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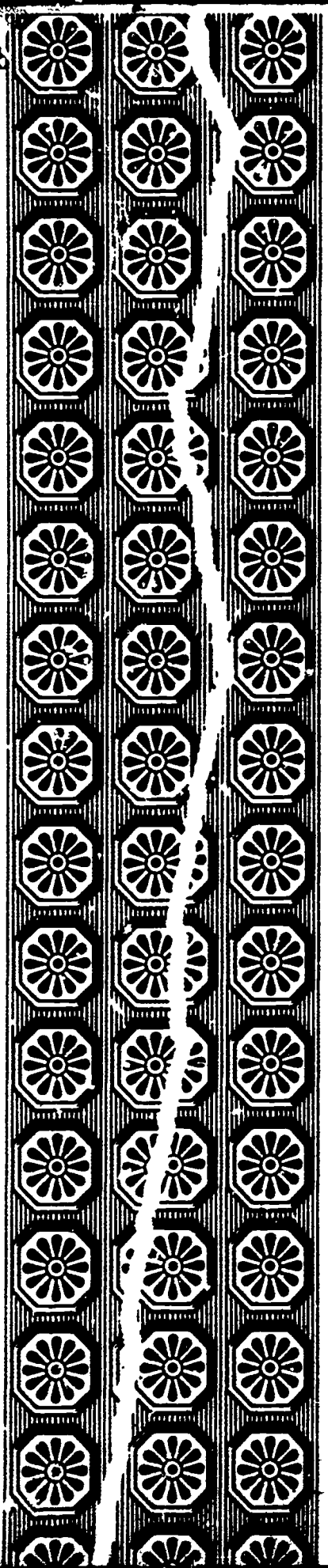
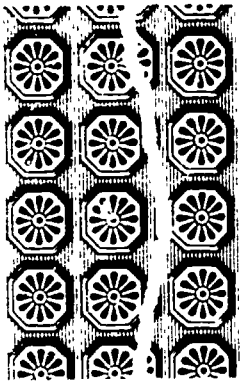
ABSTRACT

A Federal contract study with Johns Hopkins University School of Health Services was initiated to analyze career decisions and behavior of unaccepted medical school applicants for implications as to their recruitability to alternative health careers. Questionnaires were sent to a national sample, stratified by sex, of 3,500 of the 16,800 unaccepted applicants to the 1971-72 entering medical school class. From the 3,034 located respondents, there was a 68 percent return. Focus was on the 73 percent of respondents remaining unaccepted applicants in 1973. The current major activity of 53 percent of males and 49 percent females was study, with 46 percent males and 49 percent females employed. Half of both males and females were in health-related jobs or study, with very few in innovative, mid-level health occupations. Over half the unaccepted applicants reapplied to medical school within a year. Post-rejection advice to persist was the strongest correlate for reapplication. An early, single-minded commitment to a medical career also was correlated with persistence. Women displayed an overall pattern of lowered aspirations in reaction to the blocked career. Implications are the need for career information on newer mid-level and alternative health careers and intensified pre-application counseling and counseling for women. (30-page appendix). (EA)



CAREER PATTERNS of UNACCEPTED APPLICANTS TO MEDICAL SCHOOL



CAREER PATTERNS of UNACCEPTED APPLICANTS TO MEDICAL SCHOOL

A Case Study in Reactions to a Blocked Career Pathway

Prepared by: Office of Health Manpower Studies,
School of Health Services, The Johns Hopkins University

Contract No. NIH 72-4407

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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
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Bureau of Health Resources Development

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PREFACE

Although the last few years have seen substantial expansion in the number of first-year places in medical schools in the United States, the number of applicants for these places has increased even faster. As a result, many qualified applicants are unable to enter medical school each year. Some applicants rejected by medical schools have been accepted after subsequent applications in later years, while others have pursued their medical education in foreign medical schools.

In 1972, a contract study was initiated in an attempt to determine the potential recruitability of unaccepted medical school applicants into alternative health careers, and to study the effect on individuals of having a career pathway blocked. This report represents the final results of that study conducted by the Office of Health Manpower Studies of the Johns Hopkins University School of Health Services.

The study covered by the present report consisted of questionnaires sent early in 1973 to a national sample, stratified by sex, of 3,500 of the 16,800 unaccepted applicants to the 1971-72 entering medical school class. Returns were received from 68 percent of the applicants who were located. The focus of the analysis is on the unaccepted applicants to the 1971-72 medical school class who, at the time of the survey, had failed to gain admission to either U.S. or foreign medical schools in subsequent applications.

The work upon which this publication is based was performed pursuant to Contract NIH 72-4407 with the Bureau of Health Manpower Education, National Institutes of Health, now the Bureau of Health Resources Development, Health Resources Administration. However, any conclusions and/or recommendations expressed herein do not necessarily represent the views of the sponsoring organizations, or of the Department of Health, Education, and Welfare.

Work reported herein was initiated in the Division of Manpower Intelligence, which was a component of the Bureau of Health Resources Development until March 1, 1974, when it was dissolved in conjunction with reorganization of the Bureau. Staff of DMI primarily responsible for this work are now part of the Resource Analysis Staff, Howard V. Stambler, Acting Chief, Office of the Bureau Director.

AUTHOR'S ACKNOWLEDGEMENTS

This study could not have been accomplished without the help of many people, including the numerous respondents across the country (and outside the country) who showed great interest and gave generously of their time. In addition, we would like to acknowledge the assistance of several others who participated in the project at various stages.

The Association of American Medical Colleges was extremely cooperative in collaborating in the development of the study. Particular thanks are due Dr. Robert A. Thompson, Mr. Jess Darnell, Ms. Carol Skinker, and Mr. Robert A. Jungmann. College alumni offices were also very helpful in supplying us with addresses for many respondents.

In the early stages of the project, Dr. Marilyn Katatsky served as a consultant, representing a formal link between the pilot study and our larger survey. Her expert advice was most helpful.

This study presented numerous coding difficulties since the classification of occupations was a major task of the analysis. Our excellent coders--Donna Fried, Vicky Manley, and Cornel Rogers--were both patient and precise, and they readily became expert at using Census Occupation and Industry Codes. Danielle Jones served as a part-time coder and full-time secretary/research assistant. The typed manuscript is her artistry.

Mr. Joseph Barbano and Ms. Alice Fusillo of the National Institutes of Health, Bureau of Health Manpower Education, Division of Manpower Intelligence, were extremely helpful in defining the interests of the funding agency and in suggesting possible avenues of investigation.

We are very grateful for support we received from all concerned.

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Chapter I

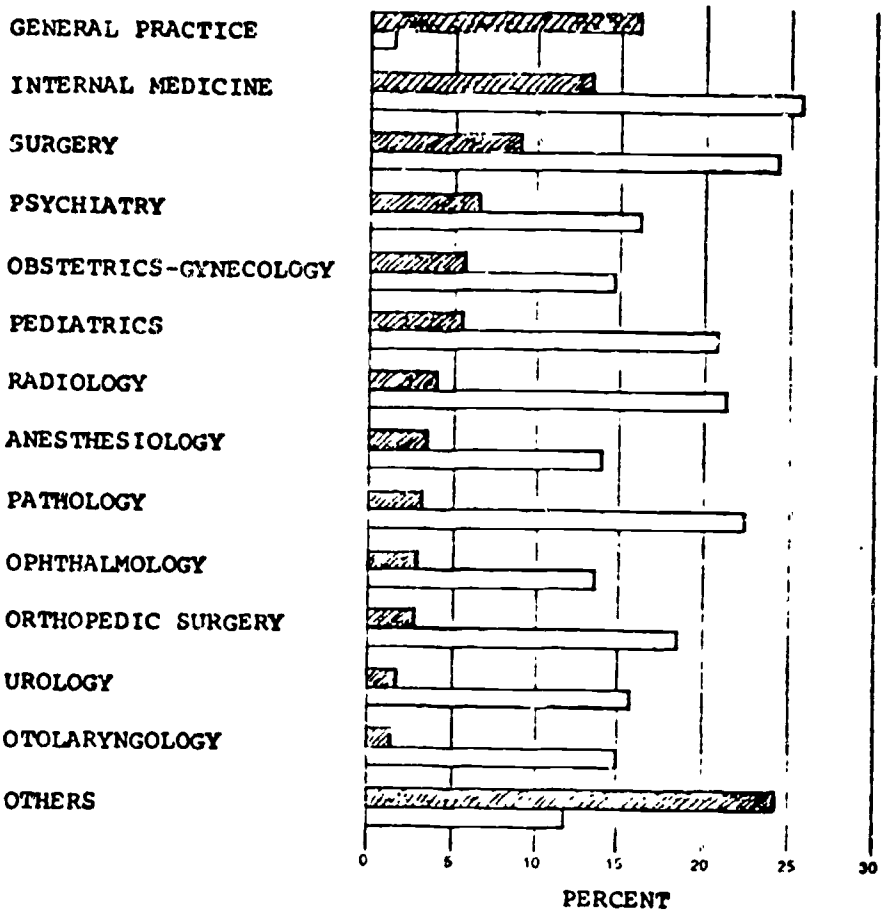
INTRODUCTION

A. Statement of the Research Problem

The nation is presently experiencing a health manpower shortage. While the debate is still open as to whether there exists a quantitative shortage of physicians, there is ample evidence to substantiate qualitative and distributional shortages. Geographical variations in physician/patient ratios, inaccessibility of medical services to segments of the population in certain areas, and utilization patterns of emergency rooms and outpatient departments in many areas of the country (rural, urban, etc.) and among several subpopulations (such as lower income groups) attest to the need for additional manpower in specific geographic areas and in particular specialties, notably primary care. For example, in 1970 in the area of pediatric primary care, compare the population per pediatrician ratio of 6,823 in New York State with one of 39,192 in South Dakota (Golden, 1973). As Figure I.1 illustrates, graduates of medical school will be supplying already oversupplied specialties such as surgery and not producing manpower for the undersupplied area of primary care.

Figure I.1

Replacement of Physicians in Various Specialties*



Gray bars indicate percent of all physicians in each field, while white bars show percent of each field represented by hospital house officers (interns and residents)

*Ebert, Robert H., "The Medical School," Scientific American, Vol. 229, No. 3 (September, 1973), p. 141.

Clearly, new types and additional sources of health manpower will be needed to meet current and future demand for health services. Throughout the country, medical institutions are developing programs to train new health practitioners who can perform the less complex and difficult duties now assumed by physicians. Such programs can recruit people who are unable or unwilling to make the greater investment of time and money in physician training or who are not prepared to acquire the most complex and difficult skills required of a physician. Not only are more people qualified to enter such programs than physician training, but the time and expense of training them is less. Further, due to scientific advances in the prevention of acute illnesses, the area of medical care dealing with education and support of patients in controlling their own chronic illnesses is expanding--an area in which these new practitioners can assume a major role.

At the same time as the need for new health practitioners is increasing, the number of applicants to medical and osteopathic schools in the United States has been increasing faster than the number of places available in those schools. Consequently, while the number of accepted applicants each year has been increasing slowly, the number of unaccepted applicants has increased quite sharply (see Figure I.2). For example, 48% of the applicants to

the 1967-68 entering class of medical school were unaccepted, but by 1971-72, only four years later, 58% of the applicants were unaccepted. This expanding pool of unaccepted applicants to medical school constitutes an actual or potential work force for other health-related occupations. The object of this study is to analyze the career decisions and behavior of unaccepted applicants for implications of their recruitability to alternative health careers.

B. Survey of the Literature

The research problem, assessing the recruitability to other health careers of unaccepted applicants to medical school, demands a theoretical framework which takes into account variables associated with the original choice of medicine as a career, with career behavior subsequent to the blocking of the pathway into medicine, and with the degree of commitment with which a subsequently chosen career is pursued. The usefulness of this research in the formulation of recruitment policies would be enhanced if, in addition to the discovery of factors predicting career behavior and commitment, insights were gained into how these factors operate.

General literature on occupational choice. The concept of occupational choice has been used in various ways according to the disciplines and interests of investigators. For the purposes of

this study, Crites' (1969) distinction between occupational choice and occupational preference is paramount. Further, Katatsky (1971), reviewing occupational choice literature, suggests that occupational preference, choice, and outcome be viewed as distinct, though overlapping concepts. The preponderance of theory in the field of occupational choice is of only limited use to this study because it assumes identity among preference, choice, and outcome and, therefore, ignores the situation which arises when they do not coincide (e.g., the situation of the unaccepted applicant to medical school). Most of the theories of occupational choice, moreover, fall into one of two categories--those which identify traits and factors associated with specific choices and those which describe processes at work in producing choices. Both sorts of theory are necessary for the present study, but neither alone is adequate to its scope.

The trait-and-factor theories represent attempts to use social and psychological statuses and the concepts of interest and value to predict specific occupational choices. Scales of occupational values have been found to distinguish between people of different occupations by Rosenberg (1957), Davis (1965), and Underhill (1967). None of these, however, addresses the process of development of values or a mechanism relating values to choices. Of the theories which are concerned with process, Holland's (1966) is the only one which is predictive

of outcomes in the manner of trait-and-factor theories. He proposes the mechanism of personal orientation as an outgrowth of personality and an inclination toward similarly oriented occupations--perhaps suggesting how occupational values are related to career preference.

Caplow (1954), in focussing on indirect career decisions forced by the educational system and remote from occupational realities, includes in his theory institutional constraints on individual choice, a generally neglected area in occupational choice literature and one pertinent to the present study. In this tradition, we might consider one function of education to be to impose reality checks on occupational plans, and Davis (1966) and Slocum (1966) suggest that occupational choice is directed by performance within the educational system. Ford and Box (1967) formulate a rudimentary theory of occupational choice as a form of risk-taking behavior with the anticipation of performance operating as a constraint on choice. Only Blau et. al. (1956) describe the interaction of job seeker factors with selector factors in producing outcomes.

Literature on the choice of medicine. While general occupational choice research does not provide an adequate theoretical framework for this study, findings of certain studies of this kind which have focussed specifically on medical applicants and students suggest variables which are of interest. Katatsky (1971) notes the emphasis

on role models in decisions to enter medical careers and on the timing of such decisions in studies by Hall (1948), Ginzberg and others (1951), Roe (1956), Super (1957), Rogoff (1957), and Astin and Panos (1969).

Shuval (1973) found Israeli medical school applicants to have been most influenced in their career decisions by acquaintances who were physicians and to place material rewards and service above prestige and opportunity for scientific research among occupational values. A longitudinal study conducted by the American Medical Association (Journal of the American Medical Association, November 20, 1972) found that people who aspired to medical careers in high school and applied to medical schools but were not enrolled had ranked higher than all other groups on measures of interest in biological sciences and health occupations. This might suggest that among unaccepted applicants, an early career choice of medicine may be associated with interest in health per se, above other aspects of the medical profession, such as high prestige and income.

Continued attempts of unaccepted applicants to be admitted to medical school will inhibit attempts to recruit them into other health careers. Hutchins and Morris (1963), studying medical school applicants who had earned high scores on the M.C.A.T. but had not been accepted by any medical school in one year (nearly half were unaccepted because of poor grades), found that one-third were subsequently enrolled in medical school and unavailable for

other health careers, but that another one-fourth were studying or working in health-related or scientific fields. Dubé and others (1972) report that a number of applicants for 1971-72 were accepted with advanced standing from other graduate and professional programs and that there has been an increase in inquiries received by the Association of American Medical Colleges' Student Affairs Information Service concerning alternate routes into medical school. Studies by individual medical schools of their own unaccepted applicants support this indication that many continue to pursue acceptance to medical school. Of interest in this regard, an Educational Testing Service national survey of college seniors (Baird) found that more of those planning to enter medical school than of any group in another field had made an early career decision and had maintained that decision. They also rated themselves higher in perseverance than did any other group. Shuval (1973) found similar patterns of commitment among applicants to medical school in Israel, reiterated by the striking finding that for virtually all applicants in medicine, compared with only about half the applicants in dentistry and pharmacy, the field applied to represented their first-choice career at the time of application.

A study of medical school attrition (Johnson and Hutchins, 1966) is in some respects analogous to the study of recruitability to other careers in that it sought to predict who might leave

careers in medicine. Among the factors (other than academic ability) which were found to distinguish between those who finished medical school and those who did not are age, sex, other careers considered besides medicine, parental attitudes toward the choice of medicine, and certain personality patterns.

Pilot study on recruitability of unaccepted applicants to medical school. A pilot study, "Evaluation of Unsuccessful Applicants to Medical School as a Health Manpower Resource," was completed in 1972. Of fundamental interest was the question of whether unaccepted applicants had chosen alternative careers in health or non-health fields. Forty-two percent of the men and 38% of the women entered health careers, and 23% of the men and 15% of the women chose scientific careers not related to health. Of those who remained in health fields, a greater proportion of men than women chose professions requiring doctoral-level training, while women were more likely to choose careers at the level of medical technology (Becker, et. al., 1972).

These findings were supplemented with information on respondents' familiarity with and interest in other health careers at the time of being unaccepted and subsequent advice received. Half of the respondents reported having considered other health careers at that point, but considerably fewer had sought additional training in health fields, giving as reasons lack of sufficient interest to pursue such training and interest in occupations which required no further formal training. Fewer than half had received

advice to enter other health careers. Fewer women than men had sought additional training in health fields, and different alternative health careers had apparently been suggested to women than to men. Typically, more traditionally female occupations and those which required less training were suggested to women. This finding is consistent with the difference in current occupations reported by men and women.

Because those unaccepted applicants who re-applied to medical school were obviously more likely eventually to be admitted and to be unavailable for alternative careers than were those who did not re-apply, persistence in seeking admission was a major focus of the pilot study. Persisters, those who re-applied at least once, predictably were found more likely than others to have taken the M.C.A.T. two or more times, but they also scored higher on the science portion of the test, in spite of having lower grades generally and being more likely to report difficulty in science courses and less encouragement from professors to continue in scientific studies. They were more likely than others to report external reasons rather than those pertaining to personal inadequacies in accounting for their not being admitted. They also reported being more upset by not being admitted, were more likely to have considered it unfair, and were more likely to have sought advice subsequently, especially from peers. A greater proportion of men than women were persisters.

Literature on sex differences in occupational choice and the choice of medicine. The pilot study found that men and women had been treated, had felt, and had behaved differently in regard to career plans. Similar indications may be gleaned from other literature. Katatsky (1971) notes such findings in the general occupational choice literature. Rosenberg (1957), Davis (1965), and Astin and Panos (1969) all found that college men and women tended to choose different clusters of occupations and that their choices became even more polarized over time. Rosenberg identified both sources of major life satisfaction and occupational values which were endorsed differentially by men and women (although women who were strongly career oriented in regard to major life satisfaction resembled men in their occupational values). Rossi (1965) also found sex differences in occupational values. Sex role socialization and occupational sex-typing have typically been used as the framework for any attempt to explain such findings.

Even women who have chosen to enter the predominantly male field of medicine do not necessarily do so for the same reasons as men. Although both men and women have cited support from significant others as a strong influence in their decision, strikingly more women report having chosen medicine because of the independence they felt it offered them (Johnson and Hutchins, 1966; Lopate, 1968; Cartwright, 1972). Among factors favoring the stability of women's career plans in medicine, special encouragement and support by parents and others and the availability of

female role models have generally been cited (Johnson and Hutchins, 1966; Ginzberg, 1966; Lopate, 1968). Women medical students have reported being more influenced by literature on medicine and experiences of personal or family illness than have men (Johnson and Hutchins, 1966; Lopate, 1968). The influence of formal pre-medical counseling either has been evaluated as discouraging to women or has been discounted (Lopate, 1968), which is consistent with the portrait of the woman aspiring to a medical career as highly independent. Although fewer women than men apply to medical schools, a greater percentage of female than male applicants have been accepted in recent years, even though women make fewer applications per person than do men (Dubé, et al., 1971; Dubé, et al., 1972). Once enrolled, however, a greater proportion of women than men drop out for non-academic reasons (Johnson and Hutchins, 1966). The finding of such sex differences in career behavior in medicine has made it imperative that the present study analyze women separately from men in order to describe the behavior of each accurately.

C. Hypotheses

From the pilot study and other literature, hypotheses may be formulated which sketch the structure of a theory of response to a blocked career pathway in medicine. To the extent that these hypotheses are confirmed or rejected, such a theory will become

a useful basis for policies of recruitment of unaccepted medical school applicants into alternative health careers.

Studying the original choice of medicine is expected to indicate the reluctance with which unaccepted applicants may alter their career plans. They, like applicants in general, may have long-standing and/or rather exclusive commitments to medicine. Many, influenced by family and friends, will have decided on a medical career early and have maintained that decision for years. For most, medicine will have been their first-choice career at the time of application. Many, therefore, are expected to have persisted in trying to be accepted, especially those who feel that no other occupation will satisfy their career expectations.

Based on suggestive findings of the pilot study, specific hypotheses relating to persistence will be tested. Persisters are expected to have lower college grades, both generally and in science, to have had difficulty in science courses, and to have less interest in a scientific career than in a prestigious career. They may blame their initial rejection on factors in the admission system rather than in themselves, have been quite upset by it, think it unfair, and have subsequently sought advice, especially from peers. More men than women will have persisted.

Unaccepted applicants' current career activities should suggest aspects of alternative careers to which they may be attracted. Persons who have entered occupations in health or

science since rejection (who may or may not also be persisters) are expected to have chosen them primarily because their education has been concentrated in these areas, usually in anticipation of medical school requirements. They may consider themselves more talented in science than do those who enter other fields, while expressing less interest in science than others. Men and women will be equally likely to enter occupations in health fields, and those with role models in health occupations will be more likely than others to enter such occupations. Men will be more likely than women to enter occupations requiring doctoral-level training.

Information on counseling of applicants both before and after rejection may suggest points of intervention for recruitment to mid-level health careers. Many women are thought to apply to medical school in the face of discouragement based on their sex, advice which may be expected to leave them unprepared for rejection based on credentials. Perhaps because of this experience, women may be less likely than men to seek advice after rejection. When they do so, they will be advised to pursue different careers than will men, those which are more traditionally feminine and require less additional training.

It is worth noting that sex differences are anticipated in counseling of unaccepted applicants, as well as in persistence in re-applying to medical school and pursuing doctoral-level training. Such expected differences suggest somewhat different

influences or different magnitudes of influence on career behavior, which might require qualitatively or quantitatively different recruitment strategies for men and women.

Figure I.3 shows the major variables that will be of interest in the analysis to follow.

D. Methodology

To achieve the purposes of this study, it was necessary to identify, locate, contact and interview a national sample of unsuccessful applicants to medical schools in a given year. The Association of American Medical Colleges (A.A.M.C.) in Washington, D.C., keeps a record of all applicants to U.S. medical schools in a given year, and the disposition of all applications submitted by each applicant. For most applicants, A.A.M.C. also has a mailing address, which was used by the individual when he or she took the Medical College Admission Test (M.C.A.T.) or applied to medical school. Given this information, a list of all applicants who received no acceptances in a given year can be constructed. A.A.M.C. supplied us with a sample of unsuccessful applicants, observing certain precautions to preserve the confidentiality of their files.

Two considerations entered into the choice of the target year for selection of our sample:

(1) A substantial amount of time since rejection from medical school must have elapsed in order to assure that most

FIGURE I.3

Major Variables

Explanatory Variables (4 types)

I. Background Factors

early commitment to medicine

parental role-models (having a physician-parent, working mother, etc.)

demographic variables

II. Activities and Interest Before Rejection

source and type of counseling received

other career interests

ability in science (grades, MCAT scores)

III. Post-rejection Activities and Interests

perceptions of reasons for rejection (externalization, internalization)

degree of persistence (number of years applied to medical or osteopathic school)

amount and type of counseling received

level of knowledge about alternative health occupations

IV. Attitudes and Psychological Attributes

occupational values

attitudes toward family roles, women's roles

self-satisfaction

Dependent Variables

*Type of career chosen (health/non-health)

Prestige ranking of chosen occupation

Highest level of education expected

Control Variable

Sex

respondents would have made alternative career plans. This is essential, since alternative career choice is the variable of interest in this study.

(2) The amount of time elapsed since rejection cannot be too great, however, since the location of respondents depends upon the accuracy of the addresses in A.A.M.C.'s files. The greater the amount of time elapsed since taking the M.C.A.T. or applying to medical school, the more likely the respondent is to have moved. The non-response rate in the pilot study was relatively high, due to the fact that five years had elapsed since rejection, and people could not be located.

With this trade-off in mind, it was decided to select the sample from the cohort of unsuccessful applicants who submitted applications for the 1971-72 entering class of U.S. medical schools.[1] Thus, when we contacted respondents during the winter of 1973, these individuals had had a full year and a half (since their 1971-72 rejection) to formulate alternative career plans (i.e., plans for two subsequent academic years would have to have been made -- 1971-72 and 1972-73). In addition, the addresses for these individuals, obtained from A.A.M.C.'s files, would have been current during the 1970-71 academic year, thus making them just

[1] Note that everyone who submitted an application for the 1971-72 entering class was not necessarily applying for the first time. An alternative study design would be to interview a sample from a cohort of unaccepted applicants who had been rejected for the first time in the same year. Such a design was not possible, however, using A.A.M.C.'s files.

slightly over a year and a half old in early 1973, the time of our first mailing. (In some cases addresses were newer, since people could have retaken the M.C.A.T. the following year or re-applied to medical school). Since such addresses might still be out of date, however, an alternative means of locating respondents, through college alumni offices, was also undertaken (see Chapter II).

For purposes of contacting and interviewing a national sample of several thousand unsuccessful applicants, a mailed questionnaire was deemed most appropriate. Three separate mailings of the same questionnaire (in March, April, and May), each with a cover letter explaining the purpose of the study, were made in order to encourage non-respondents to complete and return their questionnaires.

E. Statistics

In the analysis phase of the study, the statistics used will depend on the measurement level of the variables:

(1) Interval variables. Pearson product moment correlations and F tests are used for measuring the degree of strength and level of statistical significance between interval (continuous) variables such as M.C.A.T. scores and occupational prestige scores. We also have used Pearsonian r's to correlate interval variables with ordinal data. Although this procedure is in violation of the assumptions underlying product moment correlations, we prefer this

alternative to the loss of information incurred when continuous data are transformed into dichotomous or trichotomous variables. Point biserial coefficients are used to measure the association between continuous data and dichotomous variables.

(2) Dichotomous, nominal and ordinal variables. To measure the degree of statistical significance of relationships among dichotomous, nominal and ordinal variables we have utilized chi square tests. Significance tests are, of course, heavily dependent on sample size. For fairly large samples such as ours where even slight relationships may be statistically significant, we must be concerned not only with whether a relationship is significant statistically, but whether it is important in a substantive or policy-relevant sense. We feel that for these reasons it is important to examine the strength of relationships, not only for interval data, but for dichotomous and ordinal variables as well. For this purpose we have used gamma, a measure of association for ordinal data that has become increasingly popular among social scientists.

When utilized to measure the strength of relationships among varialbes that can be ranked (either dichotomous or ordinal data) the gamma is somewhat analogous to a Pearson product moment correlation.[2] The mathematics of gamma have been developed by

[2] It should be noted that in the special case of a 2 x 2 table, gamma is identical to Yule's Q.

Leo A. Goodman and W. H. Kruskal in "Measures of Association for Cross Classification," Journal of the American Statistical Association, 49 (December, 1954), pp. 732-764.[3] It is a measure ranging from -1.00 to +1.00 and can be given a probabilistic interpretation.

Perhaps we can illustrate the logic of the measure with the following example. We have found that for women in the sample the gamma is -.22 between age at which the decision was made to become a doctor (as measured by the following trichotomy: pre-college, college years, post-college) and whether they did or did not persist in reapplying to medical school after the initial rejection: the earlier the decision was made to go into medicine, the more likely the women were to reapply. But exactly how can this -.22 be interpreted? Let us suppose that two women randomly selected from the sample of nonaccepted applicants are brought before us and we are told that one of the two has reapplied to medical school and we must guess the identity of that individual. If we merely flipped a coin we would be right half the time. Now let us further imagine that we are given an additional piece of information: the age at which each woman decided to become a doctor. Based on our knowledge that the earlier the career

[3] See also their two later articles: "Measures of Association for Cross Classifications. II: Further Discussion and Reference," Journal of the American Statistical Association 54 (1959), pp.123-163 and "Measures of Association for Cross Classifications. III: Approximate Sampling Theory," Journal of the American Statistical Association 58 (1963), pp.310-364.

decision was made the more likely the woman was to persist in reapplying to medical school, we decide to always predict that the number of the pair who had reached the decision to apply to medical school at the younger age would be the woman who persisted in reapplication.

We must ask how much better our accuracy would be if we followed this strategy rather than the coin-flipping one. The gamma coefficient of -.22 indicates that if we always guess that the member of the pair who decided to become a doctor at a younger age was the one to reapply, we will be correct in our prediction 22 per cent more of the time than if we had relied on the flip of the coin. A gamma of 1.00 (or -1.00) would mean that we would be accurate all of the time, and a gamma of .00 would indicate that our predictions would not rise beyond the level of chance.

We have encountered problems in some portions of the analysis where we have desired to compare the strength of several relationships obtained by different measures of association (e.g., gammas with Pearsonian r's).[4] For the most part we have handled this problem by using several statistical procedures on the same data. For example, when measuring the strength of relationships among dichotomous variables we prefer to use gammas (or Yule's Q--the equivalent for 2 x 2 tables) over the phi coefficient whose value is more limited by the table marginals. It is easier,

[4] For example, our experience has shown us that gammas will usually about twice as large as Pearsonian r's calculated on the same data.

however, to compare phi with Pearsonian product-moment correlations, and when we have desired to do this, we have run both gammas and phi coefficients on the same 2 x 2 tables.[5] It is important to note that although these alternative statistical measures usually differ in value (though not in direction) when run on the same data, in almost all cases measures that are statistically significant by one method also are significant when the alternative procedure is used. Hence, the identification of relationships is not usually affected by the statistic used.

The statistical measures used in the analysis are summarized in the table on the following page (Figure I.4).

[5] Hubert Blalock is among those who suggest that "whenever clearcut criteria (for choosing among alternative statistical procedures) are difficult to apply, it is always wise to use several different tests, both parametric and nonparametric, and to report both sets of results so that a reader may make his own decision. Usually this can be done by simply reporting results of a second test in footnotes, with comments suggesting why conclusions may not have been identical." (Social Statistics, 1972: 270-271).

FIGURE I.4

Measurement level of first variable	Measurement level of second variable*		
	Dichotomy	Ordinal	Interval
Dichotomy	Chi square Gamma (Yule's Q) phi coefficient		
Ordinal	Chi square	Chi square Gamma	
Interval	F test point biserial coefficients	F tests Pearsonian r's	F test Pearsonian r's

*We have not included nominal variables in the table because there are no nominal variables, other than dichotomies, in our analysis.

Chapter II

THE STUDY SAMPLE

A. Sample Selection

According to A.A.M.C., there were 29,172 applicants to the 1971-72 entering class of U.S. Medical Schools, and these applicants submitted over 200,000 separate applications. Of those submitting applications, 42.3% received at least one acceptance, leaving 16,837 individuals who were unsuccessful in all of their applications.[1] The latter group of individuals comprise the population from which our sample was drawn.

A total sample size of 3,500 was selected in order to assure enough respondents for statistical analysis. It was also decided to stratify the sample by sex, since selecting women according to their proportion in the universe of unaccepted applicants would not yield enough women respondents to facilitate analysis of sex differences. In 1971-72, women comprised only 12.8% of the total applicant pool, and only 2,052 of the women applicants were unsuccessful. Therefore, in order to have approximately equal numbers of men and women respondents to analyze, women were over-sampled.

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[1] W.F. Dubé, Davis G. Johnson, & Bonnie C. Nelson, "Study of U.S. Medical School Applicants, 1971-72," Journal of Medical Education, Vol. 48, May 1973, pp.395-420. Article reports A.A.M.C. data.

In addition to sex, three other pieces of information about the individual were used as criteria when selecting the male sample from A.A.M.C.'s files.[2] No individual was included in the sample unless his record included each of the following:

1) a mailing address (the most recent mailing address in AAMC's files for the individual was used, that is, if a person re-applied in 1972-73, that year's address was used)

2) an undergraduate college code (i.e. a number indicating which college the individual attended)

3) M.C.A.T. scores

The first criterion of a mailing address was essential for locating the individual. The most recent address for the individual on file at A.A.M.C. was used. The undergraduate college code was necessary in case it became necessary, due to faulty addresses, to attempt to locate individuals through college alumni offices. M.C.A.T. scores were necessary not only for the analysis, but also to determine the "representativeness" of the ultimate sample of respondents. Since high M.C.A.T. scores are associated with acceptance to medical school,[3] an over-representation of individuals with either very high or very low M.C.A.T. scores could bias our sample. The most recent M.C.A.T. scores for the individuals in A.A.M.C's files were used.

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[2] For the female sample, all unsuccessful female applicants with an address on file were selected. (Of the 1,486 women selected in this way, 5% had no M.C.A.T. scores on record.) Thus our "sample" of women is really the population of all female unaccepted applicants with an address on file.

[3] A.A.M.C. data show that this relationship holds every year.

Thus in selecting the sample of 3,500 unsuccessful applicants to U.S. medical schools from A.A.M.C.'s files, the following procedure was used: The universe of unaccepted applicants was stratified by sex; among the females, every woman for whom an address was on record was selected for the sample (the total number of women selected was 1,486); every 5th male with an address, an undergraduate college code, and M.C.A.T. score was selected to bring the total sample size up to 3,500 (the total number of men selected was 2,014). Thus 13.6% of all unsuccessful male applicants, and 72.4% of the females, were selected for the sample (see Table II.1).

B. Mailing Procedures

The questionnaires were mailed in three waves (in March, April, and May). In addition to these three mailings, an attempt was made to obtain current addresses for those individuals whose questionnaires were returned to us as undeliverable by the Post Office, following the first mailing. About 450 alumni offices were contacted, yielding new addresses for approximately 530 individuals whose A.A.M.C. addresses were out of date. (Some of these new addresses were in foreign countries). Approximately 10% of the addresses received from alumni offices were also found to be out of date. As new addresses were received from alumni

TABLE II.1

THE STUDY SAMPLE

	Number Selected	% of total pool of unsuccessful applicants
Men	2,014	13.6%
Women	1,486	72.4%
Total	3,500	20.8%

offices, questionnaires were immediately dispatched to respondents, rather than waiting for the next wave. This procedure attempted to assure that each respondent for whom a current address was obtained was contacted at least twice.

Wave III was sent by certified mail, return receipt requested, in order to determine whether Post Office returns on the first two waves, which were sent by first class mail, were an accurate indication of the number of respondents who had not been located. Based on the results of this mailing and the alumni office mailings, we estimate that 464 respondents were never located. This is a low estimate, however, since it is likely that some undelivered questionnaires were never returned to us by the Post Office and since the Post Office does not return undeliverable mail sent to foreign addresses. Nevertheless, we estimate that 3,036 respondents (or 87% of the total sample) were probably located. In addition to the unlocated respondents, 2 respondents were deceased, bringing the actual mailed sample down to 3,034.

C. Response Rate

Given this estimate of the number of respondents probably located, the response rate for this study is calculated as follows:

$$\frac{\text{total number of questionnaires returned by respondents}}{\text{number of located respondents}} = \frac{2,048}{3,034} = 67.5\%$$

Of the 2,048 questionnaires received from respondents, 6% were deemed unusable for purposes of this study. The unusable questionnaires include 32 that were incomplete and 62 questionnaires from people who indicated that they had been accepted by a U.S. medical school for 1971-72. This is possible, according to A.A.M.C., since people may have been accepted late (after having been on a waiting list) and A.A.M.C.'s files might not indicate this. The complete breakdown of unusable questionnaires appears in Table II.2.

The "duplicates" noted in Table II.2 refer to two questionnaires with the same I.D. number, apparently completed by two different individuals. It appears that five respondents gave a spare copy of their questionnaire to a friend, who also filled it out and returned it to us. Since both questionnaires had the same I.D. number (which had been afixed prior to mailing), and since we had no way of knowing which questionnaire belonged to the "real" respondent, neither questionnaire could be used.

Thus, there are 1,933 usable questionnaires, representing 64% of the total <u>located</u> sample. Response rates by sex (see Table II.3) show that women were slightly more likely to respond

TABLE II.2

UNUSABLE QUESTIONNAIRES

Respondents accepted in 1971-72	62
Incomplete questionnaires	32
Duplicates	10 (5 pairs)
Respondents accepted prior to 1971-72	6
Respondents who never applied	5
Total	115

TABLE II.3

USABLE QUESTIONNAIRES BY SEX

	number of completed questionnaires received	% of total sample of men and women*	% of usable sample of 1,933
Men	1,077	53%	56%
Women	856	58%	44%
Total	1,933	55%	100%

*these percentages are based on the original sample of 3,500 since our estimate of the unlocated group cannot be broken down by sex. (Case base for men is 2,014; for women, 1,486).

than men. It had been anticipated that women might be harder to locate, due to changes of name due to marriage, thereby lowering their response rate, but it appears that this was not the case. One reason for this is that alumni offices often supplied us with female respondents' new names as well as new addresses.

All told, the response rate of 67.5%, based on the adjusted sample size (i.e., original sample minus unlocated people) is a good response rate for a national mailed survey, especially considering the following three factors operating in this particular case:

1) the use of old addresses

2) the Post Office's inconsistency with regard to returning undeliverable first class mail

3) the possibility that respondents could have been hostile toward a study of their failure to get into medical school especially since the study was conducted under the auspices of a University.

D. Representativeness of the Sample

The one criterion on which we can compare the study sample and the total population of unaccepted applicants in 1971-72 is scores on the Medical College Admission Test (M.C.A.T.). Table II.4 shows the mean M.C.A.T. scores for the total male and female population of unaccepted applicants, for the male and female samples drawn for us by A.A.M.C., and for all male and

TABLE II.4

Comparisons Between Mean M.C.A.T. Scores of the Population of Unaccepted Applicants, 1971-72*, and the Total Sample, All Respondents, and Unaccepted Respondents

	Verbal Ability	Quantitative Ability	General Information	Science	N
All unaccepted male applicants, 1971-72*	517	554	518	513	14,785
Total male sample	523**	562**	522**	521**	2,014
All male respondents	524**	568**	523**	525**	1,077
Unaccepted male respondents	515	558	518	513	738
All unaccepted female applicants, 1971-72*	537	523	521	486	2,052
Total female sample	541	531**	527**	492**	1,396
All female respondents	548**	542**	536**	502**	814
Unaccepted female respondents	543	533**	531**	492	630

* Source: A.A.M.C. data on total population of unaccepted applicants, 1971-72

** Significantly different from the population mean using a .05 two-tailed test. Z-scores follow in Table II.5.

female respondents to our questionnaire. Mean scores also are included for male and female respondents classified as "unaccepted applicants," a category formed by omitting those respondents who have gained admission to medical school since the list of unaccepted men and women was compiled by A.A.M.C. for the 1971-72 academic year.

For both males and females, the samples drawn by A.A.M.C. have significantly higher mean M.C.A.T. scores than the total male and female populations of unaccepted applicants.[4] It is not clear why this should be the case. But from examining the female sample (which unlike the male sample includes the total population for which addresses are known), it is apparent that the necessary action of including only those in the study with addresses on file serves to bias the sample towards a more highly qualified group of applicants, in terms of M.C.A.T. scores.

Table II.4 also indicates that mean scores for men and women respondents are significantly higher than scores for the total male and female populations and uniformly higher than scores for the male and female samples. These higher mean scores are attributable to the fact that individuals who have been accepted to medical school since their initial rejection in 1971-72 are more likely both to have higher M.C.A.T. scores and to have a

[4] The z-scores for all difference of means tests are included in Table II.5.

TABLE II.5

Difference of Means Test Statistics (Z-Scores) For Comparisons Between Mean M.C.A.T. Scores of the Population of Unaccepted Applicants 1971-72, and the Total Sample, All Respondents and Unaccepted Respondents.*

	Verbal Ability	Quantitative Ability	General Information	Science
Total male sample	3.00	3.90	3.90	4.08
All male respondents	2.55	5.00	2.05	4.48
Unaccepted male respondents	-0.60	1.18	0.00	0.00
Total female sample	1.53	3.11	2.61	2.52
All female respondents	3.21	5.65	4.98	5.13
Unaccepted female respondents	1.54	2.63	2.94	1.69

* A .05 two-tailed test was used. Z-scores greater than 1.96 or -1.96 are significantly different from the population mean.

higher response rate, possibly due to fewer feelings of embarrassment or bitterness about responding, but also due to the fact that they had more recent addresses on file at A.A.M.C. and therefore were more likely to have been reached by mail.

When this group of men and women currently in medical school is excluded from our study sample, the remaining respondents include only "Unaccepted Applicants," who as a group are not significantly different from the original male and female populations. (The exceptions to this statement occur for the Quantitative and General Information scores among female respondents.) We may conclude that by omitting those respondents from our sample who have been accepted to medical school, we eliminate from the analysis a bias toward "better qualified" applicants. The remaining sample of unaccepted men and women, which is the focus of our study, is representative of the total population, at least in terms of their component scores on the M.C.A.T.

Chapter III

THE UNACCEPTED APPLICANTS

A. Classification of Respondents

For purposes of this analysis of the career patterns of unaccepted applicants, the 1,933 respondents in the study are divided into three groups:

(1) Students in foreign medical schools: Those respondents who have been accepted and are attending foreign medical schools (N=91).

(2) Students in U.S. medical schools: Those respondents who have been accepted to a U.S. school since 1971-72 and are attending U.S. medical schools (N=435).

(3) Unaccepted applicants: Those respondents who have never been accepted to a U.S. medical school, whether or not they are still seeking admission (N=1,407).

The breakdown of the sample into these three groups by sex is shown in Table III.1. This table shows that 25% of the male respondents and 18% of the female respondents have gained admission to U.S. medical schools in the two years following their 1971 rejections; an additional 5% of the men and 3% of the women are attending foreign medical schools.[1] This means that 27% of

[1] Students attending medical schools in foreign countries are discussed in Appendix D.

TABLE III.1

Classification of Respondents:

Students in Foreign Medical Schools, Students in U.S. Medical Schools, Unaccepted Applicants*

	Men	Women	Total
Foreign Medical Schools	62	29	91
U.S. Medical Schools	277	158	435
Unaccepted Applicants	738	669	1,407
Total	1,077	856	1,933

* These figures are not percentaged since proportions should not be interpreted as population estimates

the respondents are pursuing their original intention to enter medicine,[2] and therefore cannot be considered as recruitable to other health careers.

B. Breakdown of Unaccepted Applicants

Thus 73% of all respondents are classified as "unaccepted applicants," and these individuals are the focus of this study. These unaccepted applicants are not a homogeneous group in terms of either current major activities (as defined in Question 1 in the questionnaire) or stages in the career ladder. As Table III.2 shows, 51% of the men and 39% of the women are currently graduate students, and 46% of the men and 49% of the women listed employment as their current major activity. Only 2% of the men and 3% of the women are still undergraduates. (The current activities of unaccepted applicants will be discussed in detail in Chapters V and VI).

Furthermore, some of the unaccepted applicants are still attempting to gain admittance to medical school, indicating that they would still prefer to become physicians. Among the male unaccepted applicants who have graduated from college, 33% had applied to a medical school (either domestic or foreign) in 1973,

[2] Note that this 27% figure should not be interpreted as a population estimate. (That is, one should not suppose that 27% of a cohort of unaccepted applicants will be in medical school two years later.) As noted in Chapter II, this proportion is probably high, due to the tendency of successful individuals to respond to the questionnaire, but we are unable to estimate exactly how high it is.

TABLE III.2

Current Major Activities* of Male and Female Unaccepted Applicants

Current Major Activity	Males	Females
Undergraduate students	2%	3%
Graduate students	51	39
Employed	46	49
Homemakers**	0	5
Others***	2	3
Total	101%	99%
(N)	(738)	(669)

* As defined in Question 1 in the questionnaire. (See discussion of "Coding Decisions" in Appendix B.)

** The term "homemaker" was used in the questionnaire due to the current aversion to the term "housewife" among many women.

*** Includes people who could not be classified because they did not respond to question 1 or because they circled more than one response to question 1 and a decision could not be made regarding the major activity. Also includes people who classified themselves as unemployed: half of the men and 2/3 of the women in the "other" category said they were unemployed. Military personnel (4% of the men) are included in the "employed" category.

and an additional 12% who had not applied in 1973 said they would "definitely" apply after 1973. (Twenty-two percent were "undecided" about future applications.) Among women, 30% had applied in 1973 and 13% said they would "definitely" apply after 1973, with 26% "undecided" about future applications. What this means is that a full two years following rejection, 44% of the men and 42% of the women unaccepted applicants can be defined as "persisters," since they are still actively seeking, or intend to seek, a career in medicine. (Note that this figure does not include those who were successful in their re-applications, since such individuals would not be classified as "unaccepted applicants" in our sample). Persistence, especially as it is related to recruitability, will be discussed in detail in Chapter V.

Table III.3 shows the age distribution of the sample of unaccepted applicants. The mean age for both men and women is just over 25 years. Nearly one-third of the respondents are over 26 years of age, and some are in their 30's or 40's. Nevertheless, the majority of respondents (79% of the men and 74% of the women) reported that they were undergraduate students when they first applied to medical school. The time sequence of the majority of career decisions in our sample is therefore clear. Most respondents had selected medicine as a potential career by the time they graduated from college, without post-graduate investment in another career. (Only 8% of the men and 7% of the women were graduate

TABLE III.3

Age Distribution of Unaccepted Applicant Sample

	Men	Women
College Age (20-22)	4%	9%
23	30	28
24	25	21
25	13	11
26-29	20	18
30 and over	8	12
Total	100%	99%
(N)	(722)	(657)
Mean Age	25.1	25.4

students when they first applied). Hence medicine was their first career choice, and subsequent career choices would have been made following the initial application to medical school.

C. Comparison of Unaccepted Applicants and U.S. Medical Students

Analytically, a comparison between those respondents who are unaccepted applicants and those who have gained admittance to a U.S. medical school by 1973 is important since it may yield some clues as to how to distinguish individuals available for a non-medical health career from those who will pursue medicine.[3]

To begin with, those respondents who gained entrance to a U.S. medical school tended to have done so in the "application year" following their initial rejection: the mean number of years applied to medical school is 2.3 for male students, and 2.2 for female students. This means that unaccepted applicants who will pursue medicine for a career are likely to be selected out of the "unaccepted applicant pool" within one year following the initial rejection. Beyond that, the likelihood of an acceptance decreases: only 27% of the male students and 20% of the female

[3] In this study, we have no way of knowing whether our group of U.S. medical students is representative of the population of U.S. medical students who were at one time unaccepted applicants. There is no group of "formerly unaccepted medical students" with which to compare our sample. However, we will proceed with a comparison of the unaccepted applicants and the U.S. medical students, with the understanding that caution should be used in generalizing from this group of respondents.

students were accepted in their 3rd, 4th, or 5th years of application.

It is obvious that for an unaccepted applicant to be accepted to medical school, he or she would have to re-apply another year. Therefore, we would expect the unaccepted respondents to have applied to medical school in fewer years, on the average, than accepted respondents. Table III.4 shows that this is the case. It should be noted, however, that the extent of re-application is widespread in our sample of unaccepted applicants: 65% of the men and 56% of the women re-applied to medical school at least once following the initial rejection. Twenty-six percent of the men and 20% of the women re-applied more than once. This means that at least half of the unaccepted applicants continued to seek a medical career for at least one year.

The A.A.M.C. has found repeatedly that the number of applications per applicant in any given year is associated with admittance to medical school.[4] For example, in 1971-72, the mean number of applications per applicant was 7.2, but the mean number of applications per accepted applicant was 8.0, and the mean

[4] The mean number of applications per applicant is increasing each year, but it is still true that more applications are associated with admittance.

TABLE III.4

Application Behavior of Accepted* and Unaccepted Respondents, by Sex

	MEN		WOMEN	
	Unaccepted	Accepted	Unaccepted	Accepted
Mean number of years applied to medical school ("application years")	2.0 (723)	2.3 (272)	1.8 (661)	2.2 (157)
% re-applying to medical school at least once	65% (723)	100% (272)	56% (661)	100% (157)
Mean number of applications submitted per applicant in first application year	7.6 (700)	7.2 (263)	6.7 (646)	5.8 (146)

*Respondents who are currently students in U.S. medical schools.

number per unaccepted applicant was 6.7.[5] (That is, on the average, the accepted applicant made 1 1/3 more applications than the unaccepted applicant.) Our data show that in the first year in which they applied (which was not uniform for all respondents), the unaccepted applicants filed slightly more applications, on the average, than the accepted applicants (see Table III.4). This finding could reflect the fact that those applicants who were eventually accepted had been over-confident when they first applied and therefore applied to too few schools. In other words, too few applications in the first "application year" could have been one reason why this group was unaccepted. This would need further study.

A further piece of evidence that supports this interpretation is the finding that the accepted respondents, as a group, are better qualified than the unaccepted respondents. Table III.5 shows the mean M.C.A.T. scores of accepted and unaccepted respondents and the scores of the accepted group are consistently (and significantly) higher. Furthermore, Table III.6 shows that accepted respondents consistently reported higher grade averages than unaccepted respondents: a higher proportion of accepted than unaccepted respondents reported grade averages of B or better in both the hard sciences and in overall studies.

[5] Source: A.A.M.C. data

TABLE III.5

Mean M.C.A.T. Scores of Respondents Who Were Accepted to U.S. Schools Following 1971 and Respondents Who Are Unaccepted, By Sex *

	Verbal Ability	Quantitative Ability	General Information	Science	N
Accepted Males	544	599	535	559	277
Unaccepted Males	515	558	518	513	738
Accepted Females	581	571	558	545	155
Unaccepted Females	543	533	531	492	630

*Difference of means test (t-test) shows each pair of means is significantly different, $p < .05$, using a two-tailed test. T-values are as follows:

males:	4.72	7.07	3.15	8.27
females:	4.74	4.74	3.48	7.32

TABLE III.6

College Grades Reported by Male and Female
Accepted and Unaccepted Respondents
(Percent reporting B, B+, or A grade averages)

Overall Grade Average	Men	Women
Accepted Respondents	76% (263)	83% (146)
Unaccepted Respondents	51% (722)	67% (639)
Hard Sciences Grade Average		
Accepted Respondents	73% (250)	75% (142)
Unaccepted Respondents	56% (713)	69% (632)

The conclusions we can draw from these comparisons between accepted and unaccepted respondents are: (1) that the unaccepted applicants whose recruitability to health careers is the subject of this report tend to have lower academi ability than medical students, on the average, and (2) that given current levels of knowledge about alternative careers, these individuals might not be recruitable until at least two years following initial non-acceptance.

Chapter IV

PRIOR KNOWLEDGE, MOTIVATION AND CONSIDERATION OF MEDICINE AND OTHER HEALTH CAREERS

This chapter will investigate some cognitive, psychological, and social psychological processes involved in the applicant's career pathway prior to rejection from medical school. First the decision to enter medicine will be explored with particular emphasis on the time of decision, the forces influencing that decision, and the level of commitment to that decision. Next the influence of advice and counsel will be investigated by analyzing the advice-seeking behavior of the applicant, the source and nature of advice given, and the relationship of those factors to variables associated with the decision to enter medicine. Lastly, the awareness and consideration of other health careers will be explored since the degree of knowledge of alternative career pathways may be an important factor not only in the initial choice of a medical career but also in the subsequent career decisions following the blocked career pathway.

A. The Decision to Enter Medicine

Socialization theory hypothesizes that commitment to a given occupation or profession is related to the length of time of consideration and the influence of "significant others" (family, peers). Previous work suggests that the decision to enter medicine

is made at an earlier age than other professions, is of a more firm nature, and is heavily influenced by the immediate family. The earlier the decision is made, the more it appears to be influenced by professional(s) in the immediate family, and the more firmly it is held--that is, the individual tends not to consider other occupations (Merton, et al., 1957; Becker, et al., 1961).

A preliminary analysis of a contemporary study from Israel reports on candidates to three professions (medicine, dentistry, and pharmacy) in that country and finds that, whereas about half of the applicants had decided for medicine before age 18 (i.e., the college years), only about a quarter of the aspirants to dentistry or pharmacy made a similarly early decision. The most important influences for all three health professions were professional acquaintances, followed by family members and friends studying in the profession. Such "significant others" would conceivably provide strong professional and social support to further intensify commitment to a particular career pathway. Candidates for both medicine and dentistry showed a stronger and more focused pattern of commitment to their selected fields than candidates for pharmacy. Furthermore, applicants to medicine were the only group in whom the vast majority (94%) were primarily oriented to that single professional choice. The Israeli study suggests an ordering of commitment as follows: highest - medicine;

middle - dentistry; lowest - pharmacy. This order parallels the order of prestige accorded to the professions in the society as well as the length of formal study required (Shuval, 1973).

In summary, previous evidence suggests that the commitment to medicine is not only made at an earlier age but is of a more intense nature than those of other professions. In terms of socialization theory and particularly the concept of anticipatory socialization, this early intense commitment should leave the medical applicant less open to alternative career pathways even after an initial rejection and more persistent in re-application than applicants to other professions.

Table IV.1 demonstrates the decision to enter medicine, by age and sex, for our study of unaccepted applicants. Consistent with previous evidence, the majority of respondents made the decision before the college experience and therefore before exposure to college counselors and advisors. Nevertheless, roughly one-third of the unaccepted applicants decided on a medical career during the college years, suggesting the potential importance of college teachers and advisors in some cases.

Table IV.2 illustrates the intensity of commitment to medicine and the reported influence of relatives on the decision to enter a medical career. In this study, less than one-fifth of the respondents were first influenced in this career pathway by relatives in medical careers and only about one-tenth had at

TABLE IV.1

Decision To Become A Physician by Age and Sex

Age	MEN	WOMEN
Before College (through age 17)	57%	61%
During College (18-22)	33	29
After College (23-39)	11	9
Total	100%	99%
(N)	(724)	(664)
Mean age of decision	16.6	16.1

TABLE IV.2

The Decision to Enter Medicine: Intensity and Influences

	MEN	WOMEN
Percent first prompted to consider a medical career by relatives in medical careers*	19% (714)	15% (646)
Percent having parent-physician	12% (719)	9% (651)
Percent stating medicine was the only career considered prior to application	48% (726)	51% (653)

* The "relatives" referred to here are almost always parents. The correlations between reporting the influence of a medical relative and having a physician-parent are Q=.94 for men, .95 for women (both significant at the .001 level).

least one physician-parent. Consequently, the impact of physician role-models in the family is not a useful explanatory variable for this group of respondents. Nevertheless, our findings do confirm another relationship found in other studies. Namely, exclusive consideration of medicine as a career, which characterizes half of our respondents (see Table IV.2), is associated with early commitment to medicine. Slightly less than a fifth of the respondents were first influenced in this career pathway by relatives in medical careers, with only about a tenth having at best one physician-parent. However, as noted in other studies, there is a fairly intensive commitment to medicine alone; approximately half of the respondents report having considered only medicine prior to application.

Table IV.3 shows that there is a strong inverse relationship between age decided to become a physician and commitment to medicine as a career: early decision is associated with having considered only medicine as a possible career prior to application to medical school. This finding, which is consistent with previous research, suggests not only that "early deciders" are less likely to be aware of alternative careers (either in health or non-health areas), but also that they might logically be more prone to persist in re-applications to medical school. (The latter hypothesis will be tested in Chapter V). The relationships between

TABLE IV.3

Commitment to Medicine by Age Decided to Become a Physician, by Sex

(% who considered only medicine prior to application)

Age Decided to Become Physician	MEN	WOMEN
Before College (through age 17)	63% (400)	70% (399)
During College (18-22)	34% (234)	25% (195)
After College (23-39)	14% (77)	14% (62)
Gamma	-.60*	-.75*

*p<.001

age of decision and career-seeking behavior will be examined further below.

These findings regarding early socialization to medicine point out that the decision to enter medicine tends to be made early in the life cycle, before the experience with higher educational institutions, and also tends to prevent the individual from seriously considering other career possibilities. (We shall see in Chapter V that some unaccepted applicants continue to resist changing their career plans for a period of years following non-acceptance, indicating an intense and single-minded commitment to medicine). Intervention in this process of early and tenacious career decisions would require influencing subjects at the high school or junior high school level, or even earlier.

The type of college counseling received by applicants prior to non-acceptance and their level of knowledge concerning alternative careers will now be considered.

B. Advice and Counsel Prior to Non-Acceptance

A second major influence upon career decision-making may be advice sought, received, and acted upon. Several factors enter into the interaction of advice-seeking and advice-owing behavior, including self-selection, differential accept-

tance or rejection of counsel, and certain enabling or constraining variables such as financial resources and time. We will now consider what sources of information and advice were available to and used by the respondents prior to rejection. Most respondents were undergraduates when they first submitted applications to medical school, and about half were college seniors (see Table IV.4). An additional 7-8% were in graduate or professional schools. This means that approximately 85% of the respondents potentially had access to college or university counseling facilities and advisors preceding and immediately following the initial non-acceptance. Currently, 48% of the men and 36% of the women are still students, having been students when they first applied to medical school (see Table IV.5). Such individuals not only had access to counseling when they were first rejected, but also have access at present. The question is, to what extent are these counseling resources utilized?

Table IV.6 shows the reported availability and use of health career information resources at the undergraduate level. Whereas a large majority of students of both sexes had access to a science professor/advisor and to vocational literature in college, only about one-fifth had access to a physician/advisor. Approximately one-half of the respondents reported that vocational guidance counselors and "Career Days" or special speakers were available to them.

TABLE IV.4

Major Activities of Male and Female Unaccepted Applicants When They First Applied to Medical School

	MEN		WOMEN	
Undergraduate (freshman or sophmore)	2%		2%	
Undergraduate (junior)	22		21	
Undergraduate (senior)	55		51	
Student in graduate or professional school:	8		7	
in health related area*		3		3
in non-health area		5		4
Employed:	11		15	
in health-related job**		5		11
in non-health job		6		4
Homemaker	0		1	
Others and No Response	2		3	
Total	100%		100%	
(N)	(738)		(669)	

* See list of "Fields of Study Defined as Health," Appendix B.
** See list of "Health-Related Occupations," Appendix B.

TABLE IV.5

A Comparison of Male and Female

Unaccepted Applicants on Major Activities

Prior to Application and Now

Prior Major Activity	Current Major Activity	MALES	FEMALES
Undergraduate Student	Undergraduate Student*	1%	3%
	Graduate Student	44	31
	Employed	31	35
	Homemaker	0	2
	Unemployed or not otherwise classified	2	3
Graduate Student	Graduate Student	3	2
	Employed	4	4
Employed	Employed	8	9
	Graduate Student	2	5
	Homemaker	0	1
Homemaker	Homemaker	0	1
	Total	95%**	96%**
	(N)	(738)	(669)

* Includes people who applied prior to senior year in college and who are still undergraduates, and those who now hold Bachelor's degrees but are taking additional courses.

** Totals are not 100% because fewer than 1% of respondents fell into each of several categories not listed.

TABLE IV.6

Availability and Use of

Undergraduate Counseling Resources*

	Percent reporting resource was available		Percent who actually consulted the resource**	
	MEN	WOMEN	MEN	WOMEN
Pre-medical advisor/ physician	22% (698)	17% (631)	70% (155)	60% (111)
Science professor/advisor	87% (721)	88% (649)	78% (630)	81% (570)
Vocational guidance counselor	54% (682)	52% (611)	34% (369)	31% (316)
"Career Days" or speakers	50% (677)	51% (614)	42% (338)	50% (314)
Vocational literature	86% (690)	85% (616)	68% (591)	77% (522)

* Respondents could report consulting as many types of counselors as they wished; categories are not mutually exclusive

** Of those who reported the resource was available

Among those respondents who reported the various resources were available, the actual use of the resources varies. The second column in Table IV.6 shows that the science professor/advisor is the most widely consulted resource, among both men and women. Vocational guidance counselors, who are usually cast as job counselors rather than graduate school advisors, are consulted least often, in only about one-third of the cases. In the rare cases where a physician/advisor was available, he was consulted in about two-thirds of those cases. "Career Days" and special speakers were employed as information resources by only half of the students who had access to them. Such behavior probably reflects the fact that most individuals have already decided on a career in medicine prior to college and are concerned only with learning how to apply to medical school, rather than with obtaining information on alternative careers. In this population, college advisors therefore have minimal impact on career choice as such.

The results in Table IV.6 show that a science professor/advisor functions as the chief undergraduate information resource for most men and women. The vocational guidance counselor, who is perhaps best informed about a variety of health careers, is apparently consulted as a career advisor in only a minority of cases. Therefore, the type of individual in the college setting who is primarily responsible for students' information regarding health careers is a professor in the hard sciences--an academician,

likely to have a Ph.D. and to be involved in research activities. Such an individual would not necessarily be familiar with health careers other than medicine or his own.

Utilization of undergraduate career information resources is, of course, associated with the age at which the decision to enter medicine is made. Those making the decision in the post-college years (ages 23-39) tended to have consulted undergraduate sources less frequently than those deciding to become physicians prior to or during the college years. (Table IV.7 points this out for all sources of information). Nevertheless, "late deciders" report as much discouragement as "early deciders".

Among those individuals who sought advice from at least one undergraduate source of information, 24% of the men and 38% of the women were discouraged from applying to medical school by one of their sources.[1] This is an interesting sex difference, supporting the speculations of Carol Lopate and others that women meet more resistance than men in pursuing a medical career. We will examine this finding further.

Table IV.8 shows the reasons advisors gave in discouraging respondents from applying to medical school. Males were primarily discouraged because of poor grades, while for females discouragement was most often articulated in terms of sex-specific

[1] Base N's are 603 for men, 549 for women.

TABLE IV.7

Sources of Advice by Age Decided to Becom

Physician, by Sex

(% consulting source)*

Age	Pre-Med Advisor/ Physician		Science Professor		Vocational Guidance Counselor		Career Days		Vocational Literature	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
up to 17	78% (86)	64% (58)	82% (352)	87% (357)	36% (201)	35% (190)	54% (198)	57% (206)	74% (335)	82% (327)
18 - 22	70% (51)	68% (34)	79% (208)	75% (165)	32% (119)	31% (94)	23% (98)	41% (87)	63% (190)	68% (151)
23 - 39	31% (16)	35% (17)	56% (57)	52% (48)	31% (42)	16% (31)	19% (36)	16% (19)	55% (58)	58% (40)

* Of those to whom source was available

TABLE IV.8

Types of Discouragement Received by Respondents

Consulting at Least One Undergraduate Source

(Of those discouraged, % reporting particular reasons*)

	MEN	WOMEN
Bad grades	80% (139)	43% (208)
Too unsure	4% (139)	6% (206)
Too little self-discipline	10% (140)	5% (205)
Too demanding a career to allow for family	8% (140)	61% (207)
Difficult for women	--	75% (206)

* Respondents could report more than one type of discouragement.

reasons (i.e., one-fourth of all women were discouraged because of the demanding nature of medicine or because it would be too "difficult" a career for women). Notice that for many women, such advice is occurring despite an absence of criticism of their credentials. It should also be noted that the women unaccepted applicants reported substantially the same undergraduate grades as men and had the same mean M.C.A.T. scores. Yet they are being discouraged more often, and for reasons of sex only. This question of the differential counseling of men and women will be taken up further in Chapter V.

In summary, the majority of students did seek advice concerning application to medical school, mainly from professional sources (teachers or literature). Specific vocational guidance counsellors were infrequently utilized. A significant percentage were discouraged from applying, with women receiving more discouragement than men. Discouragement for the males was primarily along academic lines, while for women it was primarily related to the perceived incongruity of the demanding role of medical practice and the stereotypic feminine role in our society.

C. Awareness and Consideration of Alternative Health Occupations

The consideration of alternative careers, which may occur independently of the type of advice received, will now be considered. In the pilot study, only one-third of the respondents had alternative career plans by the time of rejection, and more men than women had definite plans. It was hypothesized that increased awareness of alternative health careers would be associated with increased consideration of such careers as a secondary occupational choice, either pre- or post-rejection. Furthermore, such consideration would be associated with entrance to these alternative careers, post-rejection.

Table IV.9 shows the extent to which respondents were simultaneously considering other careers when they first submitted applications to medical school. Roughly one-fifth of both men and women submitted applications to graduate programs for masters degrees when they first applied to medical school, and roughly one-tenth applied to graduate school for doctoral degrees or to other professional schools. (Forty-seven percent of the men who applied to other professional schools applied to schools of dentistry; only 29% of the women did so). These figures seem quite small, indicating that most applicants had no career "contingency plans" that could be put into effect in the event that they did not gain admission to medical school. Recall from Table IV.2 that roughly half of the respondents said they had

TABLE IV.9

Simultaneous Application to Alternative Graduate Programs by Sex*

	MEN	WOMEN
% who applied to masters' programs	19% (707)	18% (652)
% who applied to doctoral programs	10% (705)	9% (647)
% who applied to other professional schools	14% (700)	7% (643)

* Types of applications are not mutually exclusive.

considered only medicine as a career prior to their first applications to medical school. This means that a majority of those who had considered alternative careers prior to application failed to submit simultaneous applications to other career programs. These findings imply that the degree of familiarity with alternative careers might be low among this particular population.

Table IV.10 shows the degree of familiarity with and the actual consideration of thirty alternative health careers among unaccepted applicants. Note that the wording of the question from which these data are obtained (Question 25) asks respondents if they are presently familiar with each occupation and whether they ever seriously considered entering any of those with which they are familiar.[2] The considerations to which the question refers could have occurred either prior to or following the initial non-acceptance to medical school. Hence responses to these items cannot be interpreted as necessarily representing prior knowledge of or willingness to consider given occupations. In fact, some of the occupations may have been considered only after the respondent failed to gain admission to medical school.

In addition, the careers listed in Table IV.10 are divided into three categories, which represent different work patterns and different professional statuses. "Ph.D.-level, science careers" are careers in science which require a doctorate (high status) and which usually involve health-related scientific research. No

[2] Questionnaire is reprinted in Appendix A.

TABLE IV.10

Familiarity with and Consideration of Alternative Health Careers

		Percent Familiar With		Percent Ever Considered	
		MEN	WOMEN	MEN	WOMEN
I.	Ph.D.-Science Careers				
	Biochemist	90	93	40	43
	Biologist	95	96	56	65
	Biomedical Engineer	48	38	19	7
	Biophysicist	50	47	13	8
	Chemist	92	93	33	32
	Physiologist	76	79	31	29
	Social Scientist in Health	63	70	20	26
II.	Traditional Practitioner Careers				
	Chiropractor	70	69	8	3
	Clinical Psychologist	72	78	26	32
	Dentist	92	91	44	19
	Hospital Administrator	7	72	24	16
	Medical Social Worker	53	69	7	20
	Optometrist	80	85	18	7
	Pharmacist	87	90	30	25
	Podiatry	60	69	9	4
	Speech Pathologist or Audiologist	60	74	3	6
	Veterinarian	82	90	34	31
III.	Mid-Level Health Careers				
	Clinical lab technologist	88	95	35	53
	Dental hygienist	74	83	2	4
	Diecician/Nutritionist	65	80	3	10
	Health Advocate	23	21	5	7
	Health Assistant	24	25	3	6
	Health Associate	20	19	4	6
	Health Educator	51	53	13	18
	Medical Records Librarian	52	70	2	3
	Nurse	80	93	9	34
	Nurse Practitioner	52	63	4	14
	Occupational, physical, or recreational therapist	74	86	13	25
	Physician Assistant	69	79	26	42

direct contact with patients is involved. "Traditional practitioner careers" may or may not require a doctorate, but do require specialized training and necessarily involve direct contact with or care of patients in a professional health setting. "Mid-level Health Careers" involve treatment of patients at a lower level than with the "traditional" careers and require less formal education. In terms of professional status, the mid-level careers are less remunerative than the other types of careers and offer less professional autonomy. These categories are employed to illustrate three distinct lines along which career considerations are formed.

As Table IV.10 demonstrates, the majority of health occupations were familiar to at least half of the respondents. For the most part, these were "traditional" and "science" occupations (e.g., biologist, dentist, nurse); a few exceptions to this were nurse practitioner, physician assistant, and health educator. Those careers familiar to less than 50% of the respondents were all newer careers, and in particular, three new mid-level health careers: health associate, health assistant, and health advocate.

It is interesting that even this health-oriented population is relatively unfamiliar with some of the newer medical-related careers. Further, as we shall see in Chapter VI, no respondents reported being currently involved in these particular occupations.

In contrast, only two occupations were considered by more than one half of the respondents--biologist and clinical laboratory

technologist. The data on current career status (see Chapter VI) show that these are also occupations in which many respondents are currently involved.

As expected, based on the figures for "familiarity with," no mid-level health careers were "considered" by a substantial proportion of respondents. Except for lab technology, no mid-level health occupation was considered by more than 30% of the men. The women were somewhat more likely than men to have considered such occupations. Variables that might be associated with differential consideration of careers, and particularly mid-level health careers, are of particular significance to the present study. In order to examine such associations, we have constructed three dichotomous variables indicating whether or not respondents had actually considered at least one "Ph.D.-level science career," at least one "traditional practitioner" career, and at least one "mid-level health career." These variables are constructed for all respondents, counting people unfamiliar with each occupation among those who did not consider it.

Table IV.11 shows that sex of respondent is significantly associated only with consideration of a mid-level health career: women were substantially more likely than men to have considered such a career. Whereas three-quarters or more of the applicants considered at least one Ph.D.-level or at least one traditional career, this is not the case for the mid-level health careers.

TABLE IV.11

Consideration of Alternative Health Careers

by Sex

	Percent having considered at least one.....		
	Ph.D.-level science career	Traditional Practitioner Career	Mid-level Health Career
MEN	82%	77%	53%
WOMEN	85%	74%	78%
Q*	.13	-.09	.52**

* Represents association between being female and considering at least one of each type of career

** $p < .001$

Women consider at least one career in this area as frequently as they do the other two career lines (78%), but the percentage of men drops significantly to just a slight majority (53%). Women are apparently less reluctant than men to consider relatively low-status health careers, with relatively little professional autonomy. Differences in men and women's actual career behavior following non-acceptance and the relationship between behavior and occupational values will be examined in Chapter VI.

Further analysis of the "consideration" variables shows no relationship between age of deciding to become a physician and considering alternative careers in the three categories. That is, early decision is not associated with a failure to consider a career of each type. Likewise, having considered only medicine as a career prior to initial application is not associated with considering a career of each type. That is, people who single-mindedly pursued medicine prior to rejection were as likely as other people to eventually consider at least one career of each type.

Additionally, no relationships were found between type of undergraduate advisors consulted and considering each type of career or between receiving discouragement from these advisors and considering each type of career.

In summary, this chapter has analyzed variables involved in the decision to enter medicine, the advice-seeking behavior of

applicants and their knowledge and consideration of alternative career lines. The decision to enter medicine is made early (pre-college) and is one with a high degree of commitment (i.e. considering only medicine). Sources of advice are usually of a personal nature (physician/advisor or science professor) or a general source (vocational literature, career days), but not usually vocational guidance counselors. Most respondents were encouraged to apply, and discouragement varied along several lines. Men were usually discouraged because of poor academic achievement, women usually because of sex-related reasons. Source or types of advice were not associated with early career decision-making variables. Most applicants were familiar with many alternative health careers, but considered only a few. The study will now turn its attention to factors associated with post-rejection behavior.

Chapter V

THE REACTION TO NON-ACCEPTANCE

This chapter considers the behavioral and attitudinal reactions of unaccepted applicants to the blocked career pathway. We shall consider first immediate behavioral reactions, as indicated by respondents' reports of their help-seeking activities following initial non-acceptance. One common reaction to non-acceptance is re-application to medical school in subsequent years ("persistence"), and this phenomenon is considered in detail in this chapter. The chapter concludes with a description of respondents' current career status, at least two years following the initial rejection from medical school.

A. Help-Seeking Activities Following Non-Acceptance

Chapter IV discussed respondents' use of counseling resources at the undergraduate level, prior to the initial non-acceptance to medical school. Here we consider respondents' help-seeking activities following non-acceptance, since such activities are expected to have a major impact on respondents' subsequent career decisions. Recall from Chapter IV that at the time of initial non-acceptance, most respondents were still undergraduates (usually seniors), with access to college counseling facilities most cases. In addition, roughly 40% of the respondents were

students when they first applied to medical school and are still students (most in graduate or professional school). so that they would have had access to university counseling facilities, if available, during the entire period since initial non-acceptance.

The primary concern of this study, of course, is with respondents' post-rejection behavior. The impact of counselors and advisors at that time is of potentially critical importance. Table V.1 shows that immediately following the initial rejection from medical school, respondents were most likely to consult their families, friends, and college advisors (in that order) concerning their future career plans.[1] While approximately 10% of the family members consulted were physicians themselves, for the most part these findings suggest that at least half of the respondents were likely to consult an individual who is relatively uninformed about health careers, rather than an individual who is involved in science or medicine or who is a professional advisor. Furthermore, family and friends might be expected to be supportive of the

[1] According to Table V.1, women were less likely than men to consult their families. However, apparently this is not due to the fact that women's families are perceived as less supportive, or more resistant to their daughters' decision to study medicine. Seventy percent of the male respondents and 68% of the female respondents reported having at least one parent who "encouraged you to enter a medical career." Fifty-one percent of the men and 45% of the women reported that both parents encouraged them. Hence women are not less likely than men to be encouraged by their families to pursue medicine as a career. One factor that might account for this sex difference in post-rejection behavior is the fact that a larger proportion of men than women were married when they first applied to medical school (23% of the men, 12% of the women), so that men were more likely than women to have their "own" families to consult.

TABLE V.1

Individuals Consulted Following
Initial Non-Acceptance*

Percent who consulted...	MEN	WOMEN	Sex Difference** (% difference)
Members of immediate family	70%(725)	56%(658)	.14
Friends	55%(723)	53%(655)	.02
College Advisors	50%(727)	48%(657)	.02
Physicians	44%(725)	42%(658)	.02
Medical students	33%(725)	27%(658)	.06
Employers	10%(725)	16%(655)	-.06

* Respondents could have reported they consulted more than one source.

** Men minus women

respondents' medical ambitions rather than being instrumental in diverting the respondents' ambitions to another area. The implications of this finding for the type of post-rejection advice received by respondents need to be explored.

Table V.2 shows the frequency with which certain types of advice were received by respondents who reported consulting at least one of the individuals listed in Table V.1 immediately following rejection. (The precise source of each type of advice cannot be determined from our data, although it is apparent that certain types of individuals were consulted more often than others and that, among those who sought advice, certain types of advice were more commonly received than others). Table V.3 shows the intercorrelations among types of advice received. These tables also enable us to examine sex differences in advice received. Eighty-one per cent of both men and women report having been advised to reapply to medical school the following year. The second most frequently received piece of advice, for both sexes, was to get a job or go to school in order to improve credentials for re-application to medical school; 70% of both sexes report having been counseled to do this. Other types of advice also pertain to strategies for persisting in medicine: re-taking the M.C.A.T. and applying to a foreign school are both ways of persisting in pursuing a medical career, and as Table V.3 shows, these pieces of advice are positively correlated for both men and women.

TABLE V.2

Advice Received Following Initial Non-Acceptance*

(Percent reporting advice was received, among those reporting they consulted at least one post-rejection source)

	MEN	WOMEN	Sex Difference** (% difference)
Reapply next year	81% (667)	81% (577)	.00
Get a job or go to school to improve credentials for future applications to medical school	71% (665)	70% (577)	.01
Apply to foreign schools	61% (666)	49% (575)	.12
Choose another career in health	54% (664)	57% (573)	-.03
Retake the M.C.A.T	53% (667)	50% (576)	.03
Get a Ph.D. in a hard science	28% (665)	31% (570)	-.03
Choose career unrelated to medicine	23% (662)	19% (573)	.04
Raise a family instead of undertaking a career	2% (663)	21% (570)	-.19

* Various kinds of advice are not mutually exclusive; respondents could report receiving several kinds of advice

** Men minus women

TABLE V.3

Types of Post-Rejection Advice Received:

Intercorrelations (Q's)

(Men Above Diagonal; Women Below)

		Persistence				Non-Persistence			
		a	b	c	d	e	f	g	h**
Persistence	a. Apply to foreign medical school		.58*	.57*	.32*	.32*	.38*	.38*	X
	b. Get a job or go to school to improve credentials for re-application	.61*		.75*	.48*	.40*	.27*	.35*	X
	c. Reapply next year	.58*	.72*		.70*	.36*	-.02	.30*	X
	d. Re-take the M.C.A.T	.28*	.50*	.78*		.07	.06	.37*	X
Non-Persistence	e. Choose another health-related career	.16*	.31*	.02	-.04		.52*	.32*	X
	f. Choose non-health career	-.01	.32*	.20	-.13	.45*		.28*	X
	g. Get Ph.D. in hard science	.30*	.33*	.26*	.05	.26*	.27*		X
	h. Raise a family instead of career	.19	-.05	-.04	-.14	.31*	.45*	.15	

* $p < .05$

** not calculated for men, since only 2% of the men report receiving this advice.

That is, people who are advised to pursue one "persistence" strategy also tend to be advised to pursue others. A noteworthy sex difference emerges with respect to being counseled to apply to a foreign medical school: 61% of the men but only 49% of the women reported receiving this advice. Hence men are not only more likely than women to attend foreign schools (see Appendix D), they are also more likely to be encouraged to apply to foreign schools.

With regard to types of advice which discourage respondents from pursuing medicine, we find additional support for our hypothesis that men and women receive different counseling following rejection. Fully one-fifth of the women reported that they had been advised to raise a family instead of pursuing a career (i.e. to give up their career ambitions altogether and devote themselves to mothering), and Table V. 3 shows that being advised to raise a family is correlated with being advised to choose another career (either non-health or health-related). This suggests that many advisors either see raising a family as an alternative, non-medical "career" for women or think that medicine as a career is not compatible with raising a family for a female. This finding is a very dramatic confirmation of Lopate's contention that men and women receive different feedback at various stages in the career process. The psychological impact of such negative advice on the women concerned is likely to

be substantial, and there is no evidence that there is parallel discouragement offered to men. (That is, advisors assume that men will pursue some career, and counsel them accordingly). Such advice to women not only suggests that a substantial proportion of the selected advisors are influenced by traditional conceptions of sex roles, but also that these advisors are failing to take into account the individual qualifications and motivations of these women, who have already demonstrated their career orientation by applying to medical school. In view of this, it is perhaps encouraging to notice that women do not tend to follow the advice to "raise a family instead." Whereas 21% of the women reported receiving the advice to opt out of the career process, only 5% currently describe themselves as "homemakers," although 28% are married and 10% have children. Women, at least, appear to be selective in deciding what advice to follow. The net result of the advice-seeking process, however, is that women are more likely than men to receive advice which discourages them from pursuing a medical career.

Advice which discourages people from pursuing medicine as a career can be constructive advice, of course. Table V.2 shows that over half the respondents were advised to choose another health-related career. While we have no information about which health-related careers were suggested, we can at least report that some advisors were apparently responding to individuals' interest in the health field in general, rather than to medicine in particular.

Still, it is noteworthy that the most frequently received post-rejection advice encouraged respondents to persist in their applications to medical school, either by re-applying, improving their credentials, or applying to foreign schools. As we have seen earlier, such advice is a function of the type of advisors consulted by respondents, immediately following rejection.

Respondents who report receiving post-rejection advice to re-apply to medical school cannot be distinguished from other respondents with respect to ability (i.e., undergraduate grades or M.C.A.T scores) or their undergraduate majors. However, respondents who report being advised to improve their qualifications prior to re-application -- by getting a job or going to school, or by re-taking the M.C.A.T.s -- tend to be of lower academic ability. Being advised to "improve credentials" is correlated with lower undergraduate grades (both overall grades and science grades) among both men and women. Being advised to "re-take the M.C.A.T.s" is correlated with lower M.C.A.T. scores among both men and women (See Table V.4). Respondents' reports of this advice is, therefore, consistent with our information regarding their academic credentials, and we can therefore draw the conclusion that advice received is not random.

B. Persistence: Re-Application to Medical School

Given the finding that 81% of respondents of both sexes were advised to re-apply to medical schools, an important reaction

TABLE V.4

Correlates of Receiving Advice to Persist

(phi's and point biserial r's)

	Advice Received:			
	Apply to foreign school	Improve Creden- tials	Re- apply	Re-take M.C.A.T.s
MEN				
Undergraduate major =science	-.07	-.03	.004	.03
Overall undergraduate grade average	-.11*	-.11*	.05	-.06
Undergraduate science grade average	-.08	-.11*	.07	.01
MCAT scores:**				
Verbal	.07	.10*	.05	-.19*
Quantitative	.06	.09*	.08	-.17*
General Information	.11*	.08	.05	-.17*
Science	.07	.11*	.10*	-.22*
WOMEN				
Undergraduate major =science	.01	.03	.01	-.01
Overall undergraduate grade average	-.01	-.13*	.12*	.04
Undergraduate science grade average	-.06	-.15*	.03	.01
MCAT scores:**				
Verbal	.14*	.002	.03	-.17*
Quantitative	.04	-.01	.03	-.16*
General Information	.16*	.01	.07	-.11*
Science	.08	-.02	.08	-.18*

* p<.05

**These MCAT scores are not necessarily respondents' scores when they first applied to medical school. These are the most recent MCAT scores in AAMC's files for the individual, and approximately 50% of the men and women sampled had taken the MCAT's more than once.

to non-acceptance might be assumed to be re-application in subsequent years. In fact, re-applications to medical school were submitted by a majority of the unaccepted applicants in the sample, indicating that most respondents are reluctant to abandon their plans to enter a medical career. The potential recruitability of these individuals to non-medical health careers might be low, compared to individuals who do not persist in applying to medical school, although re-application might also be an indication that the individual has no firm alternative plans and is therefore more recruitable. Hence an analysis of the factors associated with "persistence" can contribute to our understanding of career choices.

Following the pilot study, we define "persistence" as the re-application to medical school in at least one "application year" and a "persister" as someone who re-applied in at least one "application year." Table V.5 shows that 35% of the men and 44% of the women did not persist (i.e., they applied to medical school in only one application year).[2] An additional third of the sample re-applied in only one application year. Sixty percent of the

[2] This finding that 65% of the men and 56% of the women unaccepted applicants have re-applied at least once suggests that the increasing number of applicants to medical school each year might be due at least in part to an increasing tendency of unaccepted applicants to re-apply in subsequent years. A.A.M.C. figures show that the number of applications per applicant also increases yearly, and both of these trends may be the result of increasing competitiveness in the medical school application process.

TABLE V.5

Persistence: Number of Years in Which Applications Were Submitted to Medical School (Either in U.S.A. or Foreign Countries)*

Number of application years:**		MEN	WOMEN
1	(no re-applications)	35%	44%
2		39	36
3		21	16
4		4	3
5-8		1	1
Total		100% (723)	100% (661)

* "Application years" need not be consecutive.

**Note that people who submitted initial applications in this study's target year (1971-72), could only have reapplied twice since then. This means at least 5% of the men and 4% of the women had applied to medical school prior to 1971-72.

male persisters and 64% of the female persisters re-applied in just one year. The duration of persistence, for those who re-apply, can be considerable (i.e., up to eight years for two respondents). Overall, the mean number of application years among men was 1.99 and among women, 1.82.[3] In this analysis, we will be considering "persistence" as a dichotomous variable, indicating whether respondents re-applied or not, rather than as a continuous variable (i.e., the actual number of years in which respondents applied to medical school). This is done because the actual duration of persistence, in years, is dependent on the number of years elapsed since initial application, and all respondents did not submit initial applications in the same year.

What distinguishes persisters from non-persisters? As shown above, certain types of post-rejection advice implying persistence are associated with respondents' academic credentials. However, regardless of academic ability, respondents who received some type of advice implying eventual re-application are more likely to re-apply to medical school at least once (see Table V.6). For example, 73% of the men who were advised to "re-apply next year" do in fact re-apply at least once; the comparable percentage for women is 66%.[4] The result of these associations is that

[3] These means are affected by when the respondent applied for the first time. Not all respondents initially applied in the same year, so that some respondents have had more years in which to re-apply than others.

[4] Of the men and women who were not advised to "re-apply next year," only 40% and 33%, respectively, re-applied at least once.

TABLE V.6

Measures of Association Between Receiving Advice to Re-Apply to Medical School and Re-Applying at Least Once (Q's)

Advice Received:	MEN	WOMEN
Apply to foreign schools	.39**	.50**
Improve credentials for future applications to medical school	.42**	.30**
Re-apply next year	.61**	.59**
Re-take the M.C.A.T.s	.50**	.44**

** $p < .001$

persisters, as a group, are not better qualified academically (i.e., with higher grades or MCAT scores) than non-persisters. However, acceptance following re-application is associated with better academic credentials (see Chapter III, which shows that the subsequently accepted applicants have significantly higher MCAT scores than still unaccepted applicants). Hence re-application does not appear to be an entirely rational process: the best qualified respondents, with the highest probability of eventual acceptance, are not more likely to re-apply.

Rather, respondents who are advised to re-apply are the ones most likely to do so. This indicates either that respondents follow the advice they receive regarding re-application, or that respondents seek advice from advisors they know will support their medical ambitions. It is also possible that people remember most clearly the advice they eventually follow and therefore are more likely to report that advice. As we saw above, in the case of women, the latter possibility seems unlikely, since a good proportion of women were advised to abandon all career plans, but very few have done so. We cannot untangle this causal problem in a cross-sectional study such as this one, but we are at least able to report that advice received regarding re-application and subsequent behavior do tend to coincide. Specifically, a majority of people who are advised, in some form, to "persist" in attempts to enter medical school, do, in fact, re-apply.

If this finding were interpreted as meaning that unaccepted applicants are easily influenced by advisors, then we might anticipate that changing the type of counseling they receive would influence their subsequent career behavior accordingly. The problem with this reasoning is that a substantial proportion of respondents (at least half) sought post-rejection advice from non-professional sources (i.e., family and friends), over whom we could exercise no influence.

B.1. Perceptions of Rejection

The pilot study suggested that persistence is associated with how individuals perceive rejection. When compared to non-persisters, persisters were more likely to have viewed their initial non-acceptance as unfair and to have "blamed" their non-acceptance on shortcomings in the system rather than in themselves. These relationships can be tested in the present study.

Approximately half of all respondents felt they were treated unfairly by the medical schools that rejected their applications. Fifty-six percent of the men and 54% of the women felt "the schools made an unfair decision," and 27% of the men and 22% of the women felt that "the schools made a fair decision" in rejecting their initial applications. (The remaining respondents "had no opinion about schools' actions.") The respondents who felt they were treated unfairly were somewhat more

likely than respondents who felt they were treated fairly to persist in applying to medical school.[5] Respondents who do not accept their rejection apparently are inclined to re-apply, whereas the more acquiescent respondents do not persist.

Respondents were also asked to indicate the degree to which ten reasons for non-acceptance were likely to have been influential in their case. These reasons include factors such as low grades, discrimination, and poor counseling. The ten reasons can be grouped into two categories:

(1) internal reasons: those indicating that the individual believes he or she was not accepted due to personal inadequacies ("self-blaming")

(2) external reasons: those indicating that the individual believes he or she was not accepted due to inadequacies in the application and admissions process ("system-blaming")

Table V.7 shows that, in general, internal reasons are more frequently cited as reasons for rejection than are external reasons. (Note that respondents could cite more than one reason for rejection). Among men, the most frequently cited reasons, in order of descending importance, are: low overall grade average, low grades in hard sciences, low M.C.A.T. scores, and inadequate counseling. The first three of these are reasons having to do with personal qualifications. For women, the ranked list of reasons is different: low M.C.A.T. scores, sex discrimination,

[5] For men: $Q=+.19$, $p<.05$
For women: $Q=+.28$, $p<.01$

TABLE V.7

Perceived Reasons for Non-Acceptance*

(Percent describing reason as "crucial" or "very important")

Internal Reasons	MEN	WOMEN
Low overall grade average	46% (709)	28% (619)
Low grades in hard sciences	41% (706)	32% (617)
Low M.C.A.T. scores	37% (710)	40% (625)
Poor interviews	9% (665)	7% (567)
External Reasons		
Inadequate counseling	23% (690)	25% (602)
Poor recommendations	13% (687)	8% (600)
Sex discrimination	1%** (695)	36% (614)
Too few applications	13% (702)	24% (618)
Applied to "select" schools	13% (697)	21% (602)
Racial/religious discrimination	7% (692)	5% (601)

* Respondents could have reported perceiving more than one reason for non-acceptance.

** The 8 men who reported "sex discrimination" as a reason for non-acceptance perceived that they were victims of "reverse discrimination" due to affirmative action in favor of women, as indicated by comments they wrote on their questionnaires.

low grades in hard sciences, low overall grade average, and inadequate counseling. For women, the second most frequently cited reason for non-acceptance is external: women are more likely to think they were not accepted because of their sex than because of low grades. Approximately one-third of the women believe they were discriminated against because of their sex, and these women also appear to be <u>better</u> qualified academically than women who do <u>not</u> report discrimination. (The association between overall grades and reporting sex discrimination is $Q=+.27$, $p<.01$; between science grades and reporting discrimination, $Q=+.17$, $p<.05$). This finding gives some legitimacy to the women's claim of discrimination. Further accounting for this claim, women's perception of sex discrimination as a reason for non-acceptance can be traced to their experiences with undergraduate counselors. Women who reported being discouraged from <u>applying</u> to medical school by an undergraduate counselor or advisor who told them that "medicine is too demanding a career to allow much time for family and children" were also likely to report sex discrimination as a reason for non-acceptance ($Q=.54$, $p<.001$). Similarly, women who were discouraged by undergraduate advisers who told them that "women have a difficult time in medical school and as physicians" were also likely to perceive that sex discrimination contributed to their rejection from medical school ($Q=.73$, $p<.001$).

Combining this finding with a sex difference pointed out in Chapter IV leads to an interesting speculation regarding the differential counseling of male and female applicants to medical schools. We have seen that a smaller proportion of women than men report having been rejected because of poor grades. This is consistent with the finding that fewer women report having been discouraged from applying by undergraduate advisors who said that their grades and test scores were not good enough (see Chapter IV). This does not reflect the fact that women's grades were in fact better than men's; actually, men and women reported substantially the same average grades.[6] Rather, some undergraduate advisors may have felt that obstacles confronting women in medicine are such that women entering medicine should be exceptionally well qualified. Thus they may have stressed such non-academic factors to women who were not clearly superior candidates for admission, even those of our respondents who had good grades compared with others who were also ultimately unaccepted. (While men with comparable grades may also have been discouraged from applying, they would have been advised in terms of their ability, not their sex).

The next question to consider is whether citing a particular reason for rejection is associated with persistence. In

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[6] Mean grades reported were:

	Overall Average	Hard Sciences Average
Men	B-/B (5.6)	B-/B (5.7)
Women	B (6.1)	B-/B (5.9)

Means are reported on a scale of 1 to 9, where 1=D, 2=C-,...,9=A (see Question 20 on the questionnaire).

general, none of the internal or external reasons cited by at least one-third of the respondents is associated with persistence. This means, for example, that women who cite sex discrimination as an important reason for their rejection are no more likely than other women to re-apply to medical school, even though such women are also likely to view their rejection as "unfair"[7] and to report high grades. Furthermore, respondents who perceive that they were rejected due to low grades or low M.C.A.T. scores are no more or less likely than others to re-apply. We suspect at this point that it is not the respondent's perceptions of rejection which determine persistence, but the reinforcement the respondent receives immediately following initial rejection.

B.2 Antecedents of Persistence

There are very few "logically prior" variables that are correlated with persistence in this study. Some of the information obtained from respondents pertains to their characteristics and activities prior to the first application to medical school, or prior to the first re-application itself. Some of this information, which might be expected to influence persistence, has to do with parental role-models, socio-economic background, and educa-

[7] Women who believe they were discriminated against because of sex also tend to view their rejection as unfair ($Q=+.69$, $p<.05$). However, the perception of discrimination is not associated with persistence: apparently women who perceive discrimination are equally likely to assert themselves by re-applying or to give up trying to beat a system they perceive as discriminatory.

tional or occupational experience. However, as Table V.8 shows, very few of these variables are significantly associated with persistence (i.e., re-applying to medical school in at least one application year).

For women, the only background variables associated with persistence are the age at which the woman decided to become a doctor (an inverse relationship) and medicine being the only career considered prior to the first application to medical school. Early and unconditional commitment to medicine promote re-application among women.

Among men, persistence is also associated with considering only medicine as a possible career, but in addition to this, specific "contingency plans" are correlated with persistence. Men who majored in a health-related field of study as undergraduates tend not to persist, probably because they are aware of other career options in the health area. Furthermore, men who simultaneously applied to another professional school when they first applied to medical school also fail to persist. (Forty-seven percent of the 95 men who reported having applied to a professional school in addition to medical school applied to dental school). Thus it appears that men who have made contingency plans in the health area are unlikely candidates for persistence.

We have constructed three variables, based on question 25, indicating whether or not respondents had ever "seriously considered

TABLE V.8

Antecedents of Persistence
(Q's)

	MEN	WOMEN
Socialization		
Age decided to be physician	-.13	-.22**
Medicine was only career considered prior to first application	.20*	.37***
Had physician-parent	.22	.07
Had working mother	.03	.05
Education and Experience		
Undergraduate major-science	.07	-.03
Overall undergraduate grade average	.003	-.06
Undergraduate science grade average	.02	-.14
In health-related job when first applied	-.33	.03
Applied to other professional school when first applied	-.34**	-.14
Socio-economic Background		
Father's educational level	.01	.02
Mother's educational level	.11	.02
Parental income when first applied	-.01	-.07
Family Status		
Married when first applied	-.02	-.10
Current marital status	-.01	-.21*

* $p < .05$
** $p < .01$
*** $p < .001$

entering" at least one occupation in each of three categories:[8]

(1) mid-level health careers (e.g., Physician Assistant, lab technologist)

(2) Ph.D.-level science careers (e.g., Biologist, Social Scientist)

(3) traditional practitioner careers (e.g., Dentist, Optometrist)

Respondents' scores on these variables may or may not refer to their career considerations prior to the first non-acceptance, depending on their interpretations of the question and their own decision processes. However, there are no statistically significant relationships between having considered a career in any of the three categories and re-applying to medical school, with the exception that men who had considered at least one "traditional practitioner" career (i.e., dentistry, in most cases), were less likely than other men to persist in medicine.

For women, we may think of marriage as a contingency plan in the career-selection process. While only 12% of the women were married when they <u>first</u> applied to medical school, 28% are <u>now</u> married, indicating that many women married <u>after</u> the first rejection. In fact, the mean age at first marriage for women in the sample who have ever been married is 21.9, the approximate age at which most women graduate from college and by which most unaccepted applicants have been rejected. Women who married following the initial

[8] See Appendix B for complete lists of occupations, from Question 25, for each category. These variables are also discussed in Chapter IV.

rejection might be less inclined to persist (thus explaining the negative correlation in Table V.8 between being currently married and persisting) either because their husbands disapproved of their interest in a medical career or because marriage itself was perceived as an alternative career.[9]

Only 16% of the currently married women (5% of all female respondents) described themselves as "homemakers," indicating that their families are their exclusive career. However, 28% of the married women, as opposed to only 11% of the unmarried women, report that they "realistically expect" to be wives and mothers exclusively, or to be a wife and mother now, postponing employment until the children are of reasonable age, or to be a wife and mother with only "intermittent" employment. Thus close to one-third of the married women do not expect to have a continuous career outside the home, such as medicine would be. Nevertheless, most women do not expect marriage to be an exclusive career, but expect to be engaged in other work as well at some time. Marriage as a contingency plan following rejection may not, therefore, be the final, positive choice that dentistry, for example, is for some men, but functions instead as an interim measure.

Data on wives' perceptions of their husbands' attitudes toward working wives show that only 2% of the currently married

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[9] In our sample, women with a less traditional conception of sex roles, stressing the wife's right to a career, are more likely to persist ($Q=.14$, $p<.01$). A 6-item sex roles scale was constructed using responses to Question 31.

women report that their husbands "disapprove of working wives in general," but an additional 15% report that their husbands "approve of working wives only after children are grown" or "only in cases of financial need." Hence even though the vast majority of the married women in the sample (64%) report wanting marriage and a career simultaneously, and 83% report having husbands who "approve of working wives in general," married women as a group are somewhat less career-oriented than the unmarried women, and some also face the opposition of a "traditional" husband.[10] These factors could be expected to discourage women from persisting in seeking a career in medicine, at least at the present time.

To test this, we would have to observe a situation in which the husbands' attitudes are clearly antecedent conditions, with respect to the wives' persistence. In this study, the only possibility in this vein is to observe wives' current perceptions of their husbands' attitudes toward working wives in conjunction with the wives' future plans regarding medical school applications.

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[10] Alice S. Rossi, a sociologist, has suggested that career-oriented women purposely marry men who approve of working wives. We might hypothesize that women rejected applicants who are not really committed to a medical career may tend to marry men who do not approve of working wives, thus confirming their self-doubts and relieving them of the responsibility of pursuing a career of any kind. This type of self-selection would be consistent with Matina Horner's argument that highly capable women often tend to fear success. In the case of a blocked career pathway success is denied, and the individual may fall back on a more traditional female life style.

Doing this, we find that only one wife with a disapproving husband plans to apply to medical school sometime in the future, whereas 13% (N=14) of the wives with approving husbands will re-apply in the future. These are small numbers, however, and do not provide very strong evidence that marriage is discouraging women from persisting in pursuing a medical career.

To conclude, there is some evidence that previous behavior with regard to the decision to enter medicine, the choice of an undergraduate major, and applications to professional school are associated with persistence, and there is some suggestion that marriage functions as an alternative choice for some women in our sample. However, these are the only "logically prior" variables which have been found to be associated with persistence; parental role-models, socio-economic background, and undergraduate grades are not influencing persistence among respondents. The most striking finding with regard to persistence is that persisters are people who were advised to persist following the initial rejection from medical school.

C. Current Levels of Persistence Among Unaccepted Applicants

At least two years following the initial non-acceptance to medical school, approximately two-fifths of the respondents are still persisting (i.e., had either applied to medical school for

1973 or intend to apply again sometime in the future.[11] This is an extremely high proportion of respondents who are apparently quite reluctant to abandon their hopes of becoming physicians (or to admit that they have given up). As Table V.9 shows, 50% of the men and 50% of the women can definitely be classified as non-persisters at present, meaning that they say they do not intend to apply to medical school again. The current non-persisters, of both sexes, are roughly evenly divided between health-related and non-health fields of study or occupations. Twenty-five percent of the men and 27% of the women are either studying or working in health-related areas and are not persisting, and 24% of the men and 20% of the women are studying or working in non-health areas and are not persisting. Only 1% of the men and 3% of the women have suspended their careers and are not persisting.

The next chapter will consider the level of respondents' commitment to their current activities and whether a career's relationship to medicine affects commitment or satisfaction.

[11] Note that this group includes some respondents who are not necessarily included in Table V.5, which reports actual applications only and does not take intentions for the future into account.

TABLE V.9

Current Career Status of Unaccepted Applicants,

Separating Out Persisters

	MEN	WOMEN
Persisters[1]	44%	42%
In Health-Related Fields[2]	25	27
In Non-Health Fields	24	20
Suspended Careers[3]	1	3
Total	94%[4]	92%[4]
(N)	(738)	(669)

[1] Defined as all respondents who applied to a U.S. or foreign medical school in 1973 or who said they would "definitely" re-apply in the future.

[2] Respondents who are currently undergraduate or graduate students in fields of study related to health, and respondents who are currently employed in health-related occupations. (See lists entitled "Fields of Study Defined as "Health" and "Health-Related Occupations"). There are 12 men and 23 women who are currently undergraduates.

[3] For men: respondents who are temporarily in the military.
For women: respondents who are housewives

[4] Totals are not 100% of the sample because there are some respondents whose fields could not be classified as "Health-Related" or "Non-Health" or who did not respond to questions regarding applications to medical school in the future.

Chapter VI

THE CHOICE OF A HEALTH-RELATED CAREER AS AN ALTERNATIVE TO MEDICINE

This chapter examines the actual career choices made by unaccepted applicants, their levels of commitment to and satisfaction with those careers, and factors associated with the choice of health-related careers over non-health careers. The occupational choice literature has little to say about reactions to a blocked career pathway (see Chapter I), and this study is unique in having a sample of individuals whose professional aspirations have been blocked and who are compelled to select another career, either related or unrelated to their first choice. The determinants of the "subsequent career choice" are the subject of this chapter.

A. Current Career Status of Unaccepted Applicants

It is first necessary to have a clear picture of the criterion variable -- respondents' current career status. We have classified unaccepted applicants either as students, workers, homemakers, or "others," depending upon their self-classifications in response to the first item in the questionnaire.[1] We then

[1] These categories are not mutually exclusive, of course, but respondents were asked to select the one category that best describes their major activity at the time. Hence each respondent is placed in one and only one category.

divide graduate students and workers according to whether their current fields of study or jobs are health-related or not (see Table VI.1). According to this procedure, 53% of the men and 42% of the women are students, and 46% of the men and 49% of the women are employed. Combining students in health-related fields of study with workers in health-related jobs (as defined in Appendix B), we find that fully 51% of both men and women are currently in health-related activities, although women are more likely than men to be employed in a health-related area.[2]

Regardless of whether respondents are currently students or not, we find that most expect eventually to hold doctorates or master's degrees (see Table VI.2). The sex differences in highest degree expected are predictable: even though all respondents once aspired to doctorates (M.D. degrees), following rejection men are more likely than women to currently expect to receive doctorates, whereas women are more likely than men to expect to receive master's degrees. More women than men are undecided about educational plans. In general, then, we can say that women's post-rejection educational aspirations are lower than those of men (i.e., women are more likely than men to have

[2] This reflects the fact that women in our sample are less likely than men to go to graduate school, as shown in Table VI.1, and not that women are more likely than men to have selected health-related careers.

TABLE VI.1

Current Major Activity of Male and Female

Unaccepted Applicants

Current Major Activity	Males	Females	Sex Difference*** (% difference)
Undergraduate Students	2%	3%	-.01
Graduate and Professional Students	51	39	.12
in Health-Related Fields*	29	20	.09
in Non-Health Fields	21	18	.03
insufficient information to classify	1	1	.00
Employed	46	49	-.03
in Health-Related Jobs**	22	31	-.09
in Non-Health Jobs	22	16	.06
insufficient information to classify	2	2	.00
Homemakers	0	5	-.05
Others****	2	3	.00
Total	101%	99%	
(N)	(738)	(669)	

* "Fields of Study Defined as 'Health'" in Appendix B.
** See "Health-Related Occupations" in Appendix B.
*** Men minus women.
**** Includes self-described unemployed and unclassifiable respondents. Military personnel are classified as "employed".

TABLE VI.2

Highest Degree Ever Expected by Sex*

	MEN	WOMEN	Sex Difference*** (% Difference)
Associate of Arts or equivalent	0.1%	0.0%	.001
Bachelor's (BA, BS, BPhar, etc.)	4.5	3.6	.009
Master's (MA, MS, MAT, MEd, etc.)	19.4	26.7	-.073
Doctorate (MD, DDS, Ph.D, OD, etc.)	71.5	58.9	.126
None of the above	0.7	0.2	.005
Undecided	3.6	10.6	-.070
Total**	99.8%	100.0%	
(N)	(661)	(613)	

* 16 men and 9 women expect a degree but did not classify it into one of the 4 categories listed above; these individuals are not included in calculating the percentages for this question.

** This question had a relatively high non-response rate (8% of the men and 7% of the women). This could either be because some people are uncertain about education plans or because some people do not expect a degree higher than the one they now hold (see Question 5 (a) on the questionnaire) and did not indicate their current degrees in response to the question.

*** Men minus women

lowered their educational aspirations following rejection from medical schools).[3]

For those respondents who are currently graduate or professional students (51% of the men and 39% of the women), the breakdown of their principal fields of study is shown in Table VI.3. The most important finding in this table is that no field of study attracts a majority of the students, and there is considerable variation in the fields selected. The largest single group is dentistry, which claims 19% of the male students and 7% of the female students. (Note that women are considerably less likely than men to enter dental school following rejection from medical school, but that nursing does not claim the other women: only 15 women are currently studying nursing). The second largest field of study is biology, in which 13% of both men and women are studying for advanced degrees. The remaining students are spread across numerous health-related and non-health fields of study.

Table VI.4 shows a similar breakdown of the principal occupations of those respondents who are currently employed (46% of the men and 49% of the women). Clinical laboratory technology is the single largest job category for both men and women. Women are twice as likely as men to be working as "other health technicians and technologists." Among non-health occupations

[3] Current marital status of respondents is not responsible for this relationship between sex and educational aspirations. More men than women are married, and marriage is not associated with degree expected for either sex.

TABLE VI.3

Principal Fields of Study of Male and Female Unaccepted Applicants Who Are Currently Graduate Students

Field of Study	Males	Females
Dentistry	19%	7%
Biology	13	13
Other Health Professions*	7	3
Pharmacy	7	5
Physiology	7	5
Biochemistry	6	6
Other Medical Sciences**	5	8
Microbiology, Bacteriology	5	9
Public Health	2	5
Other Science***	8	11
Other Non-Science ****	22	27
Total	101%	99%
(N)	(376)	(263)

* Podiatry, Chiropractic, Optometry, Health Assistant

** Pathology, Immunology, Neurological Science, Biomedical Science, Parasitology

*** See "Fields of Study Defined as 'Science'" in Appendix B.

**** Includes 3% of the men in law school, 3% of the women in law school. This is pointed out to show that unaccepted applicants to medical school are not necessarily attracted to highly prestigious, traditional professions.

TABLE VI.4

Principal Occupations of Male and Female Unaccepted Applicants Who Are Currently Employed

Occupation	Males	Females
Clinical Laboratory Technicians and Technologists	11%	18%
Other Health Technicians and Technologists	7	13
Secondary School Teachers	7	9
Chemical Technicians	3	5
Other Health-Related Jobs*	26	27
Other Non-Health Jobs	43	25
Insufficient information to classify	3	4
Total	100%	101%
(N)	(336)	(327)

* See "Health-Related Occupations" in Appendix B.

the largest category is secondary school teachers, which claims 7% of the male workers and 9% of the female workers. (Most of these teachers are in the sciences). As noted earlier, among respondents who are currently employed, women are more likely than men to be in health-related jobs, but this does not reflect the fact that women are more dedicated to the health field than men. When we combine health-related jobs with health-related graduate studies (in which more men than women participate), we find that men and women are equally likely to be in the health field.

The findings from the last several tables, taken together, suggest that once these respondents complete their expected educations, the women who will be employed in health-related fields will be functioning at lower levels of education than men employed in health-related fields.

For a clearer picture of the distribution of men and women within the health field, we have broken down the fields of study defined as "health-related" and the occupations defined as "health-related." Tables VI.5 and VI.6 show the breakdown of "health-related" fields of study for those students whose fields of study were sufficiently described to be classified. Once again, it is apparent that no field of study claims a sufficiently large enough proportion of respondents to facilitate analysis within the group. The largest concentration of male students is

TABLE VI.5

Current Health-Related Fields of Study

of Male Unaccepted Applicants[1]

Field of Study	(N)	% of Male Students (N = 388)	% of Male Unaccepted Applicants (N = 738)
Dentistry	(70)	18%	9%
Other health professions[2]	(25)	6	3
Pharmacy	(24)	6	3
Physiology	(24)	6	3
Other medical sciences[3]	(20)	5	3
Microbiology, bacteriology	(18)	5	2
Anatomy	(9)	2	1
Veterinary medicine	(7)	2	1
Public health	(6)	2	1
Medical or laboratory technology	(6)	2	1
Therapy	(5)	1	1
Nursing	(1)	*	*
Total men in health-related fields of study	(215)	55%**	29%**
No response	(12)	3%	2%

*Less than 0.5% **Calculated from actual (N) rather than by summing percentage column

[1]Other than medicine or pre-medicine

[2]Includes podiatry, chiropractic, optometry, Health Assistant

[3]Includes pathology, immunology, neurological science, biomedical science, parasitology

TABLE VI.6

Current Health-Related Fields of Study

of Female Unaccepted Applicants[1]

Field of Study	(N)	% of Female Students (N = 286)	% of Female Unaccepted Applicants (N = 669)
Microbiology, bacteriology	(23)	8%	3%
Other medical sciences[2]	(22)	8	3
Dentistry	(18)	6	3
Nursing	(15)	5	2
Pharmacy	(13)	4	2
Physiology	(12)	4	2
Public health	(12)	4	2
Other health professions[3]	(10)	3	1
Anatomy	(8)	3	1
Medical or laboratory technology	(8)	3	1
Therapy	(4)	1	1
Veterinary medicine	(3)	1	*
Total women in health-related fields of study	(148)	52%**	22%**
No response	(7)	2%	1%

*Less than 0.5% **Calculated from actual (N) rather than by summing percentage column

[1]Other than medicine or pre-medicine

[2]Includes pathology, immunology, neurological science, biomedical science, parasitology

[3]Includes podiatry, chiropractic, optometry, Health Assistant

in dentistry (18% of the male students, who represent 9% of the male sample, but 32% of all male students in health-related fields of study). No field of study claims more than 8% of all female students or 15% of the female students in health-related areas.

Tables VI.7 and VI.8 show the detailed breakdown of health-related occupations held by those respondents who define their current major activity as employment. The largest concentration of employed men (10%) is in "clinical laboratory technologists and technicians," and the remaining men are scattered across 37 job categories, 21 of which claim only one man each. Thirty-seven percent of the employed men in health-related occupations are clinical laboratory technologists or other health technicians. The largest concentration of women is also in "clinical laboratory technologists and technicians," and the remaining women are distributed across 37 job categories, 19 of which claim only one woman each. Fifty percent of the employed women in health-related jobs are clinical laboratory technologists or other health technicians. As the last entry in Tables VI.7 and VI.8 indicates, a larger proportion of women (16%) than of men (9%) is in occupational categories that include, but are not limited to, Allied Health Professions funded by the Bureau of Health Resources Development.

TABLE VI.7

Current Health-Related Occupations of

Employed Male Unaccepted Applicants

Occupation	(N)	% of Employed Male Unaccepted Applicants (N = 336)	% of Male Unaccepted Applicants (N = 738)
Clinical laboratory technologists and technicians[1]	(35)	10%	5%
Other health technologists and technicians[2]	(24)	7	3
Nursing aides, orderlies, and attendants	(15)	4	2
Pharmacists	(12)	4	2
Health administrators	(8)	2	1
Therapists[3]	(7)	2	1
Biological scientists	(6)	2	1
Chemical technicians	(5)	1	1
Chemists	(5)	1	1
Sales representatives, wholesale trade	(4)	1	1
Biology teachers (college and university)	(3)	1	*
Engineers	(3)	1	*

*Less than 0.5%

[1]Includes, but is not limited to, Medical Technologist and Medical Laboratory Technician

[2]Includes, but is not limited to, Optometric Technologist, Sanitarian, Dietary Technician, Optometric Technician, and Sanitarian Technician

[3]Includes, but is not limited to, Occupational Therapist, Physical Therapist, and Inhalation Therapy Technician

Occupation	(N)	% of Employed Male Unaccepted Applicants	% of Male Unaccepted Applicants
Veterinarians	(3)	1%	*
Craftsmen and kindred workers	(2)	1	*
Dentists	(2)	1	*
Managers and administrators, other, except farm	(2)	1	*
Research workers, not specified	(2)	1	*
Cashiers	(1)	*	*
Checkers, examiners, and inspectors, manufacturing	(1)	*	*
Chemistry teachers (college and university)	(1)	*	*
Estimators and investigators, other	(1)	*	*
Farm laborers	(1)	*	*
Health aides, except nursing aides[4]	(1)	*	*
Health specialties teachers (college and university)	(1)	*	*
Health trainees	(1)	*	*
Insurance adjusters, examiners, and investigators	(1)	*	*
Miscellaneous clerical workers	(1)	*	*
Office managers	(1)	*	*
Officials and administrators, other, public administration	(1)	*	*

[4]Includes, but is not limited to, Ophthalmic Assistant

Occupation	(N)	% of Employed Male Unaccepted Applicants	% of Male Unaccepted Applicants
Operatives	(1)	*	*
Public relations men and publicity writers	(1)	*	*
Receptionists	(1)	*	*
Registered nurses	(1)	*	*
Sales representatives, manufacturing industries	(1)	*	*
Statisticians	(1)	*	*
Technicians, other	(1)	*	*
Therapy assistants[5]	(1)	*	*
Vocational and educational counselors	(1)	*	*
Total men in occupations which contain only one man	(21)	6%**	3%**
Total men in health-related occupations	(159)	47%**	22%**
Total men in occupation categories which include, but are not limited to, Allied Health Professions funded by Bureau of Health Resources Development (See footnotes 1-5)	(68)	20%**	9%**

**Computed from actual (N) rather than by summing percentage column

5Includes, but is not limited to, Occupational Therapy Assistant

TABLE VI.8

Current Health-Related Occupations of

Employed Female Unaccepted Applicants

Occupation	(N)	% of Employed Female Unaccepted Applicants (N = 327)	% of Female Unaccepted Applicants (N = 669)
Clinical laboratory technologists and technicians[1]	(60)	18%	9%
Other health technologists and technicians[2]	(42)	13	6
Registered nurses	(14)	4	2
Chemical technicians	(9)	3	1
Biological scientists	(8)	2	1
Pharmacists	(7)	2	1
Research workers, not specified	(7)	2	1
Therapists[3]	(7)	2	1
Social workers	(6)	2	1
Health administrators	(5)	2	1
Chemists	(3)	1	*
Managers and other administrators	(3)	1	*
Secretaries, medical	(3)	1	*

*Less than 0.5%

[1]Includes, but is not limited to, Medical Technologist and Medical Laboratory Technician

[2]Includes, but is not limited to, Optometric Technologist, Sanitarian, Dietary Technician, Optometric Technician, and Sanitarian Technician

[3]Includes, but is not limited to, Occupational Therapist, Physical Therapist, and Inhalation Therapy Technician

Occupation	(N)	% of Employed Female Unaccepted Applicants	% of Female Unaccepted Applicants
Animal caretakers	(2)	1%	*
Chemistry teachers (college and university)	(2)	1	*
Editors and reporters	(2)	1	*
Farm laborers	(2)	1	*
Psychologists	(2)	1	*
Secretaries, other	(2)	1	*
Adult education teachers	(1)	*	*
Atmospheric and space scientists	(1)	*	*
Computer programmers	(1)	*	*
Engineering and science technicians, other	(1)	*	*
Health aides, except nursing aides[4]	(1)	*	*
Health specialties teachers, (college and university)	(1)	*	*
Industrial engineering technicians	(1)	*	*
Inspectors, except construction and public administration	(1)	*	*
Lawyers	(1)	*	*
Miscellaneous clerical workers	(1)	*	*
Non-farm laborers	(1)	*	*

[4]Includes, but is not limited to, Ophthalmic Assistant

Occupation	(N)	% of Employed Female Unaccepted Applicants	% of Female Unaccepted Applicants
Nursing aides, orderlies, and attendants	(1)	*	*
Operations and systems researchers and analysts	(1)	*	*
Photographers	(1)	*	*
Photographic process workers	(1)	*	*
Religious workers, except clergymen	(1)	*	*
Secondary school teachers	(1)	*	*
Teacher aides	(1)	*	*
Technicians, other	(1)	*	*
Total women in occupations which contain only one woman	(19)	6%**	3%**
Total women in health-related occupations	(205)	63%**	31%**
Total women in occupation categories which include, but are not limited to, Allied Health Professions funded by Bureau of Health Resources Development (See footnotes 1-4)	(110)	34%**	16%**

**Computed from actual (N) rather than by summing percentage column

The major conclusions to be drawn from these tables are as follows:

(1) There is considerable variation in the career patterns of unaccepted applicants to medical school. The careers claiming the largest group of respondents represent no more than about 10% of the sample. Some of the mid-level health careers are not represented by even one respondent (e.g., medical records librarian, dental hygienist). Nevertheless, half of both men and women remain in the health area. Of those men and women in the health area (including both students and workers), the largest clusterings are as follows: 19% of the men are in dentistry and 16% are medical or health technologists and technicians; 30% of the women are medical or health technologists or technicians.

(2) Sex differences in occupational choice reveal that women settle for lower educations following rejection from medical school but are equally likely as men to enter a health-related area. The principal factor accounting for the sex difference in educational aspiration appears to be that a relatively large proportion of men (9% of the unaccepted applicants) go into dentistry, but women apparently do not view dentistry as a viable alternative to medicine. More women than men go into medical or laboratory technology -- thus staying in the health area, but failing to seek a doctorate.

B. Correlates of Selecting a Health-Related Alternative Career

The major interest in this study is whether or not unaccepted applicants to medical school eventually enter health-related occupations. We have shown that about half of the sample have entered alternative health occupations, and we have also hypothesized that certain kinds of variables relating to socialization (e.g., early and intense commitment to medicine, parental influence), educational experience, application behavior (including reapplications to medical school), post-rejection advice-seeking, and to career decisions pre- and post-rejection, are associated with the choice of a health-related career. Having defined and described what we mean by health-related careers, for both students and workers, in the previous section, we can now consider the correlates of selecting a health-related career.

Table VI.9 shows the correlations between several variables of each type[4] and the selection of a health-related career. Notice that the dependent variable in Table VI.9 is

[4] More variables than those included in the table were run against the criterion variable , but only those with statistically significant correlations or with relevance to earlier discussion in the report are included in the table.

TABLE VI.9

Correlates of Selecting a Health-Related Field (For both Graduate Students and Workers), by Sex (Q's)

Socialization	MEN	WOMEN
Age decided to be physician[a]	-.13	.10
Had parent/physician	.004	.13
First influenced by relative in medicine	.005	.04
Medicine was only career considered prior to application	-.04	-.09
Had Father in health-related career	-.05	-.08
Education		
Undergraduate major=science	.04	.07
Undergraduate science grades[b]	.04	.11
Overall undergraduate grades[b]	.11	-.08
Highest degree expected[c]	.27**	-.13
Application Behavior		
Applied to master's program when first applied to medical school	-.35***	-.31**
Applied to doctoral program when first applied to medical school	.01	.14
Applied to other professional school when first applied to medical school	.54***	.58***
Re-applied to medical school at least once	-.04	.07
Post-Rejection Behavior		
Originally chose current activity to improve credentials for re-application to medical school	.28***	.13
Originally chose current activity to be in health-related area	.80***	81***
Originally chose current activity to pursue interest in science	.12	.08
Received post-rejection advice to choose alternative health-career	.08	.17
Career Considerations		
Considered at least one mid-level health career	.04	.15
Considered at least one Ph.D.-science career	-.36***	-.10
Considered at least one traditional practitioner career	.22*	-.16

* $p<.05$
** $p<.01$
*** $p<.001$
[a] Dichotomous variable: pre-college (up to age 17) or post-college (age 18+)
[b] Dichotomous variable: B and lower or B+ and higher
[c] Dichotomous variable: non-doctorate or doctorate

behavioral rather than anticipatory; it refers to whether or not respondents are actually in health-related fields of study or jobs at the present time. As noted in Chapter V, approximately 40% of both men and women were still persisting in medicine (or anticipating persisting) when they responded to the questionnaire, but the probability of such individuals gaining admission to medical school three years or more following a non-acceptance is quite low (see Chapter III). Hence we make the assumption that the current activity is likely to be related to the respondent's actual or eventual career choice.

As Table VI.9 shows, neither socialization nor education variables are predictive of selecting a health-related career. This means that people who decided to become physicians early (pre-college), had physician parents, considered only medicine, majored in science in college, or had high grades are no more likely than others to be engaged in a health-related career at present. Rather, it appears that application behavior and post-rejection considerations are the principal factors influencing the choice of a health-related activity. Specifically, men and women who simultaneously applied to masters programs when they first submitted applications to medical school tend not to be in health-related areas. (These individuals all applied to masters programs in the hard sciences suggesting that people interested in pursuing health through graduate careers applied

for doctorate programs). Respondents who had simultaneously applied to other professional schools when they first applied to medical school tend to be working or studying in health-related areas at present (e.g., in dentistry, podiatry, optometry, or medical technology). Men who say they had at one time seriously considered a Ph.D-science career and not to be engaged in health-related activities at present. These are most likely men who are engaged in non-health scientific teaching or research

These findings suggest that prior consideration of higher level careers, either in health or not, is predictive of subsequent behavior. This finding is not conclusive, since the "consideration" variable does not necessarily refer to career considerations prior to non-acceptance, but prior considerations would be a potentially fruitful area for future research.

Table VI.9 also suggests that the role of post-rejection counseling is less decisive in relation to subsequent career choice than in relation to persistence (see Chapter V). Whereas being advised to persist was significantly correlated with reapplication to medical school, being advised to select an alternative health-related career and actually selecting one are not associated, except among women graduate and professional students. (Among women students, the association between being advised to select an alternative health-related career and being in a health-related field of post-graduate study is

=+.26, p<.05).

For men, however, there is no relationship between being counseled to choose another health career and studying in a health-related area. This suggests that following rejection, women require more encouragement (support) than men if they are to pursue advanced training in their area of interest.

There is a strong tendency for people currently engaged in health-related activities -- whether studies or jobs -- to say that they originally chose these activities precisely <u>because</u> they wanted to be engaged in a field related to medicine or health care. Hence, for the people currently in health-related areas, interest in health appears to be an off-shoot of prior interest in medicine. (Discovering the determinants of the choice of a career in medicine is not possible in this study, since there is no comparison group of people who did <u>not</u> choose medicine). It is still not clear, however, why one-half of the sample has chosen <u>not</u> to pursue their original interest in medicine by entering other health-related careers following rejection. This issue will be pursued further in the next section.

C. Prestige Levels of Alternative Careers

Health-relatedness is not the only dimension of the alternative career choice in which we are interested in this study. We have also examined the educational level of the alternative career (as measured by the highest degree the individual expects to receive) and showed that men who are in health-related areas also tend to aspire to doctorates. That is, men who remain in the health area following rejection from medical school expect eventually to receive doctorates (e.g., DDS, Ph.D, OD) more often than men who do not remain in health. Women are as likely as men to remain in the health area, but are less likely to aspire to doctoral degrees.

The prestige level[5] of the alternative career, which indicates the status ranking of the occupation in the eyes of the general population, (i.e., a measure of societal consensus) is also relevant to a discussion of career choice following rejection, since medicine is an extremely highly prestigious career to which respondents have aspired but have been denied entrance.[6]

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[5] Prestige level is coded by matching the 1970 Census occupation and industry codes for a given occupation (i.e., job currently held by respondent) with a prestige score computed from N.O.R.C. surveys asking people to rate the status of occupations. References: Robert W. Hodge, Paul M. Siegel, Peter H. Rossi, "Occupational Prestige in the United States, 1925-1963," American Journal of Sociology, Vol.72, 1966, pp.286-95. Paul M. Siegel, Robert W. Hodge, Peter H. Rossi, Social Standing in the United States (manuscript in preparation).

[6] According to the NORC prestige rankings of American occupations, physicians are the second most highly prestigious occupation measured, after Supreme Court Justices.

We hypothesize that individuals who value the high prestige of a medical career will be likely to select an alternative career with relatively high prestige. Respondents who define their current major activity as employment have been assigned an N.O.R.C. occupational prestige score, based on their descriptions of their jobs. In our sample of employed persons, the prestige level of the current job and its health-relatedness are essentially independent dimensions.[7] That is, employed persons engaged in health-related occupations are equally likely o be in high or low prestige jobs. This relationship would be expected to change over time, since individuals who will eventually be employed in the more highly prestigious health-related jobs (e.g., dentistry, health-related scientific research) are currently still in training nd would have listed their major activities as study.

Table VI.10 shows the prestige scores for a sampling of health-related occupations. Recall that 37% of the employed men and 50% of the employed women are clinical laboratory technologists and technicians and would therefore have prestige scores of 61.0. The largest non-health occupational group represented in the sample is high school teaching, with a score of 63.1.

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[7] Point biserial r's between health-relatedness (a dichotomous variable) and prestige level (a continuous variable) are +.10 for men and +.13 for women. The correlation for women is statistically significant at the .05 level but is not large enough to be substantively important.

Table VI.10

Occupational Prestige Scores of

Selected Health-Related Occupations*

Occupation	Prestige Score**
Physicians, Podiatrists	81.5
Health Specialties Teachers (university level)	78.3
Dentists	73.5
Health Administrators, Optometrists	62.0
Registered Nurses	61.5
Clinical laboratory technologists and technicians, dental hygienists, health record technologists and technicians, therapy assistants	61.0
Pharmacists	60.7
Chiropractors	60.0
Veterinarians	59.7
Therapists	57.1
Dieticians	52.1
Dental Assistants, Medical secretaries	47.8
Health trainees	45.1
Practical nurses	41.9
Nursing aides, orderlies, attendants	36.3
Health aides, except nursing	33.3
Lay midwives	23.3

* List is not exhaustive since some occupations may or may not be health-related, depending on the location or type of work.
** The range of prestige scores in general is from 81.5 (physicians, podiatrists) to 9.3 (bootblacks).

The mean prestige score for all employed men in the sample, whether or not they are in health-related jobs, is 54.6; for women, it is 55.6.[8] The prestige scores of those health occupations for which many of our respondents are preparing are relatively high (i.e., above 50.0). We can therefore conclude that, in general, unaccepted applicants to medical school tend to select alternative occupations with relatively high prestige, and those who enter health-related occupations tend to select those health occupations of relatively high prestige.

The correlates of selecting a higher-prestige career can be examined in this study for the subsample of employed respondents only. However, we have data on occupational values, including values pertaining to status and prestige, for all respondents, and we can therefore examine the correlates of valuing prestigious careers over non-prestigious careers. This will be discussed in the following section.

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[8] Eventually the mean score for men will be higher than that for women since more men are currently in training for relatively high-prestige occupations. Projecting our sample into the future, we can expect the men in both health and non-health occupations to be functioning at higher prestige levels than the women.

D. Occupational Values: Prestige vs. Service

Occupational values, or the characteristics of occupations that individuals value, were investigated in this study, since we expect that people will tend to seek out those occupations which are congruent with their values and that people will have structured their values around the original career choice, in which they invested much time and effort. Various researchers have measured value-orientations among groups of students, both medically-oriented students and non-medical students. Rosenberg (1957) developed a ten-item occupational values scale which, when used on a sample of Cornell College students, yielded three independent value dimensions: (1) people-orientation, (2) extrinsic reward orientation, and (3) self-expression orientation. Medically-oriented students scored highest on people-orientation. Davis (1964; 1965) also identified three dimensions in his work on college seniors' career choices: (1) work with people, (2) original and creative, and (3) money. Again, medicine is identified as a "people-oriented" career choice. Examining occupational values in this study may give us a clearer idea of what health-oriented people value in the occupations they select for their careers.

In this study, respondents have all chosen medicine as a career at one point in time but have been blocked in their

attempt to pursue that career. Their "second career choices" are not expected to be random, but are likely to be based upon their previous training and interests as well as on those aspects of the medical career which they valued.[9] Specifically, although people who select medicine as a career have been shown, empirically, to be more people-oriented than people who select other careers, medicine itself embodies characteristics congruent with all three value-orientations identified in previous research:

(1) medicine is people-oriented: it involves dealing directly with patients and providing a service to individuals as well as to society as a whole. (This is the dimension of a medical career that we think of as a "health orientation").

(2) medicine is extrinsically rewarding: it is highly remunerative and is also one of the highest-prestige occupations in American society.

(3) medicine is intellectually stimulating: it offers room for originality, creativity, and scientific problem-solving.

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[9] In a cross-sectional survey such as this one, we are unable to measure respondents' values at different points in time and to observe shifts in values over time. We must rely on retrospective data in response to a general question regarding occupational values during career considerations (i.e., both before and after rejection from medical school). Values may either be causal factors, influencing career decisions by directing individuals toward those careers congruent with their values, or values may reflect changes in career orientation as the various options open to individuals are pursued. The occupational choice literature generally views values as causal, and this is the theoretical perspective from which we begin this analysis.

People who select medicine as a career might be attracted to one of these aspects of medicine more than the others, and we would expect them to subsequently make another career choice based on those attractions. For example, individuals valuing the prestige dimension of medicine would be expected to select more prestigious careers as their "second choices," rather than careers that offer fewer extrinsic rewards.

Since most medical school applicants who do not gain admission to medical school must change their career choice, we postulate that it will be more convenient for individuals to select a new career congruent with their original value orientations than to adjust their values to a widely disparate type of career. We will test hypotheses regarding certain types of value orientations and career choices in this section.

In this study, we are able to identify two basic types of occupational orientations. The questionnaire included two questions (Q.17 and Q.29) which tap respondents' value orientations, both in terms of major occupational

characteristics and life goals.[10] The occupational values checklist asked the respondent to use a four-point scale, ranging from "not at all important" to "essential," to indicate how important each of the following job characteristics was "in considering possible careers for yourself:"[11]

1. Freedom from direct supervision in my work
2. Opportunity to be of service to other people
3. Financial security
4. Chance to contribute to an area of scholarship or science
5. Chance to achieve social status or prestige
6. Adequate free time to devote to my family
7. Opportunity to help solve social problems
8. Chance to be original and creative
9. Being my own boss

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[10] The items in Q.29 (life goals) were included primarily as checks for internal consistency in the questionnaire. Responses to the two questions were found to be highly correlated, even though Q.29 did not pertain to occupational values specifically. The following table shows intercorrelations between items on the two questions (Gammas are all significant at .001 level).

Occupational Values	Life Goals	Men	Women
Financial security	Financial security	.84	.84
Service to people	Service to people/society	.80	.88
Solve Social problems	Service to people/society	.54	.61
Scholarship/Science	Contribute to knowledge	.71	.70

[11] Note that this question covers all career considerations, both before and after rejection. A general question was judged to be more valid than a question requesting respondents to evaluate their own shifts in values over time.

Table VI.11 shows the proportions of men and women who endorsed each occupational value as "very important" or "essential" in their own career considerations, either before or after rejection. For both men and women, the value considered to be most important is the "opportunity to be of service to other people." Eightly-seven percent of both men and women cite this characteristic of potential careers as important or essential. This is consistent with the work of Rosenberg, Davis, and others, who find that medically-oriented people are highly service- or people-oriented. The value endorsed by the smallest proportion of men and women is the "chance to achieve social status or prestige" item. This is also consistent with past research, showing that people are relatively more reluctant to endorse status characteristics of an occupation as being important. This is an interesting finding with regard to medically-oriented people, however, since medicine is one of the highest-status occupations in this country.

The sex differences in occupational values are also of interest here. The largest sex difference occurs with regard to wanting "adequate free time to devote to my family." Surprisingly, men are more likely than women to endorse this item: 63% of the men and 44% of the women say it is important or essential in a career. The reason for this is not that more men than women are

Table VI.11

Occupational Values Endorsed

by Unaccepted Applicants

(Percent ranking value as "essential" or "very important")*

	MEN	WOMEN	Sex difference** (% difference)
Freedom from direct supervision in my work	65% (729)	58% (660)	.07
Opportunity to be of service to other people	87% (735)	87% (667)	.00
Financial security	58% (724)	43% (664)	.15
Chance to contribute to an area of scholarship or science	59% (730)	64% (663)	-.05
Chance to achieve social status or prestige	23% (730)	15% (663)	.08
Adequate free time to devote to my family	63% (728)	44% (658)	.19
Opportunity to help solve social problems	50% (730)	54% (663)	-.04
Chance to be original and creative	75% (729)	74% (665)	.01
Being my own boss	66% (729)	56% (664)	.10

* Respondents ranked each value on a four-point scale, as follows:
Essential.... 4
Very important 3
Somewhat important 2
Not at all important 1

** Men minus women

married (48% of the men, 28% of the women) and are currently facing problems of family participation, even though there is an association between being married and endorsing this item (Q=+.28* for men, +.38* for women). When we look at only married or unmarried unrespondents or only respondents who have or do not have children, we still find that men are significantly more likely than women to endorse this item.[12] Apparently women are either denying that family considerations are important in their career considerations (i.e., a sort of over-compensation for traditional expectations) or else they take for granted that they will have time for their families, regardless of what career they choose.

The other major sex difference occurs with regard to "financial security:" men are more likely than women to think it is important in a career. This is consistent with the work of Turner (1964), who found that male high school seniors seek <u>extrinsic</u> rewards from their occupations but that women seniors seek <u>intrinsic</u> rewards from their own occupations, expecting extrinsic rewards from their husbands' careers. (The implication here is that women think of the wife's status as a function of the husband's occupation).

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[12] For example, among married respondents, the association between being male and endorsing this item is Q=+.23, $p<.05$. The association between being male and endorsing this item among respondents who have at least one child is Q=+.28, $p<.05$.

Respondents' ratings of these characteristics on the four-point scale show that the items tend to cluster into two groups, for both sexes:

(1) PRESTIGE/INDEPENDENCE (PI): items 1,3,5,6, and 9, which indicate a "practical orientation" toward careers, with emphasis on extrinsic rewards and control over one's use of time. (See upper-left quadrant of Table VI.12).

(2) SERVICE/SCHOLARSHIP (SS): items 2,4, and 7, which indicate a "service orientation" toward careers, with emphasis on intrinsic rewards and making a contribution to people or to scholarship. (See lower-right quadrant of Table VI.12).

We have constructed two Likert scales based on these clusters of occupational values, and these will be referred to as the PI scale and the SS scale. Two interesting things should be noted about the composition of these scales. First, the "chance to be original and creative" item from the occupational values list is not included in either scale, since its relationship to the other items is ambiguous. Valuing the chance to be original and creative in one's occupation can be associated either with valuing independence in an occupation (i.e., with being one's own boss or wanting freedom from supervision) or with wanting to solve social problems or make an original contribution to scholarship.

Another interesting finding regarding the clustering of these items is that wanting time to spend with one's family is associated with the PI dimension, rather than with the SS dimension.

Table VI.12

Occupational Values:

Intercorrelations Between Items by Sex (Gammas)
(Men above diagonal, women below)

		PI					SS			
		a	b	c	d	e	f	g	h	i
Prestige/ Independence	a. Financial Security	X	.62*	.33*	.27*	.45*	.03	-.01	.13*	.05*
	b. Social Status & Prestige	.54*	X	.33*	.24*	.21*	.07	.12	.22*	.11*
	c. Being Own Boss	.13*	.25*	X	.76*	.18*	.15*	.03	-.02	.32*
	d. Freedom from Supervision	.11*	.20*	.80*	X	.22*	.18*	.01	.02	.30*
	e. Time for Family	.26*	.15*	.11*	.11*	X	.14	.14*	.08	.14*
Service/ Scholarship	f. Service to People	-.07	.04	.07	.10*	.01	X	.54*	.24*	.18*
	g. Solve Social Problems	-.16*	.01	.11*	.02	-.07*	.59*	X	.27*	.30*
	h. Scholarship/Science	.10*	.22*	.07*	.08*	-.03	.22*	.17*	X	.41*
	i. Originality/Creativity	-.08	.06	.43*	.39*	-.05	.08*	.40*	.41*	X

* X^2 significant at the .05 level

Among men this is not surprising, since the masculine orientation to the family in our society involves the responsibility for its financial welfare. But among women, this finding also holds: women who say they want to have time to devote to their families are not service-oriented, but rather say they want occupations that provide financial security, social status and prestige, and control over one's own time. These preferences are logically consistent since those occupations which offer the highest incomes and status are also jobs which permit the individual most control over his or her time (e.g., the professions).

Table VI.13 shows the proportions of male and female respondents who scored "high" on the PI and SS scales. Not surprisingly, men and women appear to value the service/scholarships dimension equally, although men are more likely than women to value the prestige/independence dimension highly. As Table VI.12 suggests, the two dimensions (PI and SS) are independent; the association between scoring high on the PI scale and high on the SS scale is Q=.06 for men, Q=.03 for women, and neither relationship is statistically significant.

We can now ask whether occupational values are associated in the expected way with alternative career choices. Do respondents who value prestige/independence tend to gravitate toward doctoral-level careers or to occupations with high prestige? Do respondents who value service/scholarship tend to select health careers, which involve direct service to society?

Table VI.13

Occupational Values:

PI and IH Scales, by Sex (Percent

with "high" scores*)

	Prestige/Independence Scale	Service/Scholarship Scale
Men	59% (731)	55% (731)
Women	44% (669)	56% (660)

* For the PI scale, a "high" score is a score of 13-20, calculated by summing the values (1-4) of the responses to 5 occupational values: freedom from supervision, financial security, social status and prestige, family, and being own boss. (Mean score = 12.52)

For the SS scale, a "high" score is a score of 9-12, calculated by summing the values (1-4) of the responses to 3 occupational values: service to people, scholarship/ science, and solve social problems. (Mean score = 8.64)

Table VI.14 shows that very few of the variables listed are strongly associated with occupational values. The only clearcut case where the two types of value orientation distinguish different behaviors occurs among women: women who value prestige and independence tend to be working or studying in health-related areas, whereas women who value service and scholarship tend to be working or studying in non-health areas. Neither correlation is particularly strong, but the finding is consistent with a very interesting fact regarding women's occupations. The health-related women's occupations in which the women respondents are now or will be engaged (e.g., medical technology, doctoral level teaching and research in medical sciences) have relatively higher prestige than non-health occupations in which female college graduates tend to find themselves.[13] Consequently, it is logical for women unaccepted applicants who value prestige to select health-related occupations, which are generally considered to be more prestigious than the familiar non-health female occupations, even though those health-

[13] Specifically, in 1968, 77% of all women college graduates were employed in professional or technical occupations, and an additional 13% were clerical workers. The professional occupation employing the largest number of women is elementary school teaching. About 40% of the women in professional/technical jobs were non-college teachers, and about 70% of the women teachers were in elementary schools (Women's Bureau, 1969). Elementary teaching has a prestige score of 60.1, and clerical work (general secretarial work) has a score of 45.8. See Table VI.10 for comparison scores for health occupations in which women work.

Table VI.14

Measures of Association[a] Between Occupational Values and Characteristics of Respondents' Career Choices

	High Prestige/Independance Values		High Service/Scholarship Values	
Characteristics of Current Career	MEN	WOMEN	MEN	WOMEN
Currently in health-related area[b]	-.01	.14	-.02	-.18*
Currently in highly prestigious career[c]	-.03	.05	.15*	-.06
Highest degree expected	-.01	.11*	.21*	.17*
Career Choice Behavior				
Age decided to be physician	-.02	-.02	-.06	-.10*
Medicine was only career considered prior to first application	-.01	-.04	.01	.03
Undergraduate major= science	.03	-.05	.04	-.13*
Re-applied to medical school at least once	.01	.09	.11	.40*
Simultaneous applications to:				
masters' programs	-.03	.02	.07	.07
doctoral programs	-.05	-.01	.09*	.03
other professional schools	.10*	.04	-.05	-.03
Considered at least one:				
mid-level health career	-.07	-.03	.08*	.04
Ph.D/Science career	-.03	-.07	.03	-.02
traditional practitioner career	.09*	.06	.15*	.06

* $p < .05$

[a] Point biserial r's and Pearsonian r's, as appropriate. Occupational value scales are continuous variables.

[b] Refers to both students and workers

[c] Refers only to employed respondents

related occupations may not be considered highly prestigious by the medical community. When compared to the occupational opportunities open to women college graduates, health-related occupations are of relatively high social standing.

Men and women valuing the service/scholarship dimension of occupations tend to expect to receive more advanced degrees than those not valuing this dimension, and this is reasonable since scholarly orientations would be consistent with pursuing one's studies beyond college. The remaining correlations in Table VI.14 are far from enlightening, however, and appear to indicate that current occupational values are not good indicators of current occupational status or of previous career choice behavior.

It should also be pointed out that none of the hypothesized relationships between background characteristics (e.g., parental income and occupations, having a physician-parent) and occupational values were supported by the data. For example, having parents with high incomes or high occupational prestige is not associated, in our sample, with a high prestige/independence orientation. Based on our retrospective data, we have no evidence that occupational values are determined by such factors.

Hence we have some very interesting information describing the reported occupational values of male and female unaccepted

applicants to medical school, but we are unable to demonstrate that these values are strongly associated with any behavioral dimension in our sample.

E. Current Levels of Commitment and Satisfaction

The final question to consider in this chapter is whether current levels of satisfaction with or commitment to the current career are associated in any systematic way with the general characteristics of the career (i.e., health-relatedness, educational or prestige level), with the specific characteristics of the job (e.g., working conditions), or with the individual's reported occupational values.

To begin with, among respondents who are either students or workers at the present time, roughly one-third describe themselves as "very committed" to their present fields and say they would leave that field only for medicine (see Table VI.15). An additional group say they are "very committed" and will definitely pursue their present fields for their careers. Hence more than half the respondents are very committed to their current activities.[14] Surprisingly, at least two years following non acceptance from medical school, one-fifth of the respondents say they are not committed to their current areas and will select another field.

Approximately 40% of those who say they are "very committed" to their current fields report that they became committed one year or more following non-acceptance to medical

[14] The two types of commitment are combined for purposes of analysis since the probability of any of these individuals having the opportunity to leave their current areas for medicine is quite low at this point in time. Since it is unlikely that any of these people will be admitted to medical school, they are not expected to differ, behaviorally, from other committed people.

Table VI.15

Current Career Committment, by Sex*

	Level of Committment:	MEN	WOMEN
Very Committed	Very committed; will pursue it for my career	30%	23%
Very Committed	Very committed; would leave only for medicine	32%	31%
	Fairly committed; will possibly pursue it for my career	15%	18%
	Not committed; will select another field	23%	28%
	Total	100%	100%
	(N)	(693)	(581)

* For respondents whose current major activity is going to graduate or professional school or working at a job.

school. Another 40% say they became committed within one year following rejection. Slightly less than 20% said they became committed to their current fields after filing applications to medical school but before receiving notifications of non-acceptance. Hence the vast majority of the respondents who are very committed to their current fields became so following rejection from medical school.

Interestingly, the health-relatedness of the current career is associated with degree of commitment for men, but not for women (see Table VI.16). Men in health-related jobs and studies tend to be more committed than others, whereas women in health-related and non-health areas are equally committed. For men, this relationship is due in part to the fact that students in health-related areas tend to be seeking doctorates ($Q=+.39$, $p<.05$), and doing so requires more investment of time and money, and therefore more commitment to the area. For men, expecting a doctorate is positively correlated with degree of commitment ($Q=+.23$, $p<.05$). Consequently, it is not surprising to find that among male graduate or professional students, excluding workers health-relatedness of the field of study is associated with stronger commitment ($Q=+.35$, $p<.05$). Since women do not seek doctorates, either in health-related or non-health fields, to the extent that men do, the insignificant relationship between health-relatedness and commitment is understandable.

Table VI.16

Current Commitment by Health-Relatedness of Career (Either Field of Study or Employment)

	Percent reporting they are "very committed"*	
	MEN	WOMEN
In health-related field of study or occupation	69% (358)	56% (324)
In non-health field of study or occupation	55% (311)	53% (232)
Q	+.29**	+.06

* Percent responding to Question 13 by saying they are "very committed" to their present field and will pursue it for their career or would leave it only for medicine.

** $p < .05$

Thus, men entering health-related fields of study following non-acceptance to medical school tend to seek doctorates and to be more strongly committed to their fields than others. The causal pattern here is ambigious: either men committed to health seek doctorates in the area (e.g., DDS, PhD), or men seeking doctorates in health areas become more committed.

Among employed respondents only, health-relatedness of the job is not significantly associated with commitment, among either men or women. However, the prestige level of the job is strongly associated with commitment, for both sexes.[15] Individuals in higher prestige jobs tend to be more committed to their jobs. Recall that for women workers, the correlation between prestige level and having a health-related job was significantly, though weakly, positive ($r = +.13$). This means that controlling on prestige level of the woman's job reduces the insignificant relationship between health-relatedness of the job and commitment to the job still further. Hence it appears that it is the prestige level, rather than the health-relatedness of the job, which is influencing (or is influenced by) women's commitment.

For respondents who are employed full-time, satisfaction with various aspects of the job was also measured. Table VI.17

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[15] Pearsonian r's for relationship between having high-prestige jobs and being very committed:

Men	Women
+.26*	+.38*

*p<.05

Table VI.17

Job Satisfaction For Those Respondents

Who Are Employed Full-Time,

by Sex

	Percent "very dissatisfied or "dissatisfied" with job characteristics	
	MEN	WOMEN
Salary and fringe benefits	40% (365)	33% (332)
Hours (length and flexibility)	18% (364)	15% (333)
Freedom to make decisions and initiate actions	37% (363)	37% (333)
Opportunities to deal directly with patients or clients	33% (350)	37% (321)
Prestige value of job in the eyes of the community	32% (354)	24% (327)
Opportunities to be involved in scientific research	60% (351)	54% (327)

shows the proportions of employed men and women who report being dissatisfied with certain characteristics of their jobs. The job characteristic with which respondents are most frequently dissatisfied is "opportunities to be involved in scientific research," and the characteristic with which respondents are most frequently satisfied is "hours." Regarding the income and prestige level of jobs, although men and women are in equally prestigious jobs (see section C), women are more satisfied than men with both the prestige levels and incomes of their jobs. This is consistent with the fact that women in general are more satisfied than men with lower status jobs and lower salaries. Nevertheless, both men and women in higher prestige jobs tend to be more satisfied with their jobs' prestige levels.[16]

Correlating the health-relatedness of the job with respondents' levels of satisfaction with the job, we find only one noteworthy relationship. For both men and women, being in a health-related job is associated with greater satisfaction with the "opportunities to be involved in scientific research."[17] This is consistent with the fact that most respondents engaged in health-related jobs are in laboratory settings or are teaching science (see Tables VI.7 and VI.8). For all other job characteristics in the job satisfaction item, being in a health-related job is not associated with degree of satisfaction.

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[16] For men, r=+.2?; For women r=+.27. Both correlations are significant at the .05 level.

[17] Gamma for men is +.27; for women, +.45; $p<.05$.

To conclude, it appears that factors other than health-relatedness are influencing respondents' current levels of satisfaction with and commitment to their jobs or fields of study. Among respondents who are currently employed or studying in graduate or professional school, 48% of the men and 56% of the women say they originally chose their current activities "to be in a field related to medicine or health care." Once the choice has been made, satisfaction and commitment apparently depend more on occupational characteristics (i.e., prestige or educational level, opportunities to be involved in scientific research) than on health-relatedness per se.

F. Summary

In summary, this chapter has examined the current career status of unaccepted applicants and has shown that the sample is roughly evenly divided between students and workers, and between people in health-related and non-health fields. A majority of respondents expect to receive doctorates eventually, but men are more likely than women to aspire to doctoral level educations. The health-related fields in which respondents are engaged are quite varied, and very few respondents are in the newer "mid-level" health occupations. As has been shown, one reason for this is the relatively low level of familiarity with those occupations among respondents. Moreover, few of those familiar with such occupations actually considered them.

The choice of a health-related career is not associated with any of the background variables or socialization variables thought to be potential determinants of remaining in the health area following rejection (e.g. parents' occupations, age decided to be a physician). Rather application behavior (simultaneous application to other professional schools) and, among men, the desire to pursue health rather than a Ph.D.-level science career are associated with choosing a health-related field. Valuing the prestige dimension of occupations is not

associated with selecting health-related careers, although men valuing prestige tend to have applied to other professional schools. For women, valuing service and scholarship is associated with persisting in reapplying to medical school but with selecting a non-health, doctoral level alternative career. Among men, valuing service and scholarship is associated with selecting a high-status career (doctoral-level, high prestige), but not necessarily a health career. The variable most strongly correlated with being in a health-related career is reporting that the career was selected because it is health-related. This suggests some degree of post hoc rationalization on the part of respondents.

Being in a health-related career is associated with commitment to that career among men, since men in health careers tend to be seeking doctorates. Health-relatedness of the job is not associated with workers' job satisfaction except with regard to being satisfied with opportunities for scientific research. Thus, the only variables associated with selection of a health career as opposed to a non-health career are application behavior and some career values. Persistence in medicine is not associated with currently being in an alternative health career.

The large number of unexpected findings and unsupported hypotheses in this chapter suggests that it might still be too early to analyze career outcomes, especially with regard

to health-relatedness, for this sample of respondents. At least two and one-half years following non-acceptance, half of the respondents are still primarily students, and it is conceivable that some of these students are in fields of study not specifically defined as health-related (e.g. biology), but which will enable the individual to eventually enter a health-related occupation (e.g. medical research). Hence a problem with the data in this study is that respondents are at different stages in the career ladder, many are still students, and eventual career choices may not yet be evident. A study of these same individuals at a later point in time could conceivably result in different findings.

VII. Conclusions and Implications

A. Summary of Findings

This national study of unaccepted applicants to U.S. medical schools the first based on a representative sample, has provided comprehensive descriptive information regarding unaccepted applicants' career decisions and statuses at least two and one-half years following non-acceptance. In addition, numerous hypotheses drawn from the literature on the choice of a medical career or from the pilot study have been tested. These hypotheses relate career choice to background variables, pre-rejection behavior (i.e., college performance and advice-seeking), post-rejection behavior (i.e., persistence, advice-seeking, consideration of alternative careers), and social psychological variables (i.e., occupational values, sex role attitudes). Sex was employed as a control variable throughout the analysis since the pilot study suggested that sex differences in behavior would be substantial. The results of the analysis are summarized below, and then the implications of the findings, both for policy involving health manpower and for the sociological theory of occupational choice, will be considered.

Respondents to this study's questionnaire are divided into three groups: those currently attending U.S. medical schools (having been accepted to medical school after 1971-72), those attending foreign medical schools, and those still unaccepted (i.e., the "unaccepted applicants"). The latter group is the largest -- 73% of all respondents -- and is the focus of the analysis. The small group of students in foreign schools, who do not necessarily represent the population of all American students studying medicine abroad, is described in Appendix D.

Briefly, it has been shown that at present, 53% of the male unaccepted applicants and 42% of the female unaccepted applicants describe their current major activity as study, either in undergraduate or in graduate or professional school. These individuals will not necessarily have selected a future occupation. An additional 46% of the men and 49% of the women describe their current major activity as employment. Five percent of the women are homemakers, having opted out of the career ladder, at least for the present. A majority of unaccepted applicants, regardless of current major activity, expect to receive doctorates.

Precisely half of both male and female unaccepted applicants are currently engaged in health-related jobs or study, and a detailed breakdown of the areas in which they

are engaged is provided in Chapter VI. Respondents in health occupations are distributed across a wide range of jobs, including doctoral-level occupations such as dentistry and lower-level occupations such as medical lab technology. The largest concentration of respondents in the health area can be found in medical technology (5% of the men, 9% of the women). Very few respondents are in the innovative "mid-level" health occupations, such as inhalation therapy or Physician Assistant programs.

Over half of the unaccepted applicants were committed enough to medicine to submit reapplications to medical schools, following the initial non-acceptance, in at least one "application year." At present, approximately 40% of the respondents are still "persisting" toward a medical career, although the probability of their being admitted to medical schools in this country at this late date is low. The commitment to medicine is therefore quite persistent for a substantial proportion of the unaccepted applicants.

Several hypotheses regarding the choice of a health-related career and persistence were tested. With respect to persistence, post-rejection advice-seeking which results in receiving advice to persist is the strongest correlate of reapplying to medical school. (Whereas most respondents report having received advice to reapply, nearly one-fifth of the women report being advised to abandon career plans

altogether in favor of raising a family). Early and single-minded commitment to medicine as a career is also correlated with persistence, as expected based on earlier research on the choice of a medical career. Most respondents selected medicine as a career prior to college, and half report that they considered only medicine as a career prior to applying to medical school for the first time. Most respondents had no alternative career plans at the time of rejection, but those men who had simultaneously applied to other professional schools (usually dental schools) when they first applied to medical school, were less likely than others to persist. In other words, those with contingency career plans were less likely to continue seeking admission to medical school.

With respect to the evolution of career choices, and specifically the choice of a health-related career, very few hypotheses received any support. Persistence, for example, is not associated with selecting an alternative health career. In addition, none of the background or socialization variables, including parents' occupations, are associated with being in a health-related field at present. Rather, application behavior and other career considerations (especially simultaneous application to other professional schools and interest in the health area) are correlated with being in a health area.

The paucity of statistically significant zero-order correlations between the expected explanatory variables and the choice of a health-related career suggests three things. First, these non-relationships may be real, and selection of an alternative health career over a non-health career may be the result of dynamics that were untapped in this study. Second, the principal dependent variable -- health-relatedness of the current occupation or field of study -- may have been inadequately conceptualized in this study. One possibility for re-defining the dependent variable would be to distinguish three, rather than two, types of careers:

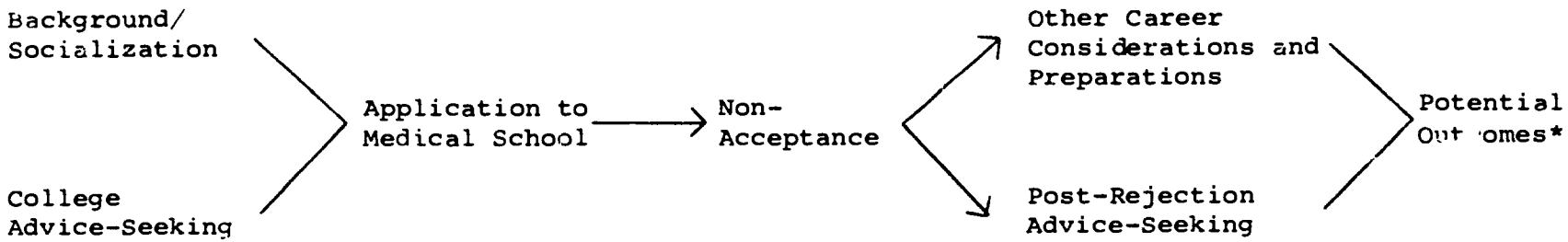
1. non-health careers,
2. health careers involving direct patient care, and
3. health careers not involving direct patient care.

This categorization was not used in the present study because the so-called "mid-level" health careers, of primary interest in questions of manpower resources, include both occupations that involve patient care (e.g. therapists) and those that do not (e.g. medical lab technologists). However, distinguishing this functional difference between types of health-related occupations might better account for respondents' motivations in the career choice process.

Third, since a large proportion (about half) of the respondents are still students, the health-relatedness of the eventual career choice (if, indeed, such a choice has been made) might not be apparent. In other words, many of the respondents in this study may not yet have reached the "outcome" stage of the career pathway, as charted in Figure VII.1.[1] Several years from now their career choices would be more visible, and clearer relationships between health-relatedness and other variables might be found.

Hypotheses regarding sex differences in occupational behavior following non-acceptance received considerable support in this study. As the pilot study suggested, women display an overall pattern of lowered aspirations in reaction to the blocked career pathway. Having aspired to a highly prestigious, doctoral-level, male-dominated career, women are less likely than men to persist in reapplying to medical school; women are less likely than men to enter graduate or professional school of any kind following non-acceptance; and women are less likely than men to expect to receive doctorates. Women are also less likely than men to report that they value the prestige dimension of occupations, but men and women are equally likely to value the service/scholarship aspects of careers. Women and men are equally likely to pursue careers in health-related areas. Projecting the sample into the

[1] Recall that about 25% of the respondents say they are not committed to their current activities and will select other areas.



* Persistence in medicine;
Choice of an alternative health career;
Choice of a non-health career;
Suspension of career

Figure VII.1

The Blocked Career Pathway

future, allowing for the completion of graduate or professional training, we expect that although men and women will be engaged in health-related occupations in equal proportions, women will be functioning at lower levels of education and will be engaged in less prestigious careers than the men. Women will tend to be more satisfied than men with the lower-status careers, and among the men, those who will be most satisfied will be in doctoral-level health careers. These are the men who have chosen careers most closely resembling medicine, in terms of both health-relatedness and prestige level.

B. Policy Implications and Recommendations

The findings of this study have implications for two major areas: a theory of occupational choice in general and the distribution of health care manpower in particular. The latter concern will be considered first.

As noted in Chapter I, there are currently important problems in health care manpower distribution, both geographically and by specialty area. Such maldistribution is associated with inadequate services (particularly primary care) being provided to substantial segments of the population. One strategy to address this problem has been the development of intermediate level health care professionals to meet current and future demand

for health services. Appropriate manpower for the new roles is therefore needed. This study has investigated the recruitment potential of one special group, unsuccessful applicants to medical school, to the new careers. This group would seem to be an ideal source of personnel, being a group increasing in size each year and consisting of highly educated individuals with an obvious interest in health care. This study has shown that even though half of the respondents are in health areas, only a small minority is engaged in mid-level health careers. This does not mean, however, that unaccepted applicants do not constitute a potentially recruitable manpower pool to alternative health careers. Based on the major conclusions of the study, the following recommendations are made:

Conclusion I: One apparent reason why respondents do not enter mid-level health careers is that they have relatively low levels of knowledge about such careers, particularly the newer ones (e.g., Physician Assistant, Health Associate).

Recommendation I: While it is reasonable to expect that levels of knowledge about the newer mid-level careers will increase in the general population with time, it is also reasonable to attempt to disseminate information about alternative health careers to the appropriate individuals, through pre-existing counseling channels that are widely utilized.

Conclusion II: Most respondents had decided on a career in medicine prior to the college years, and most respondents sought advice in college only from science professor/advisors, rather than from vocational guidance counselors. Those who had considered alternative health professions seriously enough to apply to the programs simultaneously with application to medical school were more likely to enter other health careers following rejection.

Recommendation II: College professor/advisors who counsel pre-med students on medical school application procedures should be provided with information and materials on alternative health careers and would then be in a position to inform applicants of options in the health area. Informational programs might also be instituted in secondary schools. Additionally, energy should be devoted to increasing the visibility of formal counseling services to students.

Conclusion III: Those who reapply to medical school following rejection tend to have chosen medicine as a career early in life, to have considered only medicine, and to have no alternative career plans at the time of rejection; however, they also tend to have been advised to reapply to medical school immediately following rejection.

Recommendation III: Since the advisors consulted by unaccepted applicants immediately following rejection tend to

have been non-professional (i.e. family and friends, rather than professional counselors), intervention in the post-rejection stage of the career process would seem to be impractical. More realistic pre-application counseling, at the college or pre-college level, emphasizing the difficulty in getting into medical school these days and the availability of alternative health careers, would be expected to have greater impact on application behavior.

Conclusion IV: Women behaved quite differently than men in reaction to rejection, and one apparent reason for this is that regardless of academic credentials, many women received discouragement based on their sex from both pre-application and post-rejection advisors. They further tended to perceive that they had been discriminated against because of their sex. It is probably no coincidence, therefore, that following rejection, women do not enter male-dominated health professions such as dentistry or seek doctorates to the extent that men do. A small number of women suspend their careers altogether.

Recommendation IV: More realistic counseling of college women interested in medical careers is called for. College counselors and faculty should be made aware that women tend to perceive discriminatory treatment, even if it does not exist in fact, and that myths about women being

unable to function in responsible, high-level health care provider roles have no place in counseling situations. Rather than being discouraged from seeking a medical career, women, like men, should be made aware of their chances of being accepted (based on their academic credentials) and should be informed of alternative health careers at all levels.

Conclusion V: More men than women expect to receive doctorates and report that they value the prestige/independence dimension of occupations. Men are less satisfied than women with equally prestigious occupations. Women are more likely than men to consider and enter lower-status occupations.

Recommendation V: Women are therefore potentially more recruitable than men to the mid-level health occupations. Alternative health occupations, if they are to attract male recruits in particular, will have to offer reasonable levels of prestige (social standing), remuneration, and independence or responsibility, as well as opportunities to be involved in science or health care. Part of this is a problem in public relations, but part is a real issue of status and role definition within the medical community in particular.

Finally, a recommendation regarding further research is in order. As this study shows, at least two and one-half

years post-rejection, not all unaccepted applicants have settled on their final career choices. A follow-up of unaccepted applicants after their formal educations are completed might yield more definitive information on ultimate career choices and those factors associated with the choice of a health-related career specifically. Selecting a sample of a cohort of unaccepted applicants and following them in a panel study would be the ideal research strategy, providing an opportunity to study changes in career orientations over time as well as information on outcomes.

C. Theoretical Implications

This study has provided a unique opportunity to observe reactions to a blocked career pathway in a group of people who had invested considerable time and effort toward their initial career choice. It is frequently assumed in the occupational choice literature that occupational preference and choice are synonymous (i.e., that people can usually enter the occupations they wish to enter). In this study, respondents have been denied entry to the career of their choice and, in most cases, are compelled to choose another career. The implications of our findings for a theory of occupational choice will be considered in this section.

To begin with, resistence to changing the initial career orientation is quite strong in our sample. A majority of respondents persist in seeking medical careers for at least one year, and one-fourth are still uncommitted to their fields at least two and one-half years following non-acceptance to medical schools. It is possible that this seemingly high level of persistence is peculiar to those seeking a medical career, since those pursuing it have had to prepare themselves for years through pre-college and college training and have come to expect the considerable rewards of a medical career (i.e., money, prestige, opportunities to be of service and to be involved in scientific research). There are few careers, other than dentistry, which offer the same rewards, to the same general degree.

If the initial reaction to a blocked career pathway is resistence to change of orientation, this tendency is apparently less likely to occur among those who had considered and applied to programs in alternative health-related professional careers (e.g., dentistry, pharmacy) prior to rejection. This suggests that people with plans for alternative careers that are similar to the original career in terms of both status level and type of work are more likely than others to begin pursuing alternative careers immediately after encountering the blocked career

pathway. They are also more likely than others to select an alternative career related to the original career choice.

The role of formal and informal counseling in this process appears to be critical, at least judging from respondents' retrospective reports of their own experiences. It is quite conceivable that those from whom people seek advice wish to give advice that will please the recipient. It is also possible that people attempt to protect their investments in the original career choice by seeking advice from those whom they think will reinforce their own inclinations. In either case, people are likely to receive advice to pursue their original career lines rather than being advised to consider alternative, related pathways. Such reinforcement, which occurred in the majority of cases in our study, is not conducive to an immediate alternative career choice.

The dynamics of the alternative career choice are different for women than for men. In many cases, women are reacting not only to a blocked career pathway, but also to discouraging counseling emphasizing the incompatibility of femininity and a career. Following the dual experience of a blocked career pathway and discouragement based on sex, women tend to lower their career aspirations by settling for lower levels of education and lower prestige jobs than men.

As noted in Chapter I, the occupational choice literature suggests that men and women's career choices become more

polarized (i.e., more sex-typed) over time. This implies that the more women learn about the real world and the problems women have in careers other than the traditionally "feminine" ones, the less inclined they become to be pioneers in the more "masculine" careers. For women, rejection from medical school is a rejection from a historically male-dominated profession, and we have seen that a substantial proportion of the female respondents interpret this rejection as an instance of sex discrimination. It is perhaps not surprising, then, that the women tend to avoid other high-status male-dominated professions (e.g., dentistry) following rejection and to revert to more "feminine" occupations instead (e.g., medical technology). This line of reasoning does not necessarily suggest that women are more likely than men to "internalize" the rejection; it is more reasonable to read women's reactions to the blocked career as a rational response to an occupational structure perceived as unaccomodating. Hence, in the case of women, the reaction to the blocked career pathway is confounded with sex role considerations.

These observations permit us to present a brief theory sketch regarding reactions to a blocked career pathway in general. Initially following blockage, individuals who had not previously considered alternative careers <u>similar to</u> the original career in specific ways (i.e., status level, type of work) will tend to

resist changing their career choice more often than people who had made alternative considerations. Such resistence may last for a period of years, during which individuals further their educations or take jobs viewed as temporary measures until the original career choice is achieved.

In addition, we suggest that individuals blocked in attempts to enter highly prestigious, highly selective careers (e.g., medicine) will offer more resistence to change than those seeking less prestigious, less selective careers. Women will offer less resistence than men and will be more likely than men to lower their ambitions following a blockage to a highly prestigious career. The greater the prior investment of time (educational preparation), financial resources, and emotional resources (commitment) in the original career choice, the more resistence to changing the initial career choice.

It would be interesting to test some of these propositions by comparing the career decisions of individuals blocked in their attempts to enter formal training programs for several types of careers, distinguishable in terms of amount of prior investment, prestige level, and degree of selectivity.

Appendix A

Questionnaire

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

SUITE 200 ONE DUPONT CIRCLE, N W WASHINGTON D C 20036

March 1, 1973

As noted below you are being asked to participate in a research project being performed under the auspices of the Johns Hopkins University. The AAMC considers this project to be a worthwhile research effort in the area of the Health Professions and has agreed, therefore, to assist by mailing the enclosed questionnaire to individuals selected from AAMC medical school applicant files. Your participation in the project is voluntary and the confidentiality of your personal data and MCAT scores will be maintained.

John A. D. Cooper

John A. D. Cooper, M.D.
President

THE JOHNS HOPKINS UNIVERSITY
SCHOOL OF HEALTH SERVICES

HAMPTON HOUSE

624 North Broadway - Baltimore, Maryland 21205

March 1, 1973

Dear Respondent

We are currently conducting a national survey of people who at one time seriously considered embarking on a career in medicine. The purpose of this study is to determine the process through which career decisions are made and what happens to people after applying to medical or osteopathic school. Even if you have entered a career other than medicine or are currently raising a family instead, your experience and opinions would be of great help to us.

Enclosed is a questionnaire which takes about thirty minutes to complete. We hope that you will fill out and return it to us (no postage necessary) by April 10, 1973. Your responses to all questions will remain anonymous and will be used for statistical purposes only. The number that appears on your questionnaire is to help us prepare follow-up mailing lists to people who do not respond to this mailing. Once the questionnaire is returned to us and we remove your number from our mailing list, your questionnaire can no longer be matched to you as an individual.

If you are interested in receiving an abstract of the completed study, there is a detachable piece at the end of the questionnaire on which you can indicate a mailing address for this purpose. If you wish, you may fill out this information and return it to us with your questionnaire or under separate cover.

We hope that you are willing to fill out the questionnaire and help us gain a better understanding of the way in which people confront problems of career choices. Thank you for your cooperation.

Sincerely,

David M. Levine

David M. Levine, M.D., M.P.H., Sc.D.
Project Director

O M B. #68-S73016
Approval Expires 3-31-74

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1	2	3	4	5

QUESTIONNAIRE

Instructions:

Most questions can be answered by circling the number corresponding to the best answer. In questions that require written answers, please print your responses clearly.

Most questions require that you select only one answer out of a list of several possible answers. Please select one of the alternatives given, even if it might not perfectly describe what you want to say. If you would like to write a comment in the margins to clarify your answer, we will take that into account.

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1. What do you consider to be your current MAJOR status? (Circle ONE and write in information if indicated) *(10/—)*

Student in medical or osteopathic school in U.S.A. 1

Student in medical or osteopathic school outside U.S.A. . . 2
(In what country? _____) *(11/—)*

Undergraduate student 3
(Major? _____) *(12-13/—)*
(Degree expected: _____) *(14/—)*

Student in graduate or professional school . . 4
(Field of study: _____) *(15-16/—)*
(Degree expected: _____) *(17/—)*

Employment . . . . . 5 *(18/—)*
(Job title: _____) *(19-20/—)*
(Job description: _____) *(21-23/—)*
(Type of business or industry: _____) *(24-26/—)*
(Number of hours per week: _____) *(27-28/—)*

Homemaker 6

Other (Specify: _____) . . . . 7 *(29/—)*

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2. How many times have you taken the M.C.A.T.? _____ *(30/—)*

3. (a) Please fill in information below for EACH entering class of medical or osteopathic school for which you applied, beginning with the earliest and including this year if appropriate

Entering Class Fall of	Number of schools to which you applied		Number of acceptances received	
	in U S A	outside U S A	in U S A	outside U S A
19___ (31 32)	(33 3)	(35)	(36 37)	(38)
19___ (39 42)	(41 42)	(43)	(44 45)	(46)
19___ (47 48)	(49 50)	(51)	(52 53)	(54)
19___ (55 56)	(57 58)	(59)	(60 61)	(62)
19___ (63 64)	(65 66)	(67)	(68 69)	(70)

Total number of years in which you applied _____ (71/—)

(b) If you EVER applied to medical schools outside the U.S.A., in which countries were the schools located?

_____ (72 73/—)

_____

NOTE: IF YOU HAVE NEVER APPLIED FOR ADMISSION TO MEDICAL OR OSTEOPATHIC SCHOOL, PLEASE SKIP TO Q 36 (80/1) 0 2 (1 5/—)

4. If you are not currently a medical student but WERE accepted by a medical or osteopathic school for any year prior to 1973, why did you decide not to enroll? For each of the following indicate whether it was a consideration in your case.

	Yes	No	
Financial constraints	1	0	(6/—)
Already committed to another field	1	0	(7/—)
Lost interest in medicine	1	0	(8/—)
Family responsibilities	1	0	(9/—)
Pregnancy (self or wife)	1	0	(10/—)
Accepted only by a foreign school	1	0	(11/—)
Not accepted by first-choice school	1	0	(12/—)
Other (Specify: _____)	1	0	(13/—)

5. (a) What is the highest degree you NOW hold, and what is the highest degree you EXPECT to hold? (Circle one in Column A and one in column B)

	A Now Hold	B Expect to Hold
Associate of Arts or equivalent	1	1
Bachelor's (BA, BS, BE, BPhar, etc.)	2	2
Master's (MA, MS, MEd, MAT, MSW, etc.)	3	3
Doctorate (MD, DDS, EdD, ScD, JD or LLB, PhD, etc.)	4	4
None of the above	0	0
Other (Specify. _____)	5	5
Undecided	X	6
	(14/—)	(15/—)

(b) What is/was your undergraduate major? _____ (16 17/—)

(c) In what field of study did you earn the highest degree you NOW hold?

_____ (18 19/—)

(d) If you are NOT currently a full-time student, are you taking any courses? (20/—)

Yes 1
No 0

(e) IF YES. Are these courses fulfilling requirements toward a degree? (21/—)

Yes 1
No 0

(f) IF YES: In what field? _____ (22 23/—)

6. When you FIRST applied to medical or osteopathic school, what did you consider to be your major activity at that time? (Circle ONE) (24/—)

Undergraduate (freshman or sophomore) 1
Undergraduate (junior) 2
Undergraduate (senior) 3
Student in graduate or professional school 4
(What field? _____) (25 26/—)
Employed 5
(Job title _____) (27/—)
(Job description: _____) (28 29/—)
(Type of business or industry: _____) (30 32/—)
(Number of hours per week: _____) (33 35/—)
(36 37/—)
Homemaker 6
Other (Specify: _____) 7 (38/—)

a. When you FIRST applied to medical or osteopathic school, did you SIMULTANEOUSLY apply to any of the following? (Circle appropriate responses and write in information where indicated)

	Yes	No	
Graduate school masters programs	1	0	(39/—)
(How many? _____)			(40/—)
(What field(s)? _____)			(41-44/—)
Graduate school doctoral programs	1	0	(45/—)
(How many? _____)			(46/—)
(What field(s)? _____)			(47-50/—)
Other professional schools			(51/—)
(How many? _____)			(52/—)
(What field(s)? _____)			(53-56/—)

b. Were you accepted by any of these schools? (Circle one) (57/—)

Yes, but did not attend any	1
Yes, and did attend one	2
(In what field? _____)	(58-59/—)
(For what degree? _____)	(60/—)
No accepted one	0

c. Have you ever held a FULL TIME job (other than summer jobs) while you were in school or not leaving college? (61/—)

Yes, more than one job	1
Yes, only one job	2
No	0

d. IF YES Please list below the job titles, job descriptions and type of business or industry for each FULL TIME job. List the MOST RECENT job first.

	Job title	Job Description	Type of Business or Industry	
1	_____	1. _____	1 _____	(62/—)
		_____		(63-64/—)
2	_____	2 _____	2 _____	(65/—)
		_____		(66-67/—)
3	_____	3 _____	3 _____	(68/—)
		_____		(69-70/—)
4	_____	4 _____	4 _____	(71/—)
		_____		(72-73/—)

9. If you have NEVER held any full time jobs (other than summer jobs while you were in school), which of the following best describes your situation? (Circle one) (74/—)

I entered graduate or professional school directly after college and am still a student	1	
I have been a full time homemaker since leaving college or graduate studies	2	
I have not been able to find a job that suits me	3	
I have been working or going to school part time	4	
Other (Specify: _____)	5	(80/2) (75/—)

10. (a) At present, are you actively looking for a job?

Yes, a part time job only	1	
Yes, a full time job only	2	
Yes, either a full or part-time job	3	
No	0	

(b) IF YES: What kind of job are you looking for? (Circle ONE) (7/—)

A job in a medical setting or with persons or problems related to health care or medical research	1
A job unrelated to medicine or health care	2
Any job, as long as it meets my other requirements	3

11. If you are CURRENTLY employed at a FULL-TIME job, how satisfied are you with each of the following aspects of your job? (Circle one in each row)

	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	
Salary and fringe benefits	1	2	3	4	(8/—)
Hours (length and flexibility)	1	2	3	4	(9/—)
My freedom to make decisions and initiate actions	1	2	3	4	(10/—)
Opportunities to deal with patients or clients directly	1	2	3	4	(11/—)
Prestige value of my job in the eyes of the community	1	2	3	4	(12/—)
Opportunities to be involved in scientific research	1	2	3	4	(13/—)

12. MEDICAL OR OSTEOPATHIC STUDENTS, SKIP TO Q. 16

If your current MAJOR ACTIVITY is going to graduate or professional school, or working at a job, why did you originally choose this present course of study or occupation?

	Yes	No	
To improve my credentials for future applications to medical school	1	0	(14/—)
To be in a field related to medicine or health care	1	0	(15/—)
To pursue my interest in science	1	0	(16/—)
To find out what I am interested in or good at	1	0	(17/—)
To enter a career other than medicine	1	0	(18/—)

13. If your current MAJOR ACTIVITY is going to graduate or professional school or working at a job, how committed are you to your present field of study or occupation at this time? (Circle one) (19/—)

Very committed, will pursue it for my career	4
Very committed, would leave it only for medicine	3
Fairly committed, will possibly pursue it for my career	2
Not committed, will select another field	1

14. If you answered "not committed" to question no. 13 above, which of the following best describes your situation? (Circle one) (20/—)

Am still committed to medicine	1
Have chosen another field of study or employment (What field? _____) (21 22/—)	2
Have decided to become a homemaker at this time	3
Am undecided about future career plans	0

15. If you answered "very committed" to question no. 13 above, when did you become committed to this area of study or occupation? (Circle one) (23/—)

After applying to medical or osteopathic school the first time, but before receiving notices of non-acceptance	1
Within a year after first receiving notices of non-acceptance to medical or osteopathic school	2
A year or more following first non-acceptance to medical or osteopathic school	3
Uncertain	0

16. (a) Have you applied (or WILL you apply) for admission to any of the following in 1973?

	Yes	No	
Medical or osteopathic school in U.S.A.	1	0	(24/—)
Medical or osteopathic schools outside U.S.A.	1	0	(25/—)
Schools of Dentistry	1	0	(26/—)
Schools of Nursing	1	0	(27/—)
Graduate school, masters programs (What field(s)? _____)	1	0	(28/—) (29 32/—)
Graduate school, doctoral programs (What field(s)? _____)	1	0	(33/—) (34 37/—)
Other professional schools (What field(s)? _____)	1	0	(38/—) (39-42/—)

(b) If you are not applying to medical or osteopathic school for 1973, do you think you will ever apply to them AFTER 1973? (Circle one)

Yes, definitely	2 (43/—)
Undecided	1
No	0

17. Below are some characteristics of different occupations. Please indicate how important each has been to you in considering possible careers for yourself. (Circle one in each row)

	Not at all important	Somewhat important	Very important	Essential	
Freedom from direct supervision in my work	1	2	3	4	(44/—)
Opportunity to be of service to other people	1	2	3	4	(45/—)
Financial security	1	2	3	4	(46/—)
Chance to contribute to an area of scholarship or science	1	2	3	4	(47/—)
Chance to achieve social status or prestige	1	2	3	4	(48/—)
Adequate free time to devote to my family	1	2	3	4	(49/—)
Opportunity to help solve social problems	1	2	3	4	(50/—)
Chance to be original and creative	1	2	3	4	(51/—)
Being my own boss	1	2	3	4	(52/—)

18. (a) At approximately what age did you first think seriously about becoming a physician? (53 54/—)

_____ years

(b) Which of the following do you think FIRST prompted you to consider a medical career? (Circle one) (55/—)

Experience with illness (personal or in family)	1	
Science courses in school	2	
Relatives in medical careers	3	
Vocational guidance counselors	4	
Books, articles, television	5	
Encouragement of teachers or professors	6	
A job in a health-related area	7	
Other (Specify: _____)	8	(56/—)

(c) Was medicine the ONLY career you had ever seriously considered prior to your FIRST application to medical or osteopathic school?

Yes	1	(57/—)
No	0	

19. (a) What did/do you foresee as your primary activity in medicine? (Circle one) (58/—)

Patient care	1	
Medical research	2	
Academic medicine	3	
Administrative work	4	
Other (What? _____)	5	(59/—)
Undecided	0	

(b) What specialty are/were you MOST interested in? (Circle one) (60/—)

Undecided	0	
Surgery and surgical specialties (e.g. orthopedics)	1	
Internal medicine and medical specialties (e.g. cardiology)	2	
Pediatrics	3	
Radiology	4	
Psychiatry	5	
Public Health	6	
Pathology	7	
Obstetrics, gynecology	8	
General practice	9	

20. Below, please indicate the letter grade closest to your OVERALL grade average and to your grade average in the HARD SCIENCES (i.e., biology, chemistry, physics, math) for your UNDERGRADUATE studies. (Circle one in column A and one in column B)

	A Overall Average	B Hard Sciences
A	9	9
A−	8	8
B+	7	7
B	6	6
B−	5	5
C+	4	4
C	3	3
C−	2	2
D	1	1
Don't know	0	0
	(61/—)	(62/—)

21. (a) When you were an undergraduate what sources of information about medical or health careers and the procedures for entering them were AVAILABLE to you and which did you actually CONSULT? (Circle ONE in each row)

	Not Available	Available but I did not consult	Consulted	
A pre-medical advisor who was also a physician	1	2	3	(63/—)
A science professor who was also an advisor	1	2	3	(64/—)
A vocational guidance counselor	1	2	3	(65/—)
"Career days" or special speakers invited to campus	1	2	3	(66/—)
Vocational literature	1	2	3	(67/—)

(b) Did you consult any counselors or advisors who were women?

Yes	1	(68/—)
No	0	

(c) Did any of the counselors or advisors you consulted try to discourage you from applying to medical or osteopathic school the first time? (69/—)

Yes	1
No	0

(d) IF YES: Which of the following reasons did they [illegible] in discouraging you from applying?

	Yes	No	
My science grades and test scores were not good enough	[illegible]	0	(70/–)
I was [illegible] and needed to [illegible] more carefully	1	0	(71/–
Medicine is too demanding a career to allow much time for family and children	1	0	(72/–)
I did not have the self discipline or perseverance necessary [illegible] medical school	1	0	(73/–)
Women have a difficult time in medical school and as physicians	1	0	(74/–)
			(80/3)

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(1 5, –)

[illegible] is a list of reasons some students [illegible] for not having been accepted to medical or osteopathic school. Please indicate how important each was in your own case, when you FIRST applied to medical school.

	Not at all important	Probably important	Very important	Crucial	
[illegible] overall grade average	1	2	3	4	(6/–)
[illegible] in the hard [illegible]	1	2	3	4	[illegible]
[illegible] MCAT scores	1	2	3	4	(8/–)
[illegible] at [illegible]	1	2	3	4	(9/–)
[illegible] course [illegible]	1	2	3	4	(10/–)
[illegible]	1	2	3	4	(11/–)
[illegible] against because [illegible]	1	2	3	4	(12/–)
[illegible] schools	1	2	3	4	[illegible]
[illegible] to select	1	2	3	4	[illegible]
[illegible] against because [illegible]	1	2	3	4	(15/–)
[illegible] (Specify)	1	2	3	4	[illegible]

23. When you first received notices of non acceptances from medical or osteopathic schools, did you feel that [illegible] genera[illegible] (Circle one) (17/–)

The schools made [illegible] decision	1
The schools made [illegible] unfair decision	2
Had no opinion about schools' actions	0

24. (a) Following your first unsuccessful attempt to enter medical or osteopathic school which of the following (if any) did you consult regarding your future plans?

	Consulted	Did not consult	
Members of immediate family	1	0	(18/–)
College advisors	1	0	(19/–)
Physicians	1	0	(20/–)
Medical students	1	0	(21/–)
Employer	1	0	(22/–)
Friends	1	0	(23/–)

(b) What advice, if any, did you receive?

	Yes	No	
Choose another career [illegible] related area	1	0	(24/–)
[illegible] another career, unrelated to medicine	1	0	(25/–)
[illegible] to [illegible] medical schools	1	0	(26/–)
Get a job or go to school to strengthen credentials for [illegible] applying to medical school	1	0	(27/–)
Reapply next year	1	0	(28/–)
Go for Ph.D. in a hard science	1	0	(29/–)
Retake the MCAT	1	0	(30/–)
Raise a family instead of undertaking a career	1	0	(31/–)
Other (Specify [illegible])	1	0	(32/–)

25. Below is a list of health and health-related occupations. In Column A, please indicate those which you are familiar enough with to be able to describe the kinds of tasks they entail. Based on Column A, indicate in Column B which occupations you have EVER seriously considered entering yourself.

		A		B	
		Familiar	Not Familiar	Have Considered	Have not Considered
1	Biochemist	1	0	1	0
2	Biologist	1	0	1	0
3	Biomedical engineer	1	0	1	0
4	Biophysicist	1	0	1	0
5	Biostatistician	1	0	1	0
6.	Chemist	1	0	1	0
7	Chiropractor	1	0	1	0
8.	Clinical lab technologist (or other medical technologist)	1	0	1	0
9	Clinical psychologist	1	0	1	0
10	Dentist	1	0	1	0
11	Dental hygienist	1	0	1	0
12	Dietician/nutritionist	1	0	1	0
13	Health Advocate	1	0	1	0
14	Health Assistant	1	0	1	0
15	Health Associate	1	0	1	0
16	Health Educator	1	0	1	0
17	Hospital Administrator	1	0	1	0
18	Medical Records Librarian	1	0	1	0
19	Medical social worker	1	0	1	0
20	Nurse	1	0	1	0
21	Nurse practitioner	1	0	1	0
22	Occupational, physical or recreational therapist	1	0	1	0
23	Optometrist	1	0	1	0
24	Pharmacist	1	0	1	0
25	Physician Assistant	1	0	1	0
26	Physiologist	1	0	1	0
27.	Podiatry	1	0	1	0
28	Social scientist in health (economist anthropologist sociologist, psychologist)	1	0	1	0
29	Speech pathologist or audiologist	1	0	1	0
30.	Veterinarian	1	0	1	0

(33 62/—) (80/4) D-5 (1-5/—) (6-35/—)

26. Assuming you decided to enter an occupation which required additional training, how would you probably finance that training? (Circle ONE) (36/—)

Parents would pay most of my tuition and expenses	1
Spouse would pay most of my tuition and expenses	2
I would pay out of my own pocket	3
I would depend on scholarships or loans	4
A combination of these	5
Don't know	0

27. If you are a parent, how do you arrange for the care of your children during the hours when you are at work or in school? (Circle ONE) (37/—)

I do not work or attend school	0
Spouse usually takes responsibility for their care	1
Relatives or friends usually take care of children	2
Housekeeper or babysitter takes care of children	3
Children are sent to day care center	4

28. Assuming she could arrange for good childcare during her absence from home, about how old should a woman's YOUNGEST child be before she takes a full-time or part-time job outside the home? (Circle one in column A and one in column B)

	A Full time Job	B Part time Job
child's age not relevant	1	1
1 year or less	2	2
2-4 years	3	3
5-6 years	4	4
7-10 years	5	5
11-15 years	6	6
16 or older	7	7
undecided	0	0
	(38/—)	(39/—)

29. Which of the following are major goals you would like to achieve in your life? Indicate the degree of importance each has for you.

	Not at all Important	Somewhat Important	Very Important	Essential	
Achieving financial security for myself and my family	1	2	3	4	(40/—)
Being successful in my career	1	2	3	4	(41/—)
Raising a family	1	2	3	4	(42/—)
Being of service to other people or to society	1	2	3	4	(43/—)
Making an original contribution to a field of knowledge	1	2	3	4	(44/—)
Achieving a position of leadership in my community	1	2	3	4	(45/—)

30. In general, how difficult is it for you . . .

	Very Difficult	Somewhat Difficult	Relatively Easy	Very Easy	
To accept criticism of your work or behavior?	1	2	3	4	(46/—)
To express anger at someone?	1	2	3	4	(47/—)
To do something you know will displease your family	1	2	3	4	(48/—)
To control your temper?	1	2	3	4	(49/—)
To argue with a person in authority?	1	2	3	4	(50/—)
To ignore how others think of you?	1	2	3	4	(51/—)

31. Below is a list of statements concerning family roles and responsibilities. With the example of your own current or future family in mind, please indicate your agreement or disagreement with each.

	Strongly Agree	Agree	Disagree	Strongly Disagree	
A woman's major role is as a wife and mother; job or career take second place	1	2	3	4	(52/—)
If a husband and wife both work, they should share equally in all household responsibilities including childcare	1	2	3	4	(53/—)
A wife should never earn more money than her husband	1	2	3	4	(54/—)
Even if she has professional training, a woman should be prepared to give up her career for her family	1	2	3	4	(55/—)
In a good marriage the husband's career should take precedence over that of the wife	1	2	3	4	(56/—)
Child care responsibilities fall primarily on the mother since she is better able to deal with pre school children's emotional needs	1	2	3	4	(57/—)

32. Compared to other people your own age, how satisfied are you with yourself in EACH of the following areas (even if they do not apply to you at the present time)?

	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	
Intellectual ability	1	2	3	4	(58/—)
Ability to be a good husband or wife	1	2	3	4	(59/—)
Ability to be a good parent	1	2	3	4	(60/—)
Ability to get along with others	1	2	3	4	(61/—)
General physical appearance	1	2	3	4	(62/—)
Ability to achieve success in my career	1	2	3	4	(63/—)

33. (a) Apart from temporary separations (e.g. trips, summer camp, boarding school), did you live with both of your parents until you entered college? (64/—)

- Yes 1
- No, mother only 2
- No, father only 3
- No, neither parent 4

(b) IF YES: Which of your parents . . . (Circle one in each row)

	Father	Mother	Both	Neither	
Did you genuinely admire?	1	2	3	0	(65/—)
Encouraged you to enter a medical career?	1	2	3	0	(66/—)
Was dominant in the household?	1	2	3	0	(67/—)
Was often critical of you?	1	2	3	0	(68/—)
Was emotionally supportive?	1	2	3	0	(69/—)
Would you like to resemble? . . .	1	2	3	0	(70/—)

34. Were either of your parents engaged in any of the following medical careers at any time?

	Father	Mother	Both	Neither	
Physician	1	2	3	0	(71/—)
Nursing	1	2	3	0	(72/—)
Dentistry	1	2	3	0	(73/—)
Veterinary medicine	1	2	3	0	(74/—)
Chiropractic	1	2	3	0	(75/—)
Other (Specify: _____)	1	2	3	0	(76/—)

(80/5)

(1-5/—)

35. THIS QUESTION IS FOR WOMEN ONLY

(a) In the long run, which of the following would you PREFER, and which one do you realistically EXPECT? (Circle one in column A and one in Column B)

	A Prefer	B Expect
Being a wife and/or mother exclusively	1	1
Being a wife and/or mother now, with employment later on	2	2
Being a wife and/or mother, with intermittent employment	3	3
Having a career first, being a wife and/or mother later	4	4
Being a wife and/or mother and having a career simultaneously	5	5
Having a career exclusively	6	6
Don't know	0	0
	(6/—)	(7/—)

(b) If you are currently married: What is your husband's attitude toward wives working outside the home? (Circle one) (8/—)

Disapproves of working wives in general	1
Approves of working wives only after children are grown	2
Approves of working wives only in cases of financial need	3
Approves of working wives in general	4
Other (Specify: _____)	5 (9/—)
Don't know	0

(c) If you are currently married: Have you ever held a full-time or part-time job SINCE your marriage? (10/—)

Yes, part-time job only	1
Yes, full-time job only	2
Yes, both kinds of jobs	3
No	0

THE REMAINING QUESTIONS ARE FOR EVERYONE

36. Sex?

Male	1	(11/—)
Female	2	

37. Age on last birthday? (12 13/—)

_____

38. (a) Are you the oldest child in your family? (14/—)

Yes	1
Only child	2
No	3

(b) How many brothers and sisters do you have? (Circle one) (15/—)

0 1 2 3 4 5 6 or more

39. (a) What is your current marital status? (16/—)

Married	1
Widowed	2
Divorced	3
Separated	4
Engaged	5
Single	6

(b) How old were you when you FIRST got married? ____ ____ (17 18/—)

(c) Were you married when you FIRST applied to medical school? (19/—)

Yes	1
No	0

(d) IF YES: What was your spouse's MAJOR status AT THAT TIME? (Circle ONE and fill in information if indicated) (20/—)

Medical or osteopathic student	1
Other student	2
Employment	3
(Job title: _____)	(21/—)
(Job description: _____)	(22 23/—)
(Type of business or industry: _____)	(24-26/—)
Homemaker	4 (27 29/—)
Other (Specify: _____)	5 (30/—)

40. (a) How many children do you have now? (Circle one) (21/—)

0 1 2 3 4 5 6 or more

(b) How old is your oldest child? _____ (32 33/—)

(c) How old is your youngest child? _____ (34 35/—)

41. How many children would you LIKE to have? _____ (36/—)

42. In what religion were you RAISED? (37/—)

Protestant	1
Catholic	2
Jewish	3
Other	4
None	0

43. How do you describe yourself? (38/—)

Black, Afro American	1
American Indian	2
White, Caucasian	3
Oriental, Asian	4
Mexican American, Spanish American, Chicano(a)	5
Puerto Rican, Mainlander (Boriqua)	6
Puerto Rican, Island	7
Cuban	8
Other Latin American	9
Other	0

44. In what type of community did you live until you were sixteen-years-old? Do you live now?

	Where you lived until age 16 (39/—)	Where you live now (40/—)
Open country, not a farm	1	1
Farm	2	2
Small city or town (50,000 people or less)	3	3
Medium size city (50,000 250,000)	4	4
Suburb near large city	5	5
Large city (250,000 or more people)	6	6
Uncertain	0	0

45. In what region of the country was your LEGAL residence in 1971? (41/—)

Northeast	1
Southeast	2
North Central	3
South Central	4
West	5
Other	6

46. (a) Please indicate the HIGHEST level of education reached by your parents and your spouse (if currently married only)

	Mother (42/—)	Father (43/—)	Spouse (44/—)
8th grade or less	1	1	1
Some high school	2	2	2
High school graduate	3	3	3
Some college or post-high school professional training	4	4	4
College graduate	5	5	5
Some graduate or professional training	6	6	6
Graduate or professional degree	7	7	7
Don't know	0	0	0

(b) What is the highest graduate or professional degree your parents and spouse received? What is the highest degree your spouse EXPECTS to receive? (Circle ONE in each column)

	Mother (45/—)	Father (46/—)	Spouse Received (47/—)	Spouse Expects (48/—)
Master's (MA, MS MSW, etc)	2	2	2	2
Doctorate (MD, JD or LLB PhD, etc)	3	3	3	3
None	1	1	1	1
Don't know	0	0	0	0

47. (a) What is/was your father's occupation? (49/—)

Job title: _____ (50 51/—)

Job description: _____ (52 54/—)

Type of business or industry: _____ (55 57/—)

(b) At the time when you first applied to medical or osteopathic school, was he . . . (Circle one) (58/—)

Working	1
Not working, due to illness	2
Retired	3
Unemployed, looking for work	4
Deceased	5
Not living with you	6

48. (a) Indicate whether your mother was employed or not during each of the following periods of your life. (Circle one in each ROW)

When you were:	Mother Employed: Full-time	Part-time	Mother Not Employed	Mother Not in Household	Don't Know	
5 years old or less	2	1	0	3	4	(59/—)
6-12 years old	2	1	0	3	4	(60/—)
13-18 years old	2	1	0	3	4	(61/—)
19 years old or older	2	1	0	3	4	(62/—)

(b) What is/was her most recent occupation? (63/—)

Job title: _____ (64-65/—)

Job description: _____ (66-68/—)

Type of business or industry: _____ (69-71/—)

(c) If your mother EVER worked after you were born what do you think was the MAIN reason for her employment? (Circle ONE) (72/—)

Financial reasons	1
She disliked being a housewife	2
She enjoyed her job or career	3
Don't know	0

49. What was your PARENTAL FAMILY'S approximate income (before taxes) during the year when you FIRST applied to medical or osteopathic school? (73-74/—)

Less than $4,000	01
$4,000-5,999	02
$6 000 7,999	03
$8,000 9,999	04
$10,000 11,999	05
$12,000 14,999	06
$15,000-19,999	07
$20,000-24 999	08
$25,000-49,999	09
$50,000 or more	10
Don't Know	00

50. Are you a U.S. citizen? (75/—)

Yes	1
No	0 (80/6)

51. If you are currently married, what is your spouse's current MAJOR status? (Circle one and fill in information if indicated) (6/—)

Medical or osteopathic student	1
Student in graduate or professional school (What field? _____)	2 (7-8/—)
Undergraduate student	3
Employment	4 (9/—)
(Job title: _____)	(10-11/—)
(Job description: _____)	(12 14/—)
(Type of business or industry: _____)	(15 17/—)
Homemaker	5
Other (Specify: _____)	6 (18/—)

52. Below, please indicate your current PERSONAL income (before taxes) in column A. If you are currently married, indicate your combined gross annual income (including your own and that of your spouse) for the past year in Column B.

	A Personal Income	B Family Income
Less than $4,000	01	01
$4,000 5,999	02	02
$6,000-7,999	03	03
$8,000 9,999	04	04
$10,000-11,999	05	05
$12,000-14,999	06	06
$15,000 19,999	07	07
$20,000-24,999	08	08
$25,000-49,999	09	09
$50,000 or more	10	10
Don't know	00	00
	(19 20/—)	(21-22/—)

THANK YOU VERY MUCH FOR YOUR TIME AND COOPERATION! PLEASE MAIL QUESTIONNAIRE TO US IN THE ENCLOSED ENVELOPE. (80/7)

If you would like to receive an abstract of our findings, please indicate where we can mail it to you in the future:

Name: _____

Address: _____

_____

You may detach this address and mail it to us under separate cover if you wish.

APPENDIX B: List of Codes

LIST A

Foreign Countries

Mexico (Guadalajara) 1

Italy (Bologna, etc.) 2

Canada 3

Great Britain 4

France 5

Belgium 6

Spain 7

Other 8

Blank 9

Puerto Rico is considered U.S.A

List B

Fields of Study (Undergraduate and Graduate)

ARTS AND HUMANITIES

General Humanities.....00
Architecture.....01
English Literature.....02
Fine Arts.....03
Journalism.....04
Languages.....05
Music.....06
Philosophy.....07
Speech and Drama.....08
Theology.....09

BIOLOGICAL SCIENCES

Biology (Gen.).....10
(Enviromental Sci., Sexuality, Genetics, Ecology, Entomology)
Biochemistry.....11
Biophysics.....12
Botany, zoology.....13
Microbiology, Bacteriology....14
Physiology.....15
Anatomy.....16
Other Medical Sciences: Pathology, Immunology, Neuro. Science, BioMed. Sci., Parasitology.....17

BUSINESS

Accounting.....20
Advertising & Public Relations.....21
Business Administration.....22
Data Processing.....23
Secretarial.....24
Other Business.....25

EDUCATION

Elementary.....30
Secondary.....31
Vocational.....32
Other Educ. Field.....33

ENGINEERING

Engineering (Gen.).....39
Aeronautical.....40
Chemical.....41
Civil.....42
Electrical.....43
Industrial.....44
Mechanical.....45
Metallurgical.....46

PHYSICAL SCIENCES

Chemistry.....50
Physics.....51
Mathematics.....52
Statistics.....53
Earth Sciences.....54
Geophysics and Natural Sci. & Other Physical Sciences.....55

PROFESSIONAL

Public Health, Environmental Health.....59
Dental Technology.....60
Medical or lab technology.....61
Nursing.....62
Pharmacy.....63
Law or pre-law.....64
Osteopathic & Medicine or pre-med.65
Veterinary, Pre-Vet.....66
Therapy (occupational, speech, physical, etc.).....67
Other professional (Podiatry, Chiropractor, Optometry, Health Asst.).....68
Dentist, Pre-Dent.....69

SOCIAL SCIENCES

Anthropology.....70
Economics.....71
History.....72
Political Science.....73
Psychology.....74
Social Work.....75
Sociology.....76
Other Social Science.....77

OTHER FIELDS

Agriculture.....80
Communications (TV, radio).....81
Computer Science.....82
Electronics (technology).....83
Forestry.....84
*Home Economics.....85
Industrial Arts.....86
Library Science.....87
Military Science.....88
Physical Education & Recreation...89
Other.....90
Blank.....99

*Nutrition, Decorative Arts

List C

FIELDS OF STUDY DEFINED AS "HEALTH"*

Microbiology, Bacteriology.....14
Physiology.....15
Anatomy.....16
Other Medical Sciences:
Pathology, Immunology, Neuro. Science,
BioMed. Science, Parasitology.....17
Public Health, Environmental Health.....59
Dental Technology.....60
Medical or lab technology.....61
Nursing.....62
Pharmacy.....63
Osteopathic & Medicine or pre-med.....65
Veterinary, Pre-Vet.....66
Therapy (occupational, speech, physical, etc.).....67
Other professional (Podiatry, Chiropractor,
Optometry, Health Asst.).....68
Dentist, Pre-Dent.....69

* This list was not an original part of the Coding Manual but is included here to indicate how fields of study were ultimately classified.

List D

FIELDS OF STUDY DEFINED AS "SCIENCE"*

BIOLOGICAL SCIENCES

Biology (general).....10
(Environmental Science, Sexuality, Genetics, Ecology, Entomology)
Biochemistry.....11
Biophysics.....12
Botany, zoology.....13
Microbiology, Bacteriology.....14
Physiology.....15
Anatomy.....16
Other Medical Sciences:
Pathology, Immunology, Neuro. Science, BioMed. Science, Parasitology.....17

PHYSICAL SCIENCES

Chemistry.....50
Physics.....51
Mathematics.....52
Statistics.....53
Earth Sciences.....54
Geophysics and Natural Science & Other Physical Sciences.....55

* This list was not an original part of the Coding Manual but is included here to indicate how fields of study were ultimately classified.

List E

Degrees

R.N., L.P.N., M.T.	1	- (Physical Therapist)
B. Phar.	2	
B.A., B.S.,B.D.,B.E.	3	
MED, MAT, MSW, MPH.	4	
MA, MS.	5	
Ed.D.	6	
L.L.B., J.D.	7	
M.D.,D.D.,D.D.S.,D.V.M.,OD,DO, DAM.	8	- Podiatrist, Osteopath, Chiropractor, OD - Dr. of Optometry
Ph.D.,Sc.D.	9	
Blank	0	

List F

HEALTH-RELATED OCCUPATIONS
(other than Medicine)

This list was not an original part of the Coding Manual but is an ad hoc record of all occupations which were ultimately coded as health-related. This list includes health-related occupations which appeared in answer to any item on the questionnaire, parents' and spouses' occupations as well as those of respondents. (For lists of health-related occupations of currently employed respondents only, refer to Chapter VI, Tables VI. 7 and VI.8.) Coding of occupations was accomplished with reference to industry involved as well as occupation title itself. Thus, any occupation coded as health-related was judged to be so in view of additional information not appearing on List F or tables.

Activities Director - nursing home
Administrative Assistant - hospital, personnel director hospital center
Administrator - nursing home, hospital, director of Poison Control
Air Pollution Engineer for Government
All Health Trainees (Pharmacy, Nursing, etc.)
All Interns - Medical, Pharmacy, Dental, etc.
Anaesthesiologist
Anatomy Instructor in Medical School
Army Medic
Assistant Instructor - School of Nursing
Assistant Medical Examiner (Institute of Forensic Medicine)
Assistant Scientist - Pharmaceutics
Associate Research Scientist - Pharmacology Consultant
Audiologist (consults and sells hearing aids)

Bioenvironmental Engineer - public health in U.S.A.F.
Biologist - toxicology research
Biology Instructor at School of Nursing
Biomedical Engineer (medical instruments)
Bookkeeper - drugstore
Business Administrator for Blood Bank
Business Assistant - Dentist's Office
Business Manager for Drug Abuse Program

Caseworker - Public Health Department
Caseworker for emotionally distrubed
Caseworker in mental hospital
Chemical Engineer - Antibiotics for pharmaceutical company
Chemical Engineer - Environmental pollution control
Chemist, biomedical
Chemist - Department of Health
Chemistry technician - hospital
Chief - environmental health (Public Health Department)
Child-care worker in State Hospital for Retarded
Clerk - drugstore
Clerk typist - hospital; medical records clerk
Clinic Assistant - Planned Parenthood
Clinical Lab Technician
Clinical Psychologist
Commanding Officer in Army Drug Rehabilitation Center
Company Manager - medical supplies
Coordinator of Lab Services - hospital
Curriculum Coordinator - School of Nursing
Cytotechnologist

Dental Hygienist
Dental Technician
Dentist, Pedodontist
Department Manager Special Production - Manufacturing Immunodiagnostics
Desk Clerk
Director of Free Medical Clinic

Director of In-service Training - State Mental Health Center
Director of Nursing
Director of Orientation Center for Drug Addiction Prevention
Director of Pharmaceutical Consultant Service
Director of Psychiatric Nursing
Drug Counselor
Drug Manager - Supermarket

Editor - publishes immunochemistry and radiation abstracts
Editorial Assistant - medical journal; editor and translator for cancer research
Education Specialist - dental research
Electron microscopist - bone and cartilage research
Electronics Engineer - biomedical for NIH
Emergency Room Cashier - hospital
Environmentalist - State pollution control and environment health
Epidemiologist

Family Planning Worker - Council for Contraception
Field Interviewer - medical history taken for Public Health Department
Filler - fills vials in pharmaceutical industry
Food Service Operator - hospital cafeteria

Genetics Technician

Health Sciences System Specialist - hospital
Hospital Ambulance Attendant
Hospital Corpsman - military
Hospital Dietitian
Hospital Gift Shop Supervisor
Hospital Housekeeper
Hospital Receptionist or Admitting Clerk
Hospital Seamstress
Hospital Supply Clerk
Hyperbaric Lab Manager

Inhalation Therapist
Instructor - deaf education
Instructor of Nursing
Instructors and professors in Pharmacy in Medical School
Insurance Clerk - secretarial in Physician's Office
Internal Auditor for hospital
Investigator - food and drug establishments (D.H.E.W.)

Janitor - hospital
Junior Bacteriologist - public health
Junior Scientist - Immunology research; medical school

Keypunch operator for a hospital

Lab Assistant - hospital; medical school; cleans hospital equipment
Lab Coordinator - hospital
Lab Specialist - plastic surgery research
Lab Technician - cancer research; clinical chemistry; cobalt technician for radiation therapy; drug screening; hospital; medical school; oncology - animal cancer; pulmonary

Malpractice Consultant to Law Firm
Malpractice Examiner - prepares insurance company defense for M.D.'s
Market Researcher - Pharmaceutics
Medical Assistant - doctors; pathologists; dentists; labor union
Medical Malpractice Lawyer
Medical Record Librarian
Medical Secretary, dental secretary, medical transcriber
Medical Service Officer - military service
Medical Social Worker; Social Services Assistant in Hospital; Drug Counselor
Medical Statistician
Medical Technician or Technologist (includes hematologist, radiologist)
Medical Writer - writes inserts for pharmaceutics
Medicare Interviewer in a hospital
Member of Technical Staff: Life Sciences - Areospace
Mental Health Therapist
Microbiologist - hospital; T.B. testing
Morgue Assistant - hospital

Nurse's aide
Nursing Assistant

Occupational Therapist - extended care facility, Children's Hospital
Office Manager - medical office
Operations Researcher - collects data on drug abuse and alcoholism and prevention
Optician
Optometrist
Orderly
Owner - hospital surgical supply store

Paramedic
Patient Coordinator - T.B. Hospital
Payroll Secretary - Hospital
Peace Corps Medic
Personnel Director - nursing home
Pharmaceutical Representative or Salesman; Pharmaceutical Sales Trainer
Pharmacist; Pharmacologist
Pharmacy File Clerk in hospital
Physical Therapist; Occupational Therapist; Hospital Recreational Therapist
Physical Therapy Assistant
Physical Therapy Instructor; Interaction Therapist
Physiologist
Podiatrist
Practical Nurse
Pre-med Counselor
Professor - teaches mental retardation education
Program Assistant - state mental health hospital
Programmer - Analyst; medical computer system; programmer for Public Health Survey
Project Engineer - administrative consultant to hospital
Psychiatric Attendant
Psychiatric Social Consultant
Psychiatric Social Worker
Psychologist
Psychology Professor
Psychology Technician - alcohol rehabilitation program

Quality Control Analyst for Animal Drugs

Radiobiologist in Nuclear Medicine
Receptionist - physician's office; dentist's; hospital; etc.
Red Cross - Director of Volunteers; Recreation Workers in Therapy
Registered Nurse
Research Analyst - mental and public health
Research Assistant - Pharmaceutical; medical center or medical school, Health Program Planning; Surgical; Medical Research in Diving; Medical Research for Malpractice Suits; Psych. testing; Psychogenetics; respiratory heat exchange (ocean research)
Research Biochemist - hospital; medical school
Research Biologist - drugs
Research Chemist - protein sequence work
Research Fellow - post doctoral in medical school
Research Physiologist
Research Technician - histology; immunology; dialysis; pediatric endocrinology; biochem in medical school; steroid; medical school; cancer
Respiratory Therapist

Salesman - surgical supplies to hospitals
Sanitarian - health inspector
School Nurse
Scientific Programmer - medical education
Scrub Technician in hospital
Secretary - in doctor's office
Senior Clerk in Bio-Medical Library
Social Worker - School for retarded; community health; state mental hospital
Social Work Technician - Public Health
Speech Pathologist
Speech Therapist
Staff Research Associate - medical school
Statistical Consultant - Psychiatric research
Superintendent - Department of Agriculture in Animal Health Testing
Supervisors - all clinics, medical offices, etc.

Teacher - drug rehabilitation center
Technical Representative for Medical Lab
Technician - blood plasma; inhalation therapy; hospital; psychiatric

Veterinarian
Veterinary Aide (animal medications, surgery, etc)
Vice-President Hospital Corp - Public Health Care; health coordinator - public health dept.
Vice-President of Manufacturing - producing allergenic extracts for allied health field
Vice-President - veterinary pharmaceuticals
Virologist
Vista Volunteer Health Advocate & Health Trainer

Ward Clerk - hospital
Ward Secretary - hospital
Waste Water Analyst for Pollution Control

X-Ray Technician

* This list includes occupations reported by respondents who are currently employed as well as occupations reported for respondents' parents or spouses and as respondents' former jobs.

List G

OCCUPATIONS THAT MAY BE HEALTH-RELATED, DEPENDING ON LOCATION

Administrative Scientist - Research

Assistant Scientist - Biochemistry Research

Biochemist - Consulting Co.; University Research; Redioactive Amino Acids

Chemist, not specified

Chief of State Analytical Chemistry Lab

Head of R & D - Chemical production

Jr. Microbiologist - Chemical research

Laboratory Assistant - Bacteriology research

Laboratory Supervisor - Private research lab

Laboratory Technician - Microbiology experiments; enzyme research;Biochemistry (U.) radiation; proteins; research

Manager of Chemical Corporation

President of Chemical Research Lab

Research Assistant - protozoa; biochemistry; molecular biology; University

Research Associate - University, chemical analysis

Research Chemist - for Government

Researcher - U.S. Army; Chemical Corp. (#19021)

Research Specialist - Research Lab?

Research Technician - University; Protein chemistry

Salesman - Sold chemicals for chemical firm (#11482)

List H

CAREERS DEFINED AS "MID-LEVEL HEALTH CAREERS"
(From Question 25)

Clinical lab technologist (or other medical technologist)

Dental hygienist

Dietician/nutritionist

Health Advocate

Health Assistant

Health Associate

Health Educator

Medical Records Librarian

Nurse

Nurse practitioner

Occupational, physical, or recreational therapist

Physician Assistant

List I

CAREERS DEFINED AS "PhD.-SCIENCE"
(From Question 25)

Biochemist

Biologist

Biomedical Engineer

Biophysicist

Biostatistician

Chemist

Physiologist

Social Scientist in health (economist, anthropologist, sociologist, psychologist)

List d

CAREERS DEFINED AS "TRADITIONAL PRACTITIONERS"
(From Question 25)

Chiropractor

Clinical Psychologist

Dentist

Hospital Administrator

Medical Social Worker

Optometrist

Pharmacist

Podiatry

Speech Pathologist or Audiologist

Veterinarian

APPENDIX C: References and Bibliography

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