

1983

# The woman doctorate, her doctoral study, and postdoctoral career development

Gillian Elliott Smith  
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THE WOMAN DOCTORATE, HER DOCTORAL STUDY, AND  
POSTDOCTORAL CAREER DEVELOPMENT

*Iowa State University*

PH.D. 1983

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The woman doctorate, her doctoral study,  
and postdoctoral career development

by

Gillian Elliott Smith

A Dissertation Submitted to the  
Graduate Faculty in Partial Fulfillment of the  
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## INTRODUCTION

Since the first award of a doctorate to a woman by a U.S. institution in 1877, the number of doctorates earned by women has steadily increased, and it has been projected that, while a decline in the numbers of new women doctorates would begin in 1981, women will continue to constitute an increasing percentage of new doctorates at least through 1989 (Frankel and Gerald, 1980; Appendix A). Women doctoral students and graduates, however, are a small minority of the female population, and a minority in almost all fields in which they study and work, which sets them apart as a group, and causes them to be subject to a peculiar set of problems.

Hutchinson (1930) reported the results of a study of the earliest women doctorates (1877-1924), in the hope that students and their advisers might find in the cumulative experience recorded a valuable basis on which to answer enquiries frequently made by those contemplating doctoral study. Since 1930, a number of studies of women doctorates have been published (particularly in the late 1960s and early 1970s, when studies born out of the women's liberation movement focused on early role stereotyping and its later reinforcement, and discrimination against women), yet Hutchinson's original work has seldom been referenced by later researchers, and comparisons of more recent women doctorates with their earliest counterparts have not been made.

Astin (1969, 1973) noted that it is crucial to have an accurate knowledge and understanding of the highly educated woman's career profile, in order to counsel wisely and plan appropriately for the

future, and deemed it essential to document trends in the training and career patterns of female doctorates. Oltman (1970) also pointed out the need for more information about women in higher education; Howe (1977) considered that, despite the obvious need for and interest in scholarship about women in higher education, the area remained largely uncharted; and, as late as 1979, Moore and Wollitzer noted that recent research on women as doctoral students or holders of the doctorate was very limited. In addition, no comprehensive summary of the research on women doctoral students and graduates has been made, so that the woman wishing to make decisions with respect to some facet of doctoral study or postdoctoral career development and those attempting to advise her have no single resource to aid them.

This research attempts to meet some of these needs, by providing a comprehensive summary of the research on women doctorates, together with the results of a questionnaire survey of 1973-1974 doctorates, with the objectives of comparing the most recent women doctorates with their earliest counterparts, with respect to their characteristics, doctoral study and postdoctoral career development, and providing a single body of information based upon which doctoral candidates, their advisers, prospective doctoral students, and others might be able to make decisions or give advice.

## PROCEDURES

## Definition of Terms

In this study, the term doctorate is used, as is conventional in the literature, to refer to the recipient of a third level research degree, excluding professional degrees, as well as to the degree itself. Except where otherwise specified, it may be assumed that the recipient is a woman.

## Sampling

Women who received their doctorates between July 1, 1973 and June 30, 1974 were selected for study because: the academic year 1973-1974 was the most recent year for which data on numbers of doctorates awarded to women by individual institutions were available; sufficient time had elapsed since receipt of the doctorate that postdoctoral career development could be meaningfully addressed in the study; similar time had elapsed between receipt of the doctorate and the study as in previous research, facilitating comparisons with the results of other studies.

Six thousand, four hundred and fifty-one women received doctorates from 251 institutions between July 1, 1973 and June 30, 1974 (Baker and Wells, 1976; Appendix B). Sampling was conducted by Dr. H. D. Baker, Department of Statistics, Iowa State University, with the intention of producing a sample size of about 600, and therefore about 300 respondents, which would be sufficient to make intergroup comparisons of

various factors. Approximately one woman in eleven was sampled, resulting in a sample size of 587, representing 167 institutions (Appendix B); the first woman to be sampled from each institution was randomly assigned within the first eleven women alphabetically, and each eleventh woman was sampled thereafter.

Since it was not possible to obtain a complete list of names and addresses of women who had received doctorates in 1973-1974, the alumni associations of the 167 institutions were contacted to obtain such information; in cases where the alumni association was not able to supply the information, the administration of the institution was contacted (Appendix B). In some cases, neither the alumni nor the administration was able to supply the information, or could supply it only at a prohibitive cost. Due to financial limitations, it was decided not to resample to increase the sample size, but to continue with the 248 women representing 80 institutions who had been identified with names and addresses (Appendix B).

#### Questionnaire

The questionnaire developed for this study addressed the following topics: characteristics of women doctorates, their doctoral study, their postdoctoral career development, and obstacles to their career development. Questions were based on those used by Hutchinson (1930), and on questionnaires used by more recent researchers, in order to facilitate comparison of results, and questions addressing issues of current concern were added. A format designed for ease of completion

was adopted. For economy of time, several women doctorates who were friends of the author completed a preliminary form of the questionnaire; based on their comments, the final form of the questionnaire was developed (Appendix C).

Questionnaires were sent to 248 women in June, 1982; a second mailing was made to nonrespondents in October, 1982. Of the 248 questionnaires mailed, 42 were returned as undeliverable, 8 were returned because the woman had been misidentified with respect to degree earned or date of graduation, 5 were returned but not completed, one was returned too late to be included in the analysis, and two women were reported deceased. One hundred and twelve completed questionnaires, representing doctorates from 57 institutions, were used in the analysis; the distribution of respondents by state is shown in Figure 2 (Appendix B).

Participants in the study showed a great deal of interest in the research. Many added lengthy comments at the end of their completed questionnaires; several offered additional assistance with the research; two sent papers that they had written on related subjects; and nine asked to be sent results of the study. Much interest in the research was also shown by people, especially women, at Iowa State University.

#### Presentation of Results

In reporting this work, it was decided to present a summary of the relevant research by topics, and to include results of the study of 1973-1974 doctorates along with the literature, in order to facilitate



comparisons. A profile of 1973-1974 doctorates, a comparison of 1973-1974 doctorates with their 1877-1924 counterparts, and a comparison of 1973-1974 doctorates with other doctorates which serves as an update to previous research, are presented at the end of each major section.

## WOMEN DOCTORATES

## Introduction

Table 1 and Figure 1 (Appendix A) show the number of doctorates granted to women by U.S. institutions from 1920 to 1975, and projected to 1989. The steady (and in recent years, rapid) increase in the number of doctorates earned by women masks fluctuations in the proportions of total doctorates granted that the numbers represent.

At the turn of the 20th century, about 9% of new doctorates were granted to women. This proportion rose to about 15% in the early 1920s, then began to decline, gradually at first, then rapidly, during and after World War II, to a low of about 10% in the early 1950s. Since that time, the proportion has increased, slowly at first, then more rapidly in the 1970s, reaching 22% in 1975, and projected to increase to 29% by 1989.

The increase in numbers of women doctorates also fails to indicate the sharp decline in the relative representation of women between baccalaureate and master's level and the doctorate. From 1920 to 1958, half to one percent of female baccalaureate recipients went on to attain the doctorate (Solmon, 1973), and according to Ferriss (1971), while the proportion of master's degrees per baccalaureate earned 2 years earlier was 29% for women, the rate of doctorates to baccalaureates earned 10 years earlier was only about 3%.

Women doctoral candidates and doctorates, then, constitute a small minority of the female population as a whole (0.25%; Astin, 1973), and a

small minority in most of their fields of study and work settings. This section is addressed to a description of the woman doctorate.

#### Citizenship, Ethnic Background and Religion

The citizenship, ethnic background and religion of 1877-1924 doctorates were not discussed by Hutchinson (1930).

More recent research has indicated that about 90% of doctorates from U.S. institutions are U.S. citizens, and that some of the noncitizens are permanent U.S. residents (Astin, 1969; National Research Council (N.R.C.), 1976, 1978).

In the 1973-1974 sample, 99% of women doctorates were U.S. citizens, and 1% had nonresident alien status.

Graham (1970) suggested that a substantial proportion of women doctorates has close ties to another cultural heritage, and therefore recognizes a greater variety of options for women than may be typical. Bryan and Boring (1947) reported that 19% of fathers and 16% of mothers of 1921-1940 psychology doctorates were born outside the U.S., while Astin (1969) noted proportions of 30 and 27%, respectively, for 1957-1958 doctorates, and found that 15% of the doctorates themselves were born outside the U.S.

Among 1973-1974 doctorates, 15% of mothers, 11% of fathers, and 7% of the doctorates themselves were born outside the U.S.

According to Burdett (1958), 1931-1955 doctorates were almost exclusively Protestant.

Among 1973-1974 doctorates, 46% were Protestant, 13% were Roman

Catholic, 8% Jewish, 33% atheist, agnostic or had no religion, and 2% adhered to other religious beliefs.

Four percent of 1973-1974 doctorates indicated that they belonged to a minority group.

#### Family Background

Astin (1969) suggested that the most important early determinant of educational and occupational aspirations is family background, and Astin and Bayer (1973) noted that parent-child interactions and interests, and mother's career interests and commitments are highly influential in a young woman's decisions about her education and career. Astin (1969) felt that in doctorate women one saw superior intellectual abilities, strong drive, and commitment to intellectual pursuits that were partly attributable to the characteristics of their parents, and early home environments that provided financial resources and encouragement for education.

The family background of 1877-1924 doctorates was not discussed by Hutchinson (1930).

#### Size of family

The families of women doctorates have been reported to be generally small; about 50% of 1957-1958 doctorates were first born or only children (Astin, 1969).

Among 1973-1974 doctorates, 21% were only children, 29% first born children, 21% middle children, and 29% last born children; average family size was 2.7.

### Age of parents

For 1921-1940 doctorates, median age of mothers at the time of birth of the doctorates was 29, and median age of fathers was 34; few were under 20 or over 40 (Bryan and Boring, 1947).

Among the parents of 1973-1974 doctorates, median age of mothers at the time of birth of the doctorates was 28 years (mean 29), and of fathers was 30 years (mean 33); 5% of mothers were under age 20, and 16% of fathers were over age 40.

### Parental education

The educational level of doctorates' parents has been reported to be both higher than that of their counterparts in the general population (Stoddard, 1977; N.R.C., 1978), and lower (Mitchell, 1968).<sup>1</sup> The educational level of mothers and fathers, respectively, of 1921-1940 doctorates was as follows: 7 and 9% had not completed grammar school; 24% of each had completed grammar school; 50% and 25% had completed high school; 14 and 18% had undergraduate degrees; 2 and 22% had graduate degrees (Bryan and Boring, 1947). For 1931-1955 doctorates, about 16% of mothers and fathers had college educations (Burdett, 1958); for parents of 1957-1958 doctorates, these proportions were 18 and 31%, respectively (Astin, 1969).

Among 1973-1974 doctorates, 10% of mothers and 20% of fathers had

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<sup>1</sup> It should be noted for future reference that the findings of Mitchell (1968, 1969) and Mitchell and Alciatore (1970), with respect to 1929-1967 Oklahoma doctorates, are often discrepant with the findings of other researchers.

an eighth grade education or less; 13 and 6%, respectively, had some high school education; 20 and 13% were high school graduates; 17 and 16% had completed some college; 19 and 16% were college graduates; 6 and 3% had completed some graduate school; 12 and 8% had master's degrees; 4 and 12% had professional degrees; 7% of fathers had doctorates. In 31% of families, the parents had completed the same level of education, while in 41% the father had completed a higher level, and in 29% the mother had reached a higher level.

#### Socio-economic status

Graham (1970) suggested that a substantial number of doctorates are daughters of professional women. Four percent of mothers and 38% of fathers of 1921-1940 doctorates were professionals; 4 and 5%, respectively, were semi-professionals; 28% of fathers were in managerial and proprietary categories; 17% of fathers were unemployed; 85% of mothers were homemakers (Bryan and Boring, 1947). Twenty-four percent of mothers and 87% of fathers of 1957-1958 doctorates worked in skilled or higher level categories (Astin, 1969). For 1929-1967 Oklahoma doctorates, 60% of fathers were white collar; 71% of mothers were homemakers (Mitchell and Alciatore, 1970).

Among 1973-1974 doctorates, 6% of mothers had unskilled occupations, 5% of mothers and 12% of fathers had semi-skilled occupations, 16 and 26%, respectively, had skilled occupations, 14 and 38% had business or managerial positions, 16 and 23% were professionals, and 42% of mothers were homemakers. In cases where both parents worked outside the home, 44% of couples worked in the same occupational

category, while in 37% of cases the father worked in a higher level category, and in 19% the mother worked in the higher category.

#### Age

The ages of 1877-1924 doctorates were not reported by Hutchinson (1930).

At the time of the study, 1973-1974 doctorates ranged in age from 34.1 to 72.9 years, with a median of 44.1 years (mean 44.5).

Bryan and Boring (1947) suggested that the youngest doctorates may be those supported through their education by their parents, while the older doctorates are a result of the retardation of professional progress by marriage and children. Mitchell (1969) suggested that lack of guidance and counseling and cultural expectations cause a late start to doctoral work for many women.

N.R.C. (1978) reported that age at receipt of the doctorate is less a function of age at receipt of the baccalaureate, than of the baccalaureate to doctorate time lapse, which is related to field of study; women in engineering and the natural sciences graduate slightly earlier (1975 median age 29) than those in the social sciences (median age 30) and arts and humanities (median age 32), who in turn receive their doctorates before those in the professions (median age 37) and education (median age 38) (N.R.C., 1976).

Age at receipt of the doctorate

Data on age at receipt of the doctorate have been reported in various ways, and are difficult to compare, but suggest that about 33% of women are under age 30, about 40% are between ages 30 and 40, and about 30% are over age 40 (including 8 to 9% over age 50). Median age at receipt of the doctorate has decreased from 36 (1957-1958 doctorates) to 32.5 (1974 doctorates), and mean age has decreased from about 41 (1955-1966 doctorates) to 35 (1970-1974 doctorates) (N.R.C., 1967, 1976, 1978; Astin, 1969; Centra and Kuykendall, 1974; Mahon-O'Leary, 1979).

For 1973-1974 doctorates, age at receipt of the doctorate ranged from 25.7 to 63.8 years, with a median of 32.6 years (mean 35.7); 38% were under age 30, 34% between 30 and 39.9, 19% between 40 and 49.9, 10% between 50 and 59.9, and 1% 60 or over.

Age at receipt of the baccalaureate

For 1973-1974 doctorates, age at receipt of the baccalaureate ranged from 19.1 to 46.9 years, with a median of 21.8 (mean 24.7). Baccalaureate to doctorate time lapse is discussed in the section on doctoral study.

## Personal Characteristics

The personal characteristics of 1877-1924 doctorates were not discussed by Hutchinson (1930).



### Health

Miller (1957) reported that women doctorates were physically healthy and that study for the doctorate did not affect their physical condition. Thirty-five percent of 1921-1940 doctorates reported that they were unusually robust, and 60% about average in health (Bryan and Boring, 1947).

Among 1973-1974 doctorates, 67% indicated that their health was excellent, 31% that it was good, 1% that it was fair, and 1% that it was poor.

### Attitudes towards women's rights

Four percent of 1950-1968 doctorates reported spending a great deal of time and effort working to increase women's rights and opportunities, 21% spent some time and effort, 65% supported most women's rights efforts, but were not actively involved, 6% were not interested in women's rights, and less than 1% opposed increasing women's rights. Over the years doctorates had become significantly more active in supporting women's rights (Centra and Kuykendall, 1974).

Among 1973-1974 doctorates, 14% indicated that they spent a great deal of time and effort working to increase women's rights and opportunities, 37% spent some time and effort, 46% supported women's rights, but not actively, 2% were not interested in women's rights, and 2% opposed increasing women's rights (including 1% specifically opposed to legislation).

## Marital Status

Rates of marriage

Twenty-six percent of 1877-1924 doctorates were or had been married (Hutchinson, 1930).

The dichotomy of career and marriage in the late 19th and early 20th centuries has been noted in the literature, however attitudes have changed, and facilitating factors have contributed to increased marriage among women doctorates. Data on the proportion of women doctorates ever married show fluctuations, with an overall increase from under 25% in the late 19th century to over 60% by the 1960s, since which time the proportion may have dropped somewhat (Bryan and Boring, 1947; Bliss, 1954; Graduate Education for Women, 1956; Burdett, 1958; Aurbach et al., 1964; Simon et al., 1967; Winkler, 1968; Astin, 1969; Sharp, 1970; Harrington, 1971; Graham, 1973; Solmon, 1973; Centra and Kuykendall, 1974; Cartter and Ruhter, 1975; Porter-Gehrie, 1978).

1957-1958 doctorates were less likely to be married than their counterparts in the general population or nonacademic professionals (Astin, 1969), even though Field, 1961, cited by Bernard (1964), found that women doctoral candidates, whether single or married, valued marriage above career. Broschart (1978) suggested that a sizeable majority of professional women avoids the conflicts of dual family and professional roles by remaining single.

Field differences in the proportion of doctorates who marry have been noted; the present study was too small to allow such comparisons. About 33% of 1877-1924 graduates in psychology and philosophy were

married, while for sociologists the proportion was 45% (Hutchinson, 1930). Women in education have lower rates of marriage than those in other fields; for 1957-1958 doctorates, 53% in education were single, while in all other fields combined the proportion was 38% (Astin and Bayer, 1973), and for 1958-1963 doctorates working full-time, the proportion never married ranged from 38% in the sciences to 65% in education (Simon et al., 1967).

Seventy-eight percent of 1973-1974 doctorates had been married at some time; at the time of the study, 36% were married for the first time, 15% remarried, 4% separated, 20% divorced, 19% single, 4% single members of religious communities, and 3% widowed. Twenty percent of 1973-1974 doctorates indicated that their professional goals had been a determining factor in their marital status; of these 25, 18 (72%) were currently not married, 7 (28%) were married.

#### Time of marriage

Time of marriage for 1877-1924 doctorates was not reported by Hutchinson (1930).

The trend through time has been for an increasing proportion of women to be married before beginning doctoral work (Burdett, 1958; Astin, 1969; Centra and Kuykendall, 1974).

When beginning doctoral work, 42% of 1973-1974 doctorates were married for the first time, 5% were remarried, 3% separated, 10% divorced, 44% single (including 5% who were members of religious communities), and 1% widowed. Of 1973-1974 doctorates who had married, 67% married before graduate school, 27% during graduate school, and 6%

after receipt of the doctorate.

#### Characteristics of spouses

The characteristics of the spouses of 1877-1924 doctorates were not discussed by Hutchinson (1930).

More recent researchers have found that the level of education of doctorate women's spouses is above average (Astin, 1969; Centra and Kuykendall, 1974; Stoddard, 1977), which Centra and Kuykendall (1974) suggested was the result of cultural pressure for women to marry men with equal or higher education and occupational status. Astin suggested that women doctorates tend to marry men with similar backgrounds, intelligence and interests, but not to have higher intellectual achievement than their husbands, however the proportion of spouses holding doctorates has been reported to range from 38 to 63% (Winkler, 1968; Astin, 1969; Mitchell and Alciatore, 1970; Centra and Kuykendall, 1974), indicating that many women doctorates marry men with less education; Mitchell and Alciatore (1970) reported that 20% of 1929-1967 doctorates married men with a high school education or less, however this proportion was only 4% for 1950-1968 doctorates (Centra and Kuykendall, 1974). It has been reported that 15 to 20% of spouses have some college education or a baccalaureate, and 18 to 20% have some graduate education or a master's degree (Mitchell and Alciatore, 1970; Centra and Kuykendall, 1974). Astin (1969) found that, with the exception of those in education, doctorates tended to marry men who worked in the same or a related field.

Among the husbands of 1973-1974 doctorates, 2% were high school graduates, 23% had some college education or a baccalaureate, 30% had some graduate education or a master's degree, 10% had professional degrees, and 36% had doctorates. Assuming professional and doctoral degrees to be equivalent, 55% of 1973-74 doctorates were married to men with less education than themselves. Of cases where the field of the doctorate husband was noted (15 of 21), 12 (80%) were in the same field as the doctorate of the wife.

It has been reported that the typical husband of a woman doctorate is a professional (Astin and Bayer, 1973); proportions who were professionals have ranged from over 50 to 96% in different studies (Burdett, 1958; Simon et al., 1967; Winkler, 1968; Mitchell and Alciatore, 1970; Centra and Kuykendall, 1974; Kashket et al., 1974).

For 1973-1974 doctorates married at the time of the study, 76% had professional husbands (45% academic professionals, 31% nonacademic); 13% of husbands had business or managerial occupations, 4% had skilled occupations, 5% were retired, and 2% were unemployed.

Husbands of women doctorates have been reported to have a high level of employment; 90% of husbands of 1950-1968 doctorates had been employed all or almost all of the possible time, and 6% had been employed full-time more than half the time (Centra and Kuykendall, 1974).

For 1973-1974 doctorates, 83% had been employed full-time all or almost all of the time, 12% had been employed full-time half the time or more, 2% had been employed full-time less than half the time, and 4% had

had part-time employment.

Among husbands of 1973-1974 doctorates, 34% earned \$40,000 per year or more, 25% earned \$30,000-39,999, 23% earned \$20,000-29,999, 7% earned \$15,000-19,999, 5% earned \$10,000-14,999, and 5% earned less than \$10,000 per year.

#### Career support

Among 1973-1974 doctorates who were married while working for the doctorate, 64% indicated that their husbands at that time were highly supportive of their study, 29% were somewhat supportive, and 7% were unsupportive. Among those married at the time of the study, 83% indicated that their husbands were highly supportive of their careers, while 17% were somewhat supportive. The increased support shown for 1973-1974 doctorates in their postdoctoral careers over the support shown for them during their doctoral work can be attributed both to a change in attitude on the part of the spouse, and to a change in spouse.

Among 1973-1974 doctorates married at the time of the study, 60% indicated that their careers assumed equal importance as the careers of their husbands in family decisions, 10% assumed more importance, 26% assumed less importance, and 3% assumed no importance. Centra and Kuykendall (1974) reported that comments from women doctorates have suggested that those with doctorate husbands tend to receive more career support from their spouses than other women. For 1973-1974 doctorates with doctorate husbands (21), 18 (86%) indicated that their husbands were highly supportive and 3 (14%) were somewhat supportive; these numbers are too small to be reliable.

Separation and divorce

One percent of 1877-1924 doctorates was separated or divorced (Hutchinson, 1930).

It has been reported by more recent researchers that the divorce rate among women doctorates is high (Bryan and Boring, 1947; Astin, 1969; Centra and Kuykendall, 1974; Broschart, 1978), and the data indicate a trend towards increased separation and divorce, having reached 10% for 1968 doctorates (Bryan and Boring, 1947; Bliss, 1954; Centra and Kuykendall, 1974), with 18% reported for doctorates from one state (Mitchell and Alciatore, 1970).

At the time of the study, 4% of 1973-1974 doctorates were separated, 20% were divorced, and 14% were remarried following divorce, indicating marital breakdown in 48% of marriages (38% overall).

It has been noted that time of marriage relative to doctoral work affects the rate of marital dissolution. Among 1950-1968 doctorates, those who were married before starting doctoral work were more likely to have experienced marital dissolution (38%) than those who married while working for the doctorate (14%), or those who married after receiving it (11%) (Centra and Kuykendall, 1974). Although work for the doctorate does not necessarily cause marital problems, for some women doctoral work or professional commitment conflict with family roles, and lead to role strain and divorce (Feldman, 1973; Centra and Kuykendall, 1974; Broschart, 1978); for others, the doctorate may result from a broken marriage, rather than contributing to it (Centra and Kuykendall, 1974).

Among 1973-1974 doctorates who married before starting work for the

doctorate (58), 58% had been separated or divorced; for those who married during graduate school (24), this proportion was 38%; none of the 6 women married after receipt of the doctorate had been separated or divorced. Marital dissolution among these women may have been related simply to time available for such dissolution to have occurred; those who married before starting doctoral work had averaged 19 years in marriage, those married during doctoral work had averaged 12 years, and those married after receiving the doctorate had averaged 7 years. Also, of those married before beginning graduate school (58), and since separated or divorced (33), 16 (48%) were separated, divorced or remarried when beginning their doctoral work.

Support by husband and family seems to be crucial to women who decide to pursue the doctorate after marriage, and although some women may not find this in their first marriage, they may do so in a subsequent marriage (Centra and Kuykendall, 1974); unequal educational levels and lack of career support may contribute to divorce among those who begin doctoral work after marriage.

Among 1973-1974 doctorates who were remarried following divorce at the time of the study (16), 40% indicated that their present husband had equal education as their first husband, 40% had more education, and 20% had less education; 93% indicated that their present spouse was more supportive than their first spouse, the rest being equally supportive.



### Dependents

Sixty-nine percent of 1877-1924 doctorates had been partly or wholly responsible for the support of others; the most frequent dependency was partial (often children), while for single women the responsibility was much more often for adults, but included younger siblings and other relatives; two children was the modal family size (Hutchinson, 1930).

#### Percentage with children

The fertility rate of women doctorates has been reported to be lower than that of their counterparts in the general population (Astin, 1969), and Broschart (1978) suggested that remaining childless is a way for a married professional woman to decrease role conflicts and to incur less social resistance if she places professional responsibilities above family obligations. Bernard (1964) suggested that number of children is related to extent of professional involvement, and Astin (1969) reported that the children of women doctorates are younger than those of their counterparts in the general population.

Among 1973-1974 doctorates, 21% indicated that their professional goals caused them to postpone having children, while 2% had postponed children and then decided not to have a family, and 5% had decided against a family from the beginning.

Data on parity show fluctuations, but an overall increase in the proportion of married women doctorates with children from about 33% up to 1930 to 70% in the 1950s and 1960s (Bryan and Boring, 1947; Bliss,

1954; Winkler, 1968; Astin, 1969; Centra and Kuykendall, 1974).

Among 1973-1974 doctorates ever married, 80% had one child or more; 1% overall had a dependent other than a child.

#### Family size

Doctorates have been reported to have fewer children than other women (Bernard, 1964; Astin, 1969; Graham, 1973; Podhoretz, 1974), and Broschart (1978) concluded that parenthood imposed a heavy burden on professional women, and that, even though relatively small families make conflicting demands less encompassing, limiting family size to one or two children does not eliminate conflicts between family and professional roles.

Data on parity indicate that family size has remained fairly constant at about 2, and that about 78% of women have 1 or 2 children (Bryan and Boring, 1947; Bliss, 1954; Burdett, 1958; Centra and Kuykendall, 1974).

Among 1973-1974 doctorates with children, 29% had 1 child, 44% had two, 19% three, 6% four, and 3% five.

#### Time of birth of children

Centra and Kuykendall (1974) concluded that women doctorates were increasingly likely to have some or all of their children before receiving the doctorate.

Among 1973-1974 doctorates with children, 75% had some of all of their children before receiving the doctorate.

### Nonprofessional Activities

The nonprofessional activities of 1877-1924 doctorates were not discussed by Hutchinson (1930).

#### Domestic activities

1921-1940 doctorates averaged 14 hours per week in domestic activities, with 50% spending over 16 hours (Bryan and Boring, 1947); 1957-1958 doctorates averaged 18 hours per week managing their households (Astin, 1969).

1973-1974 doctorates indicated that they spent an average of 15 hours per week managing their households.

Astin (1967) suggested that employment of a full-time housekeeper enabled those employed full-time to spend less time in domestic activities, and to be more efficient in their professional work; 47% of 1957-1958 doctorates had domestic help once or twice per week, while 16% had a full-time housekeeper.

Among 1973-1974 doctorates, 2% indicated that they employed full-time domestic help, 22% employed part-time help, and 25% employed help occasionally; 51% never employed domestic help.

1957-1958 doctorates with children averaged 25 hours per week in child care, and 14% of those with children used day care or nursery facilities, while 22% employed a daytime babysitter (Astin, 1969).

Among 1973-1974 doctorates, 29% indicated that they spent time in child care, for an average of 22 hours per week, while 12% used child care facilities, for an average of 32 hours per week.

### Community activities

Burdett (1958) concluded that women doctorates showed extensive and impressive community service. Over 50% of Bryn Mawr doctorates (1890s-1950s) were involved in community activity or work in educational associations (Bliss, 1954). About 50% of 1957-1958 doctorates took part in religious activities, over 30% took part in parent-teacher groups, and about 40% were involved in other community activities (Astin, 1969).

Fifty-one percent of 1973-1974 doctorates indicated that they spent time in community activities, for an average of 4 hours per week; 38% spent time in religious activities, for an average of 4 hours per week.

### Recreation activities

1921-1940 doctorates averaged 7 hours per week in recreational activities, and 30 days vacation per year (15% took over 2 months) (Bryan and Boring, 1947). 1957-1958 doctorates averaged 12 hours per week reading for pleasure, entertained at home 2 to 3 times per month, and went out 6 to 7 times per month, as well as spending time on hobbies and sports (Astin, 1969).

1973-1974 doctorates indicated that they averaged 12 hours per week in leisure activities; those employed full-time averaged 25 days vacation per year (9% took none and 10% took over 2 months).

### Discussion

Increasing numbers of women are earning doctorates, and women constitute an increasing percentage of new doctorates, however, very few women with bachelor's or master's degrees go on to earn doctorates, and

women constitute a small minority in most fields of study and work settings.

#### 1973-1974 doctorates

1973-1974 doctorates were almost all U.S. citizens, although almost one-fifth had at least one parent born outside the U.S., and a few were born outside the U.S. themselves.

In terms of religion, slightly under half were Protestant, while one-third had no religion, and slightly under one-fourth were Roman Catholic, Jewish, or had other religious beliefs. Four percent belonged to a minority group. Two-thirds were in excellent health, and most others in good health.

About half were oldest or only children, and half were middle or last born children; average family size was 2.7. Their mothers averaged age 28 at the time of their birth, and their fathers age 30. Slightly over two-fifths of mothers and slightly under two-fifths of fathers had a high school education or less; slightly over one-third of mothers and slightly under one-third of fathers had some college education or a baccalaureate; slightly over one-fifth of mothers and slightly over one-third of fathers had attended graduate or professional schools. Overall, the fathers had a higher level of education than the mothers. Slightly over one-tenth each of mothers and fathers had unskilled or semi-skilled occupations; almost one-third of mothers and over three-fifths of fathers had skilled, business or managerial positions; about one-sixth of mothers and almost one-fourth of fathers were professionals; over two-fifths of mothers were homemakers. Overall, the

fathers had higher level occupations than the mothers.

1973-1974 doctorates received their baccalaureates between the ages of 19 and 47 (median 22), and their doctorates between ages 26 and 64 (median 33). At the time of the study, they ranged in age from 34 to 73 years (median 41).

About half spent time working to increase women's rights and opportunities, and almost half supported these efforts without active involvement; a few were not interested in or were opposed to increasing women's rights.

Almost four-fifths had been married at some time. When beginning doctoral work, slightly under half were married, slightly under half single or widowed, and about one-eighth separated or divorced. At the time of the study, about half were married, about one-fourth separated or divorced, and about one-fourth single or widowed. About one-fourth indicated that their professional goals had been a determining factor in their marital status. Of those ever married, two-thirds married before beginning doctoral work.

One-fourth of the husbands of these women had a baccalaureate or less education, slightly under one-third had some graduate school education or a master's degree, and almost half had professional or doctoral degrees, indicating that slightly over half of these women were married to men with less education than themselves. Doctorate couples were likely to share the same field. About three-fourths of the husbands had professional occupations, and over four-fifths showed a high level of employment; about one-third earned \$40,000 per year or

more, while almost half earned \$20,000-\$39,999, and less than one-fifth earned under \$20,000 per year.

Over four-fifths of those married indicated that their husbands were highly supportive of their careers, the remainder being somewhat supportive, which was a higher level of support than experienced during doctoral study; the difference in support was attributed both to changes in spouse and to changes of attitude in the same spouse. For three-fifths of those married, their career assumed equal importance in family decisions as the career of their husband, one-tenth assumed greater importance, one-fourth less importance, and for a very few, no importance.

Almost half of marriages had ended in divorce, and marital dissolution was higher among those married before starting doctoral work than among those married during doctoral work, which was in turn higher than among those married after receipt of the doctorate. This was suggested to be related to length of time available for dissolution, and it was noted that among those married before starting doctoral work and subsequently separated or divorced, almost half had experienced their marital breakdown before starting doctoral work. Among those who were remarried, subsequent husbands were slightly more educated, and considerably more supportive than first husbands.

About one-fifth of women had postponed having children because of their professional goals, and 7% had decided against having a family for the same reason. Of those ever married, four-fifths had one child or more; only one woman overall had any other dependent. Slightly under

three-fourths had one or two children, and average family size was slightly over 2 children. Three-fourths of those with children had some or all of their children before receiving the doctorate.

These women spent 15 hours per week in domestic activities; about one-fourth had full-time or part-time domestic help, and one-fourth had help occasionally, while about half never had domestic help. Slightly over one-fourth spent time in child care (average 22 hours per week), while about one-eighth used child care facilities (average 32 hours per week). Half indicated that they spent time in community activities (average 4 hours per week), and about two-fifths took part in religious activities (average 4 hours per week). They spent an average of 12 hours per week in leisure activities, and took 25 days vacation per year (about one-tenth took none and one-tenth took over 2 months).

#### Comparison of 1973-1974 doctorates with 1877-1924 doctorates

Many of the subjects addressed in this section were not discussed by Hutchinson (1930) with reference to 1877-1924 doctorates, so comparisons are limited.

The proportion of the most recent doctorates who married was triple that of the earliest doctorates. Among the earliest doctorates, slightly over two-thirds had been responsible for the support of others, yet only about one-fourth had been married, suggesting that two-fifths had been single women responsible for adults, younger siblings and relatives other than children; some married women also had dependents other than children. Among the most recent doctorates, four-fifths of those ever married had children, but only one overall had any other



dependent, which represents slightly over three-fifths of all women. The most recent doctorates, then, were more likely to be married women with children, while the earliest doctorates were more likely to be single women with adult or sometimes younger dependents. Modal family size was the same for both sets of doctorates.

Comparison of 1973-1974 doctorates with other doctorates

A higher proportion of the most recent doctorates had U.S. citizenship than had previously been reported, and the proportion was higher than that reported for 1975 doctorates, suggesting that the sample or respondents may have been biased in this respect. This was, however, in line with the finding that a smaller proportion of the doctorates themselves and of their parents was born outside the U.S. than previously reported. Graham's (1970) suggestion that a substantial proportion of women doctorates has close ties to another cultural heritage, and therefore recognizes a greater variety of options for women than may be typical, was not considered to be substantiated for 1973-1974 doctorates, as only 18% had a parent born outside the U.S.

The most recent doctorates subscribed to a number of religions, rather than being almost exclusively Protestant, as previously reported.

Astin's (1969) finding that about half of women doctorates were first born or only children was confirmed by data for 1973-1974 doctorates, however their parents, particularly fathers, were younger than the parents of 1921-1940 doctorates, and showed a somewhat greater age range. Parents of 1973-1974 doctorates had higher levels of education than previously reported for parents of women doctorates.

Mothers of 1973-1974 doctorates were considerably more likely to work and considerably less likely to be homemakers than reported for mothers of earlier doctorates. They were considerably more likely to be professionals than mothers of 1921-1940 doctorates, and considerably more likely to work in skilled or higher occupational categories than mothers of 1957-1958 doctorates. Fathers were considerably less likely to be unemployed than fathers of 1921-1940 doctorates, and also more likely to have business or managerial positions; they were equally likely to work in skilled or higher level positions as fathers of 1957-1958 doctorates. Graham's (1970) suggestion that a substantial number of women doctorates are daughters of professional women was not considered to be substantiated for 1973-1974 doctorates, as only 16% had professional mothers.

Data on age at receipt of the doctorate for 1973-1974 doctorates confirmed the trend for women to receive doctorates at younger ages, which previous literature had indicated, but suggested that the average age is no longer decreasing.

1973-1974 doctorates perceived themselves as healthier than 1921-1940 doctorates, and the trend for women doctorates to be increasingly active in working to increase women's rights and opportunities, reported for 1950-1968 doctorates, was confirmed by data for 1973-1974 doctorates.

Data for 1973-1974 doctorates indicated that an increasing proportion of women doctorates marry, in conflict with the apparent decrease in rates of marriage since the 1960s. Professional goals were

important in determining marital status for some women, however Broschart's (1978) suggestion that a sizeable majority of professional women avoids the conflicts of dual family and professional roles by remaining single was not supported (almost four-fifths of 1973-1974 doctorates had been married). The previously reported trend for women to be increasingly likely to be married before beginning doctoral work was confirmed by data for 1973-1974 doctorates.

The husbands of 1973-1974 doctorates had more education than previously reported for husbands of women doctorates, and again it was found that they are likely to be professionals, and to have a high level of employment. Numbers were small, but, as reported for 1957-1958 doctorates, the partners in two-doctorate marriages were likely to work in the same field.

Data for 1973-1974 doctorates confirmed the trend towards increased separation and divorce among women doctorates, with the proportion who had experienced marital breakdown considerably higher than reported for earlier doctorates. Higher rates of marital dissolution among those married before starting doctoral work than among those marrying during, and especially after, doctoral work were also confirmed, and it was suggested that marital breakdown was not necessarily associated with the doctoral work, but was related simply to time available for such breakdown to have occurred. As suggested by Centra and Kuykendall (1974), subsequent husbands were found to be more supportive than first husbands, but only slightly better educated.

It was confirmed that an increasing proportion of married women

doctorates is likely to have children, the percentage for 1973-1974 doctorates representing an increase since the 1960s, with family size remaining constant at about two children. 1973-1974 doctorates were slightly less likely to have one or two children, slightly more likely to have three or more, than previously reported. The increasing likelihood of having some or all children before receiving the doctorate, suggested by Centra and Kuykendall (1974), was confirmed by data for 1973-1974 doctorates.

1973-1974 doctorates spent less time managing their households than 1957-1958 doctorates, but slightly more time than 1921-1940 doctorates. They were considerably less likely than 1957-1958 doctorates to have domestic help, and spent slightly less time in child care than 1957-1958 doctorates. About the same proportion of 1973-1974 doctorates was involved in community activities as reported for Bryn Mawr doctorates (1890s to 1950s). A smaller proportion of 1973-1974 than 1957-1958 doctorates took part in religious activities. 1973-1974 doctorates spent more time in leisure activities than 1921-1940 doctorates, but took slightly less vacation each year.

## DOCTORAL STUDY

## Introduction

This section is addressed to a description of the doctoral study of women doctorates.

## Decision to Pursue the Doctorate

Hutchinson (1930) did not discuss the decision of 1877-1924 doctorates to pursue the doctorate.

Among 1973-1974 doctorates, 8% made the decision to pursue the doctorate before beginning their undergraduate work, 24% decided during undergraduate work, 10% after undergraduate but before graduate work, 41% during graduate school, 6% after receiving a master's degree, 9% during or after working, 2% after having a family or after their children were in school, and 1% after a fellowship was offered.

## Reasons for Doctoral Study

Motivations

The following percentages for reasons for obtaining the doctorate were reported for 1877-1924 doctorates:

Idealistic:	
Absorbing interest in subject	82%
More information	41
Advanced instruction	38
Vocational:	
Training in methods of work	26
Requisite for appointment to position desired	30
Requisite for promotion	25

Up to 1890, doctorates gave only idealistic reasons, but increasingly vocational and idealistic reasons were cited; overall 53% cited only idealistic reasons, 3% only vocational, and 44% both. Motivations for doctoral work that eluded quantification included: line of least resistance, dissatisfaction with other things, easiest way to succeed, immaturity, lack of purpose, and good fun (Hutchinson, 1930).

More recent researchers have found that women work for doctorates for a variety of reasons, most of which may be classified as idealistic or vocational. Idealistic motivations have included: intrinsic interest, academic and intellectual reasons (to learn more and continue intellectual growth, scope for intellectual abilities, love of learning); desire to advance knowledge and influence educational change; personal development, achievement and satisfaction, desire for improved competency, and enhancement of self-image; desire for productive and interesting work, stimulating colleagues, a sense of usefulness, and companionship beyond that found at home (Astin, 1969; Feldman, 1973, 1974). Vocational motivations have included: professional objectives (ability to pursue desired career, secure a position or promotion); increased earning power; and desire for leadership, recognition or prestige (Graduate Education for Women, 1956; Feldman, 1973, 1974; Johnson, 1978).

Being satiated with household chores and leisure activities has also been reported to be a motivation for doctoral work. LeFevre (1972) reported that women aged 32 to 52 saw reduced family needs as an opportunity for deferred personal development; they considered

themselves intelligent and able adults, saw little further gain as housewives, and rejected typical group volunteer and leisure activities, desiring new experience and greater individuality.

Women do not generally embark on careers because nothing more attractive offers itself (Henderson, 1967, cited by Robinson, 1971), do not usually feel heavy family or social pressure to get a doctorate (Astin, 1969), and do not enter graduate school out of economic necessity (LeFevre, 1972); they are free to study because they enjoy doing so.

Reasons for working for the doctorate that were noted by 5% or more 1973-1974 doctorates were as follows:

Idealistic:	
For personal satisfaction	62%
Enjoyment of study	54
Desire to advance knowledge	42
Absorbing interest in subject	37
Desire for increased competency	35
Desire for advanced instruction	30
Desire for more information about chosen field	22
Desire for stimulating colleagues	20
Vocational:	
Ambition for leadership or recognition	32
To increase earning potential	31
Requisite for particular position	16
Desire for more training in methods of work	9
Requisite for promotion	6
Requisite for desired career	6
Other:	
Boredom with household tasks	10
Pressure from another person	5

Reasons cited by less than 5% were: wanted to change the world, needed to become independent in field, and did not know what else to do.

Forty-one percent indicated only idealistic reasons for doctoral work, 5% only vocational, and 54% a combination.

Encouragement of doctoral study

Hutchinson (1930) noted that influence, expectation, and suggestion of spouse, family or professors were motivations for some 1877-1924 graduates to work for the doctorate.

According to Mitchell and Alciatore (1970), nearly 75% of women doctorates received encouragement from their mothers for doctoral study, while less than 25% were motivated by a gifted woman model; encouragement was more likely to come from professors, employers and husbands than colleagues. Hill (1970) also reported that the influence of professors was a motivation.

Eighty-seven percent of 1973-1974 doctorates indicated that they were influenced by others in their decision to work for the doctorate, the following being somewhat or very important:

Colleagues	59%
Spouse	57% of those married
College personnel	57
Family	46
Friends	43
High school personnel	7

The contributions of others were not always positive; one woman commented that her "spouse would have been impossible to live with otherwise," and, referring to the importance of family, one noted that the doctorate was a "good excuse to move away."



## Postponement of Doctoral Study

Hutchinson (1930) did not note the actual postponement of graduate study after undergraduate work for 1877-1924 doctorates, but reported that 20% recommended that graduate study should start immediately after undergraduate work, 56% recommended that it should not begin immediately, and 23% gave contingent advice. Those who advised that graduate work should begin immediately felt that it was easier to study while one was in the habit, that the sooner the training was secured, the better would be the preparation for later work, that enthusiasm was greater in the younger student, that youth gave the capacity to cope with the work, and that fellowships were more readily granted to younger students. Those who advised that graduate study should not begin immediately suggested postponement for only a few years, although some emphasized the greater value of work to the mature student with practical experience, a definite goal and orientation in a discipline, and assurance of the soundness of her intellectual interests. It was generally advised that practical experience should occupy the hiatus, teaching being most frequently recommended, and work in the student's field also mentioned.

More recent researchers have attested that women are likely to work between undergraduate and graduate work (Aurbach et al., 1964; Astin, 1969; Sharp, 1970; Centra and Kuykendall, 1974; Thrower, 1976), however Mitchell and Alciatore (1970) found that over 60% of doctorates would have started doctoral study earlier had it been possible.

Among 1973-1974 doctorates, 34% started their doctoral work immediately after completing their undergraduate work, while 66% showed some delay. Reasons for this delay in 5% or more cases were related to:

Work	32%
Family or child-rearing	19
Marriage	12
Other interests/not wanting to work for the doctorate	8
Lack of direction	5
Lack of consideration/decision not to work for the doctorate	5

Reasons in less than 5% of cases were related to: need for a break, no opportunity or program, relocation, spouse in college, finances, living overseas, no feeling of need, not being accepted, and numerous false starts. Between completing undergraduate work and beginning doctoral work, 70% of 1973-1974 doctorates worked, 17% combined work, marriage, and child-rearing, 10% were homemakers, and 3% engaged in other activities.

When asked to give advice as to when doctoral work should begin, 22% of 1973-1974 doctorates advised women to start immediately after undergraduate work, 54% advised in favor of a delay, and 24% gave contingent advice. Those who advised an immediate start cited such reasons as: continuity and momentum, study habits and discipline, difficulty of combining study and family, lifestyle, getting school over with, the likelihood of not continuing otherwise, and personal experience. Those who advised a delay were almost all concerned with the necessity of experience (specifically "real-life," nonacademic, work experience) and maturity before entering a doctoral program, and the greater benefit to be gained from doctoral work by those with such

experience and maturity. Also mentioned were time (to determine what one really wanted to do and the need for a doctorate, for reflection, to assimilate basic knowledge, evaluate priorities, acquire perspective, learn about professional options and one's strengths and weaknesses, and make appropriate choices - also factors related to maturity), the possible need for a break from school, and the reduction of stress that could be gained therefrom. Those who gave contingent advice suggested that timing should depend on the individual, the situation, or the field of study.

When asked what experience should fill the gap between undergraduate and graduate work, 54% of advice favored some kind of work experience, 19% recommended any kind of experience, 7% suggested a combination of work, marriage and child-bearing, 4% recommended travel, 3% recommended whatever would produce funds for graduate work, 3% exploration of interests, and 1% whatever was appropriate to the proposed field of study; 9% suggested that this should depend on the individual.

#### Length of Doctoral Study

The interval between the baccalaureate and the doctorate for 1877-1924 doctorates ranged from 2 to 35 years, with a median of about 8 years (Hutchinson, 1930). Some fields were associated with a longer period of study than others; median time to earn the doctorate was less for those in the social sciences than the natural sciences and mathematics, while degrees in language, literature and the arts took

longest. Taking a degree between the baccalaureate and doctorate added about one year to the time interval between receipt of these degrees.

Time taken to obtain the doctorate has been reported in various ways and data are difficult to compare. Median time lapse from baccalaureate to doctorate increased to 18 years for 1935-1939 baccalaureate recipients, then decreased to about 10 years for 1964-1966 doctorate recipients (N.R.C., 1967; Ferriss, 1971; Boyer, 1973; Solmon, 1973). Time spent actually registered for the doctorate or actively pursuing it is much shorter; 5 to 6 years has been reported for periods from 1929 to 1967 (N.R.C., 1967; Mitchell and Alciatore, 1970). Average data mask wide variations; at Radcliffe, a range of 3 to 17 years spent obtaining the doctorate was reported (Graduate Education for Women, 1956).

Time taken to complete the doctorate is related to field of study. Doctoral programs in the natural sciences and engineering are shortest, those in the professions and education are longest, and those in the social sciences and humanities fall in between (Graduate Education for Women, 1956; N.R.C., 1967, 1976, 1978; Astin and Bayer, 1973; Centra and Kuykendall, 1974). An estimate of the number of years involved in doctoral study is: natural sciences and engineering - 8; social sciences - 11; humanities - 12; professions - 15; education - 16.

Among 1973-1974 doctorates, baccalaureate to doctorate time lapse ranged from 3.3 to 38.2 years, with a median of 9.5 (mean 12.9) years. For those who earned a master's degree (97), median time lapse between baccalaureate and doctorate was 10.2 years (mean 13.7); for those

without master's degrees (15), median time lapse was 7.5 years (mean 8.7). Time spent actually enrolled in graduate school ranged from 1 to 20 years, with a median of 5 years (mean 5).

For 50% of 1973-1974 doctorates, doctoral study was always full-time, for 8% it was always part-time, while 39% combined full-time and part-time study, and 3% had some study and some nonstudy periods. Part-time and interrupted study were caused by one or a combination of the following in 5% or more cases:

Demands of a job	24%
Husband's mobility	18
Children	12
Desire for a break	10
Cost of study	9
Marriage	7
Income loss	6

Less than 5% of cases were caused by: health problems, divorce, supporting husband, community work, field research, competing interests, and possibility of husband moving.

Factors that impede women's efforts to obtain the doctorate are discussed in the section on obstacles to career development.

#### Master's Degrees

Seventy-three percent of 1877-1924 doctorates took degrees between the baccalaureate and doctorate (Hutchinson, 1930).

N.R.C. (1978) reported that, except in chemistry, most doctorates have master's degrees; proportions with master's degrees have ranged from 67 to 84% overall in different studies (62 to 97% in individual disciplines) (Bryan and Boring, 1947; N.R.C., 1976).

Eighty-seven percent of 1973-1974 doctorates had master's degrees; 13% did not. Of those with master's degrees, 57% earned the M.A., 21% the M.S., 10% the M.Ed., 6% other master's degrees, and 5% earned more than one master's degree. Those who did not earn master's degrees received doctorates mainly in the natural and social sciences, with one in the humanities, none in education.

#### Doctorates Earned

The types of doctorates earned between 1877 and 1924 were not discussed by Hutchinson (1930).

Grigg (1965) noted that about 65 doctoral degrees were offered in the U.S.; in 1965, 83% of doctorates awarded were Ph.D.s, 9% Ed.D.s, and 8% consisted of over 40 other degrees (Schweitzer, 1965). The Ed.D. is more commonly earned by those in education; 61% of 1956-1958 doctorates in education were Ed.D.s (Brown and Slater, 1960).

Among 1973-1974 doctorates, 86% earned Ph.D.s, 11% Ed.D.s, and 3% other doctorates. Among those in education, 55% earned Ed.D.s, and 45% Ph.D.s.

#### Baccalaureate Institutions

One thousand and twenty-five 1877-1924 doctorates received their baccalaureates from 150 institutions, of which 11 awarded over 25 each, and accounted for 48% of the total; nearly 50% earned baccalaureates from doctorate granting institutions, but only about 25% earned their baccalaureate and doctorate from the same institution, and fewer again received their bachelor's, master's and doctoral degrees from one

institution (Hutchinson, 1930).

For 1957-1958 doctorates, the 11 numerically most important institutions accounted for 16% of the baccalaureates (Astin, 1969).

Sixty-two percent of 1973-1974 doctorates earned their baccalaureate from an institution in the state of their high school graduation; 62% earned the B.A. or A.B., 32% the B.S., 1% the B.Ed., 3% other baccalaureates, and 2% earned more than one baccalaureate.

Eighty-eight percent of 1973-1974 doctorates changed institutions between their bachelor's or master's degree and doctorate. Factors involved in 5% or more of these changes were:

Availability of degree or program	33%
Location/proximity	20
Desire for broader perspective, variety, different institution	13
Location of spouse	9

Factors involved in less than 5% of cases were: financial, time gap, availability of facilities, change of interest, reputation of the institution, coming to U.S. for graduate school, recommendation for a program, not getting into a program, best professor in field of interest, mutual disappointment, divorce, personal reasons, maturity, and unhappiness with lifestyle.

#### Doctoral Institutions

Thirty-nine institutions conferred doctorates to 1025 of 1575 doctorates between 1877 and 1924, the nine numerically most important accounting for 75%, and the 20 most important awarding 94% (Hutchinson, 1930).

For 1957-1958 doctorates, the 20 most important institutions awarded 53% of the doctorates (Astin, 1969).

In the period of the present study (1973-1974), 251 institutions granted doctorates to women, of which the 20 most important accounted for 38% of the degrees (Appendix B; Baker and Wells, 1976).

#### Choice of doctoral institution

Hutchinson (1930) did not discuss choice of doctoral institution by 1877-1924 doctorates.

Forty-one percent of 1958-1963 doctorates attended graduate school in their home state (Sharp, 1970). Seventy-three percent of 1929-1967 doctorates mentioned proximity as a factor in choice of institution, while for 39% cost was a factor, and 36% included each of reputation and good faculty in their choice. Only 40% reported that their doctoral institution was their first choice (Mitchell, 1968; Mitchell and Alciatoire, 1970).

Twenty-nine percent of 1973-1974 doctorates took their doctoral work in the state of their high school graduation. Factors that were mentioned by 5% or more as affecting their choice of institution were:

Proximity/location	54%
Reputation of institution	49
Offer of a position	27
Financial	21
Recommendation	18

Factors mentioned by 5% or less were: availability of program or field, spouse, faculty, availability of child care, and chance. For 79% of 1973-1974 doctorates, the doctoral institution was their first choice, 2% had no choice or considered no other institution; for 20% the



doctoral institution was not the first choice, for the following reasons: not being able to afford to leave the area financially or emotionally, too much commuting, first choice offered less money, unable to move to first choice location, choice decided by husband's choice of school or acceptance of position, not able to leave family to go to first choice, both husband and self were accepted, flunked out of first choice, had to go where funded, dependent children prevented going to first choice, first choice did not take women over 30 or part-time students.

Nineteen percent of 1973-1974 doctorates did not complete all work for the doctorate at one institution, for the following reasons: variety, flexibility, enrichment, different points of view (5 cases), husband's relocation (3), financial (2), differences with professors (2), long break between master's and doctoral degrees (2), no doctorate offered at master's institution (2), desire to relocate (1), mutual disappointment (1), flunked out of first institution (1), too much commuting (1), personal reasons (1),

#### Doctoral Subjects

The major divisions of learning were fairly equally represented by the doctorates of 1877-1924 graduates (language, literature and arts - 31%, social sciences - 33%, natural sciences and mathematics - 36%), however language, literature and arts were decreasing in popularity, the social sciences were fairly stable, and the natural sciences and mathematics were becoming more popular (Hutchinson, 1930).

### Distribution of women's doctorates

The distribution of women's doctorates has fluctuated over time; from 1924 to 1975, the physical sciences decreased in popularity, and after an increase in the 1930s, the biological sciences also decreased; the social sciences showed fluctuations with an overall increase; the arts and professions declined until the early 1960s when they gained ground; education showed the largest growth (Harmon and Soldz, 1963; N.R.C., 1967, 1976).

The field distributions of doctorates for the present study period (1973-1974) and for the 1973-1974 sample are presented in Appendix D. Overall, education accounted for 31% of the doctorates, language, literature and the arts 25%, the social sciences 23%, and the natural sciences and mathematics 21%. The questionnaire respondents earned somewhat more degrees in the social sciences, and somewhat fewer in the other major areas of learning than 1973-1974 doctorates overall.

### Percentage of field

Women have constituted varying proportions of all doctorates awarded in a field. From 1920-1924 to 1969-1971, the arts, humanities, professions and education showed fluctuations with an overall increase in the proportion of women; all other fields showed an overall decrease (Solmon, 1973). N.R.C. (1976) reported that in 1975 women constituted 33% of doctorates in the arts and humanities, 14% in the professions, 31% in education, 25% in the social sciences, and 15% in the physical sciences. In individual fields, from 1960 to 1969 women exceeded 50% of doctorates only in home economics, and exceeded 25% in folklore, foreign

languages and library science (P. R. Harris, 1974); by 1973-1974, they exceeded 25% in area studies, education, foreign languages, interdisciplinary studies, letters, library sciences and psychology.

#### Choice of field

Hutchinson (1930) did not discuss choice of field with respect to 1877-1924 doctorates.

According to Bryan and Boring (1947), 52% of 1921-1940 doctorates showed their first interest in their doctoral field when under age 20; 85% had shown interest by age 24. Twenty-five percent of 1957-1958 doctorates chose their field before high school, while over 33% did not decide until after undergraduate work (Astin, 1969; Astin and Bayer, 1973). The factor most often mentioned as influencing choice of career by 1921-1940 psychology doctorates was interest in subject matter (80%); interest in science, research, people or social problems, and influence of parents, teachers or advisors were each mentioned by at least 40%.

Among 1973-1974 doctorates, 8% decided on the field of their doctorate before beginning undergraduate work, 34% decided during undergraduate work, 21% after undergraduate but before graduate work, 35% during graduate school, 2% after receiving a master's degree, and 1% while employed. Factors involved in choice of field in 5% or more cases were:

Interest/liking/fascination/ wanting to work in an area	40%
Relationship to field of employment	11
Relationship to employment/earning potential	6
Happensance, accident, default and so on	6
Inspired by coursework or earlier	

exposure

5

Factors involved in choice of field in less than 5% of cases were: related to abilities, for continuity from previous degree(s), role models, interest in helping people/desire to give, need perceived in the field, time-related, desire for interdisciplinary program, desire to administer, independent research abroad, reaction to rigidity in baccalaureate department, sound program, nursing too masochistic, versatile, more mature treatment than previous program, related to father's occupation, current questions, fascinated by counseling people, always knew wanted to teach, best basis for teaching in medical areas, read a book, and challenge (no one else was doing it).

#### Undergraduate versus Doctoral Subjects

Seventy-three percent of 1877-1924 doctorates were taken in the undergraduate subject; where there was a change, it was almost invariably to a similar subject (Hutchinson, 1930).

More recent researchers have also noted that most women take the baccalaureate and doctorate in the same field (U.S. Department of Labor, 1966; N.R.C., 1976), and that changes in major are within rather than between major fields (Astin, 1969).

Astin (1969) reported a strong tendency for 1957-1958 doctorates to take an undergraduate major in a field considerably more masculine and intellectually demanding than the typical woman graduate, however it has been noted that even at doctoral level, women tend to study in fields traditionally considered sex-appropriate (Burdett, 1958; Carnegie

Council, 1975; McCarthy and Wolfle, 1975; Harway and Astin, 1977; Walsh, 1978), and within these fields to be concentrated in certain, often low prestige, specialties (Brown and Slater, 1960; Patterson, 1973; Freeman, 1978). Carnegie Commission (1973) noted that there had been recent increases in women receiving doctorates in traditionally male fields, but that even in the 1970s 1920-1924 percentages were not always reached, and suggested that women were less inhibited in field choice in the early years than they have been more recently.

Patterson (1973) referred to pressure and preference theories that have been advanced to explain the field distribution of women. Counseling (Roby, 1972) and lack of encouragement (P. R. Harris, 1974) may keep women in disciplines traditionally considered sex-appropriate, and shifts in field may result from realization that the effort required to succeed in traditionally male fields is disproportionate to the rewards, or from realism regarding job opportunities (Astin, 1969). Astin (1969) reported that shifts from baccalaureate to doctorate subject for 1957-1958 doctorates included an increase in education, and a decrease in arts, humanities and the natural sciences; for 1960-1974 doctorates, there was a shift out of engineering, mathematics, the physical sciences, humanities and professions into education, and to a lesser extent into the life and social sciences (N.R.C., 1978).

Forty-nine percent of 1973-1974 doctorates indicated that they had changed to different subjects between the baccalaureate and the doctorate, and a further 24% had moved to a closely related subject; 17% had made changes between rather than within the major divisions of

learning. Changes in field included increases in education and, to a lesser extent, psychology. Reasons given for change in 5% or more cases were:

Changing interests	38%
Career opportunities/practicality	18
Not good enough for first field	9
Incompatibility with family	7

Reasons given for change in less than 5% of cases were: for versatility, financial, maturity, gap between start and finish, conflict with professors, change in attitude towards work, influence of a faculty member, marriage, need to specialize, pressures of first field too great, and obscurity of first field.

#### Financial Cost of the Doctorate

Hutchinson (1930) concluded that for 1877-1924 doctorates, ease in meeting the cost of the doctorate was exceptional, and financial strain that sometimes affected health, and must have affected quality of work was far more frequent. Nearly 70% had received fellowships or scholarships, most of which covered only tuition fees; over 50% had been employed during graduate school, often in addition to receiving financial aid that required work. A few doctorates had been aided by their families, commonly in the form of living expenses at home, and occasionally the entire expense had been met by the family. In some cases, the student had relied entirely on her own efforts to meet the cost, and a few had borrowed money (Hutchinson, 1930).

Financial aid

The costs of graduate instruction have increased steadily (Graduate Education for Women, 1956), and Boroff (1971) made reference to the hardship of female graduate students; financial aid may be available, but amounts insufficient (Stoddard, 1977), so students turn to employment, family, savings, loans and other sources to meet their costs. Data on financial support have been presented in various ways, which makes comparison difficult, and no clear trends are discernible. Sources of support vary by field (U.S. Department of Labor, 1966); according to Astin (1969) and Centra and Kuykendall (1974), the greatest proportion receive support in the physical sciences, the least in education; Sharp (1970) reported greatest support in the social sciences and least in education. Marital status does not seem to have a great effect on financial aid (Harmon, 1968; Feldman, 1974), but spouse's income can be an important source of support for married women (Creager, 1971; Feldman, 1973). Discrimination in financial aid is discussed in the section on obstacles to career development.

Thirty-two percent of 1973-1974 doctorates considered the doctorate to have been a financial strain, including 11% who considered it a serious strain; 14% felt that they could have completed the doctorate in a shorter time had more financial aid been available. Overall, the funds used by 1973-1974 doctorates for their education came from the following sources:

Teaching assistantship	23%
Scholarship/fellowship	22
Research assistantship	14
Spouse	9

Full-time job	7
Part-time job	5
Family	5
Savings	5
Government	3
Loans	3
Foundations	2
Institutional funds	1
Sabbatical income	1
Mission board funds	1

The following proportions of women received money from these

sources:

Teaching assistantship	56%
Scholarship/fellowship	47
Research assistantship	31
Family	23
Part-time job	21
Spouse	20
Savings	19
Full-time job	12
Loans	11
Government	8
Institutional funds	6
Foundations	4
Sabbatical income	2
Mission board funds	1

The average percentage of total funds received from each source for

those who received funds from that source was:

Mission board funds	100%
Sabbatical income	58
Full-time job	58
Foundations	47
Scholarship/fellowship	46
Spouse	45
Government	45
Research assistantship	44
Teaching assistantship	41
Part-time job	26
Savings	24
Loans	24
Family	23
Institutional funds	16



1973-1974 doctorates' advice to prospective doctoral candidates on how to meet the cost of the doctorate was as follows:

Assistantship	23%
Fellowship/scholarship	19
Employment	13
Loans	11
Savings	9
Spouse/family	3
Funded research	2
Grants/outside funding	2
Institutional support	2
Lower standard of living	2
Planning	2
Missionary funds	1
Sabbatical	1
Any way possible/according to opportunities	12

One woman made a point of advising against full-time employment.

#### The Dissertation

According to Hutchinson (1930), the dissertation marks the culmination of work for the doctorate, testing capacity to use knowledge of the field, and to make a contribution to it that is acceptable to scholars; it is a special test of information, methods of work, and creative ability.

#### Choice of subject

About 60% of the dissertation topics of 1877-1924 doctorates were suggested by the professor in charge; about 40% of students selected their own topic. The subject was sometimes selected automatically through choice of field or major professor, and in some cases evolved naturally; sometimes a chance circumstance suggested it, or the subject arose from coursework or practical experience. A few who chose their

own subjects worked with no supervision, but for others the professor in charge dictated every step (Hutchinson, 1930).

Seventy-five percent of 1934-1957 doctorates chose their own dissertation topic, and 75% of these favored this method, while 25% would have preferred cooperation with the professor; about 8% had their topics chosen by faculty members, and almost all disliked this, favoring a cooperative decision; 13% chose topics cooperatively, of whom 80% approved this approach, and 20% would have preferred their own choice (McPhie, 1960).

Among 1973-1974 doctorates, 63% chose their own topics; for 30% choice of topic was joint with the professor in charge, and in 7% of cases the professor chose the topic. Overall, 65% would have preferred to choose their own topic, while 35% would have preferred a jointly chosen topic; for 80%, the actual and preferred methods of choice coincided.

Five percent or more of the dissertation subjects of 1973-1974 doctorates were chosen in the following ways:

From practical experience	58%
From coursework	30
Out of interest/love of material	9
From the student's own study	7
By accident	6

Factors involved in choice of subject in less than 5% of cases were: someone else's input, availability of data or instrumentation, professor's interest or expertise, involvement in a grant proposal, background in the field, a perceived research need, and influence of state legislation.

Time involved

The time involved in the dissertation for 1877-1924 doctorates varied from under 1 year (8%) to 6 years or more (4%, including several women who spent 10 years); 34% spent one to less than 2 years, 29% spent 2 to less than 3 years, and 24% spent 3 to less than 6 years (Hutchinson, 1930).

More recent researchers have noted that the dissertation can represent huge expenditures of time, but have not quantified this (McPhie, 1960; Grigg, 1965); Barzun, 1968, cited by Boyer (1973), however, felt that the "old monumental life-sentence eiderdown-quilt" dissertation was receding into the past.

1973-1974 doctorates indicated that time involved in the dissertation ranged from 0.4 to 15.2 years, with a median of 2.1 years (mean 2.5). Time spent in research ranged from 0.2 to 15 years, with a median of 1.2 years (mean 1.6), and time spent writing ranged from 0.2 to 7.0 years, with a median of 0.8 years (mean 1.0). On average, the research took 60% of the time, the writing took 40%.

Strain involved

Comments on the heavy demands of the dissertation on mental and physical energy by 1877-1924 doctorates were numerous (Hutchinson, 1930).

Graduate Education for Women (1956) suggested that pursuit of the doctorate was arduous and precarious, especially because of the dissertation. McPhie (1960) referred to the huge expenditures of effort necessary to complete the dissertation, and Boroff (1971) suggested that

the dissertation might contribute largely to the attrition of doctoral candidates.

Poloma (1972) found that the period of dissertation writing was frequently cited as a difficult time by married women, who might feel guilt associated with it. Weber Shapiro (1977) studied four couples (married at least 2 years and childless), and found that the wife's dissertation resulted in: a change in each spouse's perceptions of self, other and the relationship; an increased disengagement from the relationship by the wife; and an accentuation of sex role and autonomy related issues in marriage. Women exhibited either collaborative or competitive adaptation to the situation, and husbands demonstrated supportive or unsupportive responses. Couples varied in their capacity to adapt, the result being either integration of new role behavior and increased individual autonomy and sex role flexibility, or role strain and marital struggles. Weber Shapiro suggested that dissertation writing accentuated a crisis in women's lives related to the role transition from graduate student to transitional adulthood to adulthood.

Forty-four percent of 1973-1974 doctorates found the dissertation a source of strain in their doctoral program. In terms of help and supervision received from the professor in charge, 2% indicated that they received more than they desired, 23% received a great deal, 52% an adequate amount, 16% less than desired, 5% none (including 1% who desired none), and 1% felt undermined.

### Publication

Publication of dissertation work by 1877-1924 doctorates was not discussed by Hutchinson (1930), except to note that occasionally there was some financial return from sale of dissertation work.

McPhie (1960) reported that 65% of women had published nothing from their dissertation work, 33% had published 1 to 3 articles, less than 3% had published more; 7% had published chapters of books based on dissertation work, and 12% had published in less formal formats.

Fifty percent of 1973-1974 doctorates published work arising from the dissertation; 1% disseminated it only by presentation; 49% had not disseminated their dissertation work. Thirty-nine percent had published their work in journal articles, 4% in magazine articles, 1% in books, and 2% in other formats; only 4% had published in multiple formats. Eleven percent received some remuneration from their dissertation work.

### Perceived value

Very few 1877-1924 doctorates expressed pleasure or satisfaction in writing the dissertation (Hutchinson, 1930).

Other researchers have reported more positive attitudes towards the dissertation. Ninety-eight percent of 1934-1957 doctorates considered the research experience to have been valuable, feeling that the process opened professional doors of opportunity, and taught invaluable research techniques. Those who had chosen their own subject, or chosen through a cooperative method, found dissertation work somewhat more valuable than those whose topic had been chosen by a professor (McPhie, 1960).

Berelson (1960) reported that 82% of doctorates considered the

dissertation work to have been the most valuable part of the doctoral training.

Fifty percent of 1973-1974 doctorates considered the research experience of the dissertation to have been very valuable, 37% found it quite valuable, and 13% did not find it valuable. The writing experience was considered to be slightly less valuable than the research; 43% found it to have been very valuable, 44% quite valuable, and 14% not valuable. Sixty-three percent found the research and writing experience equally valuable; 22% found the research experience more valuable than the writing; 15% found the writing experience more valuable.

#### Evaluation of Doctoral Program

The evaluations of 1877-1924 doctorates of their doctoral programs were not discussed by Hutchinson (1930), but their recommendations to others on the desirability of obtaining the doctorate were noted; 78% advised in favor of the doctorate without reservation, 7% advised against, and 14% gave contingent advice.

More recent researchers have reported general to almost complete satisfaction with the adequacy of doctoral programs in professional terms (Bryan and Boring, 1947; U.S. Department of Labor, 1966; Mitchell, 1969; Hill, 1970; Mitchell and Alciatore, 1970; Thrower, 1976). Twenty-five percent of 1921-1940 doctorates, however, reported instruction to have been too narrow in scope, 3% noted rather poor instruction, and 3% saw their programs as decidedly inadequate preparation for professional

work (Bryan and Boring, 1947). According to Centra and Kuykendall (1974), about 22% of 1950-1968 doctorates reported inadequacies of the doctoral training for subsequent jobs. Hill (1970) reported that over 33% of doctorates felt that their programs should have provided more insight into the roles and functions of women.

1929-1967 doctorates considered the investment of time and effort in the doctorate to have been worthwhile professionally and financially (Mitchell and Alciatore, 1970), and Bryan and Boring (1947) reported that 76% of 1921-1940 doctorates would have repeated the expenditure of time and effort to obtain the degree, while 8% would not, and 15% were uncertain.

It seems that women often persist in their doctoral programs despite difficulties, because there is an intangible value and personal satisfaction in mastering a segment of knowledge that compensates for the heavy demands involved (Graduate Education for Women, 1956; Mitchell, 1969). Gains in personal adjustment and self-concept have been reported as a result of completing the doctorate (Bryan and Boring, 1947; Thrower, 1976), and the investment of time and effort has been considered worthwhile in personal terms (Mitchell and Alciatore, 1970), although some have reported mixed feelings with regard to the personal costs and benefits of the degree (LeFevre, 1972); a few 1929-1967 doctorates mentioned negative aspects such as strained relations with colleagues and friends (Mitchell and Alciatore, 1970).

Seventy-nine percent of 1973-1974 doctorates found work for the doctorate to have been an enjoyable experience, even though 32% found it

a serious mental strain, 26% found it a serious physical strain, and 11% found it a serious financial strain. One woman reported that work for the doctorate was "just tedious," and one reported it to be "an obnoxious necessity." Thirty-six percent considered the doctorate to have been excellent preparation for their present jobs, while 25% thought it was good preparation, 17% adequate, 7% rather inadequate, 6% highly inadequate, and 9% irrelevant.

Eighty-five percent of 1973-1974 doctorates considered the expenditure of time, effort and money involved in the doctorate to have been worthwhile professionally, while 11% considered it somewhat worthwhile, and 5% did not consider it worthwhile. In personal terms, 90% considered the expenditure worthwhile, 6% somewhat worthwhile, and 4% did not consider it worthwhile. In financial terms, 55% considered the expenditure worthwhile, 23% somewhat worthwhile, and 22% did not consider it worthwhile.

Professional benefits of the doctorate were listed by 79% of 1973-1974 doctorates. In 5% or more cases, benefits were related to:

Professional opportunities/fulfillment	35%
Increased status	18
Finances	13
Professional advancement	9
Professional opportunities other than jobs	7
Increased skills	6

Less than 5% of benefits were related to: interesting colleagues, independence/freedom, credentials, broadened scope, introduction to research, good hours, time for creativity, introduction to field, ability to write grants as a principal investigator, ability to be a worthy peer in an academic setting, mobility.



Forty-six percent of 1973-1974 doctorates listed personal benefits of the doctorate. In 5% or more cases, benefits were related to:

Increased confidence/self-esteem	27%
Personal accomplishment/satisfaction	27
Freedom/independence/flexibility	6
People met who would not otherwise have been available	5

Factors involved in less than 5% of cases were related to: fulfillment, opportunity to travel, gratification of being able to help others or make social contributions, insurance of a saleable skill, ability to provide better education for children, feeling important, validation of intellect, new insights, realization of capacities and drive, satisfaction of serving as a role model, other goals seeming easier, achievement of status, interests and endeavors that would have been impossible otherwise, rewarding, highly positive personal life, inability to support present lifestyle without it. One woman described the personal benefits as "inestimable" and the doctorate as the "best thing I ever did."

Fifty-seven percent of 1973-1974 doctorates, however, indicated that they were dissatisfied in some way with their doctoral program.

Dissatisfactions in 5% or more cases were related to:

Faculty	26%
Content or orientation of program	25
Treatment during program	12
Lack of rigor of program	9
Inadequate preparation for later work	6
Research or dissertation	6

Factors involved in less than 5% of cases were related to: too many barriers, red tape, length of program, department politics, lack of intellectual stimulation, pressure, intellectual chauvinism, lack of

professional socialization, lack of career development, inflexibility of program, and requirement for too much aggressiveness/competition.

Among 1973-1974 doctorates, 89% indicated that they would repeat the expenditure of time, effort and money involved in the doctorate, while 9% would not, and 3% were unsure. Fifty-two percent of 1973-1974 doctorates recommended other women to work for the doctorate without qualification, 45% recommended doctorate work with qualification or gave contingent advice; only 3% recommended against it. Qualifications to a positive recommendation and contingent advice were as follows:

- Choose a technical scientific field.
- If interested and have plans for utilization for a sufficient length of time to justify the time/expense.
- Recognizing that the doctorate is not an end in itself - merely allows other pursuits.
- Only if wants, and if gets encouragement from spouse and children. Without this, a married woman with children will have terrible difficulty obtaining the degree, and even then could lose happy marriage.
- If interested in a field where it is of benefit.
- But only in a field they find absolutely fascinating.
- If it fits their personal objectives and lifestyles; for many it would be a hollow, meaningless accomplishment, if sought for other than genuine reasons.
- If they wanted it badly.
- In an enjoyable field.
- Only if doing so really gives them pleasure as they do it, not because it will be worthwhile later.
- But only if serious and a need exists, even if it is personal fulfillment.
- If they weigh the time, effort and money involved against future

time, effort and money expenditures professionally.

-- As long as one needs the doctorate to do what wants in field and/or if find the study itself intrinsically worthwhile.

-- If career oriented, especially, or if desire advanced training for personal gratification.

-- If really enjoy research and teaching.

-- If have fewer home responsibilities than four children at home and all the duties of a farm wife which husband expected me to consider as first priority.

-- As long as they have realistic expectations of the degree and of themselves.

-- If they want to.

-- If suited to such work and capable of succeeding.

-- Depends on career goals.

-- Only after field experience appropriate to field.

-- But not in political science at present.

-- If it's what they want.

-- "Exotic" fields do not do much for the bank balance.

-- Only if job opportunities available. Can be turned down for some jobs because overeducated/overqualified, which is disheartening after all the time and effort spent.

-- If they want to and have looked realistically at the rewards and difficulties.

-- Be prepared to work/don't expect special treatment.

-- Try to find allies; don't compromise yourself.

-- Depends on the individual.

-- Only if it is the most important thing in your life.

-- Only if highly motivated to undergo such a great deal of pressure.

-- If they want to and enjoy the process.

- Depends on their strengths, weaknesses and career goals.
- Depends on circumstances, goals, ambitions, market etc.
- Depends on personality - love of study, willing to take a risk (because jobs scarce).
- Should aim for private sector money making job.
- Consider availability of jobs in your preferred geographic location.
- Only those who really want one enough to get one.
- Only if they are very good and very committed - or very rich. Compared to when I was a graduate student, the financial strain is much greater and employment prospects dim. But depends on the field too.
- Should be a pragmatic choice, not an idealistic one.
- Has to be a personal choice.

When asked to give advice to prospective doctoral students, 1973-1974 doctorates noted the following:

- Keep motivation high; work hard; take care to pick a skillful dissertation advisor; if/when depression sets in - talk it through with friends and/or advisors and/or therapist, to help you hang in there.
- Study hard. Plan to enjoy the program.
- Stick with it - select a manageable dissertation topic - stick to it, stick to it - stick to it.
- Do it.
- Supportive friends and/or family are quite important.
- Learn all you can about what will be expected of you and weigh these with your abilities, time and energy - decide whether it's worth it for you.
- For the married students, try not to compete with the other students who don't have as much responsibilities as far as time (finishing up the degree) is concerned.
- Don't study on Sunday. Take time for worship, prayer, rest, relaxation, friendship.
- Tough it out; it will be hell at times, but it's well worth it.

- Choose best and most prestigious institution.
- Build total program from day one aimed at dissertation - i.e. all possible papers for courses as resources for the dissertation etc.
- Avoid making decisions based on external pressures of any kind; begin as early as possible to establish adult priorities and in terms of these to work at achieving integration and balance of all important factors.
- Learn everything you can, find the best professors, work hard, never take yourself too seriously.
- Be very careful of putting Academia ahead of interpersonal relations.
- Be accepting of hard work and pay attention to fine detail. It will be a rewarding experience if you enjoy personal and professional sustained challenge as I do.
- Pick best school and best advisor.
- Precisely the advice one of my major professors gave me: "Don't marry until you finish your thesis."
- Have written agreement with committee members on courses required and consultation hours for writing dissertation: underwritten by department chair.
- Learn to love seeking knowledge for its own sake. Don't let research get in the way of personal knowledge and growth.
- I had 2 children in school, an invalid mother and a husband not fully supportive. If I could do it so can anyone who really wants to.
- Spousal support, particularly emotionally; supportive graduate department; clearly defined goals during and after graduation.
- At least in my field (and I believe in most others), don't take it too seriously. The academicians will hold up innumerable hoops for you to jump through, very few of which will relate to your later work, so jump on through for your own sake, without believing the hoops are more than a game and laugh as much as possible.
- Enjoy, laugh, take time to relax and explore. The degree is (or should be) fun and rewarding all the way through - not just at the end.
- Take a careful look at the emotional/time demands of the program, and how it may affect your relationships - choose a program that is flexible, allows a break or part-time in case of unexpected pressures.

-- Ignore what they say about the job market; work with a feminist, get out fast, point your dissertation toward a job.

-- Interview students who have studied with faculty to ascertain ATTITUDES.

-- Be sure of what one wants to do.

-- No need to hurry.

-- Always get agreement/promises from professors - in WRITING.

-- It can be done under less than ideal circumstances, but you must be willing and able to shoulder most of the responsibility for your own program yourself.

-- Select university carefully in terms of specific goal/ orientation.

-- Keep your life in balance (work, play, love, worship).

-- Allow time enough for studies - not just cram to get grades.

-- Be political, pick an advisor who you can talk openly with, find women professionals in your area whom you can speak with and trust (not always that easy).

-- Design dissertation as simply as possible. Get a mentor who will go out of his/her way for you.

-- Work prior to and during graduate program.

-- Finish degree before children, pursue full time if possible.

-- Be prepared to give it everything you have and be sure you have the experiential background necessary.

-- Plan for uninterrupted time to write dissertation.

-- Keep your perspective about what is really important to you now as well as in the near and far future.

-- Hang in there and get the Ph.D.

-- Get on with it and finish the dissertation. Don't put off courses, writing, etc. Stick to it and FINISH!

-- Look for programs with female faculty.

-- Go full time and finish the dissertation before leaving.

-- Love school, don't worry about job market; be tolerant of others; know how to work and how to play, and when.

-- Learn how to read and write.

-- Tailor program to future needs rather than expediency.

-- Choose your field and put your all into it and enjoy the challenge and wonderful people you will meet along the way!

-- Enter a program with a good record of getting candidates through the program; never delay work on dissertation; marry supportive men.

-- I would advise other women seeking the doctorate to consider long range prospects for employment and the dangers of being "overeducated." If possible, they should get research experience as undergraduates, and should fully comprehend the "apprenticeship" nature of the major professor-graduate student relationship before choosing a graduate school or research specialty. If possible, learn a marketable skill to fall back on.

-- Select an institution with competent faculty.

-- It's worth the agony!

-- Take a close look at the job market.

-- Do the best job you can and enjoy it/don't waste time on blaming others for holding you up and don't look for scapegoats.

-- Study what you love and worry later whether a job will be available.

-- Focus in on a well-defined project, do it, and get out of school as soon as possible.

-- Do your own research projects from the start, read like crazy, stay out of student politics - almost a direct quote from one of my professors - he was right - I followed his advice except for "staying out of student politics" and thereby wasted some valuable time.

-- Pursue your education before you start your family. It is physically difficult to continue to be all things to all people (husband and children) and a serious student as well.

-- Be selfish to survive in graduate school.

-- Attempt to finish it quickly. Some put the dissertation off.

-- Choose your dissertation director wisely.

-- Plan your personal and professional lives carefully. If you must marry, wait. Have specific professional goals. Know there is life after graduate school.

-- To choose field according to job market.

-- Keep at it. You can get the degree if you want it and are willing to persist. Be practical about what type of dissertation can be approved: feminist but not "too" feminist, radical but not "too" radical.

-- If you are bright, go for it regardless of impediments, if not, don't bother.

-- Understand that 50% of what you feel is bad and unfair is real and everybody else is experiencing it too and the other 50% you just have to have the intestinal fortitude to handle.

-- Realize it will be tough; find some likeminded people; realize you're not alone.

-- Be prepared to work harder than you've ever experienced, to give up your own ideas for another's, and be persistent.

-- Enter graduate school with prior knowledge of what a career in your field entails, requires, and means.

-- If you want a job, find out what field offers the most opportunity for employment rather than the field most attractive to you. After you graduate, you may find time to pursue your own interests.

-- Be assertive - don't be intimidated by adviser's status.

## Discussion

### 1973-1974 doctorates

Very few 1973-1974 doctorates made the decision to pursue the doctorate before beginning their undergraduate work; about one-fourth decided during undergraduate work and one-tenth between undergraduate and graduate work; about two-fifths made the decision during graduate school, a few after they had received a master's degree, and about one-tenth after working or having children.



About two-fifths cited only idealistic reasons for doctoral work, while very few cited only vocational reasons, and slightly over half cited a combination of both types of reasons; personal satisfaction was the most commonly cited reason. The majority were influenced by others in their decision to work for the doctorate; spouse, colleagues, college personnel, family and friends all made contributions, while high school personnel did not influence most women's decisions.

About one-third started their doctoral work immediately after receiving the baccalaureate. The reason for delay most often cited by the other two-thirds was work-related, while marriage and family or child-rearing were also important. Almost nine-tenths worked during the hiatus (including about one-fifth who combined work, marriage, and raising families), while about one-tenth were homemakers. Slightly over one-fifth advised students to start doctoral work immediately after undergraduate work, while over half advised against this, and about one-fourth gave contingent advice. Those who advised in favor of a delay were mostly concerned with both the necessity and benefits of experience and maturity in doctoral work. Over half advised that work experience should fill the gap between undergraduate and doctoral study, and about one-fifth advised any kind of experience.

Baccalaureate to doctorate time lapse ranged from about 3 to 38 years, with a median of 9 years. Numbers were too small to be reliable, but suggested that those who did not take a master's degree saved about 2 years on the median time lapse. Median time actually registered for the doctorate was only 5 years. Half studied for the

doctorate full-time, and most others combined full-time and part-time study. Factors related to marriage and children accounted for over two-fifths of the part-time and interrupted study, although demands of a job were the single most often cited factor (about one-fourth).

About seven-eighths earned master's degrees, over half of whom earned the M.A.; those who did not earn master's degrees studied mainly in the physical and social sciences. About six out of seven earned Ph.D.s, about one-tenth earned the Ed.D., and a few earned other doctorates; among those in education, slightly over half earned Ed.D.s, but numbers were small.

Over three-fifths took their baccalaureate in the state of their high school graduation. Over three-fifths earned the B.A. or A.B., and about one-third earned B.S. degrees. Almost nine-tenths changed institutions during their college careers, one-third due to availability of degree or program, and about one-fifth for reasons related to location.

Doctorates were earned from 251 institutions; about three-tenths took their doctorate work in the state of their high school graduation. Over half mentioned location or proximity in their choice of doctoral institution, and about half also mentioned reputation of the institution. About four-fifths took their doctorate work at their first choice institution, while about one-fifth changed institutions during their doctoral programs.

Education predominated in the distribution of doctorates with almost one-third, while one-fourth earned doctorates in language,

literature and the arts, almost one-fourth in the social sciences, and about one-fifth in the natural sciences and mathematics. P. R. Harris' (1974) data indicated that in 1973-1974 women constituted one-fourth or more of all doctorates in only seven subjects.

Few women chose their doctoral subjects before beginning their undergraduate work, while one-third chose during undergraduate work, about one-fifth between undergraduate and graduate work, and about one-third during graduate school. Interest/fascination with the subject and desire to work in that area accounted for two-fifths of choices. Almost three-fourths changed fields during their college careers, about half to a somewhat different field, and one-fourth to a closely related field; one-fifth of changes were between major divisions of learning. Changes in field included an increase in education and, to a lesser extent, psychology; change of interest was the most frequently cited reason for change of field (almost two-fifths), with career/employment opportunities and practicality cited by almost one-fifth.

About one-third found the doctorate a financial strain, including about one-tenth who found it a serious strain. Assistantships, scholarships and fellowships were the most important sources of funds for doctoral study, and more women received funds from these than from other sources, however women used funds from a variety of sources, and in individual cases other sources were more important. About one in seven felt that they could have completed the doctorate in less time had more financial aid been available. Based on their experience, they advised most often in favor of assistantships, fellowships and

scholarships to finance doctoral work.

Over three-fifths chose their own dissertation topics, while in almost one-third of cases the choice was joint with the professor in charge, and in a few cases the professor chose the subject. Slightly under two-thirds favored their own choice, and slightly over one-third preferred a joint choice; choice by the professor received no support. For four-fifths, the actual and preferred methods of choice coincided. Nearly three-fifths of dissertation topics arose from practical experience, and coursework accounted for another three-tenths. Time involved in the dissertation ranged from under one to over 15 years, with a median of about 2 years. On average, the research took three-fifths of the total time, and the writing two-fifths. Over two-fifths found the dissertation a source of strain in their doctoral program. About three-fourths received adequate help and supervision in their dissertation work from the professor in charge, while slightly over one-fifth received less or more than they desired, and one woman felt undermined. Half disseminated their dissertation work in publications (mostly journal articles), and about one-tenth received some remuneration from their dissertation work. Half considered the research experience of the dissertation to have been very valuable, and about three-eighths considered it quite valuable, while the remainder did not find it valuable; the writing experience was considered to have been slightly less valuable.

About six out of seven considered the doctorate to have been worthwhile in professional terms, while about one-tenth found it

somewhat worthwhile, and a small proportion did not find it worthwhile. The doctorate was reported to have been even more worthwhile personally - nine-tenths found it worthwhile, 6% somewhat worthwhile, 4% not worthwhile. In financial terms, the doctorate was considered to have had less value; slightly over half reported it to have been worthwhile, nearly one-fourth considered it to have been somewhat worthwhile, and slightly over one-fifth did not find it worthwhile.

About four-fifths considered the doctorate to have been an enjoyable experience, even though about one-third reported it to have been a serious mental strain, one-fourth found it a serious physical strain, and about one-tenth found it a serious financial strain. Over one-third considered the doctorate to have been excellent preparation for their present job, while one-fourth thought it was good preparation, and about one-sixth found it adequate; over one-fifth reported it to have been inadequate or irrelevant. Fifty percent of dissatisfactions with the doctoral program were related to faculty or the content or orientation of the doctoral program.

About four-fifths listed professional benefits of the doctorate, over one-third of which were related to professional opportunities and fulfillment that would not otherwise have been available, and nearly one-fifth were related to increases in status, prestige, respect, recognition, credibility, authority, power, influence, responsibility, and leadership. Over half of the personal benefits of the doctorate listed were related to increased confidence, self-esteem and so on, and feelings of personal accomplishment and satisfaction.

Almost nine-tenths indicated that they would repeat the expenditures involved in the doctorate, while one-tenth said that they would not. Slightly over half recommended other women to take the doctorate without qualification, while slightly under half recommended it with qualification or gave contingent advice; very few recommended against it. Advice to prospective doctoral candidates was presented.

Comparison of 1973-1974 doctorates with 1877-1924 doctorates

Over four times as many women earned doctorates in the academic year 1973-1974 than in almost half a century between 1877 and 1924.

1973-1974 doctorates were less likely to cite only idealistic factors in their reasons for doctoral study than their earliest counterparts, and were more likely to cite a combination of idealistic and vocational motivations, in line with Hutchinson's (1930) indication that a combination of idealistic and vocational motivations was increasingly likely to be cited after 1890. All the idealistic and vocational motivations cited by 1877-1924 doctorates were also cited by their most recent counterparts, however each was cited by a smaller proportion, and other factors had become more important. Among both sets of doctorates, spouse, family and college personnel were influential in the decision to work for the doctorate, but for the most recent doctorates, colleagues and friends also played a part in the decision.

Recommendations to prospective doctoral students as to when doctoral work should begin given by 1973-1974 doctorates were very similar to those given by their earliest counterparts. Justifications

for starting immediately differed somewhat for the two groups, with more emphasis by the earliest doctorates on the advantages of youth; justifications for a delay were similar, with the emphasis on the necessity and benefits of experience and maturity even greater among the most recent doctorates. Recommendations as to what should fill the gap between undergraduate and doctoral study given by the two sets of doctorates showed similar emphasis on practical work experience.

The range of baccalaureate to doctorate time lapse was similar for the two sets of doctorates, although the median was slightly longer for the later doctorates. More 1973-1974 doctorates than 1877-1924 doctorates had master's degrees, but for both sets of doctorates there was a time saving if no master's degree was taken.

1973-1974 doctorates earned their doctorates from many more institutions than their earliest counterparts, and were less likely to have earned their baccalaureate and doctorate from the same institution.

The field distribution of 1973-1974 doctorates showed a decrease in the natural sciences and mathematics, language, literature and arts, and social sciences since the 1877-1924 period, accounted for by the large growth in the field of education, which is now reported as a separate category from the other social sciences. 1973-1974 doctorates were considerably more likely to have changed fields during their college careers than their earliest counterparts, and were more likely to have made major field changes.

Financial strain during doctoral study was noted for both sets of doctorates. Financial resources for study came from similar sources;

fewer of the most recent doctorates had received scholarships and fellowships than was so for their earliest counterparts, assistantships having become more important. Spouses were also an important source of funds for the most recent doctorates, in line with the finding that a higher proportion was married than was so among 1877-1924 doctorates.

1973-1974 doctorates were somewhat more likely to have chosen their own dissertation topic than their earliest counterparts, and much less likely to have had it suggested by the professor in charge; joint choice of topic was not mentioned for the earliest doctorates, but was important for their most recent counterparts. Dissertation topics arose in similar ways, and time involved in the dissertation was almost exactly the same for the two sets of doctorates. It was noted that the dissertation could be a source of strain among both sets of doctorates, however the most recent doctorates considered the dissertation work to have been much more valuable than their earliest counterparts. A small proportion of both sets of doctorates received remuneration from the dissertation work.

Very few among either set of doctorates advised other women not to work for the doctorate, however the most recent doctorates were less likely to advise in favor of the doctorate without reservation, and were more likely to give contingent advice, than their earliest counterparts.

#### Comparison of 1973-1974 doctorates with other doctorates

1973-1974 doctorates gave similar reasons for working for the doctorate as earlier doctorates, and similar people were influential in their decisions, though their importance varied somewhat.



As reported for earlier doctorates, again 1973-1974 doctorates were likely to take a break between undergraduate and doctoral work, and were likely to work during this break.

Data for 1973-1974 doctorates indicated that median time lapse between baccalaureate and doctorate has probably ceased decreasing. Time spent actually registered for the doctorate was similar to that reported for earlier doctorates, and a wide range in time spent working for the doctorate was again noted.

The proportion of 1973-1974 doctorates who had master's degrees was slightly above the range reported previously, but it was found that it was not only in the physical sciences (particularly chemistry) that a master's degree is unnecessary; those without master's degrees studied in the social as well as the physical sciences. The figures for types of doctoral degrees earned by 1973-1974 doctorates were similar to those reported by Schweitzer (1965), with slightly fewer earning degrees other than the Ph.D. or Ed.D.; as previously reported, those in education were more likely to earn the Ed.D.

Data for 1973-1974 doctorates indicated that women have earned doctorates from an increasing number of institutions over time. The proportion of 1973-1974 doctorates taking their doctoral work at an institution in their home state was smaller than the proportion of 1958-1963 doctorates, but again the importance of location in a woman's choice of institution was documented; proximity/location was the most frequently cited factor in choice of doctoral institution among 1973-1974 doctorates, though it was not cited by as high a proportion as

reported for 1929-1967 doctorates. Reputation was more important for 1973-1974 doctorates than for 1929-1967 doctorates, financial factors were less important and faculty much less important, while the offer of a position and recommendation were important for 1973-1974 doctorates. 1973-1974 doctorates were about twice as likely to attend their first choice doctoral institution as 1929-1967 doctorates.

According to Solmon (1973), the proportions of doctorates awarded to women in various fields have fluctuated, with arts, humanities, professions and education showing overall increases, and other fields showing decreases; P. R. Harris' (1974) data for 1973-1974 doctorates suggested that women have made inroads into some fields. 1973-1974 doctorates were considerably slower to choose their doctoral field than 1957-1958 doctorates, but, as for 1921-1940 doctorates, interest was most often cited in choice of field, though not to the extent previously reported. Other factors mentioned by 1921-1940 doctorates as influencing their choice of field were cited much less frequently by 1973-1974 doctorates. As suggested by Astin (1969), reasons for changing field between baccalaureate and doctorate reported by 1973-1974 doctorates included factors related to career opportunities and pragmatism, although the most often cited reason was change of interest. Changes in field between the baccalaureate and doctorate included an increase in education and, to a lesser extent, psychology, in line with earlier findings.

As suggested by Boroff (1971), doctorate work can be a financial strain for some women. 1973-1974 doctorates received funding for their

doctoral work from similar sources as earlier doctorates, and the importance of spousal support previously suggested was confirmed for these women.

1973-1974 doctorates were less likely to have chosen their dissertation topics than 1934-1957 doctorates, and more likely to have chosen in cooperation with the professor in charge. The method of choice only by the professor was again not favored. The strain that can be involved in the dissertation reported by earlier researchers was again noted. 1973-1974 doctorates were more likely to have disseminated their dissertation work by publication than was reported by McPhie (1960); they did not, however, find the dissertation work quite as valuable as McPhie had reported.

As reported for earlier doctorates, 1973-1974 doctorates were fairly well-satisfied with their doctoral programs. They had similar dissatisfactions as 1921-1940 doctorates, with increased dissatisfaction related to faculty and to treatment during the doctoral program. Compared to 1950-1958 doctorates, 1973-1974 doctorates indicated less dissatisfaction with respect to preparation for subsequent jobs.

As reported for 1929-1967 doctorates, 1973-1974 doctorates considered the expenditure involved in the doctorate to have been worthwhile professionally and personally, however they found it less worthwhile financially, contrary to the evaluation of 1929-1967 doctorates. Similar personal benefits of the doctorate were noted in terms of adjustment and self-concept as reported for earlier doctorates. 1973-1974 doctorates were more likely to indicate that they would repeat

the expenditures involved in the doctorate, and were less likely to express uncertainty about this, than 1921-1940 doctorates, however about the same proportion indicated that they would not repeat these expenditures.

## POSTDOCTORAL CAREER DEVELOPMENT

## Introduction

This section is addressed to a description of the postdoctoral career development of the woman doctorate.

## Postdoctoral Fellowships

According to Folger et al. (1970), a postdoctoral fellowship is generally considered to be a reward for predoctoral performance, and a favorable predictor of future employment and productivity. Frequently it entails some financial sacrifice, but may give short- or long-term prestige to its recipient. Reskin (1976), however, found that female chemists accumulated no advantages from the postdoctorate, and suggested that it probably should not routinely be interpreted as honorific for women. Though postdoctoral fellowships may represent personal career choices, Reskin considered it more likely that women are allocated to these positions, or seek them because of barriers to regular appointments, and that this adversely affects their professional development. Astin (1969) suggested that antinepotism rules may make the postdoctorate the only option for married women, especially if both spouses work in the same field (antinepotism rules are discussed in the section on obstacles to career development).

Nine percent of 1877-1924 doctorates held postdoctoral fellowships (Hutchinson, 1930).

The proportion of women planning and taking postdoctorates

increased from about 5 to 14% overall from 1950 to 1975 (N.R.C., 1967, 1976, 1978; Harmon, 1968; Astin, 1969; Astin and Bayer, 1973; Centra and Kuykendall, 1974), but large field differences have been reported (Harmon, 1968; Astin, 1969; N.R.C., 1976), which reflect emphases on research and availability of funds (Astin and Bayer, 1973; N.R.C., 1978). From 1960 to 1974, the overall proportion planning postdoctoral study was 12%; by field the proportions were: education - 2%, professions - 3%, humanities - 3%, social sciences - 10%, engineering, mathematics and physical sciences - 27%, life sciences - 41% (N.R.C., 1978).

Research relating marital status and parity to receipt of postdoctoral fellowships has shown inconsistent results. Astin (1969) found that younger women were awarded more postdoctorates, as were those who had received support during their training, factors which may be related to field of study.

Among 1973-1974 doctorates, 6% indicated that they had held postdoctoral fellowships.

#### Labor Force Participation

An overall employment rate of 84% was reported for 1877-1924 doctorates, with no major differences in employment for the three major divisions of learning; married women were less likely to be employed than single women, and those who completed their doctorates after marriage were more likely to be employed than those who married after receipt of the doctorate, but an increasing tendency for women to

continue work after marriage was noted (Hutchinson, 1930).

#### Employment rates

It has been reported that women doctorates have a high rate of employment (Bliss, 1954; Astin, 1969; Astin and Bayer, 1973; Carnegie Commission, 1973), that the doctorate helps women to stabilize their employment (Miller, 1957), and that early career commitment persists (Astin, 1969; Centra and Kuykendall, 1974).

Seven percent of 1957-1958 doctorates had never interrupted their careers (Astin, 1969), while about 65% of 1950-1968 doctorates worked full-time with no interruption after receipt of the doctorate, a proportion that was increasing over time (Centra and Kuykendall, 1974). In terms of total possible work time, 1921-1940 doctorates showed 72% employment (Bryan and Boring, 1947). In various studies, full-time employment of women doctorates has ranged from 78 to 98%, part-time employment 1 to 10%, full- plus part-time employment 75 to 99%, and unemployment 4 to 8% (Bliss, 1954; U.S. Department of Labor, 1966; Winkler, 1968; Astin, 1969; Mitchell, 1969).

On the basis of total time since receipt of the doctorate, 1973-1974 doctorates overall showed 90% full-time equivalent employment. A breakdown indicated 82% full-time employment, 6% employment more than half-time; 4% half-time employment; 4% employment less than half-time; 5% unemployment. At the time of the study, 82% were employed full-time, 5% more than half-time, 4% half-time, 5% less than half-time; 4% were unemployed (1% due to poor health), and 2% retired (1% due to poor health). Thirteen percent had been unemployed at some time, for an

average of 2.7 years; 61% had always worked full-time. Among those not working full-time at the time of the study, 55% were intending to increase their participation in the labor force in the future.

Overall, 1973-1974 doctorates were working about the same amount of time as they preferred: 75% preferred to work full-time; 11% more than half-time; 9% half-time; 3% less than half-time; 2% preferred to be unemployed (full-time equivalent 89%). However, on an individual basis, only 77% were working the amount of time they preferred, 15% were working more, and 8% were working less. Reasons for working more than preferred were: related to finances (7 instances); time needed for research, writing and consulting (4); necessity for legitimacy in academe (1); job security (1); increased professional status (1); type of job (1); fringe benefits (1). Reasons for working less than preferred were: inability to find a full-time job (2); health problems (2); money not available to fund a full-time position (1); need for a temporary vacation (1); lack of mobility (1); the economy (1).

#### Employment in the doctoral field

The amount of employment in the doctoral field for 1921-1940 doctorates represented a 65% return on their training. The proportion of total employment since the doctorate that was related to the doctoral field for 1950-1968 doctorates was: 74% all or nearly all; 13% half or more; 6% less than half; 4% very little or none (Centra and Kuykendall, 1974).

Out of the total time that 1973-1974 doctorates had worked since receipt of the doctorate, 80% was spent working in the field of the



doctorate; 20% was out of the doctoral field. At the time of the study, 75% of employed women were working in the field of their doctorate, 18% were working out of it, and 7% were combining the two.

#### Variables affecting labor force participation

Centra (1975) noted that full-time employment among 1950-1968 doctorates varied by field: physical sciences - 70%; social sciences - 78%; biological sciences - 82%; humanities - 85%; education - 92%.

Home and personal factors and pre- and post-doctoral experiences influence the career decisions of women doctorates (Astin and Bayer, 1973), and marriage and preschool children have been reported to be the most important environmental factors affecting employment (Astin, 1967). Marriage increases the tendency to work part-time, to interrupt employment, and to be unemployed (Bryan and Boring, 1947; Graduate Education for Women, 1956; Astin, 1967, 1969; Simon and Rosenthal, 1967; Patterson, 1971; Centra, 1975; Broschart, 1978). Astin (1967, 1969), however, found that if marriage took place after receipt of the doctorate, women were more likely to be unemployed than if it took place before or during graduate school. Having children, especially preschoolers, also increases part-time and interrupted employment (Bryan and Boring, 1947; Astin, 1967, 1969; Broschart, 1978). Astin (1967, 1969) noted that if women were married to highly educated husbands with a substantial income, they were more likely to work part-time or to be unemployed, and U.S. Department of Labor (1966) reported employment of 1957 doctorates to be affected by family status, husband's attitudes, employment status and occupation, and availability of child care and

domestic help. Centra (1975) reported that 57% of occurrences of unemployment among 1950-1968 doctorates were related to marriage or family. Simon et al.'s (1967) data for 1958-1963 doctorates illustrate these effects:

	Employed		Unemployed
	full-time	part-time	
Single	96	0	4
Married	87	4	9
Married with children	59	24	16

Of 88 reasons for ever having worked less than full-time given by 1973-1974 doctorates, 5% or more were related to the following:

Children	22%
No suitable job available	20
Income not necessary	14
Pregnancy	14
Marriage	10
Spouse's mobility	6

Less than 5% were related to: poor health, not wanting to teach, pressure from spouse, pressure from family, lack of domestic help or child care, choice, wanting time for personal projects, and full-time practice not developed. Fifty-three percent of factors were directly related to marriage or children.

#### Type of Employer

Academic institutions were important employers overall of 1877-1924 doctorates, but there were large variations in the proportions of those engaged in different major work activities who were employed by such institutions (Hutchinson, 1930).

Academic institutions, particularly colleges and universities, have been a major source of employment for women doctorates and, according to

Harmon (1965) and Astin (1972), the importance of academic employment has increased over time, although N.R.C. (1978) data indicated that the proportion of new doctorates taking academic employment began to decline after 1970. The proportion of women doctorates employed by 4-year colleges and universities has ranged from 58 to 90% in different studies, while 3 to 12% has been reported for 2-year and junior colleges and schools, indicating 61 to 92% employment in academic institutions. Business and industry have been reported to employ 2 to 7% of women doctorates, government 2 to 9%, and other employment has accounted for 10 to 32% of women doctorates (Bliss, 1954; Harmon, 1965; N.R.C., 1967, 1976; Mitchell and Alciatore, 1970; Astin and Bayer, 1973; Centra and Kuykendall, 1974).

Type of employer varies by field; N.R.C. (1967) data for first postdoctoral employer of 1958-1966 doctorates indicated that those graduating in the arts and humanities, professions and education were more likely to find academic employment than those in the natural sciences and engineering or social sciences; those in the natural sciences and engineering were more likely to be employed by government than those in the arts, humanities, professions and education; those in the natural sciences and engineering were more likely than others to be employed in industry. Mitchell and Alciatore (1970) noted that college employment was more likely for those in education, the arts and humanities, while university employment was more likely for those in the natural sciences and professions.

Astin (1969) found no great differences between the employment

setting of single and married women, while Astin and Bayer (1973) found that single women were more likely than married women to remain constantly in academic positions, or to shift from nonacademic to academic work, and Patterson (1971) found that more married than single women shifted between nonacademic and academic employment.

Among 1973-1974 doctorates employed at the time of the study, 41% worked in universities (19% in doctoral institutions, 19% in other universities, 3% unspecified), 10% worked in 4-year colleges, 6% in 2-year or junior colleges, 7% in schools or for school systems, 9% in business, industry, and private enterprise, 7% in government, 4% in a nonprofit organization, 3% in a research institution or organization; 11% were self-employed, and 2% worked in other situations. Sixty-four percent overall worked in academic institutions (57% in higher education).

#### Job Activities

Teaching was by far the most common job activity among 1877-1924 women doctorates (69%); 13% had administrative and executive positions, 9% research positions, and 9% miscellaneous other positions (Hutchinson, 1930).

More recent researchers have also reported that teaching is the principal work activity of women doctorates (Bliss, 1954; Miller, 1957; N.R.C., 1967; Simon and Rosenthal, 1967; Winkler, 1968; Astin, 1969; Harrington, 1971; Centra and Kuykendall, 1974; N.R.C., 1976); fewer are involved in research, and fewer again in administration, although the

latter increases with time (Harmon, 1968). Studies have indicated that 50 to 63% are involved in teaching, 13 to 25% in research, 7 to 15% in administration, 5 to 12% in professional services to clients, and up to 15% in other activities (Bliss, 1954; N.R.C., 1967, 1976; Astin, 1969; Centra and Kuykendall, 1974).

Primary work activity has been reported to vary by field (N.R.C., 1967); more women in the arts, humanities, professions and education perform teaching functions than women in other fields, more are engaged in research in the physical sciences and to a lesser extent the social sciences than in other fields, more are involved in administration in education than in any other field, and more perform professional services to clients in the social sciences than in any other field (N.R.C., 1967, 1976; Astin, 1969; Astin and Bayer, 1973; Centra and Kuykendall, 1974).

Harmon (1968) reported no consistent differences between single and married women in proportions of time spent in various work activities, however Simon et al. (1967) and Astin and Bayer (1973) noted more single women in teaching and more married women in research, and Astin and Bayer (1973) noted more single women in administration, and suggested that this reflected the married woman's limitations in academic appointments. Married women with and without children have been reported to perform very similar activities (Simon et al., 1967). Younger academic women do more research at the same career stage than older women (Harmon, 1968), and women working full-time are more likely than those working part-time to be involved in research and

administration. Women's job activities may not always be in line with their preferences; Henderson, 1967, cited by Robinson (1971), found that women would have preferred to spend less time teaching and more in research and student counseling.

Thirty-two percent of 1973-1974 doctorates listed teaching as the major activity in their present job; for 16% it was professional services to clients; for 14% administration; for 6% research and development; for 15% it was some combination of these activities; and for 15% other activities were more important. Overall, they spent 34% of their time teaching, 22% in administration, 19% in professional services to clients, 15% in research and development, and 10% in other activities. Their preferred distribution of time would have been: teaching - 32%, research and development - 31%, professional services to clients - 16%, administration - 15%, other - 6%, indicating that overall they spent more time in administration and less in research and development than they would have preferred. Only 39% indicated that their time was distributed between the major work categories as they wished it to be.

It has been noted that the proportion of women teaching decreases as course levels increase (Howe et al., 1971), so that women, especially if untenured, are more likely to teach undergraduates than graduates. Rossi (1970a) reported that 55% taught only undergraduates, 4% taught only graduates, and 41% taught both. It has also been reported that women are likely to have to teach outside their area of specialty, particularly if untenured (Patterson, 1971; Morlock, 1973).

Among 1973-1974 doctorates who taught in higher education, 34% indicated that they taught only undergraduates, 24% taught only graduates, and 42% taught both; 63% taught in the area of their specialty, 15% taught outside their area, and 22% did both.

Harmon (1968) reported that a 40 to 44 hour work week was standard, while Centra and Kuykendall (1974) reported that 1950-1968 doctorates employed full-time averaged 50 hours per week in professional activities (24% averaged less than 40 hours, 9% more than 60). Single women worked 2 to 3 hours per week more than married women, and length of work week varied somewhat by field.

For 1973-1974 doctorates, the average length of time spent at work each week by those employed full-time was 40 hours, while 8% worked over 60 hours per week, and 28% worked less than 40 hours. Sixty-seven percent overall indicated that they spent time in professional activities whilst not at work, for an average of 9 hours per week.

#### Research

Hutchinson (1930) reported that of 1877-1924 doctorates not employed as researchers, 78% had found opportunities for research, including 17% who had found very few opportunities, and only 6% who had found ample time; less than 10% had had a sabbatical or leave of absence to do research.

Bryan and Boring (1947) reported that 1921-1940 doctorates spent about 3 hours per week in research and writing, and that many indicated a desire for more time to devote to research.

Among 1973-1974 doctorates, 19% had not found opportunities for research since receiving the doctorate, 48% had found some opportunities, and 15% had found ample opportunities; 17% had had a sabbatical or leave of absence to do research, 14% had had a scholarship or fellowship, and 22% had time allocated for research in their jobs. Several noted that they found opportunities only on their own initiative and in their own time. Fifty-one percent indicated that they regularly spent time in research, for an average of 14 hours per week; 48% had directed research projects (average of four each).

Sources of funding for research for 1973-1974 doctorates were distributed as follows:

Institutional	36%
Government	28
Own	20
Foundations	10
Research organization	3
Private sector	2
Special projects	1

Hutchinson (1930) reported that 1877-1924 doctorates listed the following reasons for conducting research:

Interest in pursuing problems	66%
Required in position held	15
Required for promotion	12

Of reasons for pursuing research listed by 1973-1974 doctorates, the following accounted for 5% or more:

Interest in pursuing problems	49%
Required for promotion	19
Required in position	17

The following accounted for 5% or less: personal satisfaction or enjoyment; renewal or change from other activities; to give students



experience; boredom with other work; impetus and motivation to keep up; integration of clinical and academic knowledge; necessity in writing/freelancing; wanting to find solutions to human needs; wanting to develop effective programs; desire for competency in the business world; challenge; research for its own sake; money; peer recognition; doing what want to do; helps learning process for writing books; needed for talks requested to give; getting a job at a different institution; intellectual stimulation.

Obstacles to research most frequently cited by 1877-1924 doctorates were job demands and personal and family reasons; lack of funds or materials was also mentioned, but lack of interest was not generally cited. It was suggested that since less than 1% reported no obstacles, these same factors must apply to those who had found opportunities, but that the latter had overcome them (Hutchinson, 1930).

1973-1974 doctorates listed 115 obstacles to research that they had encountered; the following accounted for 5% or more:

Lack of time	35%
Lack of money	12
Demands of job	11
Lack of interest, motivation, desire, incentives, laziness, lack of research relevant to interests, choice to focus elsewhere	9
Lack of job or institutional support	8
Inadequate facilities	5

Less than 5% were related to: lack of colleague support; home, marriage and children; having to make money in other ways; lack of research jobs in field; lack of ideas; health; establishing new programs; travel; the negative impact research would have on promotion; lack of statistical

skills; lack of confidence; fear of reprisal for a controversial area of interest; work incorporated into ongoing problems; ostracism from community; inability to get promoted.

Variables associated with publication

Publication rates have been reported to vary greatly by field, and women tend to work in fields where rates are low (Cross, 1974); different fields also produce different types of productivity, but, according to Astin (1969), highly productive women generally publish in more than one category. In terms of articles, women in the natural sciences publish most (Graduate Education for Women, 1956; Simon et al., 1967; Astin, 1969; Astin and Bayer, 1973), and women in the social sciences are fairly productive (Graduate Education for Women, 1956), while those in the humanities and education publish less (Astin, 1969); in terms of books, those in the arts, humanities, social sciences and education publish more than those in the natural sciences. Field differences in rates of publication probably reflect differences in types of jobs and support for research; Harmon (1968) noted that the proportion of women reporting research support in their jobs ranged from 23% in the arts and humanities to 60% in the biological sciences.

Several researchers have found no relationship between marital status and productivity (Bryan and Boring, 1947; Ferber and Loeb, 1973; Centra and Kuykendall, 1974; Broschart, 1978), while others have found married women to be slightly more productive than single women (Bryan and Boring, 1947; Graduate Education for Women, 1956; Simon and Rosenthal, 1967; Simon et al., 1967; Chmaj, 1971). Feldman (1973) found

that divorced women published slightly more articles than single or married women, and Astin and Bayer (1973) reported that women who were married to academic men were more likely than others to publish books. Simon and Rosenthal (1967) suggested that the slightly greater productivity of married women might be due to a selectivity factor, these women being more achievement-oriented if they could run homes, careers and families concurrently. Data regarding parity and publication are inconsistent.

Institutional affiliation (doctoral and postdoctoral) has been found to affect publication rates, higher quality institutions being associated with higher publication rates (Crane, 1965; Astin, 1969; Astin and Bayer, 1973; Centra and Kuykendall, 1974). According to Centra and Kuykendall (1974), those working for the federal government or for research organizations publish more than those in colleges and universities, however Astin and Bayer (1973) found that those in academic positions published slightly more than those in nonacademic positions. Full-time employment results in higher publication rates than part-time employment (Astin, 1967).

Women are often not in positions where they must publish, and probably lack incentives to do so (see section on obstacles to career development). They have conflicting interests (teaching and household responsibilities), and Rossi (1970a) suggested that if they are not the major breadwinner, they may have the luxury of avoiding the "publish or perish" syndrome; given the chance to do research, however, Crane (1965) concluded that women are productive.

### Publication rates

Among 1877-1924 doctorates who had had some opportunity for research, 53% had published scholarly research, 17% had published other work, and 30% had published only the dissertation (Hutchinson, 1930).

Data on publication show great variations. The percentage of women who have published at least one article has ranged from 33 to 83% in different studies (Graduate Education for Women, 1956; Astin, 1969; Hill, 1970; Mitchell and Alciatore, 1970; Harrington, 1971; Morlock, 1973; Centra and Kuykendall, 1974), while the proportion publishing over 10 articles has ranged from 13 to 28% (Graduate Education for Women, 1956; Astin, 1969; Centra and Kuykendall, 1974); Morlock (1973) noted that 2% had published over 20 articles, and Centra and Kuykendall (1974) found that 2% of 1950-1968 doctorates had published over 50 articles. The average number of articles published has been reported as 3 to 4 (Astin, 1969; Centra and Kuykendall, 1974). Books are less frequently published; Centra and Kuykendall (1974) reported that 19% of 1950-1968 doctorates had authored or edited one book or more.

Seventy-five percent of 1973-1974 doctorates had published since receiving the doctorate; 53% had published research articles, 27% book reviews, 23% nonresearch articles, 21% textbooks, 18% other books, 7% fiction, 4% translations, 3% book chapters, and 1% other reports. One percent had written unpublished memoranda and policy papers, 1% government plans and reports, and 1% articles for corporate publications. For those who had published in each category, the average number of publications was: fiction - 15; nonresearch articles - 11;

research articles - 8 (13% had written 10 or more, and 6% had written 20 or more); books - 4; book chapters - 4; reviews - 4; textbooks - 3; translations - 2.

#### Professional Activities

Hutchinson (1930) reported that among 1877-1924 doctorates, 75% of employed married women belonged to professional societies, while the proportion of unemployed married women was under 50%.

Women doctorates have been reported by more recent researchers to be active in professional societies (Winkler, 1968; Astin, 1969). Bryan and Boring (1947) found that on average 1921-1940 doctorates belonged to five societies, had held one office in the three years before the study, and had attended three meetings per year. Other researchers have indicated that at least 90% of women doctorates belong to one or more professional organizations (Epstein, 1970; Harrington, 1971), however Freeman (1978) suggested that until recently women have been ignored in professional organizations, and Morlock (1973) concluded that they have been underrepresented in decision-making, on programs, and in presentation of papers at national meetings.

According to Epstein (1970), single women have higher participation rates in professional societies than married women. Astin (1969) reported that those who work full-time tend to participate more frequently in professional meetings and to be active members of professional organizations than those who do not work full-time, and that, in terms of papers presented at meetings, those in the biological

sciences and education are most active, and older women are more active than younger women. Broschart (1978) found that marital status and parity were unrelated to having held office in a professional association.

Overall, 1973-1974 doctorates attended an average of four professional meetings per year, had presented a total of seven papers at professional meetings, were members of four professional societies, and had held two positions in professional societies. Eighty-two percent had attended one or more professional meetings per year, with an average of four each (9% had attended 10 or more, 3% 20 or more); 67% had presented one or more papers at professional meetings, with an average of 10 each (27% had presented 10 or more, 11% 20 or more, 2% 40 or more); 80% were members of one or more professional societies, with an average of four each (5% held 10 or more memberships); 46% had held one or more positions in professional societies, with an average of three each (3% had held 10 or more);

#### Rank and Promotion

Hutchinson (1930) indicated that colleges afforded more opportunities for promotion than universities. In university positions, 12% were full professors, 52% associate or assistant professors, and 31% instructors or assistants; in college positions, the respective proportions were 45, 41 and 9%. Receipt of the doctorate was associated with promotion for university and college teachers, while secondary school teachers tended to move to higher level institutions on receipt

of the doctorate.

### Rank

Many researchers have reported an overrepresentation of women in the lower academic ranks, and an under-representation at higher ranks, and especially in administration (Parrish, 1962; Simon and Rosenthal, 1967; Bikman, 1970; Kreps, 1971; LaSorte, 1971b; Reuben, 1971; Chambers, 1972; Astin and Bayer, 1973; Carnegie Commission, 1973; Frazier and Sadker, 1973; Loeb and Ferber, 1973; Morlock, 1973; Robinson, 1973; Astin, 1974; P. R. Harris, 1974; Sexton, 1976; Fishel and Pottker, 1977; Walum, 1977; Young, 1978), with the result that women have few opportunities to participate in decision-making (Oltman, 1970; Kreps, 1971; Astin, 1974).

Data on rank have been reported in various ways and comparisons are difficult. According to the Carnegie Council (1975), women doctorates are hired initially primarily as instructors or assistant professors; Tobias and Rumbarger (1974) reported that 47% were hired initially as assistant professors. It has been reported that 5 to 6 years after receipt of the doctorate, 12% are full professors; after 7 to 8 years, the proportion is 21%; after 13 to 14 years, 59%; and after 22 to 23 years, 85% (Astin, 1969; Centra and Kuykendall, 1974). Kashket et al. (1974) noted that full professorial rank was attained by a majority of those who attained it 20 years after receipt of the doctorate, while Patterson (1971) reported that only 29% of doctorates in graduate departments of sociology were full professors before age 60.

A consistent relationship has been found between marital status and rank. Marriage slows promotion (Graham, 1972; Morlock, 1973) by as much as 10 years (Newman, 1971) or 20% at any one time. Single women are more likely than married women to be full professors, and married women are more likely than single women to be assistant professors, instructors, lecturers and research associates (Simon et al., 1967; Astin and Bayer, 1973; Broschart, 1978). Astin and Bayer (1973) reported that being divorced was a secondary predictor of high rank. Simon et al. (1967) reported that parity did not affect rank, while Broschart (1978) found that having children decreased the likelihood of being a full professor, and increased the likelihood of holding medium rank. Ferber and Loeb (1973) found that promotion was slightly more likely to be awarded to single than married women, but that when age was controlled for, this relationship was not significant, however Broschart (1978) reported that the effects of marriage and parity on rank were unrelated to age.

Parrish (1962) noted a very strong relationship between participation rate in a field and rank, except in the sciences, concurring with reports that women are promoted faster in the arts, humanities and education than in other fields (Astin, 1969; Astin and Bayer, 1973), and have low ranks in traditionally male fields (Carnegie Commission, 1973; Carnegie Council, 1975), and that traditionally female fields have provided more opportunities for women to be involved in administration and policy-making than other fields (Oltman, 1970; Robinson, 1973). Women doctorates are likely to achieve higher ranks in



colleges than universities (Miller, 1957; Mitchell, 1968; Mitchell and Alciatore, 1970). Howe et al. (1971) noted that the proportion of women who were full professors decreased as departmental prestige increased. Astin and Bayer (1973) found that teaching at a smaller public institution was a secondary predictor of high rank, and Oltman (1970) noted that women's colleges and small schools offered more opportunities for women to participate in decision-making.

Continuous work experience (Winkler, 1968), years of employment in academe, years at current institution, and publication have also been reported to affect rank (Astin and Bayer, 1973). Traditionally, academic rewards have been based chiefly on publication productivity, with teaching ability and interests paid lip-service only (Astin and Bayer, 1973); Stiles (1963) noted that women who teach tend to predominate at lower ranks.

P. R. Harris (1974) suggested that the upper ranks are difficult for women to attain because it is assumed that they do not need the extra income associated with promotion. Graham (1973) suggested that women may not be interested in, or have financial incentives for, moving into administration, and may resist the rigid scheduling and isolation associated with it; Astin and Bayer (1973) also suggested that women hold lower status partly because of their own academic interests. Promotional guidelines generally do not consider part-time work, which puts some women at a disadvantage.

Discrimination in promotion is discussed in the section on obstacles to career development.

Among 1973-1974 doctorates who were employed in higher education (61), 2% were research associates, 5% lecturers, 3% instructors, 30% assistant professors, 33% associate professors, 10% full professors, 15% heads of department, 7% deans, and one was an assistant director. Average time to be promoted from instructor to assistant professor (n=16) was 3.5 years; average time from assistant to associate professor (n=26) was 5.6 years; average time from associate to full professor (n=5) was 4.2 years.

#### Satisfaction with rank

Women are not always satisfied with their ranks. Bryan and Boring (1947) reported that 10% of doctorates felt that they were capable of holding and would like a higher position, while 8% felt that they were ready or long overdue for promotion.

Among 1973-1974 doctorates, 63% were satisfied with their current rank, 20% were ready for promotion, 12% felt that they were overdue for promotion, and 5% felt that they were long overdue for promotion.

#### Tenure

Hutchinson (1930) did not discuss tenure with respect to 1877-1924 doctorates.

Oltman (1970) indicated that women often do not have tenure. Astin and Bayer (1973) reported that 38% of 1957-1958 doctorates had tenure 7 to 8 years after receiving the doctorate, and Patterson (1971) noted that 55% of doctorates in sociology did not achieve tenure until aged 50 or over. Tenure requirements generally consider only full-time work,

which puts some women at a disadvantage (Morlock and the Commission on the Status of Women in the Modern Language Association, 1972; Keast and Macy, 1973; Tobias and Rumbarger, 1974).

Simon et al. (1967) reported that among 1958-1963 doctorates, 44% of single women, 22% of married women, and 26% of married women with children had tenure, and Patterson (1971) indicated that married women waited about 10 years longer for tenure than single women (until close to retirement age). Astin and Bayer (1973) reported that length of time with the same institution and rank were the most important predictors of tenure; if rank was controlled for, type of institution became important, and field of specialization was also a factor.

Discrimination in the granting of tenure is discussed in the section on obstacles to career development.

Of 1973-1974 doctorates in academic employment, 49% had tenure (including 5% who had received tenure before the doctorate). For those who got tenure after receipt of the doctorate (n=27), average time between receipt of the doctorate and tenure was 4.7 years.

#### Salary

Salaries for 1877-1924 doctorates ranged from under \$750 to \$15,000, with a median of \$2732. By occupation, median salaries were: research - \$2619, teaching - \$2654, miscellaneous - \$2875, administrative and executive - \$4033. Data for teachers showed increasing salary for 5-year periods of employment up to 30 years, then a sharp jump to the highest salaries, and the influence of rising

salaries had benefitted those with shorter occupational experience; similar trends were noted for researchers. There was a wide salary range for those with the same length of experience, suggesting that factors other than occupational experience were influential; the median salary for college teachers was higher than that for university teachers, reflecting greater opportunities for promotion afforded by colleges. Almost all women received increases in salary along with promotions on receipt of the doctorate (Hutchinson, 1930).

#### Variables associated with salary

Marital status had been found to be related to income, with single women earning more than married women (Bryan and Boring, 1947; Astin, 1969; Kreps, 1971; Leive, 1971; Astin and Bayer, 1973; Ferber and Loeb, 1973; Graham, 1973); Astin and Bayer (1973) indicated that the discrepancy may be as much as 20% of the median salary. These differentials may reflect differences in age or job activities or, as Harmon (1968) suggested, married women may accept lower salaries for suitable jobs or a second income. Leive (1971) reported that parity did not affect income.

It has been suggested that women are likely to work in low-paying fields (Brown, 1967; Astin and Bayer, 1973; Morlock, 1973), however data for median annual full-time salary of 1950-1968 doctorates indicated that salaries were lowest in the humanities, increased through the physical and biological sciences to education, and were highest in the social sciences, indicating that the substantial proportion of women doctorates in education and the social sciences fares reasonably well in

terms of salary (Centra and Kuykendall, 1974).

Astin and Bayer (1973) reported that rank was the most important predictor of salary, but although one might expect steadily increasing salary with increasing rank data for 1950-1968 doctorates indicated that median salary increased less than 1% between associate and full professor ranks in 4-year colleges, and decreased by 2% in universities (Centra and Kuykendall, 1974), indicating that variables other than rank influence salary.

Salary is related to job activity, with highest salaries associated with research and administration, and lowest salaries associated with teaching (Harmon, 1968; Astin, 1969). Employment at institutions of lower level than the university, particularly 2-year colleges, has been associated with higher salaries for women, reflecting increased opportunities for promotion (Astin, 1969; Robinson, 1971; Astin and Bayer, 1973), although Centra and Kuykendall (1974) did not find this benefit when comparing 4-year colleges with universities. LaSorte (1971b) suggested that earning potential in academe is limited by noncompetitive salary schedules, and Burdett (1958) showed that the salary range for college and university teachers began about 14% lower and ended 12% lower than the range for nonacademic institutions, although Astin and Bayer's (1973) data indicated that the mean salary of nonacademic women was only 4% greater than that of academic women.

Salary increases with age (Bryan and Boring, 1947), and Ferriss (1971) noted that within an educational level, it generally increased up to age 35-44 or 45-54, the next older group having a slightly lower

median salary. Astin and Bayer (1973) reported that higher salaries were predicted by research interests, and employment as a research assistant or receipt of a fellowship during graduate study, while number of years at an institution was negatively related to salary, reflecting the financial benefit of mobility.

Brown (1967) noted that women were concentrated in a low-paying region of the country (the North Atlantic). Churgin (1978) concluded that the perception of need, rather than merit, can be a determining factor in academic remuneration, and Astin and Bayer (1973) suggested that women are not apt to use family pressures to gain increased income. Mitchell (1969) noted income appreciation due to receipt of the doctorate.

Discrimination in salary is discussed in the section on obstacles to career development.

### Income

Income has been reported in various ways over a long time period, and comparisons are difficult, so actual salaries are reported only for 1973-1974 doctorates.

At the time of the study, 2% of 1973-1974 doctorates were working for a subsistence stipend, 13% earned less than \$10,000 per year, 4% earned \$10,000-14,999, 16% earned \$15,000-19,999, 14% earned \$20,000-24,999, 21% earned \$25,000-29,999, 16% earned \$30,000-39,999, and 12% earned \$40,000 or more per year.

Forty-seven percent of 1973-1974 doctorates were satisfied with their salary, while 53% were dissatisfied, in line with the finding that

the doctorate was considered to be less worthwhile financially than professionally or personally.

#### Professional Recognition

Hutchinson (1930) did not discuss professional recognition with respect to 1877-1924 doctorates.

Astin (1969) reported that over 33% of 1957-1958 doctorates had received acknowledgements of professional achievement. Ferber and Loeb (1973) noted that professional honors were slightly more likely to be accorded to single than to married women, and Simon et al. (1967) reported that married women with children were less likely than others to be members of honor societies. Marriage and/or children did not, however, cause significant differences in the likelihood of being involved in consulting (Simon et al., 1967), and Broschart (1978) reported that professional recognition did not vary with marital status or parity. Astin (1969) indicated that women who received professional recognition tended to be older and more productive than others, and more often in education, while Patterson (1971) noted a correlation between departmental prestige and recognition, and suggested that the latter came more from affiliation than productivity.

Discrimination in professional recognition is discussed in the section on obstacles to career development.

Thirty-four percent of 1973-1974 doctorates had received honors or awards for professional achievement, with an average of three each (2% had received 10 or more). Forty-five percent had been involved in

consultancies, with an average of four each (10% had been involved in 10 or more, 4% 20 or more, and 1% 50 or more).

### Job and Career Satisfaction

Hutchinson (1930) did not discuss job or career satisfaction with respect to 1877-1924 doctorates.

#### Job satisfaction

Bryan and Boring (1947) reported that 42% of 1921-1940 doctorates were satisfied with their jobs, 42% liked their jobs but were not entirely satisfied, 5% were dissatisfied, and 5% intended to change jobs. Forty-six percent of 1929-1967 doctorates were strongly satisfied with their positions and wanted no change, 36% were satisfied but would have considered a change, and 16% were slightly dissatisfied (Mitchell and Alciatore, 1970). Centra and Kuykendall (1974) showed that overall job satisfaction of 1950-1968 doctorates employed full-time was 86%. With respect to different aspects of the job, satisfaction was: advancement opportunities - 57%, policies and practices of employer - 59%, salary - 69%, rank/status - 76%, job security - 79%, relations with colleagues - 87%, and the work itself - 91%.

Women doctorates, especially if married, may be dissatisfied with their positions in terms of fulfillment of expectations and accord with their view of their abilities (Henderson, 1967, cited by Robinson, 1971; Kashket et al., 1974). Centra and Kuykendall (1974) found that 1968 doctorates were more dissatisfied with type of employer than 1950 and 1960 graduates, possibly reflecting the tighter job market, or the time



that earlier graduates had had to come to terms with their career decisions; those who worked part-time were less satisfied with status and promotion than those who worked full-time, but overall job satisfaction was similar. Mitchell (1968) reported that university employees expressed more job satisfaction than college employees, even though they had lower positions and pay.

Among 1973-1974 doctorates, 49% were satisfied with their jobs overall, 37% were enjoying their jobs but not entirely satisfied, 8% were dissatisfied, and 6% were intending to change jobs due to dissatisfaction. In terms of different aspects of the job, 49% were satisfied with their salary, 82% with relations with colleagues, 51% with the policies and practices of their employer, and 86% with the work itself.

#### Career satisfaction

Bryan and Boring (1947) reported less discontent with the profession than with a particular job among 1921-1940 doctorates; about 50% felt that their work had generally fulfilled their expectations, while 73% would have chosen the same career again, 11% would not, and 16% were uncertain. Centra and Kuykendall (1974) found that 11% of 1950-1968 doctorates wished that they had built a career with a different kind of employer, 8% wished that they had chosen another field of study, and 9% wished that they had chosen a different specialty.

Among 1973-1974 doctorates, 54% were satisfied with their chosen career, 31% were enjoying their career but not entirely satisfied, 4% were dissatisfied but did not wish to change careers, and 11% wished

that they had chosen another career. Seventy-four percent indicated that they would choose the same field again, while 19% would not, and 7% were unsure; 79% indicated that they would choose the same specialty within their field again, while 14% would not, and 7% were unsure.

Satisfaction derived from profession

Bryan and Boring (1947) reported that professional work was a major source of satisfaction for 11% of 1921-1940 doctorates, and that work contributed more than any other interest for 27%; for 38%, work was evenly balanced with other interests, and for 29% it contributed less than other interests.

Among 1973-1974 doctorates, 13% indicated that career was the most important factor in their lives, for 18% it was more important than other things, for 45% equally important as other interests, for 21% less important, and for 2% career was not important.

Advice Given by 1973-1974 Doctorates

1973-1974 doctorates' advice to women planning to get doctorates and pursue the type of career that they had followed was as follows:

-- Forget it.

-- Dig in; enjoy; be self-confident and try to avoid being defensive - especially regarding own femininity. If you are comfortable with yourself, chances are you will not be the object of much - if any - discrimination because of sex. Be assertive about needs and rights, but not aggressive. Try friendly assertiveness rather than hostile assertiveness, whenever possible. Work hard: nothing impresses professors more than good performance on exams and in class. Be friendly but not seductive, making your expectations for a professional relationship clear. Be open but not blunt. Have a good time pursuing your education and career.

-- Stick with it.

-- Do not think of the doctorate as a ticket to promotion. Experience and work in your area counts heavily. Get a sponsor who believes in you, and will promote you to "the right people."

-- Do it but choose another field.

-- Why not? Go to!

-- Support networks are necessary! It "ain't" easy, but it can be done. The notion that "women have to do twice as much work for half as much recognition" is often true. Make certain to have "private time," time for reflection and renewal.

-- I have seen some married woman with children to try to finish her degree within the same frame of time (for example 3 years after master's degree) as some students who do not have as much responsibility as she. She would get very frustrated with a slow progress in research (experiments). But she has to realize that she cannot come to the lab and continue the experiments at nights and week-ends as some other single students or married male students whose wives would take care of children during evenings and weekends.

Personally, it took nearly one and a half times as long as the other students without much family responsibilities to complete Ph.D. I was not too much frustrated with longer time requirement for completion because I realized my personal limitations. Only with this relaxed state of mind, I could manage the degree completion together with keeping happy family life as a wife and mother of two children.

-- If you are interested in having such a career and you have the loving support of your family, I hope you enjoy it as much as I do. I definitely recommend Southeastern Theological Seminary, Wake Forest, N.C. for a D.Min. I was the first woman to receive this degree there. The support of the faculty was especially good.

-- Go for it. I love my job. It was worth a lot of groveling in graduate school.

-- Always behave professionally. Be better prepared and more knowledgeable than male superiors in a hierarchy. Be assertive. Choose employer with great care.

-- Go for it!! Get your priorities straight.

-- Pursue it at your own pace and integrate educational, job and personal experience as much as possible so as to maximize your own well-being and full-functioning.

-- Trust yourself. Care about your work. Stay healthy. Keep a sense

of humor. Have courage.

-- Be sure your personal and family goals are in tune with the demands on your time and energy. Priorities will minimize problems if you develop them and "sit loose" on the lower ones. It is also wise to remember nothing lasts forever.

-- My "career" has changed so much that I can only say, "Be flexible and maintain a sense of humor."

-- Note - while I got my degree in 73, I was really in graduate school from 64-69. In those years, there were zillions of jobs available, much financial support for graduate school, etc. This has all changed. It is a much harder decision today. Also - I went through graduate school 64-69 unmarried and cannot imagine doing it married.

-- Make money your goal - you'll need it, and that's where opportunity and independence is.

-- Have a secure job before you pursue your doctorate. Get your employer to help fund your advanced studies. Check into licensing laws in your state if you plan to do private practice. Be prepared to not earn much money for a while. Find a way to deal with the hurts and disappointments without taking it out on your husband and children. Don't be too shocked when a prospective employer says, "You don't need to work. Your husband has a good job."

-- Be tough. Do not believe public perception that AA/EEO means women get jobs easier than men. Learn to be assertive/aggressive - especially on interviews. You need women support groups - develop one - don't be afraid to be an activist.

-- Do it!

-- To honor the importance of balance in our lives - in graduate school and thereafter. Balance between professional and personal needs, learning to really appreciate both, and not wait - i.e. not postpone our personal needs for nurturance, support, empathy and the like until our professional and/or relational responsibilities are being met. So often, as professional women, we try to "be strong" and prove our competency at the expense of our emotional needs, when in fact both aspects need attention and development.

-- Go for it! It's great! Rewarding! Job market is not good just now. In a few years this should turn around.

-- Be prepared to deal with the emotional backlash from having more education than a man - at work, dating, in a marriage. Value the supportive men and women you do meet.

-- Do it.

-- Since my work is unrelated to the degree which I attained, my advice will be quite out of the ordinary, I'm afraid.

I was prepared for life, for achievement at any level by having fought the battle of overcoming the discrimination vs. women students at two graduate schools - graduate school taught me how to take an assignment and complete it to near perfection. I don't settle for mediocrity in any phase of life as a result of the goals I have set for myself in the past.

-- Be sure of goals and level of commitment, also consider availability of jobs in field.

-- Remain mobile; move while young.

-- Age is an important factor. Women should get doctorates at an earlier age than I did [59] in order to have time for continuing study, research, and travel.

-- Since I am working in the public school system, I need experience and course work in administration in order to advance in the curriculum work I do. I find administrators without my curriculum training are filling positions closed to me. It would not have been difficult to pick up supervision credits when in graduate school if I'd known. Now at 53 years, it's too late to be economically feasible.

-- Build a support network (not necessarily a traditional academic one) to get you through the rough times. Learn early to define the expected parameters for all students and demand equitable treatment. Always meet your responsibilities first - remember you are helping to pave the way for all those who come after you finish.

-- Go for it!

-- Get baccalaureate through full-time study with broad-based curriculum. Work for a time, exploring own actual orientation. Research universities carefully before selecting. Be aware of job market in selecting focus. Be assertive in and out of class.

-- I would advise women not to have children until the doctorate is finished.

-- Know yourself. Define goals with flexibility. Keep all options open at all times (as far as is practical). Balance work, play, love and worship. Choose career with the maximum flexibility and most potential for personal satisfaction.

-- Choose a field where there will be jobs available when you finish your studies.

-- Have clear goals; persevere.

-- Seek the help of women you trust in your field. And ask their advice. Try to get "old-girl" networks going to help both formally and informally.

-- If lesbian, do not come out in graduate school unless there are supportive openly gay faculty. Do not get married or have children (fellow women students expelled for these reasons). Get any promises from faculty in writing (fellow women students betrayed and "dumped" from program). Do not allow any priorities above getting a doctorate. FIND a strongly supportive mentor. Do not leave institution or take a new job at ABD [all-but-dissertation] stage. (Of 12 women in my class, I am the only one with a Ph.D. - all others dropped at M.S. level for any one of above reasons). Research your legal rights.

-- Plan to live in an area where likely positions are prevalent, or plan to operate as a consultant on own business terms.

-- Helpful if you and your husband are both pursuing the degree at the same time.

-- Take time to gain some real life experiences along the way. Never stop studying and learning whether or not you are in formal classes. Work towards improving the skills you use daily.

-- Plan time well. Assume initiative for identifying problems and proposing alternative solutions. Carry through on responsibility. Assume you are a member with equal status. Look for opportunity - not excuses. Develop information networks with men and women in and outside job. Be objective with self and others. Be prepared. Communicate effectively - provide information freely.

-- If it's what you really want, go for it but remember that living encompasses more than academic and professional achievement. Don't sacrifice personal, social, religious, interpersonal goals, unless you're willing to become a one-dimensional person.

-- Being a biologist with a Ph.D. has been most rewarding. I have many kind, considerate, brilliant friends who are biologists. I have a well-paying high level job in the area of my expertise and training. I recommend that all women who are planning to get doctorates and pursue the type of career that I have followed do it without hesitation.

-- Make sure the market is open - then get with it - be willing to pay the cost - financial, time, emotional, etc. - it's worth it! Remember what Anne Scott said - "If it's too hot, stay in the kitchen."

-- Go get it!

-- The opportunities are there - and it is up to the individual to find the right mix of training, employment, relationships, etc. to find satisfaction.

-- Same as for a man, except a woman shouldn't be too concerned with possible problems. Know your material, treat others fairly, hold up your responsibilities, act like a woman. Colleagues will respect you as a person, and be fully aware of your sex, as it should be. Have confidence in yourself and don't be on the defensive all the time. Take criticism as directed to you as a professional, not as a woman (men get criticized too!).

-- Life is a cosmic game.

-- Enjoy your work. I enjoyed all my work for my Ph.D., I did a thesis research I was really interested in that I considered to be important research. Apply for fellowships and scholarships. I supported myself and my two children for 4 years on a U.S. Public Health Service Research Fellowship.

-- Attend the best university you can afford. Obtain a "sponsor" at beginning of program. (By sponsor I mean faculty advisor). Pursue a degree program where you will learn new knowledge, gain a new expertise, or correct weaknesses in educational background.

-- I feel privileged to have had the opportunity to complete a fine doctoral program and advance professionally and personally as a result of this opportunity.

-- Feel free to choose the work that most appeals to you and for which you feel qualified - then GO!!! Success is there if you WANT it!! I have loved my work, my life style and my companions in my field from the beginning.

-- Get a broadly-based degree that does not limit job opportunities - i.e. in Administration or Business. Do not allow marriage to interfere with getting the dissertation.

-- I undertook graduate study (master's level) from a continuing strong interest in biology and academic life in general. I hoped to get a job in junior college teaching of field biology. (I passed a civil service examination for the state Department of Fish and Game, and was told flatly in my interview that they had no jobs for women - this in 1968). I applied for doctoral work at my B.A. institution, where I knew and liked the faculty, and was offered a teaching assistantship. I considered this preferable to cooking hamburgers at a fast food restaurant, which seemed the only employment available. If I had not had a reasonably supportive woman major professor, I might have quit as a result of the frustrations in my research. After receiving my degree, I found that there were several hundred applicants for each

teaching/research job; when I did get an interview, it often seemed as though I was being heard as the "token woman" - at one institution I was told that they were sorry but they had to hire the minority group member. I spent several years in temporary or part-time jobs, and took the civil service examination for my present job largely to prove to the unemployment office that I was looking for work. The level at which I entered was a "technician" level demanding only a master's degree or B.A. and 2 years of experience - the work involves a general biological background and writing ability, and is completely unrelated to my thesis topic. I have gained a good deal of "on the job experience," enjoy my job, and believe that it is worthwhile. I have recently been promoted to the highest rank in my classification. I have achieved two of my major goals - owning my own home, and living in an area with plenty of opportunities for outdoor recreation. Although I have attacks of nostalgia on my semiannual visits to university libraries, I hope to keep my present job and would not seek academic employment unless I lost it.

-- Make decisions carefully. Get your facts together. (No-one had warned me about discrimination.)

-- Be sure that you really want the personal investment in it and sacrifice to get it. Be willing to go beyond the doctorate in further training and personal psychotherapy. It is very rewarding if you are willing to apply yourself.

-- The field [psychotherapy] is very overcrowded at this time.

-- Pay close attention to timing if you plan to have children.

-- Do your job, follow your own goals and don't expect extra consideration; earn respect don't expect to have it handed to you.

-- First, pursue what you love, if you are lucky enough to know what you love. The world and market are too unpredictable to do something you aren't enthused about because it is more "practical." Better to be a poet, if you love writing poetry, and earn money at a routine job, than to be a lawyer if you find it a struggle. Pursue anthropology, though it is not very practical, as far as getting a teaching job. Be creative in designing what you might do with it.

-- Treat your graduate years as if they were a job. Work 40 hours a week and lead a normal life thereafter.

-- These days one's sex is not the handicap it once was. Look around for a department where you feel comfortable and get to work - if you have setbacks, work to overcome them instead of ruminating about sex discrimination or any other outside impediment.

-- Don't. The jobs aren't there. Tenure isn't available. The pay is



terrible. And women, especially young women, are exploited in part-time, no security jobs. It was fine when I began a Ph.D. in 1964. But the market is awful now. If it weren't for wanting to spend time with my children, I'd have left long ago for business.

-- Be sincere, take it seriously. Be honest to your own goals. Don't let the tough times rattle your cage.

-- Make sure you are going to live in an area where you can use your new education and where new career opportunities will be open to you. Have a marriage and children - but make arrangements somehow - to allow you to pursue your career without feelings of guilt at leaving them while pursuing your interests. Get your doctorate because you want to - not just because you feel it will help you. If you desire it - you'll make sure you get it.

-- Take yourself seriously.

-- It has been very successful and rewarding for me, partly because I have tried to keep it in perspective and make it part of my life rather than all of it.

-- Know what you're doing. Have precise goals. Have alternative plans. Learn something about business and how to market yourself and your skills. Understand money; think of yourself as a profit-making corporation of one - whether you have a spouse and/or family or not.

-- Working for the doctorate and in academia subjects a woman to no more discrimination than other careers/activities in a patriarchal/sexist society where women are subordinated whatever they do. If you personally or professionally want a degree, go for it.

-- Prove your worth and expect to produce even more than excellent male colleagues.

-- Be certain that the desire to complete the work is the most important thing in your life! Distractions are rampant, but it is unfair not to be committed and therefore fulfill the prophecy that every woman eventually hears - "she'll only get married and have a baby and waste our time." While marriage, babies and careers are not mutually exclusive, the first two work an unnecessary hardship if studies are not well toward completion.

-- Think about your needs carefully in advance. Find a program and job situations with optimal conditions and maximum flexibility.

-- Be strong.

-- Be the best that you can be and respect others.

## Discussion

1973-1974 doctorates

Six percent of 1973-1974 doctorates indicated that they had held postdoctoral fellowships.

On the basis of total time available for employment since receipt of the doctorate, 1973-1974 doctorates showed 90% full-time equivalent employment, and at the time of the study they were working an equivalent of 89% of full-time employment. About one-eighth had been unemployed at some time; about three-fifths had always worked full-time since receipt of the doctorate. Overall, women were working about the same proportion of time as they preferred (89% full-time equivalent), however, on an individual basis, only about three-fourths were working the amount of time that they preferred, about one-seventh were working more, and about one-twelfth less. Reasons for working more than preferred were related to financial necessity and the need for time for various activities; reasons for working less than preferred included inability to find a full-time job and health problems. Over half of the reasons for ever having worked less than full-time were directly related to marriage and children, while lack of availability of a suitable job was again a problem. Over half of those not working full-time intended to increase their labor force participation in the future.

Out of the total time worked, four-fifths was in the field of the doctorate and one-fifth was outside, while at the time of the study, three-fourths were working in the field of their doctorate, almost one-fifth outside, with the remainder combining both. Those employed full-

time averaged a forty hour work week, and two-thirds overall indicated that they spent an average of 9 hours per week in other professional activities.

Almost two-thirds worked in academic institutions (almost three-fifths in higher education), while less than one-tenth worked in the private sector, and one-tenth was self-employed. About one-third listed teaching as their major work activity, while for one-sixth it was professional services to clients, one-seventh administration, 6% research and development, about one-seventh some combination of these, and for one-seventh other activities. Overall, they spent about one-third of their time teaching, slightly over one-fifth in administration, about one-fifth in professional services to clients, one-seventh in research and development, and one-tenth in other activities. They would have preferred to spend more time in research and development, and less time in administration, and for only two-fifths of women did their actual time distribution coincide with their preferred time distribution.

Of those who taught, one-third indicated that they taught only undergraduates, about one-fourth taught only graduates, and slightly over two-fifths taught both. Over three-fifths taught in the field of their doctorate, about one-seventh outside, and slightly over one-fifth taught both in and out of their field.

About four-fifths had found opportunities for research since receiving the doctorate, about half regularly spent time in research (average 14 hours per week), and about one-fifth had time allocated for

research in their jobs. A relatively small proportion had had a sabbatical or leave of absence for research, or had received a fellowship or scholarship for research. About half had directed research projects (average 4); institutional and government sources of funding for research were most common, while one-fifth had used their own funds. About half of the motivations for research were related to interest in pursuing problems, while requirement for promotion or in a position were cited by slightly over one-third. The most often cited obstacle to research was lack of time (about one-third of women). Three-fourths had published since receiving the doctorate, most commonly in the form of research articles, but also book reviews, nonresearch articles, textbooks, fiction and other media.

Four-fifths were members of professional societies, and slightly more than this attended professional meeting(s) each year; two-thirds had presented paper(s) at professional meetings, and almost half had held at least one position in a professional society. About one-third had received honors or awards for professional achievement, and over two-fifths had been involved in consultancies.

The most common ranks for those in academic employment were associate and assistant professor (33 and 30%, respectively), while 10% were research associates, lecturers or instructors, and 10% were full professors. On average, it took 3 to be promoted from instructor to assistant professor, over 5 years from assistant to associate professor, and over 4 years from associate to full professor. About half of those with academic employment had tenure, a few having received

it before receipt of the doctorate. Overall, slightly over three-fifths were satisfied with their rank, while almost two-fifths felt that they were ready of overdue for promotion.

About half earned \$25,000 per year or more (including one-eighth who earned \$40,000 or more), while about one-eighth earned less than \$10,000, and two worked for a subsistence stipend; slightly over half were dissatisfied with their salaries. About half were satisfied with their current job overall and with the policies and practices of their employer, while over four-fifths were satisfied with the work itself and with relationships with their colleagues. About one-seventh were dissatisfied with their job or intending to change jobs due to dissatisfaction. Slightly over half were satisfied with their chosen career, almost one-third were enjoying their career but not entirely satisfied, while about one-seventh were dissatisfied or wished that they had chosen another career. About three-fourths indicated that they would choose the same field again, and about four-fifths indicated that they would choose the same specialty within their field again. For over two-fifths, career was equally important as other interests in their lives, while for almost one-third it was more important, and for about one-fourth less important.

Advice to those planning to earn doctorates and pursue similar types of careers as 1973-1974 doctorates was presented.

Comparison of 1973-1974 doctorates with 1877-1924 doctorates

A small proportion of both the earliest and the most recent doctorates held postdoctoral fellowship positions.

The employment rate of 1973-1974 doctorates was higher than that of their earliest counterparts, however retirement among the earliest doctorates may have accounted for some of the difference. For both sets of doctorates, academic employment was important. Teaching was the most common major work activity for both sets of doctorates, however it was listed as the major work activity by less than half as many 1973-1974 doctorates as 1877-1924 doctorates, while similar proportions listed administration and research and development; professional services to clients was a more important major work activity among the most recent doctorates (this activity was included in miscellaneous activities for 1877-1924 doctorates), and the most recent doctorates were more likely than their earliest counterparts to indicate other major work activities, or a combination of major work activities.

About the same proportion of 1973-1974 doctorates had found opportunities for research as was so among their earliest counterparts, somewhat more had had a sabbatical or leave of absence for research. 1973-1974 doctorates indicated the same reasons for doing research as their earliest counterparts, interest in pursuing problems being the most common reason, and requirement for promotion or in a position secondary reasons. Obstacles to research cited by the two sets of doctorates were also similar, though, somewhat surprisingly in view of the higher rate of marriage, personal and family related factors seemed

to be less of an obstacle for the most recent doctorates than for their earliest counterparts.

For both sets of doctorates, data on salaries indicated a wide range of income for women with the same length of professional experience.

Due to the method of reporting the 1877-1924 data, and the small size of the 1973-1974 sample, data on publication rates, rank, promotion, and other professional activities were difficult to compare.

#### Comparison of 1973-1974 doctorates with other doctorates

The proportion of 1973-1974 doctorates who had held postdoctoral fellowships was lower than would be expected on the basis of previous research, and may reflect a bias in the sample or questionnaire respondents with respect to this variable.

1973-1974 doctorates had a higher rate of full-time equivalent employment than 1921-1940 doctorates; their rates of full-time employment and unemployment were within the range reported by earlier researchers, while part-time employment was slightly higher than the range previously reported. More 1973-1974 doctorates had interrupted their careers than was so for 1957-1958 doctorates, and slightly fewer had worked full-time since receipt of the doctorate than was so for 1950-1968 doctorates, indicating that the proportion who work full-time with no interruption after receipt of the doctorate may no longer be increasing.

Data for employment in the field of the doctorate for 1973-1974 doctorates indicated an increased return for investment over 1921-1940

doctorates, but possibly a slight decrease over 1950-1968 doctorates. The importance of factors related to marriage and children in limiting women's participation in the labor force was again confirmed, however availability of a suitable job was also a problem for the most recent doctorates, possibly reflecting current economic conditions.

The importance of academic employment for women doctorates was again indicated by data for 1973-1974 doctorates, however, as suggested by N.R.C. (1978) data, its importance seems to be declining, and data for 1973-1974 doctorates suggested that the decrease was taking place in universities and 4-year colleges, rather than at lower level institutions. Slightly more 1973-1974 doctorates were employed in business and industry than previously reported, while proportions in government and other employment were within ranges reported for earlier doctorates.

As for earlier doctorates, more 1973-1974 doctorates listed teaching as their major work activity than any other activity; the proportion, however, was below the range reported in earlier studies. Unlike previous studies, more women indicated administration as their single major work activity than indicated research and development, and the proportion indicating administration was higher than the range reported in earlier studies; the proportions indicating research and development and other activities were within ranges previously reported, but the proportion indicating professional services to clients was higher than previously reported. Multiple major work activities may have caused some but not all of these discrepancies.



Data for 1973-1974 doctorates indicated that they were much less likely than earlier doctorates to teach undergraduates only, and much more likely to teach graduates only, suggesting an improving situation for women with respect to level of students taught. Relatively few taught only outside their area of specialty, while over three-fifths taught only in their area of specialty, again indicating an improving situation for women employed in higher education.

The average work week of 1973-1974 doctorates was similar to that reported by Harmon (1968), and the time spent in professional activities was similar to that reported for 1950-1968 doctorates. 1973-1974 doctorates spent rather more time in research than 1921-1940 doctorates, but their publication rates were within ranges reported for earlier doctorates.

Figures on membership in professional societies were lower than those reported for earlier doctorates, both in terms of proportions belonging to professional societies, and average number of memberships, however 1973-1974 doctorates attended more professional meetings than 1921-1940 doctorates. The proportion of 1973-1974 doctorates who had received honors or awards for professional achievement was similar to that reported for 1957-1958 doctorates.

The proportion of 1973-1974 doctorates in higher education who were full professors 8 to 9 years after receipt of the doctorate was slightly lower than that reported for 1950-1968 doctorates 5 to 6 years after the doctorate, and about half that reported for 1957-1958 doctorates 7 to 8 years after receipt of the doctorate, in line with the finding that

1973-1974 doctorates were considerably more likely to see themselves as ready or overdue for promotion than 1921-1940 doctorates. 1973-1974 doctorates, however, were more likely to have tenure than 1957-1958 doctorates 7 to 8 years after receipt of the doctorate.

Figures on job satisfaction indicated that 1973-1974 doctorates were a little more satisfied than 1921-1940 doctorates, and were very similar to the figures reported for 1929-1967 doctorates, except for an increase in dissatisfaction leading to intention to change jobs among the most recent doctorates. 1973-1974 doctorates were less satisfied with their jobs overall than 1950-1968 doctorates, and were less satisfied with various aspects of their jobs, but equally satisfied with the work itself. 1973-1974 doctorates indicated more dissatisfaction with field and specialty than 1950-1958 doctorates, and for these women career seemed to be somewhat more balanced with other interests in life than it was for 1921-1940 doctorates.

## OBSTACLES TO CAREER DEVELOPMENT

## Introduction

This section is addressed to a description of the obstacles, including discrimination, that women face during their doctoral study and in their postdoctoral career development.

## Obstacles to Doctoral Study

A complex interplay of factors has been reported to have an adverse effect on female doctoral candidates (Holmstrom and Holmstrom, 1974), and numerous problem areas have been identified.

For 1877-1924 doctorates, having to support dependents was reported to cause frequent interruptions of graduate work, and emphasized in their comments was the physical and mental strain of graduate work, although some carried this strain with pleasure and apparently no ill effects (Hutchinson, 1930).

Factors related to marriage and family have frequently been cited as problems for female graduate students, and have been found to carry the greatest weight in predicting their success or failure (Graduate Education for Women, 1956; Aurbach et al., 1964; Goodwin, 1966; Lewis, 1968; Mitchell, 1968, 1969; Folger et al., 1970; Rossi, 1970a; Sharp, 1970; Stokes, 1970; Creager, 1971; Kreps, 1971; Ekstrom, 1972; Husbands, 1972; LeFevre, 1972; Carnegie Commission, 1973; Feldman, 1973, 1974; Patterson and Sells, 1973; Rees, 1973; Sells, 1973; Schlossberg, 1974; Thrower, 1976; Harway and Astin, 1977), although Mooney (1968) found no

relationship between marital status and success, and Holmstrom (1974) did not consider that family pressures caused women to leave graduate school.

Responsibilities associated with marriage and family have been reported to impede women's progress through doctoral study in many ways: interrupted study; husband's mobility causing relocation; husband's attitudes of ambivalence, disapproval or pressure to drop out; lack of privacy for study; problems of time management; decreased opportunities to interact with other students; conflicts between homemaker and student roles, and guilt arising therefrom. According to Graduate Education for Women (1956) and Ekstrom (1972), about 35% of women perceived family responsibilities to be impeding factors in graduate work. Aurbach et al. (1964) reported that marriage may delay receipt of the doctorate by three years, and that having three or more dependents was associated with a similar delay.

Financial problems have also been cited as delay factors in doctoral study, and receipt of financial aid has been associated with a greater likelihood of completing doctoral work (U.S. Department of Labor, 1966; Mooney, 1968; Astin, 1969; Mitchell, 1969; Gray, 1970; Mitchell and Alciatore, 1970; Stokes, 1970; Creager, 1971; Ekstrom, 1972; Boyer, 1973; Rees, 1973; Sells, 1973; Centra and Kuykendall, 1974; Harway and Astin, 1977; Stoddard, 1977), although Patterson and Sells (1973) and Holmstrom (1974) reported that financial difficulties did not account for attrition among female doctoral students. Financial problems have been reported to cause interrupted and part-time study,

due to the cost of the doctorate and inability to support an income loss (Graduate Education for Women, 1956; Astin, 1969; Mitchell, 1969; Gray, 1970; Mitchell and Alciatoire, 1970; Boyer, 1973; Harway and Astin, 1977).

Problems encountered in graduate school have been found to vary by field (Goodwin, 1966). Women tend to study in fields where programs are long and require great persistence and commitment, where part-time study is more common, where it is difficult to get jobs after graduation, where financial incentives are relatively low, and, consequently, where the overall dropout rate is high (N.R.C., 1967; Mooney, 1968; Sharp, 1970; Patterson and Sells, 1973; Rees, 1973; Daniels, 1975).

Women in academe, both as students and faculty members, lack role models (Astin, 1969; Graham, 1972; Roby, 1972; Schwartz and Lever, 1973; Hartstock, 1974; Kashket et al., 1974; Schlossberg, 1974; Sexton, 1976; Walum, 1977); indeed, Rossi (1970b) found that 67% of female doctoral students in sociology had no model of a senior-ranking woman. Academic women also lack female colleagues, and reference has been made to a lack of emotional support and encouragement, or actual discouragement, for women, especially in male-dominated fields (Fox, 1970; Pack and Waggoner, 1970, cited by Holmstrom and Holmstrom, 1974; Gould and Pagano, 1972; Kashket et al., 1974; Fischer and Peters, 1979). Women may be left out of the male communication system, and perceive a lack of acceptance (Simon et al., 1967; Patterson, 1971; White, 1972; Freeman, 1973; Kjerrulff and Blood, 1973; Schwartz and Lever, 1973); they may be denied interaction and full working and collegial relationships (Simon

and Rosenthal, 1967; Feldman, 1973; Frazier and Sadker, 1973; Hartstock, 1974; Freeman, 1978). They may have difficulty finding advisers, advocates or sponsors (White, 1972; Schwartz and Lever, 1973; Freeman, 1978; Fischer and Peters, 1979; Holahan, 1979), and have been found to be at a disadvantage in informal interactions with faculty. Women may feel that they are ignored or given little attention in graduate school (Creager, 1971; Centra and Kuykendall, 1974; Feldman, 1974; Holmstrom and Holmstrom, 1974; Daniels, 1975), although Centra and Kuykendall (1974) found that 80% of 1950-1968 doctorates indicated that a faculty member had taken a special interest in their progress as a graduate student, and Stoddard (1977) reported that a great majority of new graduate students perceived faculty to be supportive.

As a result of these factors, women have difficulty in achieving a sense of belonging in academe (Holahan, 1979). They may feel stress from lack of support or sheer lack of numbers (Rossi, 1973), and the dearth of women at high levels may serve as a message to female students not to aim high (Roby, 1972), and lead to increased attrition and career anxiety (Rossi, 1970b). Faculty availability has been found to be related to satisfaction and performance (Daniels, 1975), and lack of availability to be associated with a female student's consideration of withdrawal, ambivalence, and fear that emotional stress might prevent degree completion (Holmstrom, 1974). Lack of interaction and communication in the male collegial system causes women to miss information and experiences necessary for professional socialization and development (Epstein, 1970; Frazier and Sadker, 1973; Kjerrulff and

Blood, 1973), and affects their opportunities for recognition and getting a good job after graduation (White, 1972; Schwartz and Lever, 1973).

Holahan (1979) reported that emotional stress in female doctoral students is an interactive function of need for support and type of department, with women in fields conventionally considered less sex-appropriate finding the graduate school environment less supportive. According to Feldman (1974), over 33% of graduate students believed that graduate education was affecting their emotional well-being, and emotional stress has been cited as a factor that might interfere with completion of graduate work by a range of 33 to 57% of students (Creager, 1971; Feldman, 1974).

Pifer and Russell (1978) suggested that role conflicts take their toll on women who aspire to academic careers. Graduate school sharpens the conflicts between traditional and alternative roles, since the typical age for women in graduate school is also a time when society makes great demands for traditional role behaviors that conflict with the student-scholar role, and women feel ambivalent about combining career and family (Rees, 1973). Newman (1971) suggested that the assumptions of women regarding their role in society act as a barrier to their full participation in higher education, and Poloma and Garland (1971) concluded that most wives are constrained by their perceptions of ideal roles, and the possibility of infringing their husbands' roles. Newman (1974) found that female graduate students experienced some role conflict, which was negatively correlated with role satisfaction and

academic performance, and Roberts (1974) suggested that they may come to see no acceptable role; they may move into traditionally female fields to find a compatible role, but become dissatisfied because they are not intellectually attracted to such fields, and the length of time taken to get degrees may be a product of the interrupted and inconsistent career patterns that result when women realize that they do not want to be what society demands that they become.

Walum (1977) suggested that, although the evidence is unclear, Horner's, 1972, and Tresemer's, 1973, work indicate that some women fear success, and perceive each academic advancement as endangering marital opportunities. Hoffman (1972, 1975) also referred to the psychological problem of achievement, and Graham (1973) suggested that married women may be especially ambivalent regarding academic success, most being reluctant to achieve higher status than that of their husband, although, according to Henderson, 1967, cited by Robinson (1971), married women indicated that they would not turn down a promotion that would result in a position above that of their husband.

Other obstacles to doctoral study that have been reported are: scheduling of classes (Goodwin, 1966; Fischer and Peters, 1979); limited course offerings (U.S. Department of Labor, 1966); health (Goodwin, 1966); age requirements (U.S. Department of Labor, 1966); lack of time/time management (Goodwin, 1966; Stoddard, 1977); personal problems (Goodwin, 1966; Stoddard, 1977); lack of confidence (Stoddard, 1977); and role ambiguity and role demands (Newman, 1974). Other factors that have been cited as causing delay in graduation are: need or desire for



a break in study (Astin, 1969); taking the doctorate at a different institution than the baccalaureate and master's degrees, or all three degrees at different institutions; and full-time engagement in professional work (Aurbach et al., 1964).

There is general agreement that lack of academic ability is not a major factor in the attrition of female graduate students, and should not be an obstacle to graduation (Rossi, 1970a, 1973; Patterson and Sells, 1973; Holmstrom, 1974; Freeman, 1978), however it has been reported that 15 to 20% of doctoral students overall (up to 26% in a particular field) have considered lack of academic ability to be a possible barrier to completion of doctoral work. Academic ability may not, anyway, be sufficient to ensure receipt of a doctorate; Goodwin (1966) concluded that success depended on a facilitating agent in the educational or home environment, in addition to the persistence and intelligence of the recipient. Roberts (1974) commented that one of the most startling characteristics of graduate women is that they do not have a clear sense that they will actually become what they are training to be; such a lack of intellectual and occupational definition cannot aid women's progress through doctoral work.

Seventy-two percent of 1973-1974 doctorates indicated that they had encountered impediments during their doctoral work, which might have slowed receipt of the degree. Impediments related to the following were encountered by 5% or more:

Emotional strain	23%	
Children	18	(38% of those with children)
Lack of confidence in abilities	18	

Demands of dissertation	18	
Lack of role models	17	
Lack of encouragement, support or interest by faculty	16	
Not taken seriously by faculty	14	
Role conflicts	13	
Marriage	13	(28% of those married)
Demands of a job	13	
Discrimination	12	
Lack of assimilation into graduate department	12	
Time-management	12	
Personal problems	11	
Physical strain/poor health	9	
Other things more important than doctoral work	9	
Lack of interaction with other students	8	
Ambiguity of role	8	
Income loss	7	
Husband's mobility	7	(15% of those married)
Length of degree program	5	
Lack of campus services, child care, day care	5	

The following were noted by less than 5%: lack of financial aid; lack of privacy for study; disapproval of spouse; lack of clear sense of purpose; lack of academic ability; disapproval of family; scheduling of classes; other family responsibilities; lack of financial incentive; negative attitudes of male students; negative attitudes of female students; burn out/lack of motivation; five different advisors; job between master's and doctorate; community unwillingness; ideological conflicts; dental surgery; three dissertation chairs; faculty; separation and divorce; being an American in Canada during the Vietnam era; lack of certainty.

Nineteen percent of 1973-1974 doctorates considered quitting graduate school for one or more of the above reasons, but only two

factors were cited by 5% or more:

Emotional strain	7%
Demands of dissertation	6

Factors that caused less than 5% to consider quitting were: lack of encouragement, support or interest by faculty; not taken seriously by faculty; other things more important than doctoral work; lack of confidence in abilities; lack of role models; personal problems; role conflicts; discrimination; ambiguity of role; marriage; lack of assimilation into graduate department; income loss; husband's mobility; lack of financial aid; lack of sense of purpose; lack of academic ability; children; demands of a job; lack of interaction with other students; length of degree program; disapproval of family; lack of financial incentive; negative attitudes of male students; negative attitudes of female students.

Forty-two percent of cases of part-time and interrupted study in graduate school were related to marriage or family. Sixty-eight percent of 1973-1974 doctorates listed factors that would have helped them to obtain the doctorate in less time:

- 23% of factors were associated with problems with the dissertation
- 21% were related to marriage or children
- 15% were related to problems with faculty
- 14% were related to lack of money
- 11% were related to problems with self-motivation
- 8% were job-related
- 9% were related to miscellaneous other factors

Not only can marriage and family have negative effects on doctoral work, but the reverse may also be true; 21% of 1973-1974 doctorates indicated that work for the doctorate had negative effects on their

marriage, and 21% indicated that it had negative effects on their family life.

Discrimination against women in graduate school is discussed below.

#### Obstacles to Postdoctoral Career Development

Obstacles to career development after receipt of the doctorate were not discussed by Hutchinson (1930) with respect to 1877-1924 doctorates.

According to Centra and Kuykendall (1974), women who persist into and through graduate school have overcome a number of barriers, but can expect to encounter even more after receiving their degrees.

One of the major problems in a woman doctorate's career development may be simply that academe is an essentially male enterprise, created and controlled by men, ordered by male values, and applying criteria applicable to the needs and lifestyles of men (Chambers, 1972). White (1972) suggested that an important barrier to the achievement of excellence and commitment by women is the expectation that their career patterns and motivations will be the same as those of men. Academe rewards behaviors that men have been trained to believe are valuable (research and administration), and in which they engage to a greater extent than women (Astin and Bayer, 1973), and rewards these activities within a time frame that men consider appropriate (Hopkins, 1973). As a result of earlier socialization and differential treatment, however, women's interests, aspirations, expectations, motivations and incentives differ from those of their male colleagues (Brown, 1967; Chambers, 1972; Graham, 1972, 1973; Astin and Bayer, 1973), and they may either reject

the value system or be unable to conform to it. The male-styled system has made few adjustments to women who desire what might be considered a normal personal life, and it is not clear that men desire any change; Frazier and Sadker (1973) noted that women who manage to complete the obstacle path through graduate school are then confronted with a variety of "Do Not Trespass" signs that guard against their further encroachment on the male domain.

1973-1974 doctorates reported the effects of being a woman on their careers as follows: 9% indicated that being a woman made it easier to obtain desired positions, while 21% indicated that it made it harder; 4% indicated that it made it easier to perform professional duties, while 20% indicated that it made it harder; 2% indicated that it facilitated promotion, while 21% indicated that it retarded or blocked promotion; 3% indicated that being a woman had necessitated a change in vocational plans; 3% indicated that it was the chief factor in abandonment of their career; and 32% indicated that it decreased earning capacity. Other effects of being a woman mentioned by 1973-1974 doctorates were that it was harder to earn respect and confidence, that women are tested more severely for their ability to do a job, that being a professional woman is lonely, and that women faculty are not treated equally; one also mentioned the difficulty, if married, of trying to find two jobs, which made moving impossible. Twenty-six percent indicated that they had experienced conflicts between their roles as professionals and women.

Marriage continues to be a competitor of academic work after receipt of the doctorate (Bernard, 1964; Harmon, 1968), and the

difficulties of combining career and marriage are compounded if children are involved (Graduate Education for Women, 1956). The system does not assist women who have home and family responsibilities (Graham, 1973), and it has been argued that the disparity between men and women in academic status and rewards results from the disadvantages caused by family responsibilities (Leive, 1971; Marwell et al., 1979).

Bryan and Boring (1947) reported that 27% of 1921-1940 doctorates employed full-time felt that marriage made pursuit of their careers more difficult (32% of those employed part-time), while 47% felt that children made pursuit of their careers more difficult (42% of part-time). None of those employed full-time reported that marriage had caused them to abandon their careers, but for those employed part-time the proportion was 24%; 3% of those employed full-time reported that children had been the chief factor in such abandonment (35% of part-time).

Two-career couples are handicapped with respect to maximizing their job prospects (Marwell et al., 1979), and decisions have tended to be made in favor of the husband, so that the wife's opportunities and career suffer (Graduate Education for Women, 1956; Feldman, 1973; Tobias and Rumbarger, 1974; Reskin, 1976; Marwell et al., 1979). Married women tend to pace their work and professional progress to fit in with family obligations, and where compromise is necessary it is generally made in favor of the family (Poloma, 1972); women are aware that their career goals are compromised for a normal family life, and have noted that it is impossible to combine an uninterrupted full-time career or a high

degree of professional commitment with a family (Johnson, 1978).

Women may be subject to forced mobility when their husbands move, and lack the freedom to move as they wish, which affects their job and advancement opportunities (Harmon, 1965, 1968; Robinson, 1971; Jensen, 1972; Feldman, 1973; Marwell et al., 1979). Astin (1969) found that about 25% of married women doctorates considered husband's mobility to be a hindrance (it was the third greatest barrier to career development), and according to Centra and Kuykendall (1974), over 50% of 1950-1968 doctorates' careers had been deterred by geographic constraints associated with their husbands' careers; location is one of the most important factors in a married woman's job decision (Morlock, 1973; Tobias and Rumbarger, 1974). Marriage and children are likely to cause job switching, part-time work, and periods of unemployment (Harmon, 1968; Poloma, 1972; Morlock, 1973; Broschart, 1978); according to Bernard (1964), up to 25% of women doctorates may drop out of the profession temporarily or permanently to raise families.

Husbands' attitudes may also represent a problem for women. Astin (1969) found that 12% of 1957-1958 doctorates considered the negative attitudes of their husbands to be a major block to career development, and Churgin (1978) suggested that a woman's accomplishments may cause feelings of incompatibility in her husband, especially if both work in the same field, although Cross (1974) pointed out that many husband-wife teams find great satisfaction in collaboration. Negative attitudes of other relatives were considered to be a major block to career development by 6% of 1957-1958 doctorates (Astin, 1969).

Twenty-eight percent of 1973-1974 married doctorates indicated that marriage made pursuit of their careers more difficult, and 2% noted that divorce had been indispensable to their careers; 43% of those ever married indicated that they had experienced conflicts between their roles as professionals and wives. Forty percent of those with children indicated that children had made pursuit of their careers more difficult, and 4% indicated that children had been the chief factor in the abandonment of their careers; 57% of those with children indicated that they had experienced conflicts between their roles as professionals and mothers.

Strain, guilt and frustration may result from attempts to combine homemaking and professional involvement (Poloma, 1972; Feldman, 1973; Centra, 1975), a major problem being that time, energy and attention have to be divided so many ways. Not all women, however, find a conflict between marriage or family and a career; married women doctorates with children may feel that they have the best of both worlds, and some have suggested that marriage and children can be advantageous to career development. Bryan and Boring (1947) noted that 50% of married 1921-1940 doctorates reported that their spouses supported their professional work enthusiastically, while Centra (1975) reported 82% for 1950-1968 doctorates; very little disinterestedness was shown. Five and 4% of 1921-1940 doctorates employed full-time and part-time, respectively, regarded marriage as indispensable in their professional achievement, 34 and 17% considered it an asset; 9 and 7%, respectively, regarded children as a major factor in professional



development; 28 and 15% considered them an asset (Bryan and Boring, 1947).

Seventeen percent of 1973-1974 doctorates ever married indicated that marriage had been an indispensable factor in their professional development, while 28% indicated that marriage had been an asset in their careers; 13% of those with children indicated that children had been indispensable in their professional achievement, while 21% considered them an asset.

Other factors that have been reported as obstacles in pre- and post-doctoral career development are: lack of campus health and medical care (Reuben, 1971; Chambers, 1972; Scott, 1974; Harway and Astin, 1977); lack of child care facilities (Chambers, 1972; Roby, 1972, 1973; Cross, 1974); absence of maternity leave policies (Chambers, 1972; Roby, 1972; Walsh, 1972); lack of good domestic help and tax deductions for such help (Astin, 1969; Roby, 1972); lack of campus housing (Scott, 1974); lack of campus meals service (Roby, 1972); male bias in curricula or curricular materials (Chambers, 1972; Roby, 1972; Sexton, 1976); full-time study requirements (Roby, 1972); counseling (Roby, 1972; Sexton, 1976); and faculties who do not give time or effort to graduate teaching (Centra and Kuykendall, 1974).

Discrimination in postdoctoral career development is discussed below.

Sixty-three percent of 1973-1974 doctorates indicated obstacles that they perceived to have affected their career development since receipt of the doctorate, of which 5% or more were related to the

following factors:

Marriage and family	22%
Employment opportunities, the job market, the economy	18
Being a woman	14
Current job	14
Self	9
Personal problems	5

Less than 5% were related to: lack of time; age; graduate work/training; health; racism; lack of state support for higher education.

As with doctoral work, not only can marriage and family have negative effects on career development, but the reverse may also be true; 17% of 1973-1974 doctorates indicated that their career had negative effects on their marriage, and 24% indicated that it had negative effects on their family life.

#### Discrimination

Discrimination on the basis of gender has been the subject of much research particularly in the late 1960s and early 1970s as a result of the women's liberation movement, and many researchers have concluded that discrimination exists in many forms, over a wide variety of disciplines, and at all levels of academe (Caplow and McGee, 1958; Kreps, 1971; LaSorte, 1971b; Newman, 1971; Oltman, 1972; Walsh, 1972; Walster et al., 1972; Kjerrulff and Blood, 1973; Morlock, 1973; Robinson, 1973; Schwartz and Lever, 1973; Astin, 1974; Cross, 1974; Feldman, 1974; Daniels, 1975; Hoffman, 1975; Fishel and Pottker, 1977; Pifer and Russell, 1978), while some have indicated that the lack of

controlled, systematic studies makes it difficult to substantiate the presence or assess the amount of discrimination (Bayer and Astin, 1968; Astin and Bayer, 1973; Rossi, 1973; Solmon, 1973; Feldman, 1974).

Newman (1971) identified three major types of barriers to the full participation of women in higher education: overt discrimination; practical institutional barriers; ingrained assumptions and inhibitions. Overt discrimination is practised by those in official capacities; practical institutional barriers are organizational patterns, policies and practices that may not be obviously discriminatory, but can hinder or halt women's efforts to obtain a higher education or employment (Roby, 1972, 1973); ingrained assumptions and inhibitions on the part of both men and women are often based on societal norms that deny the talents of women, and may be subtle and less easily countered than overt discrimination (Graham, 1972). Not all women are subject to discrimination at every turn in their careers, nor do they experience all forms in equal frequency or intensity (LaSorte, 1971b), however it has been reported that many women perceive discrimination, or experience its deleterious effects on their career development.

Those who report experiences of discrimination are more likely to be in the natural sciences and humanities than other disciplines (Simon et al., 1966; Astin, 1969), are more likely to be employed full-time than not (Astin, 1967), are more often involved in research than other activities (Astin, 1969; Lavicka, 1978), have more publications and honors than other women (Simon et al., 1966; Simon and Rosenthal; 1967; Astin, 1969), and tend to be mobile, to have mobile, academic husbands,

and to have pursued the doctorate out of interest in the field (Astin, 1969). Graduate students have been reported to be more likely to perceive and anticipate discrimination than professionals (Converse and Converse, 1971, cited by Morlock, 1973), and associate professors have been found to report more discrimination than full professors (Graduate Education for Women, 1956), although according to Ferber and Loeb (1973) age, salary, rank, and salary differential from the mean are not correlated with perception of discrimination; marital status was, however, found to be a predictor of such a perception.

#### Discrimination in graduate school

Discrimination begins long before a woman enters graduate school, being rooted in sex role socialization and differential treatment and expectations of boys and girls by parents, teachers, peers and others throughout childhood and adolescence (Lewin and Duchan, 1971; Roby, 1972; Astin and Bayer, 1973; Harway and Astin, 1977). It has been reported that discrimination exists in admission to undergraduate institutions (Astin and Bayer, 1973).

Female graduate students have been reported to perceive discrimination in graduate school admissions (Gould and Pagano, 1972; Morlock, 1973; Centra and Kuykendall, 1974), and researchers have also concluded that biased admissions policies discriminate against women, especially at high-ranking institutions (Sandler, 1970, cited by Walsh, 1972; Chambers, 1972; Roby, 1972, 1973; Carnegie Commission, 1973; Cross, 1974; A. S. Harris, 1974; Holmstrom and Holmstrom, 1974; Scott, 1974; Useem, 1974; Sexton, 1976; Harway and Astin, 1977; Churgin, 1976;

Freeman, 1978; Fischer and Peters, 1979). Heiss, cited by Freeman (1978), considered that gender was probably the most discriminatory factor applied in the graduate admissions process, and Lewis (1968) stated that "sex should be considered as a relevant variable in graduate admissions," and that, "if the girl is in her early twenties, it is both reasonable and desirable that an admissions committee look for signs that increase the possibility that she will finish her degree." Special reference has been made to discriminatory admissions practices towards mature women (Randolph, 1972; Cross, 1974).

Women have been noted to have higher undergraduate and graduate school grade points than men (Cross, 1974; A. S. Harris, 1974), lending support to the argument that they are discriminated against in the admissions process, however some researchers have concluded that the evidence does not support this (Astin, 1969; Folger et al., 1970), and that highly qualified scholars have access to the same types of schools regardless of gender (Solmon, 1973). Sells (1973) found little difference between men and women overall in the proportion of graduate applicants admitted to one institution, however no account was taken of the qualifications of applicants or of those accepted. Admissions practices that have been reported to discriminate against women are: quotas (Pullen, 1970; Walsh, 1972; Roby, 1972, 1973; Rossi, 1973; Cross, 1974; Sexton, 1976); percentages (Cross, 1974); equal rejection (Freeman, 1978); and higher admissions standards (Sandler, 1970, cited by Walsh, 1972). According to Centra and Kuykendall (1974), however, women perceive discrimination to be more of a problem after admission to

graduate school than in the admissions process itself.

Female graduate students have been reported to perceive discrimination in the awarding of fellowships and teaching assistantships (Gould and Pagano, 1972; Morlock, 1973), and researchers have also concluded that women are discriminated against in financial aid, fellowships, scholarships and assistantships (Sandler, 1970, cited by Walsh, 1972; Newman, 1971; Painter, 1971; Carnegie Commission, 1973; Frazier and Sadker, 1973; Rees, 1973; Roby, 1973; Holmstrom and Holmstrom, 1974; Scott, 1974; Sexton, 1976; Harway and Astin, 1977; Walum, 1977; Churgin, 1978; Freeman, 1978; Fischer and Peters, 1979). Particular discrimination in financial aid has been reported to affect mature and returning students (Randolph, 1972; Walum, 1977), part-time students (Roby, 1972; Rossi, 1973; Walum, 1977), and married women (Walum, 1977), although Feldman (1974) found that marital status had very little to do with receipt of financial aid. Some researchers have not found evidence that women are discriminated against in financial aid (Astin, 1969; Folger et al., 1970; Rossi, 1973; Cross, 1974), and Rees (1973) concluded that there was substantial evidence that full-time women students were not discriminated against. Roby (1973) and Rees (1973) noted that in terms of proportions receiving financial aid, there seemed to be no discrimination, and according to Solmon (1973), women may comprise a larger share of fellowship recipients than applicants; however, no account was taken of the academic ability of applicants or recipients. It has also been suggested that some women are penalized financially by families who place little value on a daughter's

education, and are unwilling to fund her graduate study (Roby, 1972; Walum, 1977).

It has been reported that women in graduate school and on faculties suffer the discriminatory attitudes and actions of male faculty and students. Their attitudes have been described as: archaic and outmoded (Randolph, 1972; Roby, 1972); antagonistic and blatant antagonism (Fox, 1970; Young, 1978); antifemale or antifeminist (Bikman, 1970; Feldman, 1973); male supremacist (Howe et al., 1971); and severe psychological harassment and intimidation (Bikman, 1970). Men's notions of women's place and roles affect the way that they treat women (A. S. Harris, 1974), and female students may be encouraged to think of themselves only as potential wives and mothers, or teachers and nurses at best (Newman, 1971), and may encounter contempt for not playing traditional roles (Daniels, 1975); it has been reported that some professors have opposed advanced study for women on the grounds of protecting their marriages (Cross, 1974).

Creager (1971) found that 31% of women stated that professors in their departments did not take women seriously, although Stoddard (1977) found that most new students believed that they were being taken seriously; researchers have also concluded that women are not taken seriously (Caplow and McGee, 1958; Fox, 1970; Carnegie Commission, 1973; Feldman, 1974; Daniels, 1975), and Ferber and Loeb (1973) suggested that married women experience more difficulty in being taken seriously than single women. It has been reported that male faculty may believe that women are less intellectually able than men, show less promise of

academic distinction, do not comprehend material as well, do not have the ability to achieve the doctorate, and are not suited to academic life (Frazier and Sadker, 1973; Rees, 1973; Freeman, 1978; Pifer and Russell, 1978). The commitment, dedication, intentions, motivations and creativity of women may be questioned by male faculty, and it has been reported that it is conventionally assumed that women are insufficiently committed and less dedicated than men (Fox, 1970; Hartman, 1972; Graham, 1973; Roby, 1973; Daniels, 1975; Freeman, 1978). Roberts (1974) found that derogatory and sexually disparaging comments are experienced frequently by women, and, even in academe, women may be treated as sex objects (Schwartz and Lever, 1973; A. S. Harris, 1974).

Men are not alone in showing negative attitudes towards academic women. About 20% of females have been reported to concur with the perception that female students are not as dedicated as males, and Goldberg (1974) discussed the tendency of women to downgrade the work of other females. Cross (1974) reported that women may criticize other women for "neglecting" their husbands and children, and Schwartz and Lever (1973) noted that faculty members' wives may resent their husbands' female students.

These negative attitudes can have deleterious effects on academic women. Roberts (1974) found that women overwhelmingly indicated that such denigration was a major problem in their careers, and suggested that the assumption that women are not serious about their careers may become self-fulfilling, and that the attrition rate of female graduate students could be traced to such attitudes. Lowered expectations of



women by professors may also become self-fulfilling (Walum, 1977); women's aspirations are lowered, and even the very talented may be affected by the "climate of unexpectation" (Newman, 1971). Similarly, the questioning of women's commitment, motivation, dedication, intentions and creativity may become self-fulfilling (Stokes, 1970; Rees, 1973); their motivations are undercut (Fox, 1970), and they may become demoralized and dissatisfied with graduate study (Daniels, 1975), and suffer emotional stress, which has been linked to an increase in attrition from graduate school.

Gould and Pagano (1972) found that 68% of female full-time graduate students were aware of discrimination, 48% had been personally exposed to it, and 64% were concerned with inequalities.

Thirty-nine percent of 1973-1974 doctorates indicated having experienced discrimination on the basis of gender as doctoral students; the following types of discrimination were experienced by 5% or more:

Not taken seriously	28%
Exclusion from informal information networks	11
Fellowships/scholarships awarded	7
Financial aid	5
Exclusion from formal information networks	5

Discrimination related to the following was experienced by less than 5%: curriculum; salary; professional expectations; personal expectations; job assignments; hiring; admission to graduate school; lack of campus services such as health and child care; housing; nepotism rules; professional recognition; abuses of part-time/temporary employees; counseling; research grants; maternity policies; exclusion from

decision-making; promotion/rank; inability to exercise authority of position; tenure; opportunities to get into administration; travel grants; fringe benefits; and examiners being unreasonably cruel to women on oral examinations.

#### Discrimination in postdoctoral career development

Comments by 1877-1924 doctorates mentioned the discrimination that many experienced in appointments, promotion and salaries (Hutchinson, 1930).

Women doctorates have reported discrimination in hiring to first and subsequent jobs (Chmaj, 1971; Morlock, 1973); proportions reporting having experienced such discrimination have ranged from 14 to 25% in different studies (Bryan and Boring, 1947; Astin, 1969; Ferber and Loeb, 1973), and 36% of 1921-1940 doctorates felt that being a woman made it harder to obtain the work that they desired (Bryan and Boring, 1947). Many researchers have also concluded that women are discriminated against in hiring, and fail to be hired in proportion to their number in the pool of doctorates (Berwald, 1962, cited by Simpson, 1972; Brown, 1967; Fischer and Golde, 1968; Astin, 1969, 1972; Fidell, 1970; Pullen, 1970; Lewin and Duchan, 1971; Chambers, 1972; Hartman, 1972; Roby, 1972; Simpson, 1972; Walsh, 1972; Frazier and Sadker, 1973; Loeb and Ferber, 1973; Robinson, 1973; Rossi, 1973; Schwartz and Lever, 1973; Freeman, 1978), although Sexton (1976) concluded that if doctoral degrees were used as the criterion, women may be overrepresented on college faculties. Lewin and Duchan (1971) suggested that women are evaluated on different (personal rather than professional) criteria than males in

the hiring process, and Simpson (1972) recommended that women should recognize that they may not be selected on an equal basis with men; in effect, they must be more highly qualified than their male competitors.

Some researchers have concentrated on hiring to the first postdoctoral appointment, since the importance of initial job placement in long-range career development has been recognized (Tobias and Rumbarger, 1974; Cartter and Ruhter, 1975; Cartter, 1976), and some have found that women are discriminated against in being hired initially at a low rank or in a nonrank position (Henderson, 1967, cited by Robinson, 1973; Morlock, 1973; Tobias and Rumbarger, 1974). Bayer and Astin (1968), however, indicated that beginning academic rank in college or university teaching was unrelated to gender for 1964 doctorates, and Cartter and Ruhter (1975) and Cartter (1976) concluded that although women doctorates had previously been disadvantaged in first job placement, there no longer seemed to be discrimination in the quality of the institution of first job placement in research and development and postdoctoral activity for 1967-1973 doctorates, and that discrimination in teaching appointments had disappeared by 1973 (probably partly as a result of legislation).

Inequalities in hiring have been reported to cause disproportionate numbers of women to be appointed to irregular positions, which may require a change of field or specialty, and rarely offer the rewards, rights, privileges, security, prestige, or fringe benefits of regular positions (Simon et al., 1966; Howe et al., 1971; Robinson, 1973; Tobias and Rumbarger, 1974). Unequal treatment in the hiring process has also

been reported to cause women to be less able than men to secure positions in the type of institution that they prefer (Robinson, 1973), so that they tend to work at smaller, low-ranking institutions, are underrepresented at high-ranking institutions (Bernard, 1964; Howe et al., 1971; Kreps, 1971; Astin and Bayer, 1973; Robinson, 1973), and have less access to prestigious colleagues, funded research and professional contacts (Patterson, 1971). Pullen (1970) concluded that women have to settle for jobs requiring less education than they have, and Hartman (1972) noted that women are overeducated and underemployed, with the result, according to Hoffman (1975), that their career commitment suffers. Some of the differential in the institutional placement of academic women, however, is due to preference, and the constraints that women place on the jobs that they will accept (Bernard, 1964).

A particular form of discrimination in hiring is related to antinepotism (Mitchell and Alciatore, 1970; Chmaj, 1971). Researchers have reported on antinepotism policies that discriminate against women, and often illustrated them with individual or personal experiences (Simon et al., 1966; Henderson, 1967, cited by Robinson, 1973; Astin, 1969; Mitchell and Alciatore, 1970; Astin et al., 1971; Chmaj, 1971; Reuben, 1971; Morlock and the Commission on the Status of Women in the Modern Language Association, 1972; Roby, 1972; Sadker and Sadker, 1972; Walsh, 1972; Carnegie Commission, 1973). Sadker and Sadker (1972) considered married couples to be the untouchables of academe, since they run afoul of formal and unwritten antinepotism policies, which prevent faculty appointments of more than one member of a family in the same

department, or sometimes in the same institution. Primarily, these policies act to prevent the hiring of a woman whose husband is a faculty member, limiting her opportunities on a basis unrelated to qualifications or competence (Shaffer and Shaffer, 1966; Simon et al., 1966; Harmon, 1968; Howe et al., 1971; Sadker and Sadker, 1972; Walsh, 1972; Morlock, 1973; Sigworth, 1974).

An AAUW study made in 1959/1960 found that of 95 higher education institutions open to women, 35% had specific antinepotism rules, and 16% had practices that became restrictive in some situations (Dolan and Davis, 1960; Shaffer and Shaffer, 1966). Bunting et al. (1970) suggested that antinepotism policies were being eliminated. Over 33% of 1957-1963 doctorates who had husbands employed in academe claimed to have been affected by antinepotism. Such policies may cause women to have no alternative but to apply for a postdoctoral fellowship after graduation (Astin, 1969; Graham, 1973).

Ferber and Loeb (1973) noted that 5% of women felt that they had been discriminated against by being given heavier work loads; 4% thought that women were less likely to be given graduate standing or graduate students. It has also been reported that women are discriminated against in job, especially teaching, assignments, with the proportion of women teaching decreasing as course levels increase (Howe et al., 1971; Hoffman, 1975; Fishel and Pottker, 1977; French, 1979), although Henderson, 1967, cited by Robinson (1973), found that women taught the same course levels as men. Kashket et al. (1974) reported that women doctorates supervised significantly fewer people than men, and Astin

(1969) reported that 33% of 1957-1958 doctorates had experienced employer unwillingness to delegate responsibilities to women. According to Bryan and Boring (1947), 19% of 1921-1940 doctorates thought that being a woman made it harder to perform their professional duties, although 10% thought that it made it easier.

Traditionally, academic rewards have been based chiefly on publication productivity, with teaching interests paid lip-service only (Astin and Bayer, 1973), and many researchers have concluded that women are less likely than men to reap rewards for active professional participation, thus being robbed of incentives for scholarly activities (Newman, 1971; Patterson, 1971; Astin and Bayer, 1973; Centra and Kuykendall, 1974; Centra, 1975); indeed, Caplow and McGee (1958) suggested that women are not just low in prestige, but fall outside the prestige system entirely, although Centra and Kuykendall (1974) and Centra (1975) saw signs of recent gains in rewards for women.

Women doctorates have perceived discrimination in promotion and therefore rank, particularly in terms of administrative positions (Graduate Education for Women, 1956; Mitchell and Alciatore, 1970; Chmaj, 1971; Harrington, 1971; Morlock, 1973). Bryan and Boring (1947) found that 21% of 1921-1940 doctorates thought that being a woman retarded or blocked promotion (1% thought that it facilitated it). Astin (1969) found that 33% of 1957-1958 doctorates employed full-time had experienced differential policies on tenure, promotion or seniority, while according to Ferber and Loeb (1973), 27% of doctorates believed that women were hired at lower rank and promoted more slowly than men,

and 18% perceived discrimination against women in administrative positions. Many researchers have noted that women work predominantly in the lower ranks of academe, that they are promoted less rapidly than men, and therefore hold lower ranks, especially in high prestige departments and institutions, that they are highly underrepresented in the upper levels of administration, on committees, and in decision-making positions, and that some of these differentials must be attributed to discrimination (Parrish, 1962; Bernard, 1964; Simon and Rosenthal, 1967; Bayer and Astin, 1968; Astin, 1969, 1972, 1974; Pullen, 1970; Chmaj, 1971; Howe et al., 1971; Kreps, 1971, 1974; Lewin and Duchan, 1971; Newman, 1971; Reuben, 1971; Chambers, 1972; Graham, 1972; Hartman, 1972; Oltman, 1972; Roby, 1972; Astin and Bayer, 1973; Carnegie Commission, 1973; Frazier and Sadker, 1973; Loeb and Ferber, 1973; Morlock, 1973; Robinson, 1973; Rossi, 1973; Centra and Kuykendall, 1974; Kashket et al., 1974; Centra, 1975; Hoffman, 1975; Sexton, 1976; Fishel and Pottker, 1977; Churgin, 1978; Young, 1978).

Astin and Bayer (1973) reported that although similar variables were most important in predicting high rank for men and women, secondary factors differed, and the average rank differential was about one-fifth of a step. Bayer and Astin (1968), however, found that for 1964 natural science doctorates, men and women were promoted comparably, and Loeb and Ferber (1973) concluded that gender by itself did not predict rank. Some of the differential is due to women's academic interests and preferences (Astin and Bayer, 1973), and it has been suggested that women may resist the more rigid scheduling and increasing isolation that

come with high level positions (Brown, 1967; Graham, 1973).

Women doctorates have also perceived discrimination in tenure (Morlock, 1973), and researchers have noted that women are less likely to have tenure than men, and receive it at a later age, if at all (Simon et al., 1966; Hartman, 1972; Morlock and the Commission on the Status of Women in the Modern Language Association, 1972; Astin and Bayer, 1973; Carnegie Commission, 1973; Morlock, 1973; Robinson, 1973; Sinowitz, 1974; Fishel and Pottker, 1977). Tenure policies generally do not consider part-time work, which may affect some women (Morlock and the Commission on the Status of Women in the Modern Language Association, 1972; Keast and Macy, 1973; Tobias and Rumbarger, 1974).

Women doctorates have perceived and experienced discrimination in salary (Graduate Education for Women, 1956; Mitchell and Alciatore, 1970; Chmaj, 1971; Harrington, 1971). According to Bryan and Boring (1947), 52% of 1921-1940 doctorates thought that being a woman decreased their earning capacity (1% thought that it increased it), while Hill (1970) found that about 33% of doctorates perceived discrimination in salary. Astin (1969) found that 40% of 1957-1958 doctorates employed full-time had experienced differential salaries with the same training and experience, while according to Loeb and Ferber (1973), 26% of women cited that women were paid less.

Studies of academic salaries have consistently found that women doctorates earn less than men, and that some of this differential is due to discrimination (Fava, 1960; Bernard, 1964; Henderson, 1967, cited by Robinson, 1973; Simon and Rosenthal, 1967, cited by Kreps, 1971; Bayer



and Astin, 1968; Harmon, 1968; Astin, 1969, 1972, 1974; Converse and Converse, 1971, cited by Morlock, 1973; Howe et al., 1971; Lewin and Duchan, 1971; LaSorte, 1971a; Newman, 1971; Reuben, 1971; Robinson, 1971, 1973; Graham, 1972, 1973; Jensen, 1972; Morlock and the Commission on the Status of Women in the Modern Language Association, 1972; Roby, 1972; Astin and Bayer, 1973; Carnegie Commission, 1973; Cates, 1973; Frazier and Sadker, 1973; Loeb and Ferber, 1973; Morlock, 1973; Rossi, 1973; Centra and Kuykendall, 1974; Howe, 1974; Johnson and Stafford, 1974; Kashket et al., 1974; Kreps, 1974; Carnegie Council, 1975; Centra, 1975; Hoffman, 1975; Scott, 1975; Sexton, 1976; Fishel and Pottker, 1977; Churgin, 1978; Freeman, 1978; Young, 1978). Astin and Bayer (1973), however, considered that studies other than that of Bayer and Astin (1968) suggested that salary differentials could be explained by influential variables, and Cartter and Ruhter (1975) and Cartter (1976) considered that differentials had almost been eliminated at the point of entry into academic teaching, although differentials persisted among older members of the profession. Gordon et al. (1974) reported that salary increments between ranks were similar for men and women, and Centra and Kuykendall (1974) suggested that income differentials were slight among those employed by the federal government.

Salary differentials reported have varied across fields, work settings and ranks, from \$500 to \$8500 per year, and women have been reported to earn 68 to 99% of the male salary. Differentials may start out relatively small on entry into the profession, but increase with increasing rank and experience (Howe et al., 1971; LaSorte, 1971a,b;

Reuben, 1971; Robinson, 1973; Johnson and Stafford, 1974; Kashket et al., 1974; Centra, 1975; Scott, 1975), so that the most highly qualified and valuable women fall progressively behind in salary (LaSorte, 1971a). Some researchers have concluded that salary differentials have been narrowing (Simon et al., 1967 (except in education); Centra and Kuykendall, 1974; Cartter and Ruhter, 1975; Cartter, 1976), while others have concluded that they have been widening (Scully, 1970, cited by Chambers, 1972; LaSorte, 1971a; Painter, 1971; Morlock, 1973; Freeman, 1978; Pifer and Russell, 1978; Young, 1978). It has also been reported that women are discriminated against in fringe benefits in academe.

Women have been said to be discriminated against in recognition in academe, being invited less frequently than men to participate in events that denote recognition, such as lectures and consultancies, and that they suffer discrimination in terms of grants (Lewin and Duchan, 1971), assignments of office space, applications for leave (French, 1979), and travel funds (Newman, 1971; French, 1979).

Some groups of women seem to be particularly subject to discrimination in academe. Older women have been reported to be especially affected (Morlock and the Commission on the Status of Women in the Modern Language Association, 1972; Randolph, 1972; Carnegie Commission, 1973; Cross, 1974). Part-time students may suffer particular discrimination, which can add to the discrimination against older and married women, who may have no choice but to study or work part-time. According to Ferber and Loeb (1973), 9% of doctorates cited particular discrimination against faculty wives.

The proportion of women reported to believe that discrimination has affected their careers has ranged from 15 to 85% in different studies, with 33 to 50% most commonly reported (Graduate Education for Women, 1956; Winkler, 1968; Astin, 1969; Mitchell and Alciatoire, 1970; Robinson, 1971; Morlock, 1973).

Fifty-four percent of 1973-1974 doctorates reported having experienced discrimination on the basis of gender in their postdoctoral career development; discrimination related to the following was experienced by 5% or more:

Salary	26%
Exclusion from informal information networks	24
Promotion/rank	19
Not taken seriously	19
Hiring	16
Professional recognition	16
Exclusion from decision-making	16
Professional expectations	15
Exclusion from formal information networks	14
Personal expectations	13
Job assignments	13
Abuses of part-time/temporary employees	13
Inability to exercise authority of position	12
Hiring to first postdoctoral position	11
Opportunities to get into administration	10
Nepotism rules	9
Appointments to committees	8
Tenure	8
Maternity policies	7
Research grants	6
Fringe benefits	6
Lack of campus services such as health and child care	5

Discrimination related to the following was experienced by less than 5%: assignment to too many committees; underground resentment and envy of males (action - criticism, foot dragging, uncooperative); level of

students taught; travel grants; curriculum. One woman made the point that all discrimination is very subtle, and one indicated that such a list could not adequately describe the total emotional and physical stress of these conditions.

Not all discrimination is based on gender. Four percent of 1921-1940 doctorates reported believing that they had lost appointments because of their religion, and 1% because of their race or nationality (Bryan and Boring, 1947).

Twenty-nine percent of 1973-1974 doctorates reported having experienced discrimination based on factors other than gender:

Marital status	15%
Religion	5
Age	4
Ethnic background	4
Pregnancy	1
Anti-union organizer	1
Job classification	1
Being short	1
Feminist interests	1
Nontenure track position	1

1973-1974 doctorates perceived the following as being agents of discrimination in higher education:

Administration	55%
Male colleagues	38
Department heads	36
Faculty	33
General public/society	29
Female colleagues	24
Students	17

In addition, it was noted that women discriminated against themselves in expectations, and against each other; one wrote: "Women, I believe, do us the worst disadvantage; by virtue of either underachieving and misrepresenting women's potential, or by assuming a hostile and paranoid

position which harms the position of all of us."

1973-1974 doctorates' perceptions of discrimination were not always in line with their actual experiences of discrimination. In 22 of 31 types of discrimination, the percentage who perceived such discrimination exceeded the sum of the percentages of women who had experienced such discrimination as students and since receiving the doctorate, in some cases by a considerable amount. Seventy-six percent of 1973-1974 doctorates reported having perceived discrimination; discrimination related to the following was perceived by 5% or more:

Not taken seriously	30%
Promotion/rank	29
Salary	29
Exclusion from informal information networks	28
Abuses of part-time/temporary employees	23
Opportunities to get into administration	22
Exclusion from decision-making	22
Professional recognition	21
Professional expectations	21
Hiring	20
Admission to graduate school	17
Inability to exercise authority of position	16
Lack of campus services such as health and child care	15
Hiring to first postdoctoral position	15
Tenure	15
Job assignments	15
Personal expectations	14
Nepotism rules	12
Exclusion from formal information networks	12
Financial aid	11
Fellowships/scholarships awarded	11
Appointments to committees	10
Level of students taught	10
Research grants	9
Maternity policies	9
Fringe benefits	8
Travel grants	8
Curriculum	7

Discrimination related to the following was perceived by less than 5%: counseling; housing; and residence requirements. It is not clear whether these women had been fortunate in not experiencing as much discrimination as they perceived to exist, or whether they perceived discrimination that did not actually exist.

#### Discrimination versus differential treatment

It has been argued that what may appear to be discrimination is actually justifiable differential treatment, based on the assumptions that women are poorer risks than men to complete doctoral programs, to use their education in employment, and to be professionally productive (Lewis, 1968; Fox, 1970; Stokes, 1970; Rees, 1973; Cross, 1974).

It has been said that so many things can happen to interfere with a woman's commitment to graduate study that a man is a better bet for a long-term contribution to society (Fischer and Golde, 1968; Cross, 1974). Attrition rates for women in graduate school have been reported to range from about 50 to 97% (Bernard, 1964; Mooney, 1968; Sharp, 1970; Patterson and Sells, 1973; Sells, 1973; Cross, 1974), however the time limits after which women are considered to have dropped out have been as low as 5 years, and it is known that many women take longer than this to earn their doctorates, so that attrition rates have included women who receive their degrees later, as well as those who have temporarily interrupted their study, or moved to other institutions to complete their degrees. It has been noted that, while women may tend to drop out of programs, they also tend to "drop in" (Newman, 1971; Cross, 1974; Churgin, 1978); they may be less likely than men to complete their

training at one institution, but Newman (1971) concluded that if they are less likely ever to complete it, this might be attributed largely to the unwillingness of institutions to accept and support transfer students. According to Tenopyr (1977), women's attrition rates are decreasing.

According to Whittaker, cited by Rees (1973), "there is ample statistical support for the proposition that the hard-pressed American taxpayer or even the generous donor is not getting his [sic] money's worth out of women graduate students if Ph.D.s practicing their profession is the goal," and Brown (1967) suggested that lower starting salaries for women represent recognition of a gamble by the employer regarding their professional commitment. Brown (1967) noted that more female than male doctorates leave the labor force, and Kreps (1974) suggested that women may be unable to pursue their careers as systematically as men, especially if married; yet it has been reported that the higher the qualifications of women, the higher their rate of participation in the labor force (U.S. Department of Labor, 1966; Lewis, 1968; A. S. Harris, 1974), indicating a high return for investment, women doctorates have been shown to have a high rate of employment, and Loeb and Ferber (1973) concluded that women are not measurably less stable as employees than men.

To account for the lack of success of women in academe, it has been said that they are generally less productive than men, where productivity is synonymous with publication. Some researchers have concluded that women publish less than men (Simon and Rosenthal, 1967;

Kreps, 1971; Astin and Bayer, 1973; Cross, 1974; Centra, 1975); others have concluded that if influential variables are controlled, women publish as much as men, or slightly more, and that differences are insufficient to warrant differential rewards (Bernard, 1964; Epstein, 1970; Patterson, 1971; Graham, 1973; Loeb and Ferber, 1973). Attention has also been called to the fact that there is no measure of quality in publication rates (Rossi, 1970a), and that measures of academic productivity take little account of teaching, to which women devote more time than men (Bernard, 1964; Rossi, 1970a; Kreps, 1971; Astin and Bayer, 1973; Cross, 1974), so that women's productivity may be severely underestimated.

Newman (1971) concluded that the argument that women are less likely than men to complete and use their training has much less basis in fact than is usually supposed, and that what basis there is seems clearly attributable to artificial obstacles that stand unnecessarily in the way of women completing and using their education, rather than to some innate disposition regarding educational or career goals.

## Discussion

### 1973-1974 doctorates

About seven-tenths of 1973-1974 doctorates felt that they had encountered impediments during their doctoral work, which might have slowed receipt of the degree; emotional strain was the most often reported problem overall, but children and marriage were greater problems among those to whom they were applicable. About one-fifth had



considered quitting graduate school due to one or a combination of impediments, but only emotional strain and demands of the dissertation were noted by 5% or more as a cause of considering dropping out.

Over two-fifths of cases of part-time and interrupted study in graduate school were related to marriage and family. About two-thirds listed factors that would have helped them to get the doctorate in less time; of these, almost one-fourth were related to the dissertation, and about one-fifth were related to marriage and children. About one-fifth indicated that work for the doctorate had negative effects on their marriage, and about one-fifth indicated that it had negative effects on their family life.

In terms of various aspects of career development, being a woman had more negative than positive effects, however in each case a majority indicated that it had no effect. About one-fourth indicated that they had experienced conflicts between their roles as professionals and women.

Over one-fourth of married doctorates indicated that marriage made pursuit of their careers more difficult; however, over one-fourth indicated that marriage had been an asset in their professional development, and almost one-sixth more indicated that marriage had been indispensable in their careers. Over two-fifths of those ever married indicated that they had experienced conflicts between their roles as professionals and wives.

Children were perceived to be more of a handicap to career development than marriage and less of an asset. Two-fifths of those

with children indicated that children had made pursuit of their careers more difficult, and in a few cases, children had led to abandonment of a career. About one-fifth had found children to be an asset in their professional development, and about one-eighth indicated that children had been indispensable in their careers. Almost three-fifths of those with children indicated that they had experienced conflicts between their roles as professionals and mothers.

Over three-fifths listed obstacles which had affected their career development since receipt of the doctorate, slightly over one-fifth of which were related to marriage and family, and slightly under one-fifth related to employment opportunities, the job market and the economy. About one-sixth indicated that their career had negative effects on their marriage, and about one-fourth indicated that it had negative effects on their family life.

As doctoral students, about two-fifths had experienced some type of discrimination; the problem most commonly mentioned was that they were not taken seriously (over one-fourth). After receiving the doctorate, over half reported having experienced discrimination, and more types of discrimination were reported; that related to salary was most commonly mentioned (about one-fourth), and exclusion from informal information networks was also cited by about one-fourth.

Women were not only discriminated against on the basis of gender. Over one-fourth reported having been discriminated against on the basis of other factors, most commonly marital status (about one-seventh), but also religion, age, ethnic background, pregnancy, anti-union organizer,

job classification, feminist interests, nontenure track position and being short.

Administrators were perceived as agents of discrimination by over half, male colleagues, department heads and faculty by one-third or more each, public/society by over one-fourth, female colleagues by almost one-fourth, and students by about one-sixth. It was also noted that women discriminated against themselves and each other.

These women perceived more discrimination than they actually experienced, and in terms of individual types of discrimination, sometimes a considerable discrepancy was noted. About three-fourths had perceived discrimination; over one-fourth perceived discrimination to exist in not being taken seriously, promotion/rank, salary, and exclusion from informal information networks. It was not clear whether these women had been fortunate in not experiencing as much discrimination as they perceived to exist, or whether they had perceived discrimination that did not actually exist.

#### Comparison of 1973-1974 doctorates with 1877-1924 doctorates

Hutchinson (1930) did not deal to any great extent with obstacles in graduate school experienced by 1877-1924 doctorates, so comparisons are limited.

For both sets of doctorates, it was noted that dependents were a cause of interruption of graduate work, however the most recent doctorates reported other factors which also interrupted their study. 1973-1974 doctorates found emotional strain to be a problem in graduate school, as did their earliest counterparts, however physical strain

seemed to be less of a problem for the most recent doctorates.

Hutchinson (1930) did not discuss obstacles to postdoctoral career development with respect to 1877-1924 doctorates.

Discrimination in graduate school was not discussed by Hutchinson (1930) with respect to 1877-1924 doctorates, but it was reported that their comments indicated that many experienced discrimination in appointments, promotions and salaries. These three factors ranked in the top five forms of discrimination experienced by 1973-1974 doctorates in their postdoctoral career development; the most recent doctorates, however, reported experiencing many other types of discrimination based on gender and, to a lesser extent, on other factors, both during their doctoral study and in their postdoctoral career development.

Discrimination seemed to be a much more serious problem for the most recent doctorates than it was for their earliest counterparts.

#### Comparison of 1973-1974 doctorates with other doctorates

Family responsibilities were found to be impeding factors in doctoral work for 1973-1974 doctorates, as reported for earlier doctorates, however such problems were experienced by a smaller proportion than previously reported. As for earlier doctorates, factors related to marriage and family were a major cause of part-time and interrupted study; marriage, children, husband's mobility, disapproval of spouse, lack of privacy for study, problems of time management, lack of interaction with other students, role conflicts and other family responsibilities were all impediments in graduate school for 1973-1974 doctorates, as for earlier doctorates, though some were cited by only a

small proportion of women.

Financial problems were again cited as impediments in graduate school by 1973-1974 doctorates; cost of study and income loss caused part-time and interrupted study, and income loss and lack of financial aid were reported as impediments to doctoral work, but only by very small proportions of women.

As for earlier doctorates, lack of role models was again a problem for 1973-1974 doctorates; it was cited as an impediment in graduate school, and caused a small proportion to consider quitting. Lack of encouragement, support or interest by faculty, lack of assimilation into the graduate department, lack of interaction with other students, not being taken seriously by faculty, discrimination, and negative attitudes of male and female students were also cited as impediments and causes of small proportions of 1973-1974 doctorates considering quitting graduate school.

As reported by earlier researchers, emotional stress impeded the graduate work of 1973-1974 doctorates; this was the most commonly cited impediment, and also the factor most often cited in consideration of quitting graduate school, however the proportions were lower than those reported for earlier doctorates. Role conflicts were again considered impediments to doctoral work, and were a cause of a small proportion of 1973-1974 doctorates considering graduate school.

As previously reported, demands of a job were again cited as an impediment to women's doctoral study, causing about one-fourth of cases of part-time and interrupted graduate study for 1973-1974 doctorates,

and causing a very small proportion to consider dropping out of graduate school.

Similar to Roberts' (1974) finding, a small proportion of 1973-1974 doctorates indicated that lack of sense of purpose was an impediment in graduate school, and considered quitting for this reason. Since all the 1973-1974 doctorates completed their programs successfully, it is assumed that they did not lack academic ability, however again lack of academic ability was cited by small proportions as an impediment to their doctoral work, and a cause of considering quitting graduate school. The proportions, however, were considerably lower than those cited by earlier researchers.

Other problems during graduate study that had previously been reported and were confirmed as obstacles by 1973-1974 doctorates were: scheduling of classes, strain/health, time management, personal problems, lack of confidence, role ambiguity, demands of the dissertation, length of degree program, and lack of financial incentive. Some of these factors also caused women to consider quitting graduate school.

The problems associated with the fact that academe is an essentially male system are reflected in the opinions of 1973-1974 doctorates on the effects of being a woman on career development. In terms of obtaining desired work, performing professional duties, promotion, and earning capacity, few saw any advantage in being a woman; more saw disadvantages than saw advantages, although lack of effect was more common in each case. Some also indicated that they had experienced

conflicts between their roles as professionals and women.

Figures on the effect of marriage and children on the careers of 1973-1974 doctorates were similar to those reported for 1921-1940 doctorates employed full-time. Again, as would be expected, it was noted that children represent more of a problem for professional women than marriage. The problems of marriage and family were also reflected in the obstacles to career development cited by 1973-1974 doctorates. As reported previously, it was found that role conflicts were problems for 1973-1974 doctorates, and again the proportions who had experienced conflicts between their roles as professionals and as wives and mothers indicated that children caused more of a problem than marriage. 1973-1974 doctorates, however, were more likely to see marriage and children as being indispensable to their careers than 1921-1940 doctorates, but, as for the earlier doctorates, children were viewed less favorably than marriage.

As previously reported, many 1973-1974 doctorates experienced discrimination on the basis of gender both in their pre- and post-doctoral career development, and discrimination was reported in all three of Newman's (1971) categories; however, again not all women experienced discrimination, and not all experienced the same types or amounts of discrimination.

Although not addressed in the study of 1973-1974 doctorates, several mentioned that early socialization, differential treatment and expectations had been a problem for them. Discrimination in graduate school admissions was again experienced by a small proportion of

1973-1974 doctorates, confirming that it still exists (and this was among women who succeeded in getting into graduate school). Small proportions of 1973-1974 doctorates also reported discrimination in the awarding of fellowships and scholarships, financial aid, and hiring in graduate school.

As reported by earlier researchers, discriminatory attitudes and actions were again experienced by 1973-1974 doctorates. Not being taken seriously was by far the most frequently noted form of discrimination, and exclusion from informal information networks was the second most frequent form; discrimination in exclusion from formal information networks, professional and personal expectations, and recognition were also experienced by small proportions of 1973-1974 doctorates.

In their postdoctoral career development, 1973-1974 doctorates experienced even more discrimination than they experienced during their doctoral study. As previously reported, 1973-1974 doctorates experienced discrimination in hiring to the first and subsequent postdoctoral positions, and in the form of antinepotism rules, although discrimination in hiring to the first postdoctoral position was experienced by a smaller proportion than previously reported; a smaller proportion of 1973-1974 doctorates reported that being a woman made it harder to obtain desired work than was so for 1921-1940 doctorates.

1973-1974 doctorates again indicated experiencing discrimination in job assignments and level of students taught, as previously reported. About the same proportion of 1973-1974 doctorates felt that being a woman made it harder to perform their professional duties as reported



for 1921-1940 doctorates, however fewer of the most recent doctorates thought it made it easier.

1973-1974 doctorates again experienced discrimination in promotion and rank, however the proportion was smaller than that reported for 1957-1958 doctorates. The proportions of 1973-1974 doctorates who thought that being a woman facilitated or retarded/blocked promotion were almost identical to those reported for 1921-1940 doctorates. 1973-1974 doctorates also experienced discrimination in opportunities to get into administration, but again the proportion was lower than that reported by Ferber and Loeb (1973). Discrimination in exclusion from decision-making and in appointments to committees were also experienced by 1973-1974 doctorates; appointment to too many committees was specifically mentioned by a small proportion - a problem not previously reported (it was commented that males can decline committee assignments for health or professional reasons, but that if females do, it is a sign of weakness or inability to cope). Discrimination in tenure was again experienced by 1973-1974 doctorates.

Discrimination in salary was the most commonly experienced type of discrimination among 1973-1974 doctorates; the proportion experiencing salary discrimination was lower than that reported by Hill (1970) or for 1957-1958 doctorates, but the same as that reported by Ferber and Loeb (1973). A smaller proportion of 1973-1974 doctorates believed that being a woman decreased their earning capacity than was reported for 1921-1940 doctorates, suggesting that the situation with respect to salary may be improving. Again, 1973-1974 doctorates experienced

discrimination in fringe benefits, recognition, research and travel grants.

As reported for 1921-1940 doctorates, not all discrimination was based on gender. Discrimination on the basis of religion was reported by about the same proportion of 1973-1974 doctorates as 1921-1940 doctorates, and based on ethnic background was higher, though the proportions among both sets of doctorates were small. 1973-1974 doctorates also reported discrimination based on marital status, age, pregnancy, anti-union organizer, job classification, feminist interests, nontenure track position, and being short.

Discrimination seems to have become an increasing problem for women doctorates; at least it is increasingly perceived and reported, and the number of types of discrimination experienced does not seem to be decreasing. However, the proportions of women doctorates experiencing some types of discrimination suggest that some may be lessening in extent, possibly as a result of legislation.

## COMMENTS MADE BY WOMEN DOCTORATES

The following comments were made by 1973-1974 doctorates, and are presented for the additional understanding of women doctorates that they provide:

-- I felt fortunate that at ... University there was a very positive attitude toward women in psychology. There were many women on the faculty and several couples who had arranged joint appointments to separate departments (e.g. psychology department and counseling center). Many graduate students were women. This was true on internship too .... When I was working on my dissertation and required an extension because I was having a baby, the department and the graduate college were very supportive. I have known of women who have had extremely trying circumstances to cope with, and I was very glad I never had to face this kind of discrimination.

-- I experienced very little discrimination based on sex in the doctoral program possibly because it was a traditionally women's field (curriculum and instruction). Professors who influenced me most were women. This would have been a different story in other parts of the Education Department, e.g. Administration, where the faculty is entirely male.

-- I think that the problems of marriage vs. career are no different for Doctoral women than for women at large. I think that our most serious problems were caused by timing, not by sex. The post World War II baby boom has created some of its own career problems, especially in Academia. We were trained by universities to be scholars and hired by colleges to be teachers of material we had learned to regard as trivial. And now, unrealistic pressure to publish is being used by institutions which are financially insecure as a way to avoid making tenure commitments to their faculty. Our main problems are caused by demography, and economics, not sexuality.

-- My thoughts or experiences are mainly for those lady students who are married and having the growing children. It has been and still is my personal policy that the first priority in my life is family and then next my career. Fortunately, my husband has shared a similar thought with me.

When I started my doctorate work, I was 31 and a half years old with almost 4 years old daughter and a University faculty husband. Soon after I enrolled, I found out that I was pregnant with the second child. When I completed my doctorate, I was nearly 37 years old, with 9 and a half years old girl and nearly 5 years old girl. What I am trying to say is that I had a lot of other responsibilities as a wife, mother, pregnant woman and also mother of an infant. With those

responsibilities, it took over 5 years for me to complete the Ph.D. However, it was not as difficult as many other housewives with young children might have thought.

I feel that I am quite successful professionally as well as domestically. I am proud of myself not just because I obtained doctorate but because I maintain happy marriage and family life and also because I am utilizing my knowledge obtained during doctorate process, to full extent and still continuing to learn. My husband and children are proud of me for what I have done and am doing professionally as well as domestically.

There are many complex factors responsible for the simultaneous success in profession and family situation. The following may be a few possible reasons:

1. Let the family members know that my priority in life is keeping happy family. When family needs me, I am there, Fortunately, I've had physically, emotionally healthy family and so there has not been a serious crisis for me to give up my career. It is extremely important to let them know.

2. My good health played a very important role in maintaining happy family and career.

3. Wise judgments are also important. When I face the conflicting situation (between career and family), I have to make a choice. The reason of certain choice should be understood and convinced by every member of my family. Discuss with them. Sometimes my choice is reversed by their input, because their reasoning is more sound, logical, and I get convinced. Try to include every member of family to express. Last but not least,

4. Good organization (as far as timing is concerned) is most helpful to optimize the situation.

-- I never felt discriminated against at ... or ... But when I got pregnant while a student at ..., my financial aid was removed because I "might not make it." Decision was supported by Department Chairman and Dean! I could have sued, but then I never would have gotten my degree. Well, I did make it, but with very much more hardship. Those jerks! (And it was a woman who decided to take my grant away.) Other than that rotten experience, I never felt at a disadvantage because I was a woman.

-- In the particular period I have worked during my life, nursing and its administration have been primarily fields for women. In patient care areas salaries and hours may not always be compatible with family life, but in education both are relatively good and have been favorably affected by EO and AA laws. When I state that I might now choose medicine, it is because of changes I perceive in the health care delivery system and in educational opportunity. This would have been much less appropriate as a choice in my personal time frame. I enjoy my work although I can always find a person or two who try to make life difficult, but generally life has been very good to me and personally fulfilling as well.

-- Low demand for Ph.D.s in Housing field now. I went back and got my degrees after my divorce. The children were teenagers, and my preoccupation with college was hard on them, and elderly family members needed me. I felt guilty about not carrying out my family obligations.

-- I'm predicting that more and more couples will have to do what I've done by taking a job 900 miles away from home in order to have satisfactory career opportunities. Sometimes I think it's a great way to live. Sometimes it feels horrible. One of the most satisfying aspects of my present position is the many opportunities I have to counsel with women doctoral students. Sometimes I'm honest enough to admit to them my frustration. It's the best therapy in the world.

-- Questions of what caused problems are hard to answer.

The real challenge to a woman professional are the subtle day-to-day items that can use energy unproductively.

I'm a success; no overt discrimination in my career path; promotions on schedule. The problems I cope with:

- No role models to try.
- I work in a male dominated environment. If I have lunch with a colleague, it will undoubtedly be male - gossips like to make something of it.
- Sexual harassment is real
  - I spent 4 months fighting a nonwork-related, persistent, frightening telephone caller. When you deal with that, work suffers. My experience is not unique - two other colleagues (about 10% of single women I know in work area) have had similar experiences in last 2 years.
  - I've had overt sexual advances from a colleague who did not want to accept no for an answer - that affects performance.
  - The steady flow of comments that you have to ignore from people around you.
  - How is assertiveness/aggressiveness from me perceived by others - I know the rules are different, but what are they.
  - Non-professional women often don't know how to relate - either want to be best of friends or can't handle me at all as a boss.
  - Lots of people (male) want to explain to you (using lots of your time) a) how liberated they are and what they are doing to help women or b) why they think women's liberation is a bunch of crap.
  - Still spend much of my professional life as an oddity - we really expected a male and don't quite know how to act with a woman instead.

-- There have been a few times in my career that I felt there was some discrimination but these were minor incidents as far as I was concerned.

-- If I had it to do over again - I certainly would! My family has been most supportive - my husband helped with child care, housework, even my research project during my graduate training. My children have seen what it takes to get a graduate degree and are now pursuing their own education with very pragmatic expectations. In spite of the problems women face, I believe we are equal to the task - without any

fanfare or fighting in the streets.

-- I think Ph.D. granting institutions should:

1) Serve as research resources for their graduates after graduation - should invite graduates to lectures, seminars, etc. - not necessarily free of charge.

2) Realize that job hunting does not just take place the year after graduation and that ties to the placement office could be over a number of years.

3) Work to improving working conditions at their own and other institutions - to end exploitation of part time and revolving door (non-tenure-track) positions.

If they do this they will get alumna support (financial and otherwise) and on the long term will be healthier institutions.

-- A few comments -

- although I have not directly been the victim of discrimination against women, it certainly exists at my institution.

- my motivation for really earning my own living has never been great as my husband has basically supported our family. My salary has allowed for luxury, savings etc. and very good child care.

-- Be careful about oversimplifying the knotty problems of being a professional and a woman. The discrimination argument works in some situations overtly. In my own it was much more covert. There were unique barriers set up internally that were fed externally which have led to my current lack of job security and benefits. Yet I can't point to a specific act of discrimination. I might add that I'm a feminist, set up two women's centers and helped publish a feminist newspaper for 3 years.

-- You do not discuss sexual relations between women students and male faculty. This was common practice in my program. I feel my married mentor was committed or bonded to me as his mistress. While we had a mutual feeling, my use of this situation was to have a full commitment from him to give me emotional support through graduate school. (He had an "open" marriage and I was friends with his wife and children.) Also, because of this bond he defended me against sexist faculty who thought me too uppity. We shared an intellectual, emotional and physical space. He was my only significant other through 5 years (though I had numerous affairs). Without that relationship I could never have survived those 5 years. Many times I cried with him.

I think women can manage to get a mentor who will not betray them without a sexual bond by appealing to liberal guilt, perhaps. However, those women in my school who were sexual with professors were more likely to succeed. They were often the most intelligent, too. The exchange was never "for a grade," but for psychological support and protection from other faculty. If a woman could not keep up with the intellectual competition the sexual relationship could not help, but hinder. She would, rather, be seen as foolishly desparate.

Apart from what I've said above is the whole issue of social segregation of single women in the academic setting. I found more social acceptance during the time I pretended to be married to a male graduate student who cooperated for the same reason.

-- ... I had just one child at home and had the opportunity to study for my doctorate. It was challenging and rewarding and I'd do it again.

-- If people (men or women) approach their positions with confidence and the desire to communicate and learn - many perceived impediments and discriminations are minimized. A support group is helpful in working through temporary negatives.

-- In college teaching I do think age and marital status tend to confer more prestige and authority.

-- Having a Ph.D. solves the problem of whether to be called MRS., MISS or MS. DR. has the nicest ring of all!

-- My experiences were rich and varied - and a university position only accounted for 3 of the last 10 years. Women are increasingly selecting other professional options:

private industry

government

self-employment

business

educational agencies at the state and local level.

-- ... in my case, there has been little or no problems related to my sex, so these responses may not help you pinpoint problem areas. In biology, most people are "goofy" anyway, so we all get along well. I think that the college environment has changed dramatically over the last couple of years, so that overall attitude of state toward education is a much more serious problem than my status as a single female. Dissatisfactions I have with my work are directly related to the "get more for less" attitude of the state. Students and faculty treat me well - all are equals. Attitude of administration - job is primarily teaching, but must do research to be promoted - is demoralizing, but not related to sex.

-- ... I am technically between jobs and so is my husband. Both of us, however, are so burned out with jobs that we do not look forward to employment and will probably seek to avoid "regular" jobs in the future. I love teaching; I love research even more; I do not like universities and what they do to people. I do feel I have been the "victim" of sex discrimination on one or two occasions but I also think those occasions (tenure, salary) were combined with racial discrimination (not directly at myself but at my field - I am a WASP Africanist). No doubt there may have been other occasions on which I was a "victim" but by and large missed my own victimization because sex discrimination is so silly I

either laugh at it or ignore it - it is amazing how many men forget that there is a difference when I do (of course some men don't forget, but I tend to ignore them as well as their problems). This is not to say that it does not exist for others, rather that for myself I just don't put it in my calculations ... my current husband is no doubt the major source of my present confidence and equanimity. He supports me personally and professionally, and he even types for me. Without his help I might have a much sadder tale to tell and surely would have been more sensitive to sex discrimination.

-- As a girl I was expected by my family to go to college and marry. As a result, no-one took seriously my job aspirations. Had I been a boy (or my brother) someone would have taken me in hand and pointed out the practical (i.e. job-related) aspects of such choices as my undergraduate major, first graduate school major, second graduate school etc. Being female gave me much more freedom than a man would have enjoyed.

On the other hand, I was free because, generally, my possible career was not taken seriously - by my family, my peers, my schools, or society at large - and, most of all, myself.

When I finally did pursue a career (after a B.A. and a second degree) consistently and seriously (in an area in which there are many women) I was not aware of any discrimination. On the other hand, there were only four other women (out of about fifty or sixty people) who held the same kind of assistantship I had. I do not know if this reflected the proportions of applications or the male to female ratio in the graduate division of the university. (It may have been either factor - or some other).

In my present job, at a branch campus of a state university, women make up about 10% of the faculty and about 1% of the higher administration. I do not think that this is the result of discrimination, but of other factors that extend back to the fact that no little girls said to themselves, "I'm going to be a college president when I grow up." ... deeper social reasons ... are the real "discrimination" against women (and others).

-- Female students seem to be regarded as "fair game" by both students and professors. I have seen women fail because they did not understand the "game" that was being played and suffered unnecessary emotional strain because of it. Minority women are often pursued for all sorts of exotic reasons and therefore not only have negative experiences that all women encounter but another negative overlay as well. Unfortunately as students and professionals women must always stay alert. As a student and as a professional I have participated in successful networks and support groups that keep women successful and reduce stress.

-- In all honesty, I am very fortunate I have been able to carve out a plan which fits me and my family, at least for now. But while the full-time mothers I know respect my work in psychology, I am not so sure that my colleagues uniformly respect the equally important work I do as a parent.



-- I was in Europe all last semester on leave (I got half pay but my husband had to take a leave without pay to come with me), and am now in my second semester of leave, this time not with my husband. I brought our child with me. All these considerations have been difficult, but I am a much stronger, better and more interesting person because I persevered and did finish the Ph.D. None of what I've accomplished in the past 6 years - in a totally different field, women's studies - could I have done, had I not already had the doctorate and thereby the position and the freedom to go in a new direction. Otherwise, I'd still be teaching freshman English.

Women who are contemplating or engaged in doctoral work and those who are interested in reading more about the female doctoral experience are recommended to read: "The Ph.D. Experience: a woman's point of view," edited by S. Vartuli, and published in 1982 by Praeger Publishers, New York. The book is a personal account of the experiences during doctoral study of 11 women in professional education at Ohio State University, and discusses topics such as: motives for graduate work, the comprehensive examinations, the dissertation, surviving in a predominantly male world, stress and networks to cope with it, personal relationships, combining student, wife, and mother roles, job hunting, and whether or not the Ph.D. is worth it.

## PROGRESS OR REGRESS FOR WOMEN DOCTORATES

Researchers have considered the situation of women doctorates with respect to various factors, and tried to assess the trends and make predictions about their future.

Newman (1971) noted that the share of doctorates earned by women was smaller in the 1960s than in 1921-1940, and concluded that the American woman was losing ground; Roby (1972, 1973) also suggested that, even though in absolute terms women had shared in the education boom of the previous half century, in relative terms they had lost ground in academe, and had never had more than a tentative foothold.

Carnegie Commission (1973) concluded that women had made inroads into some fields, but that even in the 1970s, the 1920-1924 proportions of women in traditionally male fields were not always reached, and suggested that women were less inhibited in field choice in the early years than they have been more recently. Painter (1971) noted that women had constituted a decreasing proportion of college faculties since 1940, while Stiles (1963) reported that the proportion of women in college teaching had declined from a peak in 1930, and Carnegie Commission (1973) concluded that the relative representation and status of women had deteriorated in the previous half century, along with the decline in the importance of women's colleges, the trend to greater sex differentiation of fields, and the greatly increased emphasis on scientific research. Pifer and Russell (1978) also pointed out that the decline in women's and liberal arts colleges had had a deleterious effect on the status of women.

Carnegie Commission (1973) noted that women had been losing ground at the higher faculty levels since the 1960s, but gaining ground at lower faculty levels - it is not clear whether the latter represents a positive trend (that is, whether it will carry through to the upper levels), or whether it indicates that women are becoming increasingly locked in to low-ranking positions. Astin and Bayer (1973) concluded that women doctorates were overrepresented in 2-year colleges and underrepresented in universities, however a trend towards universities and away from 2- and 4-year colleges was reported for 1950-1968 doctorates (Centra and Kuykendall, 1974; Centra, 1975); Cartter (1976) also noted a decline in proportions of women hired at lower academic institutions and an increase at universities (particularly the more prestigious ones) from 1967 to 1973. Several researchers have noted that the position of women can be summed up as "the higher, the fewer" (in rank, salary, prestige, and responsibilities, in universities, as elsewhere) (A. S. Harris, 1974; Walsh, 1972; Stacey et al., 1974).

The trend with respect to discrimination against women doctorates is not clear. Bunting et al. (1970) suggested that antinepotism rules were being eliminated, while Cartter and Ruhter (1975) and Cartter (1976) concluded that discrimination in first job placement in academe had been eliminated by 1973, and Cartter (1976) found that the amount of differential in rank that could be attributed to gender halved between 1968-1969 and 1972-1973. Conclusions with respect to salary differentials by sex have been mixed. Cartter and Ruhter (1975) and Cartter (1976) concluded that the differential was narrowing, as did

Simon et al. (1967; for 1958-1963, except in education), and Centra and Kuykendall (1974). Carnegie Commission (1973) suggested that the differential might be improving at lower levels, and Cartter and Ruhter (1975) reported that differentials had been almost eliminated at the point of entry into college teaching. Roby (1972), however, concluded that the gap between the income of men and women with the same educational attainment had not significantly decreased, while Painter (1971), LaSorte (1971a; for 1959-1960 to 1967-1968), Morlock (1973; for the previous decade), Freeman (1978), Pifer and Russell (1978), and Young (1978) concluded that the overall salary differential was widening, and Morlock (1973) suggested that differentials at each rank were also increasing.

Bunting et al. (1970) suggested that academic freedom and incentives for women were increasing, and that the situation with respect to catering for women's needs was improving, and Centra and Kuykendall (1974) and Centra (1975) noted signs of recent gains in rewards for women, but questioned whether these represented a new trend or tokenism. Caplow and McGee (1958) concluded that an analysis of the situation at that time indicated that there had been little improvement the situation of academic women in the previous 14 years, however Howe et al. (1971) concluded that there were some positive trends in the data. Newman (1971) suggested that rigid policies and practices still pressured women into making choices between marriage and children on the one hand and advanced study and a career on the other, causing many to lose out permanently.

Predictions of the future for women doctorates have not been very optimistic.

Researchers have suggested that the position of women with respect to higher education is closely related to the economy. Roby (1972) noted that the development of higher education for women has been closely related to the economy's need for female workers with particular skills, and the financial needs of colleges and universities, and Rossi (1973) concluded that many women owe even their small and insecure foothold in academe to the fact that doctorates have enjoyed a long period of a seller's market, with institutional need and desire for doctorates having exceeded the number available for 25 years; Rossi suggested, however, that post-1970 would be a buyer's market in terms of need for doctorates, and Kreps (1974) reported that projections of the supply and utilization of doctorates showed a significant oversupply for the future, so that women will face an increasingly competitive situation when trying to enter academe. In a tight job market, women are hurt more than men and fail to be hired (Rumbarger, cited by Pullen, 1970; Women Ph.D.s, 1971; Carnegie Commission, 1973); Pifer and Russell (1978) noted that the retrenchment of higher education was leading to fewer jobs and more competition for women, and this will probably continue to be the case as higher education cuts back with declining enrollment projections, so that as more women become available, fewer will be hired. Roby (1972) considered that educational equality for women was unlikely to be realized within the present economic structure, and Hopkins (1973) concluded that, given the patterns of women in

academe, and a shrinking college job market, faculty women were likely to become another vanishing species.

Reference has been made to the relationship between the position of women and the male system in academe. Graham (1973) noted that positions of power and prestige have been defined with men in mind, and Hopkins (1973) concluded that so long as masculine values continued to dominate the reward system and probationary timetables, few women would be able to enter on a permanent basis; rather, the masculine criteria dominating the system would continue to select women out. Graham (1973) suggested that if women are to participate on an equal basis with men, the conditions of their employment must be redefined, and Kreps (1974) concluded that there would be very little change in the reward system until both men and women opted for a reorientation of academic goals. Astin (1972) suggested that it was difficult to be optimistic regarding the future status of women doctorates, unless specific efforts were made towards eliminating discrimination where it existed, and Kreps (1974) concluded that significant salary differentials were likely to remain.

Reference has also been made to the relationship between cultural and societal attitudes, expectations and stereotypes, and the position of women in higher education and the professions (Howe et al., 1971; Lewin and Duchan, 1971; Harway and Astin, 1977). Cross (1974) reported that some are denied the right to pursue higher education by social pressures that define acceptable behaviors for women, and that the woman who embarks on graduate education runs into barriers erected by society. Kreps (1974) considered that socialization plays a role in limiting

women's expectations and achievements, and Coser and Rokoff (1971) suggested that the small representation of women in the professions is a logical consequence of their cultural mandate, which prescribes that their primary allegiance be to the family, and that men be its providers of economic means and social status. Once the premise of this mandate is granted, women who have, or wish to have, careers, are said to have a "conflict" and this conflict is seen as a source of disruption in the social order. The limiting of women's access to high tenure positions and prestige professions can then be regarded as helping to prevent disruption in the occupational and familial systems. Astin and Bayer (1973) concluded that women hold lower status partly because of limitations imposed on them by the traditional sex role system, and Graham (1973) also reported that the status of women in academe reflects society's expectations of women. When young, they are likely to have status comparable to men, but as they get older the status discrepancy increases considerably, because of social expectations that women should remain in a relatively subordinate position and not move into equality with older men. Newman (1971) noted that women can only look forward to dropping still further behind as their careers progress. Kreps (1974) considered that, for some time to come, the traditional division of labor in academe is likely to be made along sex lines, and made the point that expectations of new doctorates are shaped in the traditional mold.

Kreps (1974), however, also noted that the attitudes of women towards combining career and family have shifted significantly in the past few decades. The woman who took her doctoral degree in the World

War II era was likely to devote a substantial proportion of her time to hearth and home, and sometimes apologize for having a career at all. In the late 1950s, the woman scholar was both rare and subdued, and not until the 1960s did women evidence strong career drives and a greatly increased interest in higher education. For the younger woman in higher education at the present time, career is likely to be the dominant theme; home and child care responsibilities are taken seriously, but are not all-consuming; she expects to be able to manage the household with a minimum of time, leaving her major energies for research and teaching, and expects her family to cooperate fully with her career and aspirations. So, women's attitudes have changed and, despite socialization, differential treatment, and expectations, they will probably continue to change. Kreps (1974) argued that if women gain their doctorates in a broader range of disciplines, place a heavier emphasis on research and writing, and move to the universities offering the best opportunities, they can achieve academic status comparable to that of men, but progress will be slow.

From the present study, again both positive and negative trends for women doctorates could be discerned.

Increasing numbers of women have been earning doctorates, and women have constituted an increasing proportion of new doctorates, both of which are positive trends. The number of new women doctorates, however, was projected to decrease after 1980, while the proportion of new doctorates who were women would go on increasing to the end of the 1980s only because the total number of new doctorates would be decreasing;



even at its peak, the proportion of new doctorates who were women was projected to be less than 30%.

Women doctorates are increasingly likely to marry and have children, suggesting that they feel it is possible to combine the roles of professional, wife and mother; however they are also increasingly likely to separate and divorce, and many find conflicts between their multiple roles. Academic and other institutions and society in general seem to have made little effort to cater to those with home and family responsibilities, so that marriage and family represent obstacles for women both in doctoral study and postdoctoral career development. At the same time, doctoral work and career development have negative effects on marriage and family life for some women, and two-career families are handicapped with respect to maximizing career opportunities, so that one or both partners suffer.

Women are faced with many obstacles both during their doctoral study and in their postdoctoral career development. Being a woman in an essentially male world causes problems such as lack of role models and colleagues, lack of support, loneliness, and role conflicts. In addition, women suffer sexual harassment and discrimination, and feel that they are not taken seriously. It has been suggested that overt discrimination has decreased due to legislation, however 1973-1974 doctorates reported experiencing various forms of overt discrimination, and much covert discrimination which is more difficult to counter. The assumptions of both men and women stemming from their socialization also inhibit women's progress. Discrimination was experienced by the

earliest women doctorates, and is still being experienced by the most recent doctorates, not only on the basis of gender, but also other factors. A small example, perhaps, but an indication of assumptions is illustrated by the Concurrence Form for this dissertation, which reads: "It is the responsibility of the professor in charge of a candidate's program to supervise the preparation of preliminary and final drafts of the thesis or dissertation, so as to assure the highest level of quality when the student presents his work to the committee for final approval" (emphasis added).

Some positive signs can be discerned with respect to women doctorates. Women are making inroads into some fields, and earning their baccalaureates and doctorates from an increasing number of institutions; they are also spreading out into employment other than in academic institutions. The most recent women doctorates seem to be less likely than previously reported to teach at low levels or outside their specialty, and the proportions experiencing some forms of discrimination are lower than previously reported.

The future economic situation and cutbacks in higher education, however, do not bode well for women doctorates, and it is suggested that until the economy, academe and society change, their future is somewhat bleak; even when change comes, socialization and the assumptions of both men and women will cause inertia and progress will be slow.

Centra and Kuykendall (1974) suggested that cultural traditions, sex role expectations, and discriminatory practices have been too important in determining the career development of women doctorates, and

hoped that in the future ability, hard work, personal choice, and good luck would largely determine their careers; the author echoes this hope.

## SUMMARY

Increasing numbers of women are earning doctorates each year, and women constitute an increasing proportion of new doctorate recipients, but women doctoral students and graduates are a small minority of all women, and a minority in almost all fields of study and work settings, which sets them apart as a group, subject to a peculiar set of problems.

The first study of women doctorates was made in 1930, yet this study has seldom been referenced by other researchers, and comparisons of the earliest doctorates with their more recent counterparts have not been made. Despite more recent research on women doctorates, the need for more information about women as doctoral students and holders of the doctorate has been pointed out. In addition, no comprehensive summary of the research on women doctorates has been made, so that those considering doctoral study or wishing to make decisions with respect to some aspect of doctoral study or postdoctoral career development, and those attempting to advise them, have no single resource to aid them.

The work reported here was, then, designed with the objectives of comparing the most recent women doctorates with their earliest counterparts, and providing a comprehensive summary of research on women doctorates. The characteristics of women doctorates, their doctoral study, postdoctoral career development, and obstacles to their career development were addressed. Findings with respect to the earliest (1877-1924) doctorates were presented, along with a summary of other research on women doctorates, and the results of a questionnaire survey of the most recent (1973-1974) doctorates. A profile of 1973-1974

doctorates, a comparison of the most recent doctorates with their earliest counterparts, and a comparison of 1973-1974 doctorates with other doctorates which serves as an update to previous research, were presented at the end of each major section. The situation and future of women doctorates were discussed.

It was found that over four times as many women earned doctorates in the single academic year 1973-1974 as in almost half a century between 1877 and 1924. The characteristics, doctoral study and postdoctoral career development of the earliest and most recent doctorates were similar in many ways, but differences were also noted.

The most recent doctorates were considerably more likely to have married than their earliest counterparts, and were also considerably more likely to have separated or divorced; they were much more likely overall to have children, and much less likely to have other dependents.

The most recent doctorates were considerably less likely than their earliest counterparts to study for the doctorate only for idealistic reasons, and considerably more likely to study for a combination of idealistic and vocational motivations. The relative importance of various factors and people as motivations for doctoral work had changed somewhat, as had justifications for advising women to begin doctoral work immediately after completing undergraduate work.

The most recent doctorates took their doctoral work at a much greater number of institutions than their earliest counterparts, and the time lapse between baccalaureate and doctorate was slightly longer on average for the more recent doctorates, who were also somewhat more

likely to have earned master's degrees than their earliest counterparts.

The most recent doctorates were less likely than their earliest counterparts to earn their doctorates in the natural sciences and mathematics, social sciences, and language, literature and arts, and more likely to earn them in education; they were also considerably more likely to have changed subjects between baccalaureate and doctorate, and the changes were more likely to be major than minor shifts in field.

Fellowships and scholarships were a less important source of funds for doctoral work for the most recent doctorates than for their earliest counterparts, while assistantships were more important; spouses were also more important for the most recent doctorates, in line with their higher rate of marriage.

The most recent doctorates were somewhat more likely than their earliest counterparts to choose their own dissertation topic, and considerably less likely to have it suggested by the professor in charge; joint choice was important among the most recent doctorates, but not mentioned with respect to their earliest counterparts. The research and writing experience of the dissertation work was considered to have been much more valuable by the most recent doctorates than by their earliest counterparts.

The most recent doctorates were less likely to advise other women to work for the doctorate without reservation, and more likely to give contingent advice than the earliest doctorates.

Major work activities were somewhat different for the two sets of doctorates; teaching was the most common major work activity for both,

however the proportion of the most recent doctorates who indicated teaching as their major work activity was much lower than the proportion of the earliest doctorates; the proportions engaging in research and development and administration were similar, while the proportions engaging in professional services to clients and in other major work activities were higher among the most recent doctorates, and a combination of major work activities was also important for these women, but not mentioned by their earliest counterparts. Somewhat surprisingly in view of the higher proportion married and with children, personal and family factors were less important obstacles to research in the postdoctoral experience for the most recent doctorates than for their earliest counterparts.

The most recent doctorates cited a much greater number of obstacles to doctoral study and postdoctoral career development than their earliest counterparts, however physical strain seemed to be a less serious obstacle for the most recent doctorates than for their earliest counterparts.

The most recent doctorates reported having experienced many types of discrimination in addition to those mentioned by the earliest doctorates, during both their doctoral study and postdoctoral career development, and they experienced some discrimination based on factors other than gender; discrimination seemed to be a much more serious problem for the most recent doctorates than for their earliest counterparts.

It was concluded that the model of the typical single, career-

oriented, idealistic woman doctorate of the late 18th and early 19th centuries does not fit the woman doctorate of the present time, who is more likely to combine marriage and family with her career, and is more vocationally-oriented and less idealistic than her earliest counterparts. The woman doctorate today also seems to face more obstacles, including discrimination, in her career development than her earliest counterparts, some of which are related to the combination of career, marriage and family, while others result from the failure of academe and society to meet the needs of women during their doctoral study and postdoctoral career development. An analysis of the situation of women doctorates showed both positive and negative trends, and it was concluded that progress for women doctorates will be slow.



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This research would not have been possible without the women doctorates who made the time and effort to respond to the questionnaire; their contribution is gratefully acknowledged.

**APPENDIX A: DOCTORATES AWARDED TO WOMEN**



Table 1. Number and percentage of doctorates awarded to women by U.S. institutions<sup>a</sup>

Year	#	%	Year	#	%	Year	#	%
1920	88	15.7	1945	333	20.5	1970	3970	13.5
1921	107	16.2	1946	381	19.2	1971	4582	14.4
1922	112	14.4	1947	412	13.9	1972	5282	16.0
1923	157	14.8	1948	466	12.0	1973	6082	18.0
1924	170	15.0	1949	546	10.1	1974	6415	19.4
1925	202	16.8	1950	621	9.5	1975	7193	21.9
1926	200	13.9	1951	682	9.3	1976	7801	22.9
1927	233	15.1	1952	732	9.5	1977	8075	24.3
1928	236	14.5	1953	789	9.4	1978	8482	26.4
1929	321	16.8	1954	794	9.1	1979	8608	26.9
1930	313	15.1	1955	881	9.9	1980	9137	27.9
1931	361	15.4	1956	806	9.5	1981	9267	28.1
1932	384	16.0	1957	701 <sup>b</sup>	11.3	1982	9207	28.2
1933	347	14.1	1958	991	11.3	1983	9003	28.4
1934	350	13.0	1959	976	10.6	1984	8840	28.5
1935	369	14.6	1960	1042	10.7	1985	8697	28.6
1936	413	15.2	1961	1128	10.8	1986	8561	28.7
1937	403	14.7	1962	1236	10.7	1987	8421	28.8
1938	419	15.2	1963	1391	10.9	1988	8274	28.9
1939	424	14.4	1964	1561	10.9	1989	8078	28.9
1940	428	13.1	1965	1759	10.8			
1941	403	11.6	1966	2090	11.6			
1942	421	12.4	1967	2440	12.0			
1943	394	15.2	1968	2931	12.8			
1944	333	17.0	1969	3387	13.2			

<sup>a</sup>Data for 1920 to 1957 are reported by calendar year, for 1958 to 1975 by fiscal year, and for 1976 to 1989 are projected for academic years ending in the year specified (N.R.C., 1976; Yearbook of Higher Education 1980-1981).

<sup>b</sup>First half of calendar year.

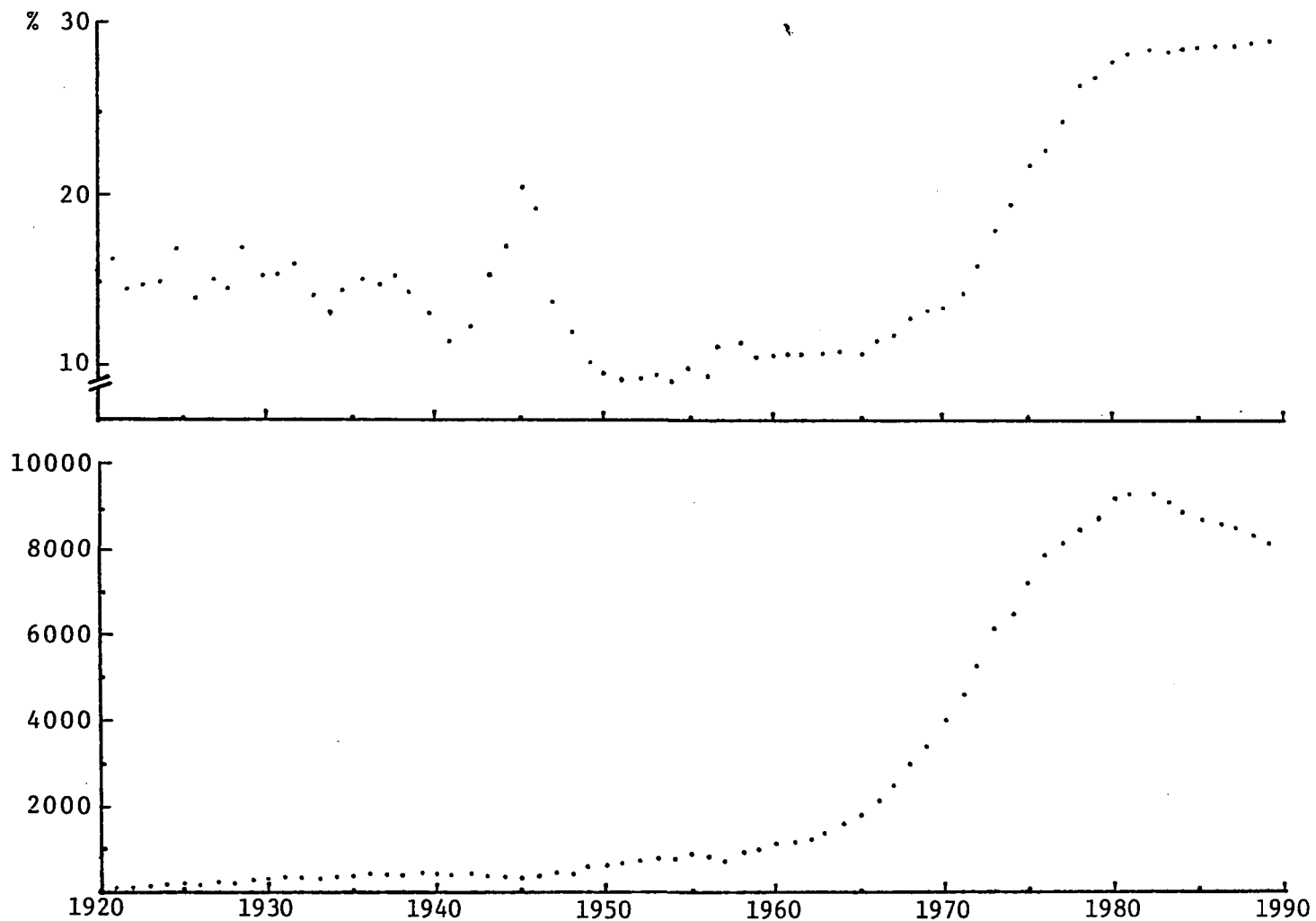


Figure 1. Number and percentage of doctorates awarded to women by U.S. institutions, 1920-1975, and projected to 1989

**APPENDIX B: SAMPLING INFORMATION**

IOWA STATE UNIVERSITY  
of Science and Technology  
AMES, IOWA 50011

217 Davidson Hall  
Iowa State University  
Ames  
Iowa 50011

April 26, 1981

Dear Sir/Madam:

I am a doctoral candidate in Professional Studies at Iowa State University. My doctoral research involves contacting women who graduated with doctorate degrees in 1973-74, in order to compare their experiences and attitudes with those reported by women who graduated with doctorates previous to 1925.

This research would be greatly aided if you could supply me with a list of current names and addresses of women who graduated with doctorate degrees from your institution between July 1, 1973 and June 30, 1974.

This information can be sent to me at the following address:

Gillian E. Smith  
217 Davidson Hall  
Iowa State University  
Ames, Iowa 50011

Thank you in advance for your assistance with this research.

Sincerely

Gillian E. Smith  
Research Associate

IOWA STATE UNIVERSITY  
of Science and Technology  
AMES, IOWA 50011

217 Davidson Hall  
Iowa State University  
Ames  
Iowa 50011

September 20, 1981

Dear Sir/Madam:

I am enclosing a copy of a letter which I sent you previously, requesting your assistance in my doctoral research.

I would be most grateful for your help, since many people have shown interest in this project, and I am anxious to complete the work and disseminate the results. However, if you do not find it possible to supply me with the information requested, perhaps you would be good enough to let me know.

Thank you for your assistance.

Sincerely

Gillian E. Smith  
Research Associate

Encl.

IOWA STATE UNIVERSITY  
of Science and Technology  
AMES, IOWA 50011

217 Davidson Hall  
Iowa State University  
Ames  
Iowa 50011

November 30, 1981

Dear Sir/Madam:

I am a doctoral candidate in Professional Studies at Iowa State University. My doctoral research involves contacting women who graduated with doctorate degrees in 1973-74, in order to compare their experiences and attitudes with those reported by women who graduated with doctorates previous to 1925.

I have been in contact with the Alumni Association of your institution, requesting a list of current names and addresses of women who graduated with doctorate degrees between July 1, 1973 and June 30, 1974. Unfortunately, the Alumni Association was not able to supply me with such information, and I am therefore contacting you with the same request.

I would be most grateful for your assistance, since many people have shown interest in this project, and I am anxious to complete the work and disseminate the results. However, if you do not find it possible to supply the information requested, perhaps you would be good enough to let me know.

Thanking you in advance for your assistance.

Sincerely

Gillian E. Smith  
Research Associate

IOWA STATE UNIVERSITY  
of Science and Technology  
AMES, IOWA 50011

217 Davidson Hall  
Iowa State University  
Ames  
Iowa 50011

November 30, 1981

Dear Sir/Madam:

I am a doctoral candidate in Professional Studies at Iowa State University. My doctoral research involves contacting women who graduated with doctorate degrees in 1973-74, in order to compare their experiences and attitudes with those reported by women who graduated with doctorates previous to 1925.

Several contacts with the Alumni Association of your institution have not yielded any reply, and I am therefore writing to you with my request for a list of current names and addresses of women who graduated with doctorate degrees between July 1, 1973 and June 30, 1974.

I would be most grateful for your assistance, since many people have shown interest in this project, and I am anxious to complete the work and disseminate the results. However, if you do not find it possible to supply the information requested, perhaps you would be good enough to let me know.

Thanking you in advance for your assistance.

Sincerely

Gillian E. Smith  
Research Associate

Table 2. 1973-1974 doctorates by institutions, number sampled, number identified, and number of questionnaire respondents

Institution	Doctorates	Sampled	Identified	Respondents
<b>Alabama:</b>				
Auburn U. Main Campus	21	2	2	1
U. of Alabama	40	4	4	2
U. of Alabama in Birmingham	6	1	1	0
<b>Alaska:</b>				
U. of Alaska Fairbanks	1	0	-	-
<b>Arizona:</b>				
Arizona State University	62	3	3	2
U. of Arizona	36	2	2	1
<b>Arkansas:</b>				
U. of Arkansas Main Campus	7	0	-	-
U. of Arkansas Medical Center	1	0	-	-
<b>California:</b>				
Cal. Institute of Technology	4	0	-	-
Cal. School of Professional Psychology Main Campus	10	1	1	1
Cal. State U., San Diego	1	0	-	-
Cal. School of Professional Psychology, L.A.	9	1	1	1
Claremont Graduate School	14	1	0	-
Fuller Theological Seminary	1	0	-	-
Graduate Theological Union	1	0	-	-
Loma Linda University	4	1	0	-
Stanford University	86	8	0	-
U.S. International University	38	3	3	2
U. of Cal., Berkeley	142	13	0	-
U. of Cal., Davis	23	2	0	-
U. of Cal., Irvine	19	2	0	-
U. of Cal., Los Angeles	130	12	12	4
U. of Cal., Riverside	14	1	0	-
U. of Cal., San Diego	19	2	0	-



Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
<b>California:</b>				
U. of Cal. San Francisco Medical Center	14	1	0	-
U. of Cal., Santa Barbara	15	1	0	-
U. of Cal., Santa Cruz	6	1	1	1
University of the Pacific	7	0	-	-
U. of Santa Clara	1	0	-	-
U. of Southern California	109	10	0	-
<b>Colorado:</b>				
Colorado State University	11	1	1	1
U. of Colorado Main Campus	56	5	5	0
U. of Denver	10	1	1	1
U. of Northern Colorado	26	2	2	1
<b>Connecticut:</b>				
Hartford Seminary Foundation	1	0	-	-
U. of Connecticut Main Campus	36	3	0	-
Wesleyan University	3	1	1	0
Yale University	90	8	0	-
<b>Delaware:</b>				
U. of Delaware	14	1	1	1
<b>District of Columbia:</b>				
American University	15	2	2	0
Catholic U. of America	39	3	3	2
Georgetown University	24	3	3	1
George Washington University	41	3	0	-
Howard University	11	1	0	-
<b>Florida:</b>				
Nova University	1	0	-	-
Florida Atlantic University	5	0	-	-
Florida State University	83	8	8	6
U. of Florida	46	4	4	1

Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
<b>Florida:</b>				
U. of South Florida	5	0	-	-
U. of Miami	24	2	2	0
<b>Georgia:</b>				
Atlantic University	1	0	-	-
Emory University	25	2	2	2
Georgia State University	24	2	2	0
Medical College of Georgia	1	0	-	-
U. of Georgia	57	6	6	2
<b>Hawaii:</b>				
U. of Hawaii at Manoa	13	2	0	-
<b>Idaho:</b>				
Idaho State University	4	1	1	1
U. of Idaho	3	0	-	-
<b>Illinois:</b>				
Illinois Institute of Technology	11	1	1	1
Illinois State University	3	0	-	-
Loyola University	25	3	0	-
Northern Illinois University	12	1	0	-
Northwestern University	70	6	0	-
Seabury-Western Theological Seminary	1	0	-	-
Southern Illinois University, Carbondale	41	4	4	0
U. of Chicago	87	8	0	-
U. of Illinois Chicago Circle	3	0	-	-
U. of Illinois Medical Center Chicago	11	1	0	-
U. of Illinois Urbana Campus	129	12	12	3
<b>Indiana:</b>				
Ball State University	16	2	2	1
Indiana State University	1	0	-	-
Indiana University at Bloomington	137	12	0	-

Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
<b>Indiana:</b>				
Purdue University Main Campus	64	6	0	-
U. of Notre Dame	23	2	2	1
<b>Iowa:</b>				
Iowa State University	18	1	1	0
U. of Iowa	53	5	0	-
<b>Kansas:</b>				
Kansas State University	13	2	2	1
U. of Kansas	64	5	0	-
Wichita State University	1	0	-	-
<b>Kentucky:</b>				
Southern Baptist Theological Seminary	1	0	-	-
U. of Kentucky	25	3	3	1
U. of Louisville	5	0	-	-
<b>Louisiana:</b>				
Louisiana State U., Baton Rouge	23	3	3	3
Louisiana State U., Medical Center, New Orleans	2	1	1	1
Louisiana State U., New Orleans	2	0	-	-
Moneese State University	3	0	-	-
Northeast Louisiana University	2	0	-	-
Northwestern State College of Louisiana	3	0	-	-
Tulane University	25	3	3	3
U. of Southwestern Louisiana	1	0	-	-
<b>Maine:</b>				
U. of Maine at Orono	1	0	-	-
<b>Maryland:</b>				
Johns Hopkins University	47	4	0	-
Peabody Institute of Baltimore	1	0	-	-
U. of Maryland, College Park Campus	78	7	0	-

Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
<b>Maryland:</b>				
U. of Maryland, Baltimore Professional Schools	2	0	-	-
<b>Massachusetts:</b>				
Andover Newton Theological School	4	1	1	0
Boston College	31	3	3	0
Boston University	85	7	0	-
Brandeis University	35	4	4	1
Clark University	9	0	-	-
Harvard University	146	14	0	-
M.I.T.	37	3	3	1
Northeastern University	7	1	1	0
Smith College	2	0	-	-
Springfield College	1	0	-	-
Tufts University	16	1	0	-
U. of Massachusetts, Amherst	72	7	0	-
Worcester Polytechnic University	2	0	-	-
<b>Michigan:</b>				
Michigan State University	102	10	0	-
U. of Detroit	1	0	-	-
U. of Michigan - Ann Arbor	167	15	0	-
Wayne State University	52	5	0	-
Western Michigan University	7	0	-	-
<b>Minnesota:</b>				
U. of Minnesota - Minneapolis-St. Paul	119	11	0	-
U. of Minnesota - Mayo Graduate School of Medicine	1	0	-	-
<b>Mississippi:</b>				
Mississippi State University	9	0	-	-
U. of Mississippi Main Campus	13	2	2	1
U. of Mississippi Medical Center	1	0	-	-
U. of Southern Mississippi	21	2	2	1

Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
<b>Missouri:</b>				
St. Louis University	28	3	3	1
U. of Missouri Columbia	36	3	0	-
U. of Missouri Kansas City	12	1	1	1
Washington University	35	3	0	-
<b>Montana:</b>				
Montana State University	6	0	-	-
U. of Montana	4	0	-	-
<b>Nebraska:</b>				
U. of Nebraska - Lincoln	3	3	3	1
U. of Nebraska Medical Center	1	0	-	-
<b>Nevada:</b>				
U. of Nevada - Reno	1	1	0	-
<b>New Hampshire:</b>				
Dartmouth College	4	1	1	0
U. of New Hampshire	2	0	-	-
<b>New Jersey:</b>				
Drew University	1	0	-	-
Fairleigh-Dickinson Teaneck Campus	1	0	-	-
Princeton University	33	3	0	-
Rutgers University	80	7	0	-
<b>New Mexico:</b>				
New Mexico State University	7	1	0	-
U. of New Mexico	53	5	5	4
<b>New York:</b>				
Adelphi University	11	1	1	0
C.U.N.Y Graduate School and University Center	52	5	5	2
Clarkson College of Technology	1	0	-	-

Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
New York:				
Columbia University Main Division	183	17	0	-
Columbia University Teachers College	94	8	0	-
Cornell University Endowed Colleges	55	5	5	4
Cornell University Medical Center	8	1	1	0
Cornell University Statutory Colleges	35	3	3	0
Fordham University	57	5	0	-
General Theological Seminary	1	0	-	-
Hofstra University	10	1	0	-
Jewish Theological Seminary of America	2	1	0	-
New School for Social Research	16	1	0	-
New York Medical College	1	0	-	-
New York University	171	16	0	-
Polytechnic Institute of New York	1	0	-	-
Rensselaer Polytechnic Institute	4	0	-	-
Rockefeller University	2	0	-	-
St. Bonaventure University	1	0	-	-
St. John's University	9	1	0	-
S.U.N.Y. at Albany	19	2	0	-
S.U.N.Y. at Binghamton	9	1	0	-
S.U.N.Y. Buffalo Main Campus	29	2	0	-
S.U.N.Y. Health Science Center Buffalo	4	1	0	-
S.U.N.Y. Stony Brook Main	15	1	0	-
Syracuse University	62	6	0	-
Union Theological Seminary	2	0	-	-
U. of Rochester	42	4	4	3
Yeshiva University	21	2	2	1
North Carolina:				
Duke University	50	4	4	0
Southeastern Baptist Theological Seminary	1	1	1	1
North Carolina State University	20	1	0	-
U. of North Carolina at Chapel Hill	79	8	8	4

Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
North Carolina:				
U. of North Carolina Greensboro	16	1	1	0
North Dakota:				
U. of North Dakota	8	0	-	-
Ohio:				
Bowling Green State University	8	1	1	0
Case Western Reserve University	43	4	0	-
Kent State University	26	2	2	0
Miami University	4	1	1	0
Ohio State University	124	11	0	-
Ohio University	12	1	1	1
Union Experimenting Colleges and Universities	22	2	0	-
United Theological Seminary	1	0	-	-
U. of Akron	5	0	-	-
U. of Cincinnati	28	3	0	-
U. of Dayton	1	0	-	-
U. of Toledo	14	1	1	1
Oklahoma:				
Oklahoma State University	24	3	0	-
U. of Oklahoma Health Science Center	9	0	-	-
U. of Oklahoma Norman Campus	29	3	0	-
U. of Tulsa	8	1	0	-
Oregon:				
Oregon State University	14	1	0	-
Portland State University	3	0	-	-
U. of Oregon Main Campus	56	5	0	-
U. of Oregon Medical Center	1	0	-	-
U. of Portland	3	1	1	0
Pennsylvania:				
Bryn Mawr College	22	2	0	-

Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
Pennsylvania:				
Carnegie-Mellon University	8	1	0	-
Duquesne University	1	0	-	-
Lehigh University	15	1	1	1
Medical College of Pennsylvania	1	0	-	-
Pennsylvania State University Main Campus	52	5	5	4
Pennsylvania State University Hershey Medical Center	1	0	-	-
Temple University	45	4	0	-
Thomas Jefferson University	4	1	0	-
University of Pennsylvania	90	8	8	4
University of Pittsburgh	96	9	9	2
Rhode Island:				
Brown University	33	3	0	-
U. of Rhode Island	4	0	-	-
South Carolina:				
Clemson University	4	0	-	-
Medical University of South Carolina	1	0	-	-
University of South Carolina	14	2	2	1
South Dakota:				
South Dakota State University	1	1	1	1
U. of South Dakota	1	0	-	-
Tennessee:				
George Peabody Teachers College	23	2	0	-
Memphis State University	4	0	-	-
Middle Tennessee State University	4	0	-	-
Tennessee Technological University	1	0	-	-
U. of Tennessee Knoxville	66	6	6	2
U. of Tennessee Center for the Health Sciences	7	1	1	0
Vanderbilt University	14	1	1	1



Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
<b>Texas:</b>				
Baylor College of Medicine	2	0	-	-
Baylor University	2	0	-	-
East Texas State University	15	2	0	-
North Texas State University	23	2	0	-
Rice University	21	2	0	-
Southern Methodist University	3	0	-	-
Southwestern Baptist Theological Seminary	1	0	-	-
Texas A and M University	10	1	0	-
Texas Christian University	9	1	1	0
Texas Tech University	14	1	1	1
Texas Woman's University	30	3	0	-
U. of Houston	35	3	1	1
U. of Texas at Austin	102	9	0	-
U. of Texas Health Science Center, Dallas	7	1	0	-
U. of Texas Health Science Center, Houston	4	0	-	-
U. of Texas Medical Branch Galveston	3	0	-	-
<b>Utah:</b>				
Brigham Young University	9	0	-	-
U. of Utah	30	3	3	0
Utah State University	8	1	1	1
<b>Vermont:</b>				
Middlebury College	3	0	-	-
U. of Vermont	4	0	-	-
<b>Virginia:</b>				
College of William and Mary	4	0	-	-
Union Theological Seminary in Virginia	1	0	-	-
U. of Virginia	35	3	3	1
Virginia Commonwealth University	9	1	1	1
Virginia Polytechnic Institute and State University	19	2	2	1

Table 2 (continued)

Institution	Doctorates	Sampled	Identified	Respondents
Washington:				
U. of Washington	74	7	7	2
Washington State University	10	1	1	0
West Virginia:				
West Virginia University	16	2	2	2
Wisconsin:				
Marquette University	13	1	0	-
Medical College of Wisconsin	1	0	-	-
University of Wisconsin Madison	127	12	12	7
University of Wisconsin Milwaukee	2	0	-	-
Wyoming:				
University of Wyoming	4	1	1	1
TOTAL				
251	6451	589	248	112

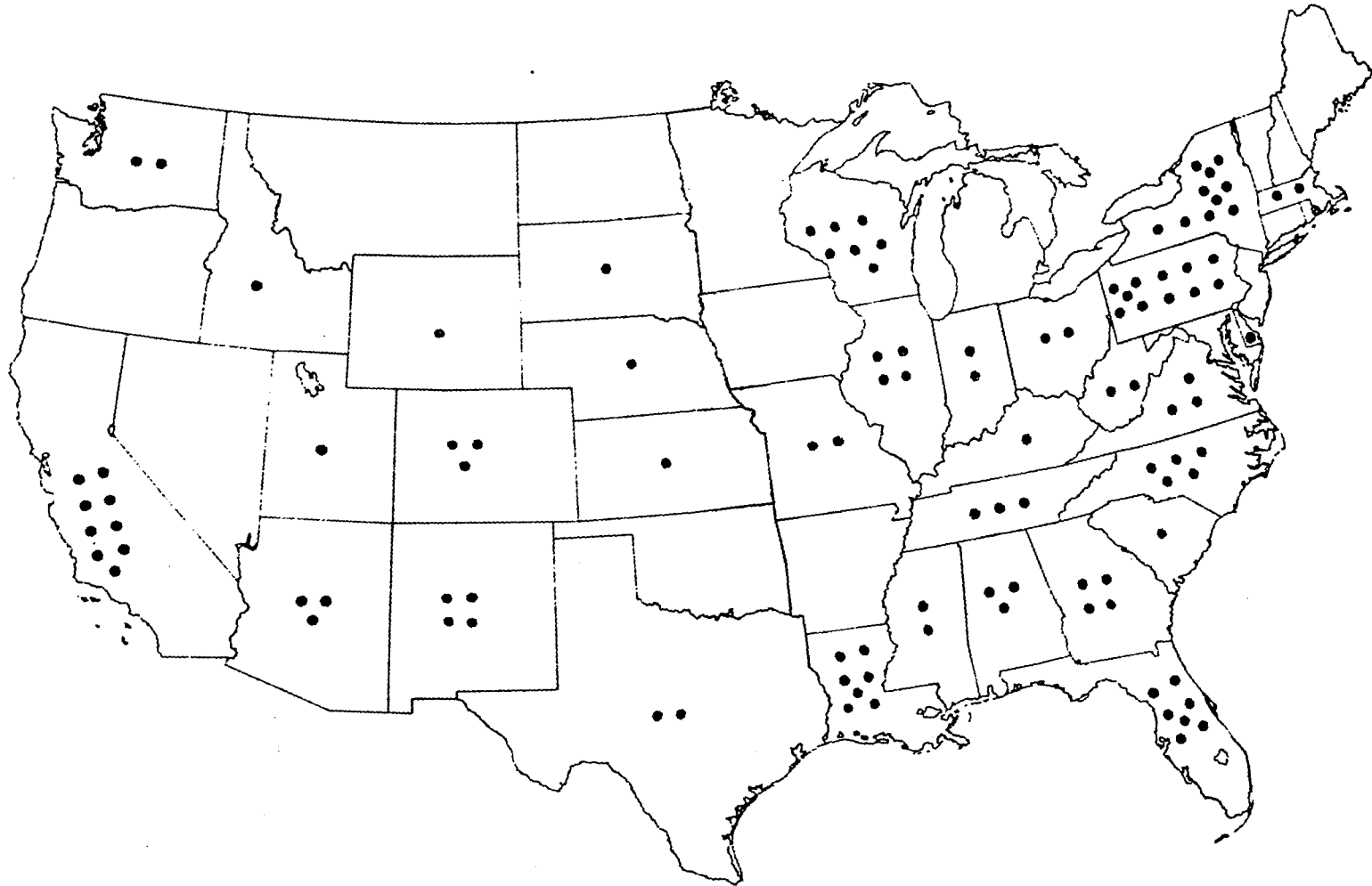


Figure 2. Distribution of questionnaire respondents by state

**APPENDIX C: QUESTIONNAIRE**

IOWA STATE UNIVERSITY  
of Science and Technology  
AMES, IOWA 50011

217 Davidson Hall  
Iowa State University  
Ames  
Iowa 50011

June 1, 1982

Dear 1973/74 doctoral graduate:

I am doctoral candidate in Professional Studies at Iowa State University. My doctoral dissertation involves a study of women who graduated with doctorates in 1973-1974, in order to compare their attitudes and experiences during and after their doctoral programs with those of women who received doctorates up till 1924 (studied in 1930). It is also hoped to provide an up-to-date data base upon which today's doctoral candidates, their advisers, and prospective doctoral students can draw to give advice and make informed decisions.

I would, therefore, be most grateful for your time and cooperation in filling out and returning the attached questionnaire. I realize that some of the questions are of a personal nature - please be assured that all your responses will remain strictly confidential, and leave blank any questions which you would rather not answer. Also, please feel free to add any comments, and elaborate wherever you would like to.

My sincere thanks in advance for your assistance with my research.

Sincerely

Gillian E. Smith

Encl.

/over

IOWA STATE UNIVERSITY  
of Science and Technology  
AMES, IOWA 50011

217 Davidson Hall  
Iowa State University  
Ames  
Iowa 50011

October 1, 1982

Dear 1973/74 doctoral graduate:

I am a doctoral candidate in Professional Studies at Iowa State University. My doctoral dissertation involves a study of women who graduated with doctorates in 1973-1974, in order to compare their attitudes and experiences during and after their doctoral programs with those of women who received doctorates up till 1924 (studied in 1930). It is also hoped to provide an up-to-date data base upon which today's doctoral candidates, their advisers, and prospective doctoral students can draw to give advice and make informed decisions.

Attached is a questionnaire which I sent out in May of this year. If you returned it at that time, please accept my thanks. If not, I would be most grateful for your time and cooperation in filling it out and returning it as soon as possible. I realize that some of the questions are of a personal nature - please be assured that all your responses will remain strictly confidential, and leave blank any questions that you would rather not answer. Also, please feel free to add any comments, and elaborate wherever you would like to.

My sincere thanks in advance for your assistance with my research.

Sincerely

Gillian E. Smith

Encl.

/over

Please check or circle all applicable answers to each question, and fill out all blank spaces possible. Feel free to elaborate wherever you would like to.

1. Date of birth: month \_\_\_\_ year \_\_\_\_ .
  2. Citizenship: U.S. citizen ( ), permanent resident ( ), nonresident ( ).
  3. Country of birth: self \_\_\_\_\_, mother \_\_\_\_\_, father \_\_\_\_\_.
  4. Please check if you are a member of a minority group ( ).
  5. Religion \_\_\_\_\_.
  6. How would you describe your present health: excellent ( ), good ( ), fair ( ), poor ( ).
  7. Age of parents when you were born: mother \_\_\_\_\_, father \_\_\_\_\_.
  8. Number of siblings in your family older \_\_\_\_ and younger \_\_\_\_ than you .
  9. Educational level of your parents (please indicate M for mother, F for father):  
8th grade ( ), some high school ( ), high school graduate ( ), some college ( ),  
college graduate ( ), some graduate school ( ), master's degree ( ), doctorate  
( ), professional degree ( ).
  10. Parents' principal occupation while you were growing up (please indicate as for  
question 9): unskilled ( ), semi-skilled ( ), skilled ( ), business/managerial  
( ), professional ( ), unemployed ( ), other \_\_\_\_\_.
  11. State in which you attended high school \_\_\_\_\_.
  12. Dates (month,year) that you: graduated from high school ( , ), graduated with  
baccalaureate ( , ), graduated with master's degree ( , ), graduated with  
doctorate ( , ).
  13. Marital status (please indicate C for current status, D for status when doctoral  
work was begun): single, never married ( ), single, member of religious order ( ),  
married, first time ( ), married, remarried ( ), separated ( ), divorced ( ),  
widowed ( ).
  14. Have your professional goals been a determining factor in your current marital  
status: yes / no.
- If never married, skip to question 26
15. How many years have you been / were you married \_\_\_\_\_.
  16. Did your first marriage take place: before ( ), after ( ), during ( ) graduate  
school.
- If not presently married, skip to question 22
17. What is your spouse's education level: less than high school ( ), high school  
graduate ( ), some college ( ), college graduate ( ), some graduate school ( ),  
master's degree ( ), doctorate ( ), professional degree ( ). If your spouse  
attended college, please indicate his field of study \_\_\_\_\_.
  18. What is your spouse's present occupation: unskilled ( ), semi-skilled ( ), skilled  
( ), business/managerial ( ), professional, academic ( ), professional, nonacademic  
( ), unemployed ( ), other \_\_\_\_\_.
  19. What is your spouse's present income (annual): under \$10,000 ( ), 10,000-14,999 ( ),  
15,000-19,999 ( ), 20,000-29,999 ( ), 30,000-39,999 ( ), over 40,000 ( ).
  20. What type of employment pattern best describes your spouse since marriage: employed  
full-time all or almost all of the time ( ), employed full-time more than half the  
time ( ), employed full-time about half the time ( ), employed full-time less than  
half the time ( ), has had some part-time employment ( ), employed half-time more  
than half the time ( ), has had very little or no employment ( ).
  21. Compared to your husband's career, does your career assume equal importance ( ),  
more importance ( ), less importance ( ), or no importance ( ) in family decisions.  
Would you describe your spouse as: unsupportive ( ), somewhat supportive ( ), or  
highly supportive ( ) of your career.
  22. If married while working for the doctorate, was your husband: unsupportive ( ),  
somewhat supportive ( ), or highly supportive ( ) of your study.
  23. If remarried, does your present spouse have less ( ), more ( ) or equal ( )  
education to that of your first husband. Is he less ( ), more ( ), or equally ( )  
supportive of your career.

24. How many children \_\_\_\_\_ and other dependents \_\_\_\_\_ do you have. Were your children born before ( ), during ( ) or after ( ) your doctoral work.
25. Have your professional goals led you to postpone having children ( ) or to decide not to have children ( ).
26. How many hours per week do you spend in the following activities: at work \_\_\_\_\_, in other professional activities \_\_\_\_\_, managing your household \_\_\_\_\_, in child care \_\_\_\_\_, in leisure activities \_\_\_\_\_, in community activities \_\_\_\_\_, in religious activities \_\_\_\_\_.
27. Do you employ household help: full-time ( ), part-time ( ), occasionally ( ).
28. How many hours per week do you use child care facilities \_\_\_\_\_.
29. How many days vacation do you take off from work each year \_\_\_\_\_.
30. Which of the following statements describes your attitudes towards women's rights: spend a great deal of time and effort to increase women's rights and opportunities ( ), spend some time and effort ( ), support women's rights, but not actively ( ), not interested in women's rights ( ), opposed to increasing women's rights ( ).
31. Was your doctoral study: always full-time ( ), always part-time ( ), some full-time and some part-time ( ), some study and some nonstudy periods ( ).
32. How long were you actually enrolled in graduate school: \_\_\_\_\_ years \_\_\_\_\_ months.
33. What caused any part-time and / or interrupted study: income loss ( ), cost of study ( ), desire for a break ( ), marriage ( ), children ( ), husband's mobility ( ), other \_\_\_\_\_.
34. Indicate the percentage of the total cost of your doctorate which was met from the following sources: teaching assistantship ( ), research assistantship ( ), institutional sources ( ), scholarship/fellowship ( ), government aid ( ), foundation aid ( ), full-time employment ( ), part-time employment ( ), spouse's income ( ), family ( ), savings ( ), loans ( ), other \_\_\_\_\_.
35. Do you consider getting the doctorate to have been a financial strain: yes / no
36. Could you have completed the doctorate in a shorter time if more financial aid had been available: yes / no.
37. How would you advise prospective doctoral candidates to meet the cost of the doctorate \_\_\_\_\_.
38. Who was involved in choosing your dissertation subject, and what would would have been your preferred method of choice (Indicate A for actual, P for preferred): own choice ( ), professor's choice ( ), joint choice ( ), other \_\_\_\_\_.
39. How was the dissertation subject chosen: arose from practical experience ( ), arose from coursework ( ), arose by accident ( ), other \_\_\_\_\_.
40. How much time was involved in your dissertation (years, months): research \_\_\_\_\_, writing \_\_\_\_\_.
41. How much help and supervision did you receive from your major professor in the dissertation process: more than was desired ( ), a great deal ( ), an adequate amount ( ), less than was desired ( ), none ( ).
42. How much value did you derive from the dissertation (indicate R for value derived from the research experience, W for writing): very valuable ( ), quite valuable ( ), not valuable ( ).
43. Did you find the dissertation a source of strain in your doctoral program: yes / no.
44. Was work arising from the dissertation published in the following forms: journal article ( ), book ( ), magazine article ( ), other \_\_\_\_\_.
45. Did you receive remuneration from work which came from the dissertation: yes / no.
46. How satisfactory did you find your doctoral program as preparation for your present job: excellent ( ), good ( ), adequate ( ), rather inadequate ( ), highly inadequate ( ).
47. Please list all the degrees you hold, years received, institutions and fields:
- | Degree | Year | Institution | Major field |
|--------|------|-------------|-------------|
|        |      |             |             |
|        |      |             |             |
|        |      |             |             |



48. Why did you decide to work for the doctorate: absorbing interest in subject ( ), desire for advanced instruction ( ), desire for more information about chosen field ( ), desire for more training in methods of work ( ), requisite for promotion ( ), requisite for a particular position ( ), pressure from another person ( ), to increase earning potential ( ), ambition for leadership or recognition ( ), desire to advance knowledge ( ), for personal satisfaction ( ), desire for increased competency ( ), desire for stimulating colleagues ( ), boredom with household tasks ( ), enjoyment of study ( ), other \_\_\_\_\_.
49. Rate the following as to their importance in your decision to work for the doctorate (V-very important, S-somewhat, N-not important): spouse ( ), family ( ), friends ( ), colleagues ( ), high school personnel ( ), college personnel ( ), other \_\_\_\_\_.
50. When did you decide to pursue a doctorate: during high school ( ), after high school but before college ( ), during undergraduate work ( ), after undergraduate but before graduate work ( ), during graduate school ( ), other \_\_\_\_\_.
51. Did you begin doctoral work immediately after undergraduate work: yes / no. If not, what was the reason for the delay \_\_\_\_\_.  
What did you do between undergraduate and graduate work \_\_\_\_\_.
52. When would you advise students to start work for the doctorate: immediately after undergraduate work ( ), not immediately ( ), other \_\_\_\_\_.  
What are the reasons for your advice \_\_\_\_\_.  
What experience should fill the gap between undergraduate and graduate work \_\_\_\_\_.
53. How did you choose your doctoral institution: proximity ( ), good reputation ( ), position offered ( ), recommended ( ), according to cost ( ), other \_\_\_\_\_.
54. Was your doctoral institution your first choice: yes / no. If not, why not \_\_\_\_\_.
55. If you changed institutions between baccalaureate and/or master's and doctorate, what was the reason for the change \_\_\_\_\_.
56. If you did not complete all work for the doctorate at one institution, what was the reason for the change \_\_\_\_\_.
57. When did you decide on the field of your doctorate: during high school ( ), after high school, before college ( ), during undergraduate work ( ), after undergraduate, before graduate work ( ), during graduate school ( ).
58. Why/how did you choose your doctorate field \_\_\_\_\_.
59. If you changed fields during your college career, what were the reasons for the change \_\_\_\_\_.
60. Would you choose the same field again: yes / no; would you choose the same specialty within your field again: yes / no.
61. In what ways were you dissatisfied with your doctoral program \_\_\_\_\_.
62. What benefits has the doctorate had for you professionally and personally \_\_\_\_\_.
63. Do you consider the time, effort and cost involved in the doctorate to have been worthwhile (Y=yes, S-somewhat, N-No): professionally ( ), personally ( ), financially ( ).
64. Did you find work for the doctorate: a serious mental strain ( ), a serious physical strain ( ), a serious financial strain ( ), an enjoyable experience ( ).
65. Would you repeat the expenditure of time, effort and money involved in the doctorate: yes / no. Would you recommend other women to work for the doctorate: yes / no / contingent advice \_\_\_\_\_.

66. In what areas did you encounter impediments during your doctoral work, which might have slowed your receipt of the degree (indicate E), and did you consider quitting your doctoral program on account of these factors (indicate Q): scheduling of classes ( ), physical strain/poor health ( ), emotional strain ( ), demands of a job ( ), time management ( ), lack of privacy for study ( ), role conflicts ( ), marriage ( ), children ( ), other family responsibilities ( ), income loss ( ), lack of academic ability ( ), lack of role models ( ), discrimination ( ), disapproval of spouse ( ), disapproval of family ( ), husband's mobility ( ), lack of financial incentive ( ), length of degree program ( ), negative attitudes of male students ( ), negative attitudes of female students ( ), not taken seriously by faculty ( ), lack of interaction with other students ( ), lack of encouragement, support or interest by faculty ( ), ambiguity of role ( ), lack of assimilation into graduate department ( ), lack of campus services, child care, day care ( ), lack of clear sense of purpose ( ), lack of confidence in abilities ( ), personal problems ( ), demands of dissertation ( ), other things more important than doctoral work ( ), lack of financial aid ( ), other \_\_\_\_\_
67. What would have helped you to get your doctorate in less time \_\_\_\_\_
68. What advice would you give to prospective doctoral students \_\_\_\_\_
69. List employment beginning immediately before starting graduate work to present, using the following abbreviations: Employer type A-doctoral institution, B-other university, C-other 4-year college, D-2-year or junior college, E-research institution/organization, F-nonprofit organization, G-elementary/secondary school, H-business/industry/private company, I-government, J-postdoctorate fellowship, K-self-employed, L-other; Salary a-less than \$10,000/year, b-10,000-14,999, c-15,000-19,999, d-20,000-24,999, e-25,000-29,999, f-30,000-39,999, g-40,000 or over; Major work activity I-teaching, II-research and development, III-administration, IV-professional services to clients, V-other; work in or out of doctorate field.
- | Title | Dates | Full/part<br>time | Employer<br>type | Salary/<br>year | Major work<br>activity | In/Out of<br>field |
|-------|-------|-------------------|------------------|-----------------|------------------------|--------------------|
|       |       |                   |                  |                 |                        |                    |
70. Please indicate your current (C) and preferred (P) work status: employed full-time ( ), employed more than half-time, less than full-time ( ), employed half-time ( ), employed less than half-time ( ), unemployed ( ).
71. If your current and preferred status do not match, give reasons for the discrepancy \_\_\_\_\_
72. Since receiving the doctorate, how many years have you spent in the following employment categories: employed full-time \_\_\_\_\_, employed more than half-time \_\_\_\_\_, employed half-time \_\_\_\_\_, employed less than half-time \_\_\_\_\_, unemployed \_\_\_\_\_, in the field of your doctorate \_\_\_\_\_, outside the doctorate field \_\_\_\_\_.
73. If you have ever worked less than full-time, give reasons for this: marriage ( ), children ( ), pregnancy ( ), no suitable job available ( ), spouse's mobility ( ), income not necessary ( ), pressure from spouse ( ), pressure from family ( ), poor health ( ), lack of domestic help/child care ( ), did not want to teach ( ), other \_\_\_\_\_

74. If you are not currently working full-time, do you intend to increase your participation in the labor force in the future: yes / no.
75. Indicate the percentages of time you spend in the following activities in your present job, and the percentages you would prefer; teaching, actual \_\_\_\_, prefer \_\_\_\_; research and development, actual \_\_\_\_, prefer \_\_\_\_; administration, actual \_\_\_\_, prefer \_\_\_\_, professional services to clients, actual \_\_\_\_, prefer \_\_\_\_; other \_\_\_\_\_.
76. If you teach in higher education, do you teach: undergraduates only ( ), undergraduates and graduates ( ), graduates only ( ), in your area of specialty ( ), outside your area of specialty ( ).
77. What opportunities have you had to do research since receiving the doctorate: none ( ), some ( ), ample ( ), sabbatical or leave of absence ( ), time allocated as part of job ( ), scholarship/fellowship ( ), other \_\_\_\_\_.
78. Why have you pursued research or would you like to do so: interest in pursuing problems ( ), required in position ( ), required for promotion ( ), other \_\_\_\_\_.
79. How many research projects have you directed \_\_\_\_\_. What sources of funding have you had for research: government ( ), foundation ( ), research organization ( ), institutional ( ), own ( ), other \_\_\_\_\_.
80. Indicate how many hours per week you spend in research activities \_\_\_\_\_.
81. How many publications have you had since receiving the doctorate in the following categories: books \_\_\_\_, research articles \_\_\_\_, syllabi/textbooks/manuals \_\_\_\_, book reviews \_\_\_\_, translations \_\_\_\_, fiction/poetry \_\_\_\_, nonresearch articles \_\_\_\_, other \_\_\_\_\_.
82. What obstacles to research have you encountered since receiving the doctorate \_\_\_\_\_.
83. How many: professional meetings do you attend each year (average) \_\_\_\_, papers have you presented at professional meetings (total) \_\_\_\_, professional society memberships do you hold \_\_\_\_, positions have you held in professional societies \_\_\_\_, honors or awards have you received for professional achievements \_\_\_\_, consultancies have you been involved in \_\_\_\_\_.
84. If your employment is academic, list dates the following ranks were attained (mo, year): research associate \_\_\_\_,\_\_\_\_; lecturer \_\_\_\_,\_\_\_\_; instructor \_\_\_\_,\_\_\_\_; assistant professor \_\_\_\_,\_\_\_\_; associate professor \_\_\_\_,\_\_\_\_; full professor \_\_\_\_,\_\_\_\_; head of department \_\_\_\_,\_\_\_\_; dean \_\_\_\_,\_\_\_\_; tenure \_\_\_\_,\_\_\_\_; other \_\_\_\_\_.
85. Are you: satisfied with your current rank ( ), ready for promotion ( ), overdue for promotion ( ), long overdue for promotion ( ), satisfied with your present salary ( ), dissatisfied with your present salary ( ).
86. Are you satisfied with your current job overall ( ), enjoying job, but not entirely satisfied ( ), dissatisfied with current job ( ), intending to change jobs due to dissatisfaction ( ). Are you satisfied with the following aspects of your current job (yes / no): advancement opportunities \_\_\_\_, relations with colleagues \_\_\_\_, policies and practices of employer \_\_\_\_, the work itself \_\_\_\_\_.
87. Are you: satisfied with your chosen career ( ), enjoying career, but not entirely satisfied ( ), dissatisfied, but do not wish to change ( ), wishing you had chosen another career ( ).
88. How important is your career, compared to other things in your life, including marriage and children: career is most important thing ( ), career is more important than other things ( ), career is equally important as other interests ( ), career is less important than other things ( ), career is not important ( ).
89. If applicable, how would you describe the effects that marriage and/or children have had on your career (indicate M for marriage, C for children): indispensable factor in professional achievement ( ), definitely an asset ( ), advantages balance disadvantages ( ), made pursuit of career more difficult ( ), chief factor in abandonment of career ( ), other \_\_\_\_\_.

90. Have you experienced conflicts between your roles as a professional and as a woman ( ), wife ( ), mother ( ).
91. Has work for the doctorate had a negative effect on your marriage (yes / no) and/or family life (yes / no). Has your career since receiving the doctorate had a negative effect on your marriage (yes / no) and/or family life (yes / no).
92. What obstacles have you perceived to have affected your career development since receiving the doctorate \_\_\_\_\_
- 
93. Do you think that your sex has affected your career in any of the following ways: easier to obtain desired position ( ), easier to perform professional duties ( ), facilitated promotion ( ), little or no effect ( ), harder to perform professional duties ( ), necessitated a change in vocational plans ( ), harder to obtain desired work ( ), chief factor in abandonment of career ( ), retarded or blocked promotion ( ), decreased earning capacity ( ), other (advantages or disadvantages)
- 
94. Have you perceived that women are discriminated against in any of the following ways (indicate P), and have you experienced such discrimination either as a doctoral student (indicate S) or in your career since receiving the doctorate (indicate D): admission to graduate school ( ), not taken seriously ( ), residence requirements ( ), lack of campus services such as health and child care ( ), financial aid ( ), fellowships/scholarships awarded ( ), curriculum ( ), housing ( ), counseling ( ), first postdoctoral position ( ), hiring ( ), nepotism rules ( ), promotion/rank ( ), level of students taught ( ), tenure ( ), salary ( ), professional recognition ( ), abuses of part-time/temporary employees ( ), opportunities to get into administration ( ), research grants ( ), travel grants ( ), professional expectations ( ), personal expectations ( ), appointments to committees ( ), maternity policies ( ), exclusion from informal information networks ( ), exclusion from formal information networks ( ), exclusion from decision-making ( ), inability to exercise authority of position ( ), fringe benefits ( ), job assignments ( ), other \_\_\_\_\_
- 
95. Whom do you perceive to be the agents of any discrimination in higher education: students ( ), female colleagues ( ), male colleagues ( ), faculty ( ), department heads ( ), administrators ( ), general public ( ).
96. Have you experienced any discrimination based on factors other than sex, such as: marital status ( ), religion ( ), ethnic background ( ), other \_\_\_\_\_
97. What advice would you give to women planning to get doctorates and pursue the type of career that you have followed:

Please feel free to elaborate on any of your previous answers, and to add any comments you would like to make with regard to the questions, or anything else you consider important, which was not included in the questionnaire:

Thank you for your time and cooperation.

**APPENDIX D: FIELD DISTRIBUTION OF 1973-1974 WOMEN DOCTORATES**

Table 3. Field distribution of women's doctorates, 1973-1974

Field	%
Agricultural and natural sciences	<1
Architecture and environmental design	<0.01
Area studies	<1
Biological sciences	11
Business and management	<1
Communications	<1
Computer and information sciences	<1
Education	31
Engineering	<1
Fine and applied arts	2
Foreign languages	6
Health professions	2
Home Economics	1
Law	<0.1
Letters	13
Library science	<1
Mathematics	2
Physical sciences	4
Psychology	11
Public affairs and services	<1
Social sciences	12
Theology	<1
Interdisciplinary studies	<1

Table 4. Field distribution for sample of 1973-1974 doctorates

Field	#
Administration/supervision	1
American history	1
American literature	2
American studies	1
Anthropology	4
Art history	1
Behavior disabilities	1
Biology	2
Biochemistry	3
Botany	1
Business administration	1
Cereal chemistry	1
Clinical psychology	7
Communications	2
Counseling	2
Counselor education	1
Counselor education/guidance psychology	2
Counselor psychology	1
Curriculum/supervision	1
Curriculum and instruction	4
Early childhood	1
Education	4
Educational administration	3
Educational psychology	2
Elementary education	2
English	3
Foundations education	1
French/linguistics	1
Health administration	1
Hearing science	1
Higher education administration	1
Higher education/English	1
History	2
History/curriculum development	1
Home/family life	1
Housing	1
Humanities/English	1
Instructional design	1
Linguistics	1
Mathematics	1
Mathematics education/computer applications	1
Microbiology	1
Music/music education	1
Musicology	1
Neurosciences	1



Table 4 (continued)

Field	#
Nuclear chemistry	1
Nursing	1
Organic chemistry	1
Pharmacology	1
Philosophy	1
Physical anthropology	1
Physical chemistry	1
Political chemistry	1
Political science	1
Psychology	7
Psychotherapy	1
Public health	1
Reading	1
Romance languages	1
Secondary education	1
Social psychology	3
Social science/education	1
Sociology	5
Spanish	1
Speech/communication	1
Zoology	1
Unspecified	6