not assume the importance in graduate education that it does on the undergraduate level. Hence, the "teaching problem" may be relatively unimportant to begin with. The function that progressively takes upon greater meaning at the graduate level is the complex interaction between the student and his

major advisor(s) or mentor(s). The difficulties associated with these interactions are by and large the ones registered under the "personal attention" category. And it will be noted in Table 6.14 that these kinds of obstacles are the dominant ones in the Institutional--Personnel class. Because of this predominance, the personal attention category will be analyzed rather than the class as a whole.

Stage of Progress

It was found that seven independent variables were associated statistically with the reporting of personal attention obstacles. Four and perhaps five of these variables relate to the student's academic progress toward the doctorate.

Coursework

In the first, 2.5 per cent of the students engaged in coursework reported personal attention obstacles, as compared with a figure of 6.3 per cent among students not so engaged. According to a chi-square test, this difference is significant at the one per cent level of confidence ($X^2 = 30.15$, $p = .01$).

Thesis

Correspondingly, personal attention obstacles were indicated by 5.6 per cent of the students working on their dissertations, compared with 2.4 per cent of the students who had not begun thesis work ($X^2 = 22.53$, $p = .01$).

Stage of Thesis

These data are complemented by the results shown in Table 6.15. Here it may be seen that reported personal attention obstacles increase, although somewhat irregularly, through successive stages of the dissertation.

TABLE 6.15.--Personal attention obstacles reported by students, by stage of thesis

Stage of thesis	Students at each stage	Students reporting personal attention obstacle
No topic	1204 (35.6%)	30 (2.5%)
Topic developed	676 (20.0%)	16 (2.4%)
Outline prepared	182 (5.4%)	9 (4.9%)
Collecting data	638 (18.9%)	33 (5.2%)
Analyzing data	184 (5.4%)	8 (4.3%)
Writing	373 (11.0%)	29 (7.8%)
Completed	123 (3.6%)	10 (8.1%)
Totals	3380 (100%)	135 (4.0%)
		$X^2 = 34.14$ $p = .01$

Years of Academic Study Completed

The other important measure of academic progress, years of study beyond the baccalaureate completed, shows a similar relationship to personal attention obstacles. In Table 6.16, the reporting of these obstacles is shown to increase regularly as more years of study are completed.

TABLE 6.16.--Personal attention obstacles reported by students, by years of academic study beyond the baccalaureate completed

Years of academic study completed	Students within each category	Students reporting personal attention obstacle
Less than one	173 (5.1%)	9 (1.2%)
At least one but less than two	394 (11.7%)	8 (2.0%)
At least two but less than three	802 (23.7%)	13 (2.6%)
At least three but less than four	721 (21.3%)	29 (4.0%)
Four or more	1272 (37.6%)	80 (6.3%)
Other	18 (0.5%)	3 (16.7%)
Totals	3380 (100%)	135 (4.0%)
		$X^2 = 36.98$ $p = .01$

Year First Began Graduate Study

One additional variable that should be noted at this point concerns the year in which graduate study was begun. Although this variable is related to academic progress, it is not as clear a measure as the foregoing because of the effect of interruptions of academic study on the data obtained. For this variable the overall tendency was an increase in reported personal attention obstacles the longer ago a student began graduate study. Although this increase was gradual but even in the years since 1960, it was irregular prior to that point.

Taken together, the data presented so far in this section show reported personal attention obstacles increasing as the students move through successive academic stages toward the doctorate. Again it may be questioned whether these results are due merely to cumulative reporting or to real differences inherent in the successive stages of study. There appears to be no way to rule out the former possibility. However, the latter seems entirely credible in view of the nature of doctoral progress. Initially engaged in coursework, the student's need for close personal attention--and perhaps even his desire for it--is limited. But later on as the student's academic interests become more specialized and as he identifies a thesis topic and, usually, a major advisor to go with it, the need for closer personal interaction increases. It is in this latter context--where supportive relationships are most necessary--that problems due to a lack of personal attention are most likely to occur. And, according to the students in this sample, they do.

Field of Study

The lack of personal attention afforded to students by faculty may stem from a variety of factors. One of the principal factors mentioned by students in this survey was the preoccupation of faculty with their own research. If the data obtained from this sample are reliable, it would appear that faculty preoccupation with research and other matters is more of a problem in the physical and biological sciences than in the social sciences and humanities. For in the former two areas (including mathematics and statistics) 5.6 per cent of the students reported personal attention obstacles. Whereas in the combined social science and humanities fields the reported percentage was 3.4. This difference was significant at the .01 level of confidence ($X^2 = 6.85$).

It would probably be going too far to assert on the basis of these results that faculty in the social sciences and humanities are more concerned with their students and value those kinds of interactions more highly than their counterparts in the physical and biological sciences. But it would provide an interesting hypothesis for further study.

Citizenship Status

One final characteristic that varied in association with reported personal attention obstacles was the student's citizenship status. It was found that 4.3 per cent of the United States citizens in the sample reported this obstacle as compared with 2.2 per cent of the non-U.S. citizens

(foreign students). This difference, significant at the .05 level ($X^2 = 4.73$), is particularly noteworthy in view of the fact that the foreign students in this sample were concentrated more highly in the physical and biological sciences than in the social sciences and humanities.

One explanation of this result is that faculty and other graduate school personnel may be making a greater effort to assist foreign students in order to compensate for the difficulties these students have with the language, culture, and educational system. Alternatively, the personal attention foreign students receive in this country may seem relatively generous--relative, that is, to the rather impersonal higher education milieu to which they are accustomed in their native lands.

CHAPTER VII

PERSONAL AND OTHER OBSTACLES AND RELATED VARIABLES

Summary of Major Findings

A. Personal Obstacles

Among the classes of obstacles established for this study, the personal class ranked a distant second to finances in terms of the number of students reporting obstacles. Personal problems were indicated as delaying the progress of 13.8 per cent of the students in the sample. As shown in Table 7.1, personal class obstacles were spread over eight different categories, with the marriage or family category receiving the largest number of responses.

As a class, personal obstacles were shown to increase with age, with years of academic study beyond the bachelor's degree, and with years elapsed since the student first began graduate study. Personal obstacles were greater among females, married students, and those with dependents than among males, single students, and those without dependents, respectively. Students who derived the major portion of their income from their spouse's income and whose parental income was $20,000 were affected by personal problems substantially more than students in the other categories of these two independent variables.

There were no significant differences among major areas of study that could be attributed directly to differential reporting of personal obstacles. Orientals and non-U.S. citizens encountered far fewer delays related to personal problems than did whites and U.S. citizens in this sample. Negroes, on the other hand, reported personal problems more frequently than whites and at a rate three to four times greater than Orientals and other minority racial groups.

B. Other Obstacles

Obstacles not related to financial, institutional, or personal considerations were reported by 12.9 per cent of the sample. The majority of responses in this class were in two categories--inadequate preparation and other employment. Inadequate preparation was associated with field of study and with stage of academic progress. The majority of responses concerning this obstacle were received from students in the biological and physical sciences; and it was shown that problems associated with inadequate preparation increase throughout successive academic stages and are at their greatest when the student is analyzing data and writing his dissertation.

Obstacles relating to outside (other) employment were closely related to financial obstacles because of the inability to distinguish the two kinds of responses in the coding and for obvious inherent reasons as well. Other employment obstacles were indicated pri-

marily by students whose major source of income was either faculty appointment or other employment and those in fields of study characterized by the "less desirable" sources of support. In terms of academic progress, other employment obstacles were perceived as being most troublesome by students who had not yet begun work on a dissertation and by those who were engaged in writing the document. This tendency was related to the higher proportions of students at these stages who derived the major portion of their income from faculty appointment and other employment. This same factor appeared to be responsible for the increase in other employment obstacles reported by successive age groups.

Analysis of Personal and Other Obstacles and Related Variables

Up to this point, the obstacles considered have related to the financing of graduate education, the academic nature of graduate study, and the organization and operations of graduate institutions. These are broad and ubiquitous problems. As such, they have received considerable attention by those concerned with alleviating unnecessary delays in progress toward the doctorate. However, the final two classes of obstacles to be examined--personal and other--are seen and discussed in a somewhat different light. Because these latter problems are so varied and idiosyncratic, and, primarily, because they are usually beyond the control of the graduate school, they are often ignored in investigations of the

duration of doctoral study. Yet for a given student a personal problem may impede his progress as severely as a financial problem or a language requirement for another student. For this reason personal and other obstacles will be given some attention here. And as will be shown, these kinds of problems may bear more relationship to financial and institutional obstacles than would be expected at the outset.

Personal Obstacles

Slightly over one quarter of the students in the sample indicated that their progress had been delayed by personal or other (extra-graduate school) obstacles. A total of 13.8 per cent reported one or more of the eight personal obstacles listed in Table 7.1. Of the eight categories only one, marriage or the family, appears at first glance to be of sufficient magnitude to permit separate analysis. However, this category may be spuriously inflated due to the coding procedure. If, for example, a respondent stated that "having a family" proved to be a major obstacle, he might have meant that the additional financial burden of a family was the root of his problems rather than the family itself. Yet, in order to avoid interpretation in the coding, this response would have been coded under "marriage or the family." Perhaps as many as half of the responses in this category in fact related to financial rather than marital or family problems.

TABLE 7.1.--Personal obstacles reported by students

Obstacle categories	Number of students reporting obstacle	Percentage of total sample
Mental ability and motivation	68	2.0
Indecision or uncertainty	54	1.6
Shift in field, program or institution	56	1.7
Diverse competing interests	52	1.5
Physical illness or disability	17	0.5
Physical characteristics	14	0.4
Marriage or the family	172	5.1
Other personal problems, attitudes, decisions	88	2.6
Totals for class	467[a]	13.8[a]

[a]Columns do not add to totals for class because of multiple responses.

Thus, because of the diversity of responses in the personal class and the fact that no single category would seem to influence the values obtained for the class in any regular way, the personal class will be analyzed as a whole. The question to be answered is: What characteristics or conditions of students would tend to render them more susceptible to personal obstacles?

Time Related Variables

Inasmuch as personal problems have a way of increasing through time, it would be expected that reported personal obstacles should vary in association with the time-related independent variables. And indeed the following three tables show that reported personal obstacles increase regularly with age (Table 7.2), with years of academic study beyond the bachelor's degree (Table 7.3), and with the year the student first began graduate study (Table 7.4).

TABLE 7.2.--Personal obstacles reported by students, by age

Age	Students within each age group	Students reporting personal obstacle
22 and under	47 (1.4%)	3 (6.7%)
23 to 25	677 (20.0%)	64 (9.5%)
26 to 29	1081 (32.0%)	144 (13.3%)
30 to 49	1507 (44.6%)	239 (15.9%)
50 and over	68 (2.0%)	17 (25.0%)
Totals	3380 (100%)	467 (13.8%)
		$X^2 = 25.72$ $p = .01$

TABLE 7.3.--Personal obstacles reported by students, by years of academic study beyond the bachelor's degree

Years of study completed	Students within each category	Students reporting personal obstacle
Less than one	173 (5.1%)	12 (6.9%)
At least one but less than two	394 (11.7%)	34 (8.6%)
At least two but less than three	802 (23.7%)	109 (13.6%)
At least three but less than four	721 (21.3%)	94 (13.0%)
Four or more	1272 (37.6%)	217 (17.1%)
Other	18 (0.5%)	1 (5.6%)
Totals	3380 (100%)	467 (13.8%)
		$X^2 = 27.34$ $p = .01$

TABLE 7.4.--Personal obstacles reported by students, by year first began graduate study

Year began graduate study	Students within each category	Students reporting personal obstacle
1964 or 1965	257 (7.6%)	16 (6.2%)
1963	385 (11.4%)	29 (7.5%)
1962	510 (15.1%)	59 (11.6%)

TABLE 7.4.--Continued

Year began graduate study	Students within each category	Students reporting personal obstacle
1961	496 (14.7%)	62 (12.5%)
1960	432 (12.8%)	60 (13.9%)
1958 or 1959	485 (14.3%)	71 (14.6%)
1955 to 1957	370 (10.9%)	76 (20.5%)
1945 to 1954	376 (11.1%)	72 (19.1%)
Before 1945	69 (2.0%)	22 (32.4%)
Totals	3380 (100%)	467 (13.8%)
		$X^2 = 71.00$ $p = .01$

Sex

One of the most significant student characteristics that led to a differential reporting of personal obstacles was sex. It was found that 21.6% of the females in the sample as compared with 12.1% of the males indicated delays in progress resulting from personal problems.

Marital-Dependent Status

Associated indirectly with sex is the student's marital-dependent status. This variable is of particular interest in view of its direct relevance to the "marriage or the family" category of obstacles. Table 7.5 shows the personal (class) obstacles and the marriage or family (category) obstacles reported by students in the four marital-dependent status groups.

TABLE 7.5.--Personal (class) obstacles and marriage or the family (category) obstacles reported by students, by marital-dependent status

Marital-dependent status	Students within each category	Students reporting personal (class) obstacle	Students reporting marriage or the family (category) obstacle
Single, with no dependents	1144 (33.8%)	137 (12.0%)	8 (0.7%)
Single, with one or more dependents	92 (2.7%)	19 (20.7%)	10 (10.9%)
Married, with no dependents	703 (20.8%)	93 (13.2%)	30 (4.3%)
Married, with one or more dependents	1441 (42.6%)	218 (15.1%)	124 (8.6%)
Totals	3380 (100%)	467 (13.8%)	172 (5.2%)
		$X^2 = 9.15$ $p = .05$	$X^2 = 89.23$ $p = .01$

It will be noted that there are considerable differences among the four groups in the reporting of the marriage or family obstacle. As expected married students as a group indicate more problems in this area than non-married students; and students with dependents report the obstacle more frequently than students without dependents.

When the entire class of personal obstacles is examined, the distribution of responses among the four groups is seen to be more even. In fact, single students with dependents is the only group which varies significantly from the mean. It is interesting to note that marriage or family obstacles constitute slightly more than half of all the personal obstacles reported by both groups with dependents. The marriage or family category is about a third of the personal class total among married students with no dependents, but only a small fraction of the total reported by single students with no dependents.

It is difficult to imagine why the reporting of obstacles other than marriage or the family in the personal class should be different among the four marital-dependent status groups. Yet the data indicate that these other personal obstacles are far more significant in delaying the progress of single students with no dependents than of the other three groups. Perhaps the answer lies in the manner in which the students responded to the open-ended question. If marital or family problems were perceived by married students and those with dependents to be of paramount importance in delaying their progress, this perception might well have suppressed other personal problems which could have surfaced had the students been questioned further. On the other hand, students with no marital or dependent responsibilities would not be expected to encounter problems in this area. Thus, for these students the question would elicit responses related to other obstacles in the personal class. If this analysis is correct, it illustrates again one of the major drawbacks of the open-ended type of question used in a questionnaire of this sort.

Major Source of Income

Another variable for which the students' marital status appeared to influence the reporting of personal obstacles was major source of income. Only one of the major source groups varied significantly from the overall average with respect to the reporting of personal obstacles--that was the source group whose students received 75 per cent or more of their income from spouse's employment. Of the 101 students in this group, 35 (34.7%) indicated that their progress had been delayed by a personal problem. Twenty-four of these 35 personal problems mentioned were in the marriage or family category. Thus, it would appear that even if reliance on a spouse for income did not disadvantage a student financially, it would tend to create other problems which may in the long run interfere with his progress as much as financial problems do.

Parental Income

One additional financial variable that showed an interesting tendency, was parental income. Among the groupings of students according to the income of their parents, the reporting of personal obstacles was highest among those students whose parental incomes were greatest ($20,000 or over per year). While the reporting of personal obstacles ranged between 12 and 16 per cent in the other parental income groups 22.0 per cent of the $20,000 or over group (33 of 150 students) indicated one or more personal obstacles. The particular categories of personal obstacles reported by these presumably well-to-do students were closely proportional to the categories reported by the total sample.

In explanation of this result two possibilities suggest themselves. The first relates to the matter of perception mentioned earlier. It could reasonably be assumed that personal problems have to some degree delayed the progress of far more students than the 13.8 per cent who reported personal obstacles. Yet because problems concerning finances, the academic program, and the graduate school are of a more immediate and encumbering nature, personal problems related to delays do not loom as large in the perception of those so encumbered. Personal problems are, in a sense, overwhelmed or, as we have said, suppressed. However, students from families with annual incomes over $20,000 are probably well endowed, financially and intellectually. And if financial and academic factors present no problems, then personal problems--which are undoubtedly more widespread than these data indicate--will be expressed. A somewhat simpler, but equally undemonstrable, explanation for these data is that students from wealthy families are, in fact, beset by more personal problems than students from middle class backgrounds.

Field of Study

When all 23 fields of study in the sample were analyzed according to reported personal obstacles, differences among the fields were significant only at the 10 per cent level of confidence. Groupings of the fields into broad areas, as shown in Table 7.6, also failed to yield very significant differences. However, it will be noted in this table that similar percentages of personal obstacles were reported by students in the life and physical

sciences and by students in the social sciences and humanities. The combined percentage for the life and physical sciences is 11.3 and for the social sciences and humanities, 15.4. A chi-square test reveals that this difference is significant at the .01 level ($X^2 = 9.12$).

TABLE 7.6.--Personal obstacles reported by students, by broad areas of study

Broad areas of study	Students within each area	Students reporting personal obstacle
Life sciences: biological sciences, agriculture and forestry, health professions	760	87 (11.4%)
Physical sciences: physical sciences, mathematics and statistics	448	50 (11.2%)
Social sciences: psychology, history, business and commerce, social work administration, other social sciences	662	104 (15.7%)
Humanities: English and journalism, fine and applied arts, foreign languages, philosophy, religion	795	120 (15.1%)
Education: (all education fields)	403	58 (14.4%)
Engineering:	151	18 (11.9%)
Totals	3219	437 (13.6%)
		$X^2 = 9.98$ $p = .10$

Why the difference? The particular categories of personal obstacles were reported at nearly identical levels by students of the two groups, with one exception. The marriage or family obstacle was indicated as a source of delay by 3.6 per cent of the students in the life and physical sciences as compared with 6.2 per cent in the social sciences and humanities. This difference cannot be explained by numbers of married students alone; for in fact there were slightly more married students in the life and physical sciences (64%) than in the social sciences and humanities (59%).

Unless one is willing to assert, then, that there are inherent differences in the marital and familial situations of the two groups, the observed differences probably stem from coding contingencies. As noted in the section on Personal Obstacles the coding process may have resulted in the inclusion of true financial obstacles in the marriage or family category. If this was the case, and if financial obstacles were greater among the social sciences and humanities than among the life and physical sciences--whch they were (see Table 5.2)--then it would have been differences in reported financial obstacles that caused the apparent difference in the reporting of marriage or family obstacles by the two groups.

Race and Citizenship Status

The final variables that were statistically associated with personal obstacles were the related ones of race and citizenship status. Of the 459 non-U.S. citizens in the sample, 30 (6.5%) indicated that personal obstacles

had impeded their progress toward the doctorate. This percentage is considerably below the 15.0 per cent of U.S. citizens who reported obstacles of the same class.

These results are consistent with those shown in Table 7.7. The most interesting aspect of Table 7.7 is that one minority group (Negroes) should report encountering personal obstacles at a rate higher than whites,

TABLE 7.7.--Personal obstacles reported by students, by race

Race	Students in each race	Students reporting personal obstacle
White	3067 (90.7%)	442 (14.4%)
Negro	69 (2.0%)	13 (18.8%)
Oriental	196 (5.8%)	10 (5.1%)
Other	48 (1.4%)	2 (4.2%)
Totals	3380 (100%)	467 (13.8%)
		$X^2 = 18.63$ $p = .01$

while two other minority groups (Orientals and Other) should be considerably below the percentage reported by whites. An examination of the personal obstacles categories reported by the minority groups reveals two categories in which responses by Negroes were considerably higher than average and

in which there were no responses by Orientals. These were the "physical characteristics" category, including responses relating to a person's race, and the "other personal problems" category. In the latter were coded obstacles of an undifferentiated personal nature and those concerning miscellaneous personal problems, attitudes, and decisions. These obstacles were reported, respectively, by 4.3% and 5.8% of the black students in the sample.

Unfortunately, the data on minority racial groups in this sample are too few to permit meaningful analyses to be made of the categories of personal obstacles. Perhaps all that can be said in viewing the class as a whole is that the psycho-social and economic conditions of the several racial groups are sufficiently different in the higher education milieu so as to predispose them to differential numbers and kinds of personal obstacles.

Other Obstacles

The final class of obstacles to be examined is a miscellaneous grouping of those obstacles that do not "fit" into any of the previously discussed classes. Students responding to the question on delays in progress indicated a number of problems that are not seen as evolving from financial, institutional, or personal consideration. These "other" obstacles, reported by 12.9 per cent of the total sample are shown in Table 7.8. It will be noted that the majority of responses in this class fall within two categories--inadequate preparation and other employment. Because these

two variables have the greatest influence on the results obtained for the class, and because of the variety among the other categories in the class, attention will be focused on these two.

TABLE 7.8.--Other (external) obstacles reported by students

Obstacle categories	Number of students reporting obstacle	Percentage of total sample
Inadequate preparation	92	2.7
Military service	59	1.7
Physical factors	23	0.7
Lack of time	23	0.7
Other employment	189	5.6
English as a foreign language	23	0.7
Miscellaneous other	61	1.8
Totals	437[a]	12.9

[a]Columns do not add to totals for class because of multiple responses

Inadequate Preparation

When students indicate that inadequate undergraduate preparation was responsible for delaying their progress toward the doctorate, it might be asked "What kinds of students are so delayed?" and "At what stage in their progress did these inadequacies become apparent?" To answer the

first query, it was hypothesized that this obstacle would be more prevalent among the academically less able. However, there proved to be no significant differences among ability groupings (by undergraduate grade point average) with respect to the reporting of this obstacle.

Field of Study

The variable which influenced the reporting of inadequate preparation to the greatest extent was the student's field of study. As Table 7.9 shows, there are significant differences among students of the several broad areas of study in the reporting of this obstacle. But perhaps more interesting is the manner in which one field in particular--biological sciences--stood out above the others. Of the 92 students who indicated problems arising from inadequate preparation, 28 of them were in the biological sciences. Thus 8.3 per cent of students in this particular field were affected by this obstacle. The next largest groups of students reporting the obstacle were in the physical sciences field (14 or 5.5 per cent) and agriculture and forestry (8 or 3.4 per cent).

TABLE 7.9.--Inadequate preparation obstacles reported by students, by broad areas of study

Broad areas of study[a]	Students within each area	Students reporting inadequate preparation obstacle
Life sciences	760 (22.5%)	38 (5.0%)
Physical sciences	448 (13.3%)	18 (4.0%)
Social sciences	662 (19.6%)	15 (3.3%)

TABLE 7.9.--Continued

Broad areas of study[a]	Students within each area	Students reporting inadequate preparation obstacle
Humanities	795 (23.5%)	14 (1.8%)
Education	403 (11.9%)	4 (1.0%)
Engineering	151 (4.5%)	1 (0.7%)
Miscellaneous	161 (4.8%)	2 (1.2%)
Totals	3380 (100%)	92 (2.7%)
		$X^2 = 29.41$ p = .01

[a]See Table 5.2 for the fields of study included within the broad areas.

Stage of Progress

At what point in their program do students perceive that their preparation for graduate school was inadequate? According to the data collected here, it is later rather than earlier. Of the students who were engaged in course work, 2.2 per cent reported this obstacle as compared with 3.6 per cent of those not taking courses. Conversely, 3.7 per cent of the students working on their dissertations indicated the inadequate preparation obstacle compared with 4.7 per cent of those who had not yet

embarked on their dissertations. These differences were significant at the .02 and .01 levels respectively. Complementing these results are the data in Table 7.10. Here again the percentage of students indicating

TABLE 7.10.--Inadequate preparation obstacles reported by students, by stage of thesis

Stage of thesis	Students at each stage	Students reporting inadequate preparation obstacle
No topic	1204 (35.6%)	22 (1.8%)
Topic developed	676 (20.0%)	15 (2.2%)
Outline prepared	182 (5.4%)	4 (3.2%)
Collecting data	638 (18.9%)	23 (3.6%)
Analyzing data	184 (5.4%)	9 (4.9%)
Writing	373 (11.0%)	18 (4.8%)
Completed	123 (3.6%)	1 (0.8%)
Totals	3380 (100%)	92 (2.7%)
		$X^2 = 17.58$ $p = .01$

problems arising from inadequate preparation increases regularly at each successive stage of progress. It is interesting to note that once the active thesis stages are completed, the reporting of this obstacle drops off markedly. Although the numbers are small, this pattern indicates again that the reporting of obstacles is not cumulative. Rather, students appeared to perceive obstacles largely in terms of their present situation.

The problem of inadequate preparation, then, would seem to be associated primarily with the preparation of a thesis, and in particular the data analysis and writing portions. But this is not surprising. Undergraduate education as presently structured serves to transmit information about a field to students via discreet, content-oriented courses. Rarely is the undergraduate curriculum designed to impart understanding or develop skills in the area of independent investigation. And for students in the biological and physical sciences--who seem to suffer most from inadequate preparation--even less attention is paid in their education to the writing of such a document. It might be deduced, therefore, that the inadequacies in their preparation to which students refer relate chiefly to training in research and the production of a research paper.

Other Employment

Reported by 189 students or 5.6 per cent of the total sample, the most important category in the Other class (in terms of number of responses) is that of other employment. In this category were coded all obstacles

relating to the student's employment in a position outside the institution he was attending or in a position whose locus was undefined. Obviously the problem of interpreting responses raises its ugly head again. Great care was taken in the coding to distinguish responses concerning financial problems from those related to employment. That is, when employment undertaken for financial reasons was indicated as an obstacle, it was coded as a financial problem. But consider the following response: "Having to hold down a full-time job while trying to complete my dissertation delayed me at least a year." It is probable that this respondent took on a "full-time job" in order to support himself during this period. Thus finances may well have been the primary cause of the obstacle. Yet to code this response as "financial" would have required an interpretation which was to be avoided in the coding. As a result this category of other employment in undoubtedly inflated by a considerable number of what were really financial obstacles, even to a greater extent than the marriage or the family category discussed earlier. This inflation is reflected in the fact that the other employment obstacles, as a dependent variable, behaves much the same as the financial obstacle with respect to the independent variables.

Major Source of Income

The independent variable that shows the clearest relationship with the other employment obstacle is major source of income. As indicated in Table 7.11 the majority of persons reporting this obstacle are, as expected,

TABLE 7.11.--Other employment obstacles reported by students, by major source of income

Major source of income	Students within each source group	Students reporting other employment obstacle
Scholarship or fellowship	435 (12.9%)	13 (3.0%)
Teaching assistantship	232 (6.9%)	5 (3.2%)
Research assistantship	245 (7.2%)	3 (1.2%)
Faculty appointment	174 (5.1%)	27 (15.5%)
Other employment	527 (15.6%)	71 (13.5%)
Spouse's employment	101 (3.0%)	3 (3.0%)
All other major sources	88 (2.6%)	3 (3.4%)
No single major source	1578 (46.7%)	64 (5.1%)
Totals	3380 (100%)	189 (5.6%)
		$X^2 = 123.03$ $p = .01$

those who rely on faculty appointments or other employment as their major source of income. It will be remembered that these two source groups ranked first and second in the number of students reporting financial obstacles (see Table 5.1).

Field of Study

In the section on financial obstacles, the fields of study were divided into two groups according to the courses that provided financial support for the students. Table 5.4 showed that the fields whose students received their major financial support from "more desirable" sources were associated with low levels of reported financial obstacles; conversely, students from fields characterized by "less desirable" sources of support indicated a relatively high level of financial obstacles. Similar results were obtained from these independent variables when they were analyzed against other employment obstacles. As shown in Table 7.12, the reporting of delays due to other employment is greater among those fields whose students characteristically rely on this source of support.

TABLE 7.12.--Major source of support groups and other employment obstacles reported, by field of study

Field of study	Percentage of students supported by		Percentage of students reporting other employment obstacle
	scholarships, fellowships, T.A.'s and R.A.'s	faculty appointment and other employment	
Group A (fields with more desirable sources of support)			
Biological science	44.7	4.2	2.6
Agriculture and forestry	41.5	9.8	0.9
Health professions	41.1	14.9	2.1
Physical science	36.2	9.8	3.9

TABLE 7.12.--Continued

Field of study	Percentage of students supported by		Percentage of students reporting other employment obstacle
	scholarships, fellowships, T.A.'s and R.A.'s	faculty appointment and other employment	
Group B (fields with less desirable sources of support)			
Education (combined)	6.2	51.9	10.2
Fine and applied arts	7.5	24.3	7.5
Business and commerce	10.5	26.3	5.3
Library science	15.0	30.0	10.0
All fields	27.0	20.7	5.6

Stage of Progress

With regard to the occurrance of other employment obstacles at different stages of progress, the results are less clear. There was no meaningful difference in the reporting of this obstacle by students engaged in coursework as opposed to those working on their dissertations. There are, however, some slight but interesting tendencies according to the stage of thesis reached. Table 7.13 shows that the reporting of other employment obstacles is relatively high among students who have not yet begun their dissertation work. This level drops off as active work on the

TABLE 7.13.--Other employment obstacles reported by students and major source of income, by stage of dissertation

Stage of dissertation	Students in each stage	Students reporting other employment obstacle	Students whose major source of income was faculty appointment or other employment
No topic selected	1204 (35.6%)	83 (6.9%)	345 (28.7%)
Topic selected	676 (20.0%)	24 (3.6%)	129 (19.1%)
Have outline	182 (5.4%)	7 (3.8%)	35 (19.2%)
Collecting data	638 (18.9%)	27 (4.2%)	64 (10.0%)
Analyzing data	184 (5.4%)	9 (4.9%)	27 (14.7%)
Writing	373 (11.0%)	31 (8.3%)	66 (17.7%)
Completed	123 (3.6%)	8 (6.5%)	35 (28.5%)
Totals	3380 (100%)	189 (5.6%)	701 (20.7%)
		$X^2 = 19.60$ $p = .01$	

thesis begins and continues to climb through all the active stages of the dissertation. Interestingly enough the level of reporting is lowered among those students who have completed their dissertation, even though the percentage of students whose income is derived from faculty appoint-

ments or other employment continues to rise. This latter result tends to confirm the belief that students responded to the questionnaire largely in terms of their present situation.

As shown in Table 7.13 the percentage of students reporting delays occasioned by other employment roughly parallels the percentage who obtain their major financial support from faculty appointments or other employment. The major exception to this pattern is at the writing stage. Here the reported obstacles are out of proportion to the percentage of students employed outside the institution. This difference may be attributed to the fact that students, particularly in the social sciences, humanities, and education, frequently undertake employment--and often at some distance from the institution--once the data are collected and analyzed with the hope of writing in absentia. The added difficulties of this kind of arrangement may hamper the student's progress and increase his awareness of outside employment as a source of delay.

Age

Faculty appointments and other employment would be expected as a rule to serve as the major source of income for older, as opposed to younger, students. The degree to which this was true in the sample studied is shown in the right column of Table 7.14. The tendency for other kinds of employment to increase with age is reflected in (and is

TABLE 7.14.--Other employment obstacles reported by students and major source of income by age

Age	Students within each age group	Students reporting other employment obstacle	Students whose major source of income was faculty appointment or other employment
22 and under	47 (1.4%)	0 (0.0%)	2 (4.3%)
23 to 25	677 (20.0%)	12 (1.8%)	30 (4.4%)
26 to 29	1081 (32.0%)	41 (3.8%)	152 (14.1%)
30 to 49	1507 (44.6%)	127 (8.4%)	493 (32.7%)
50 and over	68 (2.0%)	9 (13.2%)	24 (35.3%)
Totals	3380 (100%)	189 (5.6%)	701 (20.7%)
		$X^2 = 58.14$ $p = .01$	

undoubtedly responsible for) the increased level of other employment obstacles reported by successive age groups. Reported financial obstacles, it will be remembered, exhibited a similar pattern.

CHAPTER VIII

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

One of the major problems confronting graduate education is the amount of time students take to complete the doctorate degree. Since World War II the average time lapse from baccalaureate to doctorate for all students has remained at about eight years. As indicated in Chapter I, duration of this magnitude affects not only graduate students but graduate institutions and the larger society as well. Over the past 15 years considerable effort has been devoted to understanding, analyzing, and resolving this problem. Those who have studied and written on the subject have attributed the causes of delay to a variety of factors. These range from institutional policies and curricular requirements to personal decisions and finances to factors essentially outside the control of either the institution or the individual.

It is clear that all these factors may play a role in delaying the progress of some students, and were so indicated by the respondents of this study. However, the importance that different writers attach to each of the factors stems, it seems to me, from the particular perspective each investi-

gator has on the problem, or the assumptions on which he bases his study. If, for example, an investigator assumes that a student is able to afford continuous, if not full-time, progress toward the degree and is actively engaged in meeting degree requirements, his attention would likely be focused on the academic hurdles and institutional requirements the student encounters as well as the student's personal problems and decisions. If, on the other hand, the investigator looks at the problems of delay without prejudice or presupposition and makes no assumptions about financial condition, field of study, enrollment status, etc., he is more likely to consider the importance of financial factors in the B.A.-Ph.D. time lapse.

The Primacy of Financial Obstacles

In essence, this study made no assumptions about causes in examining the problem of doctoral delay. The students were asked to respond to a straightforward question concerning "the most serious obstacles that delayed your progress toward an advanced degree." Because the question was open-ended, the respondents were not directed or influenced by the alternatives that are characteristic of a check-list type question. To the question on obstacles the students replied rather convincingly that financial problems were the principal source of delay. Thirty per cent of the respondents pointed directly to this obstacle; and, as discussed in Chapter VII, perhaps five or 10 per cent more were really thinking of financial factors when they indicated marriage or the family or other employment as obstacles.

A number of other considerations mentioned in Chapter I also emphasize the paramount importance of financial obstacles. Berelson's[1] and Wilson's[2] data indicate that on the average the actual (full-time-equivalent) time spent working on the degree and the time spent in attendance at a graduate institution are, respectively, 3.2 and 4.4 years. Thus, in view of the desideratum that Ph.D. study require between three or four years of study, it appears that the actual degree requirements and other factors associated with the institution are not providing the major obstacles. Complementing these findings are the studies of Arlt, Beach, Harmon, and Creager[3] that show the effect of generous financial support in reducing the time required to complete the degree. No parallel studies have demonstrated the shortening effects of modified institutional or curricular requirements.

One additional effect of financial problems on duration of graduate study should be mentioned. This effect stems from the potential interaction of financial obstacles with personal and other obstacles. It was shown in Figure 5.1 that when a student's income fails to meet his needs he is often forced to interrupt his studies or continue at a reduced rate. As a result of this kind of delay, the student grows older without making progress toward the degree. The analyses of the personal

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[1]Berelson, op. c.t., p. 159.

[2]Wilson, op. cit., pp. 25-28.

[3]see Chapter I, pp. 34-38.

and other obstacles (Chapter VII) revealed that these obstacles increase with age. Thus it may be seen that one kind of obstacle (in this case, financial) encountered by a student can predispose him to obstacles of other kinds.

However, in all fairness it must be noted that obstacles associated with the institution or graduate school were reported by 21.4 per cent of the sample; personal obstacles by 13.8 per cent; and other obstacles by 12.9 per cent. Unfortunately, it is difficult to pinpoint particular sources of delay within institutional classes because there was such a diversity of obstacles mentioned; only one of the specific obstacle categories (foreign language requirement) was mentioned by more than five per cent of the sample.

Field of Study and Doctoral Delay

As discussed in Chapter V, the principal cause of financial problems is insufficiency of funds to meet the student's needs. It was shown that students whose needs can be met by sources such as scholarships and fellowships, teaching assistantships and research assistantships are far less likely to report financial obstacles than students who are supported by faculty appointments or other employment. It was also shown that the former, more desirable sources of support are more characteristic of some fields (primarily the biological and physical sciences) than of others (education, the humanities, and some social sciences). It is not a coinci-

dence, therefore, that the fields that can make available to greater numbers of students the kinds of financial support that permit continuous study, and those fields whose students consequently report fewer financial obstacles, are the same fields that have the best records in terms of speed of Ph.D. attainment. The differences among the fields with regard to these variables were shown to be unrelated to the average academic ability of the students within the fields.

From the data in this study, then, it might be concluded that the student's choice of a field of study is the most important factor in determining the rapidity with which he will complete the doctorate. The support that a given field or, specifically, a given department can make available to its students derives from a number of sources. Teaching assistantships and some scholarships are paid from departmental general funds. Thus, unless a department chooses not to employ graduate students as teachers of undergraduates, this form of assistance should not differentiate among departments or fields. In the area of research assistantships and most scholarships and fellowships, however, there are striking differences. Since World War II the federal government has poured billions of dollars into colleges and universities in support of research and training. But as Harold Orlans and others have pointed out, the support has been uneven--concentrated primarily in the physical and biological sciences.[1] As a

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[1] Harold Orlans, The Effects of Federal Programs on Higher Education: A Study of 36 Universities and Colleges (Washington, D.C.: The Brookings Institution), pp. 293-94.

result a student in these areas has a much greater opportunity of being supported as an assistant on a sponsored research project or directly from a federal agency than his counterpart in the humanities, social sciences, or education.

There are, in addition, a number of other traditions or practices of the several fields of study that directly affect the length of time required for students to complete the doctorate. These practices, it will be seen, also add indirectly to the financial problems of students in those fields.

1.) First should be noted the requirement or recommendation of certain fields in education and a few other professional fields that practical experience be gained before the student embarks on doctoral study. Seldom, if ever, is such a requirement made of students in the sciences.

2.) Second, it has been said that the subject matter of the sciences (particularly mathematics and the other physical sciences) lends itself to more rapid completion of the doctorate. If the subject matter is logical and ordered, the argument goes, the knowledge and techniques that need to be mastered are more readily apparent and the steps to this mastery are clearer. Moreover, dissertation topics in the physical sciences are more clear cut, the methodology is more highly developed and standard, and the results are more reliably judged.

3.) And, finally, in the humanities, students may not be encouraged to complete their degrees rapidly; they may in fact be discouraged from doing so. Speaking of the humanities, Dean J. P. Elder, himself a classicist, has noted that "there is still a touch of the genteel tradition, a feeling that there is something inelegant and ill-bred about hurrying a man along."[1]

All these traditions and practices by themselves militate against early completion of the doctorate in non-science fields. But, in addition, the students so delayed are older than their colleagues in the sciences and tend to have greater financial responsibilities. These responsibilities may not be met by the scholarships and assistantships of $3,000 or less (plus tuition waiver) which may suffice for the (typically) younger (married or unmarried) student in the physical or biological sciences. The older student may then have no recourse but to accept more lucrative full-time employment, which, of course, slows his progress even further or stops it entirely. And so it goes.

Recommendations

The foregoing conclusions have emphasized the difference between the fields whose students complete the doctorate at a relatively rapid rate and those in thich the past of students is relatively slow. But there are, of course, fast and slow students in every field of study; and any recom-

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[1] quoted in Berelson, op. cit., p. 162.

mendations concerning a speed-up of the process should apply to all fields inasmuch as they all show average duration time that are longer than optimal.

The results of this study indicate that financial problems provide the major obstacle to rapid completion of the doctorate. Hence, our attention should be directed toward making it financially possible for a student to obtain his degree in four years or so. There is, however, a danger in taking too narrow a view of the problem. As Wilson has said, "Solutions predicated on a monistic conception of the problem will not prove to be satisfactory..."[1] In this study, for example, it was shown that there are also a number of other obstacles, both related and unrelated to financial obstacles, that do delay the progress of a considerable number of students and need to be taken into account. But as will be explained, finances are the best place to start.

Financing Graduate Education

There are two major problems with regard to the support of graduate students by institutions or fields of study. This first is the source of funds and the second is the manner of distribution of those funds, once obtained, to students. Concerning the former, it is perhaps enough to say that the present system of supporting graduate education in general and graduate students in particular is far from adequate. Individual institutions do not have the resources to assist large numbers of students in meeting the rising costs of education; and, as mentioned earlier, the federal support presently

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[1] Wilson, op. cit., p. 159.

available is disbursed very unevenly among the fields of study rather than on a policy designed to maximize Ph.D. production. Recognizing this problem the National Science Board has proposed that a national policy for graduate education be implemented and that "The Federal Government...accept a continuing responsibility for a significant, perhaps the major, share of the total support of graduate education."[1]

We shall assume for the moment that such federal support to graduate schools is forthcoming, and, along with support from foundations and other external agencies, supplements the graduate school's internal resources. How is this money to be used most effectively? In the framework of this study this second major question will be approached solely in terms of the problems of duration. The quality of a doctoral program, it will be assumed, is independent of the time required to complete it.

Allocation of Available Funds

If the objective, then, is to realize the maximum return in terms of Ph.D.'s produced over a given period of time, the limited dollars available to a graduate school or department must be invested in those students 1.) who can be reasonably expected to complete the degree in the shortest period of time and 2.) whose total needs (i.e., total living expenses) can be met with the smallest expenditure of funds. This study implies that those recipients would be students without dependents (probably

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[1] National Science Board, Toward a Public Policy for Graduate Education in the Sciences (Washington, D.C.: U.S. Government Printing Office, 1969), p. 11.

single, but not necessarily so), younger students, and those who have recently received the baccalaurate. Moreover, direct financial assistance should be made available only in support of full-time study toward the degree.

Secondly, in the words of the National Science Board, "the student's stipend should be regarded as a means for his personal support, not as a fee for service."[1] Although a teaching or research assistantship may provide the student with valuable experience and may, in the case of the latter, actually assist him with his research and dissertation, the service aspect of the assistantship almost invariably prolongs the period of doctoral study. And in addition to this direct delay there may be some undesirable indirect effects of the required service. It will be remembered that in this study a considerable number of research assistants (a highly able group) reported being delayed by academic obstacles. The evidence suggested that these delays resulted from the student's being drawn away from his academic endeavors by his required duties.

Third, whatever support is made available should be limited to a definite period of time, certainly no more than four years. It should be made perfectly clear to the recipient, first, that the support will terminate at the end of the specified period and, second, that support during that time is contingent upon meeting certain criteria of academic progress or advancement. The Ford Foundation graduate

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[1] Ibid, p. 19.

aid program, designed to establish a regularized schedule for the completion of all degree requirements, is admirable in this respect. In most of the ten institutions that have received Ford support, four year programs to the doctorate have been the standard. The student in such a program knows that if he progresses as expected he will be supported (typically) by a fellowship in his first and second years of course work, by a teaching assistantship in the third year, and by a dissertation fellowship in his fourth year.

The Academic Program

Supporting a student in this manner for a specified period of time is wholly desirable, but only if the student has some assurance that he will be able to complete the degree requirements in that period. However, he often does not have that assurance--which brings us to some recommendations about the academic programs.

Nearly everyone who has seen fit to comment on the issue of duration has called for the "tightening" of graduate education; and Carmichael has made it his principal concern. In his words:

> "The entire operation needs to be tightened up. More vigorous demands, more clearly defined procedures, more definite and explicit instruction as to expectations should replace the usual uncertainties that surround the novice. In short, what is needed is a more efficient operation."[1]

And Berelson has recommended "a clearer, more compact, more specified program of study including more supervision and direction by the faculty."[2]

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[1] Carmichael, op. cit., p. 180.

[2] Berelson, op. cit., p. 235.

Rather than make particular recommendations concerning each of the academic requirements I would suggest that graduate schools and departments adopt the following general policy: For each course of study the particular requirements be set forth in considerable detail. And in the programmed learning lexicon, the requirements should be described in terms of behavioral objectives. That is, the specific knowledge and techniques that the students are expected to acquire should be indicated. Along with this, the graduate school or department should state the precise means used to evaluate whether or not the student has accomplished the objectives.

For example, the nature and purpose of the comprehensive or preliminary examination should be made perfectly clear. Information should be provided on the areas of study to be covered, the level of mastery required, and the kinds of questions employed to assess that mastery; in addition, if the exam is used to determine levels of competence in broad areas covered by courses, the appropriate course requirements should be waived if proficiency is demonstrated in the exam.

A policy statement should be available regarding the objective of the dissertation (an "original contribution" to knowledge? a trial run in scholarship?). The general approach to preparing a dissertation should be set forth, together with potential problem areas, and the expected length of the thesis.

These general and particular objectives of the doctoral program should be made widely available, and especially to those who show some interest in a degree program (applicants). In particular, with regard to each academic

requirement and the overall program, an indication should be given of the time anticipated for completion. These data should be presented under the assumption of full-time study and may be based on the (FTE) experience of students in the department or school or an ideal but reasonable pattern.

General and Individual Time Schedules

The preceding practices would, of course, entail establishing a "model time schedule" for the Ph.D. Dean Elder has described the problem of a model time schedule as "a 'nonsense' problem, and interesting exercise for new deans."[1] The Dean's comments are well taken in the sense that although such a schedule is designed for everyone, it may actually apply to only a few. However, I feel there is value in the establishment and the distribution of a model schedule in that it gives potential students a much clearer idea of what is expected of them and how long the whole process is expected to take.

I would suggest, however, that greater attention be paid to the development of an individual time schedule for each new Ph.D. student in a department or school, based, of course, on the general model. This

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[1] Dean J. P. Elder, in a panel discussion on "A Model Time Schedule for Completing the Ph.D." in the Proceedings of the Second Annual Meeting of the Council of Graduate Schools in the United States (Dallas, Texas: December, 1962), p. 47.

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attention would be paid to the progress of the student. If he should fall behind schedule, the student would need to show cause why he should not be dropped from the program.

It seems to me that in terms of speeding progress toward the doctorate and utilizing more effectively the university's human and financial resources, this proposed plan is far superior to the present laissez-faire system in which the primary impelling regulation is a six or seven year statute of limitations. And that is honored most frequently in the breach.

Outcomes of a Clear Program and Time Schedule

The establishment of a clearly defined progression of steps to the doctorate, based on a model time schedule but tailored to the needs of individual students, has numerous advantages with regard to the duration of doctoral study. First, it forces a department to consider very carefully the essential ingredients in a doctoral program and to plan a program with both its substance and completion rate in mind. Once established, the program and schedule could result in considerable savings to the department and the institution in terms of human and financial resources, by decreasing the number of stalled or "lost" students. It would also have the humanizing effect of focusing faculty attention on the needs and development of students as individuals. From the student's point of view a clearly specified program and associated model time schedule would be beneficial primarily in the psychic sense. A reduction in the vagueness characteristic of most doctoral

programs would facilitate the student's planning and reduce much of the anxiety and uncertainty students presently fell about graduate work. However, it must be recognized that no amount of advance scheduling will eliminate the kinds of delays that can arise from within the several academic stages, the dissertation in particular.

Interactions of Programs and Finances

But the most interesting effect of "tightening" degree programs and the one with the greatest potential impact on shortening doctoral duration has to do with the financing of graduate education. As noted earlier, optimum use is made of support dollars if they are expended on younger students, those with least financial need, and those who can attend full-time. However, this rather hard-nosed policy would seem highly unfair to those older students, perhaps with family obligations, who decide to enter graduate study long after receiving the baccalaureate. How are their financial needs to be met? At this point our recommendations concerning the degree program come into play. If 1.) it can be shown that a clearly defined and well-ordered program exists that is geared to rapid progress and 2.) it is demonstrated that the program can be completed in less than four years by a full-time student, then the picture changes considerably. Rather than pay for his credits with time, as Davis points out is presently the case, the student will pay with money. He may borrow the money--or at least a greater proportion of it than students presently do--assured that at the end of a finite period his degree objectives will be met.

It goes without saying that there will never be enough money to assist all the students who wish to pursue the doctorate. The general plan proposed above simply spreads the available resources among the large group of students with relatively small financial needs who can be expected to attend full time and complete the degree in a short period. Students who do not qualify academically for the support or whose needs are great should be encouraged to seek other sources (primarily loans) that will permit them to progress rapidly.

Over time, it seems to me, these measures would have a spiral effect. As the average duration of doctoral study decreases, more students will be convinced that rapid completion is not only possible but of great advantage to them, and will finance their studies so as to complete them in the shortest possible time. This will decrease the average duration, and so on. Initially, graduate schools and the society must be called upon to construct the programs and supply the resources necessary to begin the spiral. However, this initial expenditure should be regarded as an investment, inasmuch as it is to these institutions that the benefits of rapid doctorate completion ultimately redound.

APPENDIX A

Academic Fields Sampled and Sample Size

Broad areas and fields of study	Size of Office of Education sample	Size of sample in this study
LIFE SCIENCES	2067	760
Biological science	821	385
Agriculture and forestry	570	234
Health professions	676	141
PHYSICAL SCIENCES	1314	448
Physical science	524	254
Mathematics and statistics	790	194
SOCIAL SCIENCES	3545	662
Psychology	629	219
History	695	196
Business and commerce	815	38
Social work administration	710	12
Other social sciences	696	197
HUMANITIES	2787	795
English and journalism	692	159
Foreign languages	707	232
Fine and applied arts	600	107
Philosophy	485	210
Religion	303	87
EDUCATION	3581	403
Elementary education	776	18
Secondary education	779	66
Educational administration	846	150
Counseling and guidance	583	95
All other education	597	74

APPENDIX A--Continued

Broad areas and fields of study	Size of Office of Education sample	Size of sample in this study
ENGINEERING	564	151
Engineering	564	151
MISCELLANEOUS	1852	161
Library science	863	20
Miscellaneous fields (includes architecture, geography, home economics, information science, law, and other others)	989	141
Totals	15,710	3,380

APPENDIX B

Sample of Institutions Awarding Advanced Degrees

Adelphi University (39)[a]
Air Force Institute of Technology (0)
Austin Peay State College (0)
Boston College (20)
University of Bridgeport (3)
Butler University (6)
University of California (147)
(Berkeley)
University of California (104)
(Los Angeles)
University of California (102)
(San Franciso)
Chapman College (1)
City University of New York (10)
Columbia University (139)
Cornell University (136)
Duquesne University (27)
Eastern Michigan University (0)
Fairleigh Dickinson University (3)
University of Florida (92)
Hartford Seminary Foundation (25)
Hofstra University (5)
University of Houston (63)
Howard University (25)
Hunter College (8)
Indiana University (63)
Indiana State College (1)
(Pennsylvania)
Johns Hopkins University (121)
Kansas State University (83)
Long Island University (2)
California State College
at Los Angeles (4)
Marquette University (47)
University of Maryland (76)
Massachusetts State College
at Boston (6)
Miami University (13)
(Ohio)
University of Michigan (113)
Michigan State University (97)
University of Minnesota (97)
University of Missouri (64)
University of Nebraska (109)
University of New Mexico (43)
New Mexico State University (20)
New York University (113)
University of North Carolina (100)
Northeastern University (2)
Northern Illinois University (28)
Ohio State University (68)
University of Pennsylvania (58)
Queens College (10)
Rutgers, The State University (98)
St. Cloud State College (0)
St. Louis Unversity (58)
San Diego State College (1)
San Francisco State College (4)
San Jose State College (6)
University of South Carolina (57)
University of Southern California (35)
Southwestern State College (2)
(Oklahoma)
Stanford University (110)
State University of New York
College at Oneonta (0)
Syracuse University (45)
University of Texas (101)
University of Utah (35)
Virginia Polytechnic Institute (67)
University of Washington (78)
Wayne State University (33)
West Chester State College (5)
Western Michigan University (8)
Western Reserve University (57)
University of Wisconsin (130)
Yale University (157)

Total institutions in Office of Education sample = 68.

Total institutions in this study = 63.

[a]The numbers following the institution represent the size of the sample at each institution in this study.

APPENDIX C

CODING MANUAL

for

An Analysis of the Obstacles Perceived by Graduate Students as Delaying their Progress Toward the Doctorate

CODING MANUAL

I. GENERAL INFORMATION AND BACKGROUND

A questionnaire entitled "Survey of the Academic and Financial Status of Graduate Students" was distributed to a national sample of graduate students in the spring of 1965. The six-page questionnare sought information concerning the student's general background and present personal status, his studies, past and future employment, academic activity, and finances. These data were obtained largely by means of fixed alternative and short fill-in questions.

However, a final open-ended question was included in order to elicit a free personal response on the issue of duration of graduate study. The question read:

> "Indicate in your own words the most serious obstacles that delayed your progress toward an advanced degree. What do you think can be done to speed up graduate education? Please make any other general comments that you wish to make."

The purpose of the present study--of which this coding is a part--is to analyze the obstacles perceived by graduate students as delaying their progress toward the doctorate. This goal will be accomplished by, first, categorizing the obstacles listed by the students in their responses to the question above; and, second, analyzing these obstacles in relation to the other information provided by the rest of the questionnaire.

The first step of categorizing and numerically representing the written responses is the function of content analysis or coding. Because the information obtained from this procedure provides the basis for the study, it is essential that the coding be performed accurately, objectively, and sensitively. The instuctions contained in this manual will aid the coder to attain these coding objectives, thereby increasing the likelihood of consistency or uniformity in the coding.

II. GENERAL INSTRUCTIONS AND SUMMARY OF CODES

The responses to be coded appear in the bottom two-thirds of page 6 of the questionnaire following the question that was quoted above. Responses elsewhere on the questionnaire (e.g., to the question in the middle of page 6 about non-professional employment) are not to

be considered unless the words written there are obviously a continuation or a part of the response to the question on obstacles.

Coders of the U.S. Office of Education previously performed a rough and incomplete content analysis of these responses for a somewhat different purpose. The red or blue lines, marks, and numbers which these readers placed on the questionnaires are to be ignored entirely in the present coding process. It will be noted that the open-ended question on page 6 of the questionnaire is actually a three-part question. The first sentence deals with obstacles, the second concerns speeding up graduate education, and the third invites general comments. In this study only those responses which appear to be directed toward the first part of the question (concerning obstacles) will be coded. Responses directed solely to part two or three will be coded as "not ascertained." More specific directions about the "not ascertained" category appear later in the manual.

Summary of Obstacle Codes

The various categories of obstacles which may appear in the responses and the code numbers which are to be assigned to them are shown in the summary below. The coder is referred to the pages which follow for more complete instructions on the categories, including some examples of each.

CLASS CODE	CATEGORY CODE	OBSTACLE	Location of detailed instructions concerning obstacle
1		FINANCIAL	
	11	financial	4
2		INSTITUTIONAL--ACADEMIC REQUIREMENTS	
	21	coursework and course requirements	5
	22	major examinations	6
	23	foreign language requirement	6
	24	research and the dissertation	6
	25	other institutional--academic	7

CLASS CODE	CATEGORY CODE	OBSTACLE	Location of detailed instructions concerning obstacle
3		INSTITUTIONAL--ORGANIZATION, PROCEDURES, GENERAL REQUIREMENTS	
	31	admission or transfer	7
	32	lack of desired program	8
	33	physical facilities or services	8
	34	teaching assistantship, research assistantship, or other university employment	8
	35	general requirements and regulations	9
	36	other institutional--organization	10
4		INSTITUTIONAL--PERSONNEL	
	41	teaching	10
	42	personal attention	10
	43	other institutional--personnel	11
5		PERSONAL	
	51	mental ability and motivation	11
	52	indecision or uncertainty	11
	53	shift in field, program, or institution	11
	54	diverse competing interests	12
	55	physical illness or disability	12
	56	physical characteristics	12
	57	marriage or the family	12
	58	other personal problems, attitudes, decisions	13

CLASS CODE	CATEGORY CODE	OBSTACLE	Location of detailed instructions concerning obstacle
6		OTHER (EXTERNAL)	
	61	inadequate preparation	13
	62	military service	13
	63	physical factors	14
	64	lack of time	14
	65	other employment	14
	66	English as a foreign language	15
	67	miscellaneous other	15
7		STATED NO OBSTACLE	
	71	stated no obstacle	18
8		NOT ASCERTAINED	
	81	no response	19
	82	not ascertained	19

III. ELABORATION OF OBSTACLE CODES - Which Obstacle Category to Code?

CLASS: FINANCIAL (Class Code 1)

CATEGORY: Financial (Category Code 11)

Includes: All responses that point to a financial difficulty as an obstacle to progress during the graduate school experience or as the stated cause of another obstacle (see the note of "Primary Stated Cause," p. 16). Because of the interrelatedness of various kinds of financial difficulty and the problems associated with sorting out and coding different kinds, all financial obstacles will be coded as 11.

(In the responses the word "afford," unless otherwise defined, is to be regarded as meaning "financially afford." Similarly, "support" will be thought of as "financial(ly) support.")

(If employment, need to work, etc. is stated as an obstacle but is not in any way related by the respondent to financial necessity, it should be coded as "other employment"--code 65.)

Examples: "money," "finances," "lack of financial support," "need to accept employment to support family," "need to work to make ends meet," "cannot afford to take time off from full-time employment in order to pursue the degree," "lack of good fellowships and loans"

CLASS: INSTITUTIONAL--ACADEMIC REQUIREMENTS (Class Code 2)

This class comprises the academic obstacles to the doctorate. The four major hurdles included are coursework, major exams, foreign languages, and the dissertation. Other general obstacles related to the academic nature of the graduate program are also included in this class. However, all other general or specific requirements not directly associated with the four hurdles or with the student's academic program are to be coded in the appropriate category under Class 3--"Institutional--Organization."

CATEGORY: Coursework and Course Requirements (Category Code 21)

Includes: All obstacles concerning academic coursework in terms of general or specific requirements for, or difficulty of, existing courses, classes, seminars, etc. Also includes comments about the quality of courses when no reference to teaching is made, and about component parts of courses (e.g., required reading, tests, and papers). Because the curriculum is generally regarded as a particular organization of courses, responses concerning the curriculum are coded in this category.

(The lack of desired courses is to be coded under "lack of desired program"--code 32.)

Examples: "major courses have been the toughest obstacle so far," "heavy departmental course requirement," "antiquated and rigid curricular requirements," "courses are repetitious and uninspiring," "course conflicts and other scheduling difficulties"

CATEGORY: Major Examinations (Category Code 22)

Includes: All obstacles relating to any of the major (non-course) examinations required for the doctorate: qualifying, preliminary, or comprehensive exams and the orals or thesis defense exams. Refers to either the exams themselves or the requirements concerning them.

Examples: "prelims," "comps," "the requirement that preliminary exams be taken in the first year," "lack of time to prepare for the qualifying exams"

CATEGORY: Foreign Language Requirement (Category Code 23)

Includes: All obstacles associated with the foreign language requirement for the doctorate: the nature of the requirement, its supporting philosophy or rationale, its administration or timing, and the difficulty of the requirement.

(Difficulties associated with English as a foreign language are coded under "English as a foreign language"--code 66.)

Examples: "the anachronistic and absurd requirement that a doctoral student be acquainted with two foreign languages," "the trouble I have with foreign languages," "passing the German requirement"

CATEGORY: Research and the Dissertation (Category Code 24)

Includes: All obstacles that relate to the dissertation, its requirement and performance: selection of topic, collection and analysis of data, and the writing. "Dissertation" includes the major doctoral research piece, a master's thesis, or any major research work or project not associated with a particular couse. Obstacles encountered in "research" but not designated as a part of dissertation work are also included in this category.

Examples: "my master's thesis has been the greatest obstacle to date," "the search for a suitable thesis topic has been most frustrating," "the doctoral dissertation as it presently stands is not preparing me effectively for future work in my field," "research in mathematics is in itself a tremendous obstacle"

CATEGORY: Other Institutional--Academic (Category Code 25)

Includes: All obstacles that are attributed to the rigorous academic nature of the graduate school experience, but not specifically indicated as one of the four academic hurdles above.

(Comments about deficiencies in organization, administration, or quality of the total program rather than its degree of difficulty should be coded as "other institutional--organization"--code 36.)

Examples: "most serious obstacle is surely the long period of study required for the Ph.D.," "difficult academic requirements," "large volume of knowledge which must be encompassed," "my field requires longer training than other areas of the humanities," "the high academic standards of the history dep't."

CLASS: INSTITUTIONAL--ORGANIZATION, PROCEDURES, GENERAL REQUIREMENTS (Class Code 3)

This class includes obstacles that are related to the organization and administration, the policies and procedures, or the general requirements and regulations of the graduate school the student is attending or has attended. Excepted are those specific or general academic requirements of the five categories in Class 2.

CATEGORY: Admission or Transfer (Category Code 31)

Includes: All obstacles concerning the evaluation of a prospective student and his admission to graduate school or a given department or program; also obstacles associated with transferring from one institution to another. Includes the policies and practices of an institution or department regarding admission or transfer or the difficulties associated with either process.

(The transfer obstacles include loss of credit, required repetition of courses, or other delays, and any such problems created by the lack of uniformity among the nation's graduate schools. However, problems that result from a personal desire to change institutions or programs and that are not attributed by the respondent to institutional policies or practices should be coded as "shift in field or institution"--code 53 under the "Personal" Class.)

Examples: "failure of (institution A) to evaluate me fairly or properly," "reluctance of the Sociology department to accept nurses into their programs," "(institution B's) refusal to accept credit I have received at (institution C)," "the engineering department's transfer policy held me up for a year," "the differences between graduate schools regarding semester and trimester caused me a lot of trouble when I transferred"

CATEGORY: Lack of Desired Program (Category Code 32)

Includes: All obstacles encountered because of the lack of a desired program at an institution of the respondent's choice, or the lack of a suitable institution with the desired program; also includes the lack of the components of a program--courses, faculty, etc.

(Those obstacles concerning the organization or quality of existing courses should be coded as "coursework"--code 21; of existing professors under the appropriate category of "Institutional--Personnel"--Class 4; and of existing programs under "other institutional--organization"--code 36.)

Examples: "it was impossible to find a program in (field X)," "lack of a graduate school offering work in (field Y)," "paucity of courses in my field," "no qualified professors here in (field Z)"

CATEGORY: Physical Facilities or Services (Category Code 33)

Includes: All obstacles concerning physical facilities, equipment, supplies, operations, or related services: their unavailability, inaccessibility, distribution, quality, etc.

Examples: "lack of sufficient parking facilities on campus," "delays in obtaining supplies," "impossible to get anything mimeographed around here," "no central pool where academic records are on file," "difficult to obtain services necessary for research"

CATEGORY: Teaching Assistantship, Research Assistantship, or Other University Employment (Category Code 34)

Includes: All obstacles associated with a teaching assistantship, a research assistantship, or with any other kind of employment that is designated as being performed at the institution where the respondent is or has been a student.

(These are non-financial obstacles. Problems related to inadequate salaries for these positions should be coded as financial obstacles. Unspecified teaching or research assistantships should be coded as if they were held at the institution the respondent was attending. However, obstacles associated with other unspecified positions (e.g., "my teaching post" or "teaching and administrative duties") should be coded as "other employment"--code 65.)

(If the respondent states that although the position delayed his progress somewhat it was a valuable experience, or it was important to his graduate training, or something of that sort, it should not be coded as an obstacle.)

Examples: "excessive teaching fellow assignments," "research fellowship takes too much time from my coursework," "the necessity of having to work as a research and teaching fellow"

CATEGORY: General Requirements and Regulations (Category Code 55)

Includes: All obstacles attributed to the requirements or regulations established or maintained by the department or institution. Includes comments about general or unspecified requirements or specific requirements not included in any of the previous categories.

(Comments concerning the academic difficulty of requirements should be coded under the appropriate category of Class 2--"Institutional--Academic.")

Examples: "the requirements of this (department/institution) are (e.g.): archaic, non-sensical, obtuse, picayune, purely formal, time-consuming, irrelevant, mickey-mouse, unreasonable, rigid, inflexible, etc.," "constant changes in requirements," "lack of definite, specific departmental requirements," "the arbitrary limit on credits (hours) which may be taken each semester," "the residency requirement," "time limits imposed on students," "departmental prohibitions against specializing within a given field"

CATEGORY: Other Institutional--Organization (Category Code 36)

Includes: All obstacles which relate to the organization, procedures, and other characteristics of the institution (Class 3 obstacles) but which do not fall within any of the previous categories of Class 3.

Examples: "administrative red tape," "internal disorganization in the graduate school," "vagueness and uncertainties associated with the graduate program," "the quarter system," "the pressure for grades," "lack of academic freedom," "impersonal atmosphere of a large campus"

CLASS: INSTITUTIONAL--PERSONNEL (Class Code 4)

This class includes all obstacles concerning any personnel (administrators, faculty, or students) associated with the institution where the respondent is or has been a graduate student.

CATEGORY: Teaching (Category Code 41)

Includes: All obstacles related to ineffective teaching (classroom or individual instruction) by graduate school personnel: either the teaching process or function, or the teacher's instructional ability.

Examples: "lousy classroom instruction," "poor instructors," "bad teaching," "the courses I took were taught so poorly that I was inadequately prepared for prelims"

CATEGORY: Personal Attention (Category Code 42)

Includes: All obstacles concerning the lack of personal attention afforded the student--characterized by faculty or administrative indifference, disinterestedness, inaccessibility, or preoccupation with other matters; also includes unsatisfactory attention in terms of detrimental or ineffective guidance, counseling, advice, or treatment on the part of graduate school faculty or administrative personnel.

Examples: "the faculty members tend to put off the student," "there's a lack of concern here for the achievement of the graduate student," "lack of personal contact with the faculty," "unenlightened advising," "dishonest treatment by thesis advisor," "I was given a bu steer on course selections," "at a time when I needed psychiatric counseling, none was available"

CATEGORY: Other Institutional--Personnel (Category Code 43)

Includes: All obstacles that concern personnel within the institution (Class 4), but which could not be coded in any of the previous categories of Class 4. Includes general feelings or attitudes of personnel not directly relating to personal counseling, advice, or treatment. Also includes permanent or temporary loss of professors, advisors, etc. by death, resignation, movement, sabbatical leave, etc.

Examples: "10th Century thinking on the part of the University administration," "the attitude of people here that a man's growth is to be measured in terms of degrees, grades, and other formalities," "inordinate demands made by the regular faculty," "dissention, politics, and intrigue among the faculty," "death of committee chairman," "loss of major professor to a non-teaching profession"

CLASS: PERSONAL (Class Code 5)

This class includes all obstacles that relate to personal characteristics of the individual respondent--mental or physical characteristics as well as personal choices, attitudes, and interests.

CATEGORY: Mental Ability and Motivation (Category Code 51)

Includes: All obstacles attributed to an insufficiency of intellectual ability or motivation. Varieties of motivation include such attributes as ambition, initiative, incentive, etc.

Examples: "frankly, I just don't have the brains to get through in the usual length of time," "my native lack of ability," "I can't get motivated to finish my dissertation," "lack of ambition," "laziness," "I'm a procrastinator"

CATEGORY: Indecision or Uncertainty (Category Code 52)

Includes: All obstacles that relate to the respondent's indecision or uncertainty regarding his personal goals, future, lifework, or specific educational plans.

Examples: "lack of specific goal for life career," "personal uncertainty about the profession I wanted to enter," "indecision," "my inability to decide on a specific field in Zoology cost me about a semester"

CATEGORY: Shift in Field, Program, or Institution (Category Code 53)

Includes: All obstacles arising from a personal decesion to change one's major field, program, area of specialization, or institution.

(Excluded are obstacles which are stated to be the result of administrative policies or procedures as discussed under "admission or transfer"--code 31.)

Examples: "delay was occasioned in my early stages when I changed my program twice," "much time was required to adequately obtain a foundation for a new field," "getting an M.A. at one institution and a Ph.D. at another delayed my progress"

CATEGORY: Diverse Competing Interests (Category Code 54)

Includes: All obstacles the result of the respondent's interest in other activities of a non-financial nature: hobbies, community and other extracurricular activities, competing academic and professional interests, personal desire to gain employment or other experience.

Examples: "my other interests, viz., golf, bridge, and a small business," "I organize and direct a musical ensemble on campus which takes a lot of time from my studies," "church and community responsibilities," "some delay resulted from my desire to gain some work experience," "a desire to put to practical use in the real world of life some of the learnings and techniques I had acquired"

CATEGORY: Physical Illness or Disability (Category Code 55)

Includes: All obstacles attributed to poor physical health, illness, or disability, as well as lack of physical strength or energy.

(Undefined "illness" should be coded as physical illness.)

Examples: "health has been my most serious obstacle," "hyperinsulinism condition retarded my progress," "illness caused me some delay," "I have a severe physical handicap--an obstacle almost impossible to surmount"

CATEGORY: Physical Characteristics (Category Code 56)

Includes: All obstacles that are regarded as stemming from certain physical characteristics of the respondent, viz., race, sex, and age.

Examples: "the fact that I am a Negro proved to be an obstacle," "being a woman," "my rather advanced age has deterred me somewhat"

CATEGORY: Marriage or the Family (Category Code 57)

Includes: All obstacles related to marriage and/or family circumstances: time and effort required to maintain a marriage or family as well as the particular problems or difficulties which arise.

(Financial problems associated with a marriage or family should be coded under "financial"--code 11.)

Examples: "time required to care for my house and family," "combining marriage with career preparation," "illness in my family," "domestic problems," "a pending divorce"

CATEGORY: Other Personal Problems, Attitudes, Decisions (Category Code 58)

Includes: All obstacles that are of an undifferentiated personal nature or those concerning personal problems, attitudes, decisions, etc. that would not be included in any of the categories above.

Examples: "the most serious obstacles have been my own personal problems," "psychological problems," "I have a poor attitude toward the doctorate in my department," "sheer boredom and inertia," "lack of experience and immaturity caused the most delay," "bad planning on my part and other errors in judgment"

CLASS: OTHER (EXTERNAL) (Class Code 6)

This class includes all obstacles that would not fall into any of the categories described above. Class 6 obstacles are considered to be external to the individual and the graduate school(s) he has attended.

CATEGORY: Inadequate Preparation (Category Code 61)

Includes: All obstacles attributed to incorrect, improper, or ineffective preparation for any aspect of graduate education: faulty preparation at the college or pre-college level or in the extra-academic world, in terms of academic skills and knowledge or counseling and guidance.

Examples: "my biggest obstacle has been overcoming the poor preparation I received in college," "need to make up academic deficiences," "poor undergraduate counseling," "I needed a better aptitude testing program in college"

CATEGORY: Military Service (Category Code 62)

Includes: All obstacles associated with service in any of the United States armed forces at home or abroad.

Examples: "a five year hitch in the Navy was my major obstacle, "the draft," "the reserves," "difficulties with my local draft board"

CATEGORY: Physical Factors (Category Code 63)

Includes: All obstacles resulting from physical (i.e., natural, geographical) factors outside the control of the graduate school(s) attended.

Examples: "commuting distance from the school," "inadequate public transportation facilities to and from school," "having to move frequently from place to place," "poor housing facilities in town"

CATEGORY: Lack of Time (Category Code 64)

Includes: All obstacles relating to the lack of time to do everything one has to do.

(This category should be used only when the respondent's comment about time is unelaborated, i.e., when no other factors or activities are mentioned as taking time from academic pursuits. If sufficient information is given to demonstrate the reasons for the lack of time, those reasons or factors should be coded under the appropriate categories and not under this one.)

Examples: "I consider time my only obstacle--there just isn't enough of it," "lack of time," "not enough hours in the day to get everything done"

(However, the following response: "Lack of time. My family and professional activities prevent me from making much progress," would be coded as "marriage/family"--code 56 and "diverse interests"--code 54. Here the conditions causing the lack of time are elaborated.)

CATEGORY: Other Employment (Category Code 65)

Includes: All obstacles associated with some form of employment outside the institution the respondent is attending and where no financial consideration is mentioned.

Examples: "having to hold a full-time job for six months impeded my progress," "difficulty of getting leaves of absence from my job," "full-time teaching and administrative load," "obligations to my employer"

CATEGORY: English as a Foreign Lanugage (Category Code 66)

Includes: All obstacles attributed to the difficulty a foreign student has had with the English language.

(The respondent must specifically designate English as the language causing the difficulty. If the response states only "language difficulty," even if the respondent is a foreigner, the response would be coded as "foreign lanugage requirement"--code 23.)

Examples: "my beginning difficulty with the English language," "the ability to communicate in English without prior good English retarded me in the academic work"

CATEGORY: Miscellaneous Other (Category Code 67)

Includes: All unspecified obstacles or delays as well as particular obstacles that are external to the individual and the institution(s) he has attended, but which do not fall into any of the previous classes or categories.

Examples: "I was delayed primarily by a three-year interruption of my graduate studies," "my delay was not caused by obstacles," "the constant flow of forms and questionnaires (like this one) requested of graduate students," "international-political events delayed my progress," "the extended period of time which elapsed between my B.A. and the start of graduate work was my biggest obstacle," "the needs and requirements of my religious order," "the sharp difference in the educational system between my country and the U.S.A."

Recording the Codes: Multiple Responses

When the coder has decided which code is appropriate for the particular response, he should record the Class Code number and the Category Code number beside the questionnaire identification number on the sheet provided him. If the respondent has indicated more than one obstacle, all of those stated should be coded in their order of mention regardless of the importance attached to each. But only the first four obstacles mentioned by the respondent will be recorded on the code sheet. If the respondent mentions the same obstacle twice, it is recorded only once.

"Primary Stated Cause"

In the case of multiple responses, sometimes the obstacles mentioned therein are interrelated, sometimes they are not. In the cases where the obstacles seem to be related, the coder must search for what may be called the "primary stated cause." An example will serve to illustrate the method of this search:

> "My biggest obstacle has been a lack of time due to my full-time job which I have to hold in order to support myself while I am in school."

In this example three obstacles can be detected - 1) lack of time, 2) full-time job (outside employment), and 3) the need to support himself (finances). The coder must search for the primary, basic, or underlying cause of the obstacle. But equally important, it must be the primary cause which has been stated by the respondent. In the example above,the respondent has clearly connected (or shown a causal relation between) his lack of time, his full-time job, and his financial responsibilities. The respondent has in writing led the coder to the primary cause--that of the financial problem of supporting himself. Therefore, only one obstacle (finances) would have been coded for this response.

However, had the example read:

"My biggest obstacle has been a lack of time due to my full-time job"

the coder might have been tempted to code the response in the same manner assuming that the respondent needed to hold a full-time job to support himself. But assumptions of cause and effect or primary cause are not to be made by the coder. The coder may go only as far toward the primary cause as the respondent has led him in writing. Therefore, in this case the response would be coded according to the most basic stated cause of the obstacle--the full-time job (other employment).

The responsibility of the coder, then, is to search for the words which indicate a causal relationship between two or more obstacles and then to code the obstacle that is stated as the underlying or primary cause of the delay. Where two or more obstacles are stated but no clear indication of a causal relationship is given, all the stated obstacles should be coded.

General vs. Particular Obstacles

It is possible for a respondent to indicate a rather general obstacle as delaying his progress, and then to relate some specific examples of the general obstacle which by themselves could be coded as obstacles. Consider the following example:

> "The delays I encountered were caused by a great number of personal problems; for example, I had hepatitis for six months, my wife and I were separated, and I decided to change schools, to name a few."

Here the general obstacle is undifferentiated personal problems, code 58. However, the specific delays enumerated are hepatitis, "physical illness or disability"--code 55; separation, "marriage or the family"--code 57; and change of schools, "shift in institution"--code 53.

Notice how the following example differs from the above:

> "The greatest obstacles have been the following two ridiculous requirements of my institution--the foreign language business and the fact that 75% of the courses I take are required."

In this case, again a general obstacle ("general requirements and regulations"--code 35) and two specific obstacles ("foreign language"--code 23; and "course requirements"--code 21) have been mentioned.

The difference between the two is that in the first case, the respondent has not indicated that all the examples he could think of under the "other personal" category have been described. Thus, the response must be coded for "other personal"--code 58 as well as for the specific examples. However, in the second case, the respondent has made it clear that there are two and only two specific requirements which have delayed his progress. Thus, the category of "general requirements" would not be coded because all the specific requirements have been elaborated.

In summary, if both the general class of obstacles and some specific examples are mentioned, everything (general and particular obstacles) is to be coded unless it is indicated that the particular obstacles stated are all the ones and the only ones which the respondent would include in the general class. In this latter case, only the particular obstacles would be coded.

IV. ELABORATION OF OBSTACLE CODES--An Obstacle or Not?

The preceding section (III.) described the procedures and codes to be used in categorizing obstacles mentioned by respondents as delaying their progress toward the doctorate. However, some responses will be encountered in which the respondent denies that obstacles have delayed his progress. And in other cases it may be impossible for the coder to ascertain what, if any, obstacle has been indicated. These kinds of responses and the procedures and codes used to categorize them are the subject of this section.

CLASS: STATED NO OBSTACLE (Class Code 7)

CATEGORY: Stated No Obstacle (Category Code 71)

Includes: All responses in which the respondent has specifically stated in one way or another that he has encountered no obstacles or delays in his progress toward the doctorate.

Examples: "I have had no major delays," "no obstacles," "none," "no troubles," "progress has been smooth," "I'm proceeding normally"

If the respondent qualifies his denial that obstacles have hindered his progress...

a) ...by questioning the necessity for a given requirement or step, code as "stated no obstacle"--code 71.

e.g., "I had no major delays, but the foreign language requirement struck me as a needless absurdity."

(Here the respondent has given no indication that the "needless absurdity" has delayed his progress.)

b) ...by stating that there were some minor hindrances which were overcome without much trouble, code according to the minor obstacle or hindrance mentioned.

e.g., "I encountered no serious obstacles, but I would have been able to finish sooner with more adequate financial support."

(Code as "financial"--code 11. The degree of magnitude of the obstacle mentioned is not to be of concern to the coder. Any factor that has been indicated by the respondent as causing any sort of delay in his progress is still to be coded as an

obstacle. Moreover, an obstacle that has been overcome is to be coded as an obstacle if it has caused some delay. However, had the answer been "Finances were a continual worry to me, although I don't think they slowed my progress any," code as "not ascertained"--code 82. The respondent has indicated that no delay was occasioned by the "worry" and delay is the major factor to be considered in such cases.)

c) ...by using a phrase which is intended to rule out the majority of factors other than the one indicated, code according to the obstacle mentioned.

e.g., "There were no serious obstacles except for some areas of poor preparation for graduate work which caused me to do some back-tracking."

(Code as "inadequate preparation"--code 61. The phraseology here indicated that the respondent has chosen to single out a particular problem area, viz., poor preparation.)

CLASS: NOT ASCERTAINED (Class Code 8)

Two major categories of response are included in this class. Both involve responses in which it is impossible for the coder to ascertain what obstacles have been indicated as delaying the respondent's progress or whether, in fact, any obstacles have been mentioned.

CATEGORY: No Response (Category Code 81)

Includes: All blank responses: questionnaires in which no response at all has been made to the question at the bottom of page 6.

CATEGORY: Not Ascertained (Category Code 82)

As a general guideline, all the obstacles mentioned in the response are to be coded according to their appropriate categories as indicated above. The only instances where the "not ascertained" code is to be used are as follows:

...If the response is directed toward the second or third part of the open-ended question rather than the first; code as "not ascertained"--code 82.

(Again it should be noted that the final question consists of three parts. The first concerns obstacles that delayed graduate progress; the second asks for suggestions for speeding up graduate

education; and the third offers an opportunity to make any general comments. The coder's concern is only with responses to the first part.

INFORMATION CONVEYED IN RESPONSE TO THE SECOND OR THIRD PART SHOULD NOT BE CONSIDERED IN CODING THE RESPONSE TO PART ONE.

If the response is a recommendation or a statement describing a more desirable situation, it should be considered as a response to part two and coded as "not ascertained." Recommendations are usually stated in the imperative case or as a matter of opinion. However, if the response indicates that the recommendation has grown out of personal adverse experience with the obstacle, it should receive the code for the appropriate obstacle.

If the overall response is autobiographical or explanatory and gives no indication that the events described provided unwanted delays, it should be considered a response to part three of the final question and coded as "not ascertained." Such a response may serve to clarify or expand upon an answer given elsewhere in the questionnaire. Or it may be an explanation or rationalization of the length of time an individual has spent on his graduate education. Again the coding decision turns on whether the event or obstacle described is indicated by the respondent as having been a delaying factor. If such indication is given, the response should be coded according to the obstacle described.

...If the delaying factor is indicated by the respondent to have been a rewarding experience, one which he seems to regard as a necessary or valuable part of his graduate study or training, it should not be coded as an obstacle, but rather as "not ascertained."

...If the response indicates that the respondent is describing an obstacle that has delayed other individuals but not himself if should not be coded as an obstacle, but rather as "not ascertained."

(Responses referring to groups of students may or may not include the respondent--e.g., "most students," "many people," "married students," etc.--are to be coded according to the stated obstacle if some indication is given that the respondent himself has encountered the obstacle.)

...If the response describes a potential or anticipated (future) obstacle or one that could have been a delaying factor but was not, it should be coded as "not ascertained." Also, all comments relating to obstacles encountered in pregraduate years, with the exception of "inadequate preparation"--code 61, should be coded as "not ascertained."

...If the response refers to obstacles which were encountered by the student while engaged in graduate education in a foreign country (not one of the 50 states), it should be coded as "not ascertained."

On Objective and "Gray Area" Responses

If the response is stated in objective terms without any personal or situational reference, it should be coded according to the obstacle mentioned.

e.g., "finances provide the greatest single obstacle to rapid progress," "finances," "graduate study is very expensive," code as "finances"--code 11; or "many courses are required in the department and are not really useful," code as "course requirements"--code 21.

Similarly, responses which are in the "gray area" between a definitely stated obstacle and the "stated no obstacle" or "not ascertained" categories should be coded according to the obstacle(s) mentioned.

The rationale for this procedure is the same in both cases. The respondent has written a statement in response to a specific stimulus. Because the stimulus was a question concerning "obstacles that delayed your progress toward an advanced degree" (my italics) it must be assumed that the answer was a reaction to this stimulus, and that the discussion, however equivocal or round about, indeed reflects the respondent's experience with the obstacle and his attitude toward its existence as a delaying factor.

OE 2216 (3-65)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202

BUDGET BUREAU NO. 51-6508
APPROVAL EXPIRES 1/30/66

APPENDIX D: The Questionnaire

SURVEY OF THE ACADEMIC AND FINANCIAL STATUS OF GRADUATE STUDENTS SPRING 1965

NAME AND ADDRESS OF STUDENT

INSTRUCTIONS

When a question requests "√ one," please check the statement that comes closest to describing your circumstances or personal history, even if it does not fit your situation precisely.

To the Graduate Student:

The Office of Education, with the assistance of the National Opinion Research Center, is conducting a survey concerned with the academic progress and the financial status of students currently registered for a program of studies leading to a master's or higher degree. The results of the survey will be considered in formulation of financial aid policies of the Federal Government. We should like to ask your help in the survey.

The questionnaire, which is being sent to a sample of students, includes items related to your field of graduate study, your progress toward a degree, your method of financing your graduate education, and your anticipated career.

You have been selected as one of the students to be included in the sample. It is of utmost importance that you complete this questionnaire. Your answers will remain completely confidential, and only statistical summaries of survey results will be published.

An envelope which requires no postage is enclosed for your convenience in returning the questionnaire to the National Opinion Research Center.

Your cooperation is vital to the success of this survey; it will be appreciated.

Sincerely yours,

A. M. Mood
Assistant Commissioner for
Educational Statistics

ARE YOU REGISTERED THIS TERM, SPRING 1965?

1 ☐ YES 2 ☐ NO *(If NO, return this questionnaire in the enclosed envelope)*

(If YES, please read the above instructions before completing this questionnaire)

PERMANENT MAILING ADDRESS OF STUDENT *(Street, City, State and ZIP code)*

A GENERAL INFORMATION

1 NAME AND ADDRESS OF INSTITUTION *(Street, city, State, and ZIP Code)*

2 SEX
1 ☐ MALE 2 ☐ FEMALE

3 SOCIAL SECURITY NO.

4 DATE OF BIRTH *(Month, day, year)*

5 RACE
1 ☐ WHITE *(Caucasian)* 2 ☐ NEGRO 3 ☐ ORIENTAL
4 ☐ OTHER *(Specify)*

6 U.S CITIZEN
1 ☐ YES 2 ☐ NO

7 IF CURRENTLY ON EXTENDED ACTIVE DUTY IN THE ARMED FORCES, GIVE RANK

8 MARITAL STATUS
1 ☐ MARRIED 2 ☐ SINGLE *(Incl. widowed or divorced)*

9 HOW MANY DEPENDENTS DO YOU HAVE? *(Excl. self and spouse)*
0 ☐ NONE 1 ☐ ONE 2 ☐ TWO 3 ☐ THREE OR MORE

IF MARRIED COMPLETE ITEMS 10 AND 11

10 CURRENT OCCUPATION OF SPOUSE *("√" one)*
1 ☐ EMPLOYED BY UNIVERSITY 2 ☐ EMPLOYED ELSEWHERE
3 ☐ GOING TO SCHOOL 4 ☐ HOUSEWIFE
5 ☐ OTHER *(Specify)*

A GENERAL INFORMATION

11 If spouse is going to school, for what degree? ("√" one)

1 ☐ BACHELOR'S 2 ☐ MASTER'S 3 ☐ DOCTOR'S

4 ☐ NONE OF THE ABOVE

12 Where do you live now? ("√" one)

1 ☐ With parents or other relatives

2 ☐ University-owned residential unit

3 ☐ Rented room or apartment *(Not university-owned)*

4 ☐ In house I rent *(Not university-owned)*

5 ☐ In house I own

6 ☐ Other *(Specify)*

13 Size of community in which you were living at the time you were graduated from secondary school *(Give best estimate)* ("√" one)

1 ☐ Farm or open country
2 ☐ Less than 2,500 population
3 ☐ 2,500 to 9,999
4 ☐ 10,000 to 24,999
5 ☐ 25,000 to 99,999
6 ☐ 100,000 or more

14 Give State, territory, or foreign country where living at time you were graduated from secondary school.

15 Income category for parents at time of your graduation from secondary school. *(Consider annual income from all sources before taxes)* ("√" one)

1 ☐ Less than $5,000 per year

2 ☐ $5,000 to $7,499

3 ☐ $7,500 to $9,999

4 ☐ $10,000 to $14,999

5 ☐ $15,000 to $19,999

6 ☐ $20,000 and over

7 ☐ Do not know

A CONTINUED

16 Highest level of education completed by your parents ("√" only one in each column)

	LEVEL	FATHER	MOTHER
A	DID NOT COMPLETE GRADE SCHOOL	1 ☐	2 ☐
B	COMPLETED GRADE SCHOOL BUT NOT HIGH SCHOOL	1 ☐	2 ☐
C	COMPLETED HIGH SCHOOL BUT NOT COLLEGE	1 ☐	2 ☐
D	COMPLETED ONE BUT LESS THAN FOUR YEARS OF COLLEGE	1 ☐	2 ☐
E	COMPLETED A FOUR-YEAR COLLEGE PROGRAM	1 ☐	2 ☐
F	OBTAINED MASTER'S DEGREE	1 ☐	2 ☐
G	OBTAINED PH. D. OR PROFESSIONAL DEGREE	1 ☐	2 ☐

17 Which of the following categories best describes father's occupation at time you were graduated from high school or during most of his life? ("√" one)

1 ☐ Teacher or other educator

2 ☐ Professional, other than above

3 ☐ Semi-professional, clerical or sales

4 ☐ Proprietor or manager *(Except farm)*

5 ☐ Farm operator or manager

6 ☐ Skilled craftsman or foreman

7 ☐ Semi-skilled operative

8 ☐ Service worker *(Domestic, protective, etc.)*

9 ☐ Laborer *(Farm or non-farm)*

B YOUR STUDIES—DEGREES AND ACADEMIC FIELD

Please indicate the highest earned degree you now hold, Spring term 1965, the next earned degree you expect to receive, and the highest earned degree you ever expect to hold. Page 7 is a list of academic fields by code number. Insert code number and write the name of your specialty within the field. If you cannot find your specific field in the code sheet, use the code for "Other" and write in your specialty. ("√" one on each line)

	ITEM	NONE	BACHELOR'S BA, BS, BE, B. CHEM. ENG., ETC.	MASTER'S MA, MS, M. CIV. ENG., ETC.	SIXTH YEAR DEGREE ED. SPEC., ETC	FIRST PROFESSIONAL LLB, MD, DDS, DVM, ETC	DOCTORATE PH. D., ED. D., D. Sc., ETC.	ACADEMIC FIELD (Use code sheet, page 7) CODE NUMBER	ACADEMIC FIELD (Use code sheet, page 7) SPECIALTY
1	Highest degree you now hold	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐		
2	Next degree you expect to receive	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐		
3	Highest degree you ever expect to earn	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐		

B YOUR STUDIES (Continued)

4 Have you satisfactorily completed the student teaching requirement of any institution?
1 ☐ YES 2 ☐ NO
(If "Yes", in which academic field.)
Use Code Sheet, pg. ___
CODE NO
NAME OF ACADEMIC FIELD

5 Have you completed all requirements for teacher certification at any level?
1 ☐ YES 2 ☐ NO *(If "Yes", in which academic field No.)*
CODE NO
NAME OF ACADEMIC FIELD

6 Have you been granted a professional certification by any State?
1 ☐ YES 2 ☐ NO *(If "Yes" complete a, b, and c)*
a. NAME OF STATE WHICH GRANTED CERTIFICATION
b. KIND OF CERTIFICATE
c. LEVEL

7 GRADUATE WORK

		MONTH	YEAR
a.	GIVE DATE OR YEAR YOU FIRST BEGAN GRADUATE STUDY		
b.	WHEN DO YOU EXPECT TO COMPLETE ALL REQUIREMENTS FOR THE DEGREE YOU ARE NOW WORKING TOWARD		
c.	WHEN DO YOU EXPECT TO COMPLETE ALL REQUIREMENTS FOR THE HIGHEST DEGREE YOU EXPECT TO EARN		

8 Which of the following degree requirements are you working on this term? *("x" any that apply)*
1 ☐ Courses or seminars
1 ☐ Comprehensive or "Qualifying Exams"
1 ☐ Language Examinations
1 ☐ Research for and preparation of thesis
1 ☐ None
1 ☐ Other *(Specify)* _____

9 How many years of academic study (or equivalent) beyond the baccalaureate have you completed? *("x" one)*
1 ☐ Less than one year
2 ☐ At least one year, but less than two
3 ☐ At least two years, but less than three
4 ☐ At least three years, but less than four
5 ☐ Four or more
6 ☐ Other *(Specify)* _____

10 YOUR PLANS FOR EARNING A DOCTOR'S DEGREE: 9 ☐ NO PLANS SKIP TO NEXT QUESTION

Which category best describes the stage you have reached in the preparation of the Doctoral Thesis or dissertation or project work? ("x" one)
1 ☐ Have not selected topic
2 ☐ Have selected topic
3 ☐ Have an outline
4 ☐ Collecting data
5 ☐ Analysing data
6 ☐ Writing
7 ☐ Completed

11 CREDIT HOURS *(Translate as best you can if no credit hours)*

		NO. OF HOURS
a.	WHAT IS CONSIDERED A FULL CREDIT-HOUR LOAD AT YOUR INSTITUTION?	
b.	FOR HOW MANY CREDIT HOURS ARE YOU ENROLLED THIS TERM?	

12 How many calendar years elapsed between the time you received your baccalaureate degree and the start of your graduate studies? *("x" one)*
0 ☐ LESS THAN 1 YEAR 2 ☐ 2 YEARS 4 ☐ 4 YEARS
1 ☐ 1 YEAR 3 ☐ 3 YEARS 5 ☐ 5-9 YEARS
6 ☐ 10 OR MORE YEARS

13 During which of the years in the table below were you enrolled for graduate study? *("x" only one vertical column for each year of graduate study)*

	ENROLLMENT IN GRADUATE STUDY	JUL '61 TO JUN '62	JUL '62 TO JUN '63	JUL '63 TO JUN '64	JUL '64 TO JUN '65
a.	NOT YET BEGUN MY GRADUATE STUDIES	1 ☐	1 ☐	1 ☐	1 ☐
b.	NOT ENROLLED IN GRADUATE STUDY DURING THE YEAR	2 ☐	2 ☐	2 ☐	2 ☐
c.	ENROLLED FULL-TIME AT LEAST ONE TERM OF GRADUATE STUDY	3 ☐	3 ☐	3 ☐	3 ☐
d	ENROLLED PART-TIME BUT NOT FULL-TIME FOR AT LEAST ONE TERM OF GRADUATE STUDY	4 ☐	4 ☐	4 ☐	4 ☐

14 Letter grade that best represents your grade point average so far in your graduate studies and bachelor's degree (If letter grades not given, translate into letter grades as best you can.) *("x" only one on each line)*

	STUDIES	NO GRADE REC'D YET	C+ OR LESS	B−	B	B+	A−	A
a.	GRADUATE STUDIES	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
b.	BACHELOR'S DEGREE		2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐

c. WERE YOU EVER AWARDED A SCHOLARSHIP AS AN UNDERGRADUATE STUDENT?
1 ☐ YES 2 ☐ NO

15 If you have a Bachelor's and/or Master's Degree, complete this section. If no degree, skip to next question.

DEGREE	WHEN WAS DEGREE RECEIVED (Month and year)	WHERE DID YOU RECEIVE THIS DEGREE (Give name and address of institution where you received your Bachelor and Master Degree)
BACHELOR		NAME OF INSTITUTION, (City and State)
MASTER		NAME OF INSTITUTION, (City and State)

C FUTURE EMPLOYMENT

After completing your present program of study, indicate which of the following you expect as your (a) First Employer, (b) your Long-Run Employer. *("x" only one in each column.)*

	TYPE OF EMPLOYMENT	FIRST EMPLOYER	LONG-RUN EMPLOYER
1	Elementary school	1 ☐	1 ☐
	Secondary school	2 ☐	2 ☐
	Combined elementary and secondary levels	3 ☐	3 ☐
	Junior college or technical institute	4 ☐	4 ☐
	4-year college or university	5 ☐	5 ☐
	Research organization or institute	6 ☐	6 ☐
	Hospital, clinic, church, welfare or other non-profit organization	7 ☐	7 ☐
	Federal Government (U.S.) *(Other than above)*	8 ☐	8 ☐
	State or local government *(Other than above)*	9 ☐	9 ☐
	Private company	0 ☐	0 ☐
	Professional partnership	X ☐	X ☐
	Other *(Specify)*:	Y ☐	Y ☐

2 Have you accepted an offer of full-time employment after completion of your graduate study *("x" one.)*

1 ☐ Already employed full-time
2 ☐ I have accepted an offer
3 ☐ I have not accepted an offer

3 Which of the following best indicates where you plan to pursue your career? *("x" one.)*

1 ☐ In the same State where now enrolled
2 ☐ In another State
3 ☐ Outside U.S.
4 ☐ Not sure

4 The following activities cut across a number of specific jobs. Which ones do you anticipate will be an important part of your long-run career work? *("x" as many as apply.)*

1 ☐ Other *(Specify)*
1 ☐ Teaching
1 ☐ Basic research
1 ☐ Applied research
1 ☐ Administration or management
1 ☐ Professional service to patients or clients

D PRIOR EMPLOYMENT

1 Have you been employed for at least six months in any of the following categories? *("x" as many as apply)*

Full-time elementary teacher or professional staff member	1 ☐
Full-time secondary teacher or professional staff member	1 ☐
Full-time junior college faculty or professional staff member	1 ☐
Full-time faculty or professional staff member in a 4-year college or university	1 ☐
Hospital or clinic, church, welfare, or other similar organization	1 ☐
Self-employed or business owned by family	1 ☐
Private company	1 ☐
Professional partnership	1 ☐
Research organization or institution	1 ☐
Other Federal Government *(Include Armed Forces)*	1 ☐
State or local government *(Other than above)*	1 ☐
Other *(Specify)*	1 ☐

2 What were the annual earnings before taxes of the highest paid regular full-time job you held before entering graduate study

$ _____

E ACADEMIC ACTIVITY

1 Consider a typical week of your academic activity during this term. Indicate the proportion of time spent in each of the academic activities listed below. Enter "0" where no time was involved.

Professional activities related to your current graduate program	
Academic study *(Including preparation and class time, thesis work, practicum, etc.)*	%
Teaching *(Including conducting labs, teaching classes, preparing course material, grading papers, etc.)*	%
Research at any level *(Exclude assignments and thesis work)*	%
Other professional activities related to graduate study *(Specify)*	%

2 Professional activities not related to your current graduate program	
Teaching at any level	%
Private instruction *(Including tutoring, music lessons, etc.)*	%
Research at any level *(Exclude assignments and thesis)*	%
Other professional activities not related to graduate study *(Specify)*	%
3 TOTAL (Sum of 1 & 2)	100%
4 What is total number of hours you spend on professional activities in a typical week?	No. of hours

F YOUR FINANCES

1 GRADUATE STUDY EXPENSE — *By June 30, 1965, what do you estimate your total expenditures for graduate study will have been for the preceding twelve month period? Note that you are being asked to estimate both your academic expenses and living expenses for the entire year.*

	EXPENSES	AMOUNT
a	ACADEMIC EXPENSES FOR SELF — *(Include tuition fees, texts, reference books, supplies, instruments, equipment, thesis costs, include dollar value of waived tuition, etc.)*	$
b	LIVING EXPENSES FOR SELF AND DEPENDENTS — *(Include housing, food, clothing, personal maintenance, entertainment, taxes, insurance, car and other)*	
c	**TOTAL** (Sum of a + b)	$

2 SOURCE OF FUNDS — *Which of the sources of funds listed below were used to meet the expense of your graduate work for the year (July 1, 1964 to June 30, 1965) as reported in item 1–c above. In col "Amount" enter your best estimate of the amount from each source.*

	ACADEMIC AWARDS	AMOUNT
1	SCHOLARSHIP	$
2	FELLOWSHIP	$

S2 SOURCE OF FUNDS — (Continued)

	EMPLOYMENT	AMOUNT
1	TEACHING ASSISTANTSHIP	$
2	RESEARCH ASSISTANTSHIP	
3	FACULTY APPOINTMENT	
4	OTHER EMPLOYMENT	$

	OTHER SOURCES	AMOUNT
1	NDEA LOAN	$
2	COMMERCIAL LOAN	
3	UNIVERSITY LOAN	
4	WITHDRAWALS FROM SAVINGS	
5	SPOUSE'S EMPLOYMENT	
6	GIFTS OR LOANS FROM RELATIVES	
7	OTHER (Specify)	
d	TOTAL (Sum of a + b + c) This total should not be less than total reported in item 1–c	$

e SOURCE OF FUNDS BY NAME OF CONTRIBUTING AGENCY — *Have you had, or do you have now, a fellowship, scholarship, teaching assistantship, research assistantship, or other research employment, between July 1, 1964 and June 30, 1965?*

1 ☐ YES 2 ☐ NO If "Yes", report information applicable to the largest single source in the table below and all others in the table on following page.

1 SINGLE LARGEST SOURCE THAT CONTRIBUTED FUNDS *(Check only one opposite the name or source)*

	NAME OF CONTRIBUTING AGENT (Source)	TYPE OF FUNDS ("y" only one) 1 TEACHING ASSISTANTSHIP	2 RESEARCH ASSISTANTSHIP	3 FELLOWSHIP	4 SCHOLARSHIP	5 OTHER (Present Employment)	TOTAL VALUE (Dollar amount)	TOTAL NUMBER OF MONTHS HELD	TOTAL NUMBER OF HOURS PER WEEK IN REQUIRED DUTIES	DUTIES REQUIRED DURING THIS PERIOD ("y" as many as apply) NONE	TEACHING	RESEARCH	CONSTRUCT EXAMS	GRADE PAPERS	RESIDENT COUNSELOR	ADMINISTRATION	CLERICAL	PROFESSIONAL SERVICES	OTHER
01	Atomic Energy Commission						$												
02	Department of Defense																		
03	National Defense Education Act																		
04	Other Office of Education																		
05	National Science Foundation																		
06	Public Health Service																		
07	N.A.S.A.																		
08	Other Federal Government																		
09	The institution I attend																		
10	Business or industry																		
11	Private foundation																		
12	State or local government																		
13	I don't know the source						$												

F. YOUR FINANCES ITEM 2e. SOURCE OF FUNDS BY NAME OF CONTRIBUTING AGENCY (Continued)

2 MORE THAN ONE SOURCE — If you had more than one, report all those not reported on the previous page in table below. If more than one from the same source, enter total amount, number of months, and hours. Report all others separately according to name or source of funds.

	NAME OF CONTRIBUTING AGENT (Source)	TYPE OF FUNDS ("x" as many as apply) 1 TEACHING ASSISTANTSHIP	2 RESEARCH ASSISTANTSHIP	3 FELLOWSHIP	4 SCHOLARSHIP	5 OTHER (Private Employment)	TOTAL VALUE (Dollar amount)	TOTAL NUMBER OF MONTHS HELD	TOTAL NUMBER OF HOURS PER WEEK IN REQUIRED DUTIES	DUTIES REQUIRED DURING THIS PERIOD ("x" as many as apply) NONE	TEACHING	RESEARCH	CONSTRUCT EXAMS	GRADE PAPERS	RESIDENT COUNSELOR	ADMINISTRATION	CLINICAL	PROFESSIONAL SERVICES	OTHER
01	Atomic Energy Commission						$												
02	Department of Defense																		
03	National Defense Education Act																		
04	Other Office of Education																		
05	National Science Foundation																		
06	Public Health Service																		
07	N.A.S.A.																		
08	Other Federal Government																		
09	The institution I attend																		
10	Business or industry																		
11	Private foundation																		
12	State or local government																		
13	I don't know the source						$												

Are you engaged in any non-professional employment? 1 ☐ YES 2 ☐ NO If YES, during a typical week, approximately how many hours do you spend on this activity? _____ hours.
Describe these duties

Indicate in your own words the most serious obstacles that delayed your progress toward an advanced degree. What do you think can be done to speed up graduate education? Please make any other general comments that you wish to make.

• U. S. GOVERNMENT PRINTING OFFICE : 1967 O - 274-632

APPENDIX E

Analysis of Obstacles to the Doctorate
Chi-square Test Results

Student characteristics and conditions (independent variables)	Reported obstacles by class (dependent variables)			
	Financial	Institutional: academic	Institutional: organization	Institutional: personnel
sex	1.44	10.38**	0.36	0.04
age	181.68**	16.54**	4.35	5.40
race	23.58**	1.50	5.92	5.63
marital-dep. status	116.04**	5.15	3.00	6.90
citizenship status	17.18**	1.43	0.45	7.16**
undergraduate g.p.a.	13.55**	8.49*	1.53	2.13
graduate g.p.a.	6.78*	2.13	1.71	0.10
parental income	71.99**	7.91	5.58	2.15
previous earnings	156.08**	6.88	5.43	4.36
major income source	164.36**	51.26**	18.42	6.62
duty hours per week	47.13**	31.16**	18.36*	10.06
control of institution	5.34	20.12**	1.89	1.14
size of institution	0.55	1.79	0.02	0.04
years elapsed B.A. to entry	34.14**	13.51*	3.61	5.36
yr. began grad. study	131.43**	42.57**	16.09*	24.87*
years beyond B.A.	33.14**	19.04**	10.47*	34.30*
year received M.A.	59.27**	17.89*	9.28	12.40
highest degree held	52.58**	7.49	3.58	4.75
enrollment status	56.11**	22.17**	0.78	0.51
courses or seminars	14.74**	22.81*	2.11	32.22**
major examinations	0.52	0.36	0.20	0.47
foreign language	1.95	11.49**	0.16	3.19
research and thesis	29.28**	48.34**	2.75	20.37**
stage of thesis	29.34**	46.91**	3.33	31.63**
field of study	164.28**	96.77**	23.49	16.42

APPENDIX E--Continued

Student characteristics and conditions (independent variables)	Reported obstacles by class (dependent variables)		
	Personal	Other	No Obstacle
sex	37.21**	1.86	0.14
age	25.72**	60.79**	125.86**
race	18.63**	1.88	3.86
marital-dep. status	9.15*	3.98	26.50*
citizenship status	23.64**	4.61*	1.49
undergraduate g.p.a.	1.15	0.76	19.79**
graduate g.p.a.	1.29	3.04	5.01
parental income	12.61*	20.49**	35.49**
previous earnings	22.10**	43.52**	63.50**
major income source	52.51**	74.83**	54.90**
duty hours per week	11.86	26.98**	11.95
control of institution	1.13	3.77	2.50
size of institution	0.01	0.03	1.71
years elapsed B.A. to entry	3.83	22.61**	17.89**
yr. began grad. study	71.00**	60.70**	142.75**
years beyond B.A.	27.34**	12.53*	75.31**
year received M.A.	26.47**	36.92**	32.87**
highest degree held	6.81	6.39	60.65**
enrollment status	3.98*	18.38**	21.89**
courses or seminars	4.75*	2.16	3.53
major examinations	2.76	1.16	0.82
foreign language	6.42*	1.62	0.17
research and thesis	0.10	0.68	0.10
stage of thesis	7.58	16.60*	14.52*
field of study	31.72	23.30	28.11

** = significant at .01 level.

* = significant at .05 level.

APPENDIX F

MISCELLANEOUS TABLES

TABLE F.1.--Years elapsed between bachelor's degree and start of graduate study, by undergraduate grade point average

Undergraduate grade point average	Years elapsed B.A. to start of graduate study	
	Less than one	Four or more
A or A-	687 (32.9%)	120 (24.7%)
B+ or B	908 (43.5%)	222 (45.8%)
B- or less	493 (23.6%)	143 (29.5%)
Totals	2088 (100%)	485 (100%)

$X^2 = 14.15$ $p = .01$

TABLE F.2.--Years elapsed between bachelor's degree and start of graduate study, by major source of income

Major source of income	Years elapsed B.A. to start of graduate study	
	Less than one	Four or more
Scholarship, fellowship, T.A., or R.A.	583 (27.9%)	99 (20.4%)
Faculty appointment, other employment	376 (18.0%)	137 (28.3%)
All other sources (including no single major source)	1129 (54.1%)	249 (51.3%)
Totals	2088 (100%)	485 (100%)

$X^2 = 29.59$ $p = .01$

TABLE F.3.--Years elapsed between bachelor's degree and start of graduate study, by field of study (in major source of support groupings)

Field groupings by major source of support	Years elapsed B.A. to start of graduate study	
	Less than one	Four or more
Fields of study with highest financial support ratings[a] (biological science, agriculture and forestry, health professions, physical science, philosophy)	795 (38.1%)	154 (31.8%)
Fields of study with lowest financial support ratings[a] (education, fine and applied arts, business and commerce, library science, social work administration, miscellaneous, religion)	401 (19.2%)	177 (36.5%)
All other fields of study	892 (42.7%)	154 (31.7%)
Totals	2088 (100%)	485 (100%)

$X^2 = 68.18$ $p = .01$

[a]See Table 5.4.

TABLE F.4.--Enrollment status of students, by undergraduate grade point average

Undergraduate grade point average	Enrollment status	
	Full time	Part time
A or A-	792 (33.4%)	243 (24.0%)
B+ or B	1000 (42.2%)	449 (44.4%)
B- or less	577 (24.4%)	319 (31.6%)
Totals	2369 (100%)	1011 (100%)

$X^2 = 35.07$ $p = .01$

TABLE F.5.--Enrollment status of students, by major source of income

Major source of income	Enrollment status	
	Full time	Part time
Scholarship, fellowship, T.A., or R.A.	781 (33.0%)	131 (12.9%)
Faculty appointment, other employment	213 (9.0%)	488 (48.3%)
All other sources (including no single major source)	1375 (58.0%)	392 (38.8%)
Totals	2369 (100%)	1011 (100%)

$X^2 = 682.42$ $p = .01$

TABLE F.6.--Enrollment status of students, by field of study (in major source of support groupings)

Field groupings by major source of support	Enrollment status	
	Full time	Part time
Fields of study with highest financial support ratings[a] (biological science, agriculture and forestry, health professions, physical science, philosophy)	1023 (43.2%)	201 (19.9%)
Fields of study with lowest financial support ratings[a] (education, fine and applied arts, business and commerce, library science, social work administration, miscellaneous, religion)	410 (17.3%)	398 (39.4%)
All other fields of study	936 (39.5%)	412 (40.7%)
Totals	2369 (100%)	1011 (100%)

$X^2 = 250.46$ $p = .01$

[a]See Table 5.4.

TABLE F.7.--Students engaged in course work, by undergraduate grade point average

Undergraduate grade point average	Students taking courses or seminars	Students not taking courses or seminars
A or A-	598 (29.0%)	437 (33.2%)
B+ or B	878 (42.5%)	571 (43.4%)
B- or less	589 (28.5%)	307 (23.3%)
Totals	2065 (100%)	1315 (100%)

$X^2 = 13.07$ $p = .01$

TABLE F.8.--Race of graduate students, by undergraduate grade point average

Undergraduate grade point average	Race			
	White	Negro	Oriental	Other
A or A-	908 (29.6%)	15 (21.7%)	93 (47.4%)	19 (39.6%)
B+ or B	1314 (42.8%)	27 (39.1%)	82 (41.8%)	26 (54.2%)
B- or less	845 (27.5%)	27 (39.1%)	21 (10.7%)	3 (6.3%)
Totals	3067 (100%)	69 (100%)	196 (100%)	48 (100%)

$X^2 = 55.18$ $p = .01$

TABLE F.9.--Race of graduate students, by field of study (in major source of support groupings)

Field groupings by major source of support	Race	
	Negro	Oriental
Fields of study with highest financial support ratings[a] (biological science, agriculture and forestry, health professions, physical science, philosophy)	33 (47.8%)	122 (62.2%)
Fields of study with lowest financial support ratings[a] (education, fine and applied arts, business and commerce, library science, social work administration, miscellaneous, religion)	17 (24.6%)	14 (7.2%)
All other fields of study	19 (27.5%)	60 (30.6%)
Totals	69 (100%)	196 (100%)

$X^2 = 15.32$ $p = .01$

[a]See Table 5.4.

TABLE F.10.--Undergraduate grade point average of students, by sex

Sex	Undergraduate grade point average			
	A or A-	B+ or B	B- or less	Totals
Male	794 (28.6%)	1171 (42.2%)	813 (29.3%)	2778 (100%)
Female	241 (40.0%)	278 (46.2%)	83 (13.8%)	602 (100%)

$X^2 = 67.78$ $p = .01$

TABLE F.11.--Undergraduate grade point average of students, by control of institution

Control of institution	Undergraduate grade point average			
	A or A-	B+ or B	B- or less	Totals
Public	575 (26.8%)	950 (44.3%)	621 (28.9%)	2146 (100%)
Private	403 (37.3%)	435 (40.2%)	243 (22.5%)	1081 (100%)
Roman Catholic	57 (37.5%)	63 (41.4%)	32 (21.1%)	152 (100%)
Other	0 (0%)	1 (100%)	0 (0%)	1 (100%)

$X^2 = 45.50 \quad p = .01$

SELECTED BIBLIOGRAPHY

Arlt, Gustave. "The First Ph.D.'s under Title IV." Journal of Higher Education, Vol. 34, No. 5, May 1963, pp. 241-249.

Association of American Universities. Journal of Proceedings and Addresses of the First and Second Annual Conferences of the Association of American Universities. Chicago, Illinois: February 27-28, 1900 and February 26-28, 1901.

Beach, Leonard B. "The Graduate Student." Graduate Education Today, Edited by Everett Walters. Washington, D.C.: American Council on Education, 1965, p. 124.

Berelson, Bernard. Graduate Education in the United States. New York: McGraw-Hill, 1960.

Braley, Ian. "View from the Underside." Liberal Education, Vol. 46, No. 4, December 1960, pp. 499-503.

Carmichael, Oliver C. Graduate Education: a Critique and a Program. New York: Harper & Brothers, 1961.

Carmichael, Oliver C. "Some Basic Problems of Graduate Education." Liberal Education, Vol. 49, No. 1, March 1963, pp. 81-5.

Cartter, Allan M. An Assessment of Quality In Graduate Education. Washington, D.C.: American Council on Education, 1966.

Cartter, Allan M. "Future Faculty Needs and Resources." Improving College Teaching, Washington, D.C.: American Council on Education, 1967, p. 122.

Caswell, Hollis L. "Problems of Doctoral Study in Education." School and Society, Vol. 88, October 22, 1960, p. 373.

Committee of Fifteen. The Graduate School Today and Tomorrow: Reflections for the Professions. New York: Fund for the Advancement of Education, 1965.

Committee on Policies in Graduate Education. Report of the Committee. "Doctors and Masters--Good and Bad!" Journal of Proceedings and Addresses of the Fifty-Eighth Annual Conference of the Association American Universities and the Ninth Annual Conference of the Association of Graduate Schools. Princeton, New Jersey: October 22 and 23, 1957.

Committee on Policies in Graduate Education. "Report of the Committee on Policies in Graduate Education." Journal of Proceedings of the Fifty-Seventh Annual Conference of the Association of American Universities and the Eighth Annual Conference of the Association of Graduate Schools. Chicago, Illinois, October 24 and 25, 1956.

Council of Graduate Schools. Proceedings of the Second Annual Meeting of the Council of Graduate Schools in the United States. Dallas, Texas, December, 1962.

Council of Graduate Schools. Proceedings of the Fifth Annual Meeting of the Council of Graduate Schools. Washington, D.C., December, 1965.

Creager, John A. A Study of Graduate Fellowship Applicants in Terms of Ph.D. Attainment. Technical Report No. 18. Washington, D.C.: Office of Scientific Personnel, NAS-NRC, March 22, 1961.

Davis, James A. Stipends and Spouses: the Finances of American Arts and Science Graduate Students. Chicago, Illinois: The University of Chicago Press, 1962.

Dure, Leon S. "More Graduate Students Are Key to Nation's Search for Scientists." American Mercury, Vol. 90, April 1960, p. 114.

Elder, J. P. A Criticism of the Graduate School of Arts and Sciences in Harvard University and Radcliffe College. Cambridge, Massachusetts: Harvard University, 1958.

Grigg, Charles M. Graduate Education. New York: The Center for Applied Research in Education, 1965.

Harmon, Lindsey R. The Effects of Fellowships on Acceleration of Ph.D. Attainment. Technical Report No. 14. Washington, D.C.: Office of Scientific Personnel, NAS-NRC, January 15, 1959.

Heard, Alexander. The Lost Years in Graduate Education. Atlanta, Georgia: Southern Regional Education Board, 1963.

Heiss, Ann M. Berkeley Doctoral Students Appraise Their Academic Programs. Mimeo. Berkeley, California: Center for the Study of Higher Education, April 1964.

Hollis, Ernest V. Toward Improving Ph.D. Programs. Washington, D.C.: American Council on Education, 1945.

Jencks, Christopher, and Riesman, David. "Where Graduate Schools Fail." The Altlantic Monthly, April 1968, p. 51.

Kirk, Grayson. "It Takes a Person Too Long to Get an Advanced Degree." Nations's Schools, Vol. 64, No. 1, July 1959, p. 50.

Lecht, Leonard A. Manpower Needs for National Goals in the 1970's. New York: Frederick A. Praeger, 1969.

Lehman, Harvey C. Age and Achievement. Princeton, New Jersey: Princeton University Press, 1953.

Loewenberg, Peter. "Emotional Problems of Graduate Education." Journal of Higher Education, Vol. XL, No. 8, November 1969, pp. 610-623.

Mechanic, David. Students Under Stress: a Study in the Social Psychology of Adaptation. New York: The Free Press of Glencoe, 1962.

National Academy of Sciences. Careers of Ph.D's: Academic versus Non-academic. Washington, D.C.: National Academy of Sciences, 1968.

National Academy of Sciences. Doctorate Recipients from United States Universities, 1958-1966. Washington, D.C.: National Academy of Sciences, 1967.

National Academy of Sciences--National Research Council. Doctorate Production in United States Universities, 1920-1962. Washington, D.C.: National Academy of Sciences--National Research Council, 1963.

National Science Board. Graduate Education: Parameters for Public Policy. Washington, D.C.: U.S. Government Printing Office, 1969.

National Science Board. Toward a Public Policy for Graduate Education in the Sciences. Washington, D.C.: U.S. Government Printing Office, 1969.

National Science Foundation. Science and Engineering Doctorate Supply and Utilization, 1968-80. Washington, D.C.: National Science Foundation, 1969.

Orlans, Harold. The Effects of Federal Programs on Higher Education: A Study of 36 Universities and Colleges. Washington, D.C.: The Brookings Institution.

Pressey, Sidney L. "Age and the Doctorate--Then and Now." Journal of Higher Education, Vol. 33, March 1969, pp. 155-156.

Pressey, Sidney L. Educational Acceleration: Appraisals and Basic Problems. Columbus, Ohio: Bureau of Educational Research, Ohio State University, 1949.

Prior, Moody E. "The Doctor of Philosophy Degree," Graduate Education Today, Edited by Everett Walters, Washington, D.C.: American Council on Education, 1965, p. 51.

Rosenhaupt, Hans. Graduate Students: Experience at Columbia University, 1940-1956. New York: Columbia University Press, 1958.

Special Report on Women and Graduate Study. Resources for Medical Research. Report No. 13. National Institute of Health, Department of Health, Education, and Welfare. Washington, D.C.: U.S. Government Printing Office, June 1968.

Tucker, Allen, et al. Factors Related to Attrition Among Graduate Students. Comparative Research Project No. 1146. East Lansing, Michigan: Michigan State University, 1964.

United States Department of Labor. Manpower Report of the President. Washington, D.C.: U.S. Government Printing Office, January 1969.

Wilson, Kenneth M. Of Time and the Doctorate. Atlanta, Georgia: Southern Regional Education Board.

Wright, Charles R. "Success or Failure in Earning Graduate Degrees." Sociology of Education, Vol. 38, No. 1, Fall 1964, pp. 73-97.