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ABSTRACT

Results are summarized of a study conducted to determine whether certain characteristics of medical school students can be used as predictors in determining: the career choice between academic medicine and clinical practice, primary versus non-primary care, the geographic distribution of physicians, the distribution of manpower into the various medical specialties, the attitudes toward government involvement in medical care, and the reported level of income of the physician. The data for the study were obtained from approximately 1,850 graduates of 28 medical schools. Initial data were collected in connection with their formal entry into medical school in 1956 and the most recent from a survey of their practice characteristics conducted in 1976. Variables were categorized as belonging to one of six classes of information: (1) general background factors; (2) personal qualities or attitudes as measured during medical school; (3) achievement measures, obtained at the same time; (4) characteristics of premedical college attended; (5) characteristics of medical school attended, and (6) personal factors at the time of graduation from medical school that might operate as constraints on future choices. (Author/SPG)

AAMC LONGITUDINAL STUDY OF MEDICAL SCHOOL GRADUATES OF 1960

EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

AAMC Longitudinal Study of Medical School Graduates of 1960

Do physicians who deliver primary medical care have certain identifiable characteristics that distinguish them from those providing secondary and tertiary care? What are these characteristics? Are they traceable to background? Are they introduced and/or modified during medical school? Do these distinguishing features depend heavily upon other choices or situational constraints? Would it be helpful to have formal assessments of personal characteristics at the time of entrance into medical school?

In the report of the AAMC Longitudinal Study of Medical School Graduates of 1960, questions such as these were focused on that segment of medical manpower which provides first contact care to the American public. A similar set of questions was posed also for five other policy relevant aspects of the medical care system: the career choice between academic medicine and clinical practice, the geographic distribution of physicians, the distribution of manpower into the various medical specialties, the attitudes toward government involvement in medical care, and the reported level of income of the physician.

Each of these aspects was considered to be directly involved in the issue of the accessibility of medical care to the American public. Accordingly, the report viewed each as an outcome and posed the above series of questions.

The data for this study were obtained from approximately 1,850 graduates of 28 medical schools. Initial data were collected in connection with their formal entry into medical school in 1956 and the most recent from a survey of their practice characteristics conducted in 1976. Approximately 900 items of information were collected during this interval, but for purposes of this study 49 variables were identified for close scrutiny, after a series of data reduction measures.

These remaining variables were categorized as belonging to one of six classes of information: (1) general background factors; (2) personal qualities or attitudes as measured during medical school; (3) achievement measures, obtained at the same time; (4) characteristics of premedical college attended; (5) characteristics of medical school attended; and (6) personal factors at the time of graduation from medical school that might operate as constraints on future choices.

The research questions then revolved around the determination of the role each of these types of information may be considered to play when attempting to predict each outcome under study. In addition, the study sought to clarify the relationships among the various types of predictor information with respect to each outcome. (See Figure 1).

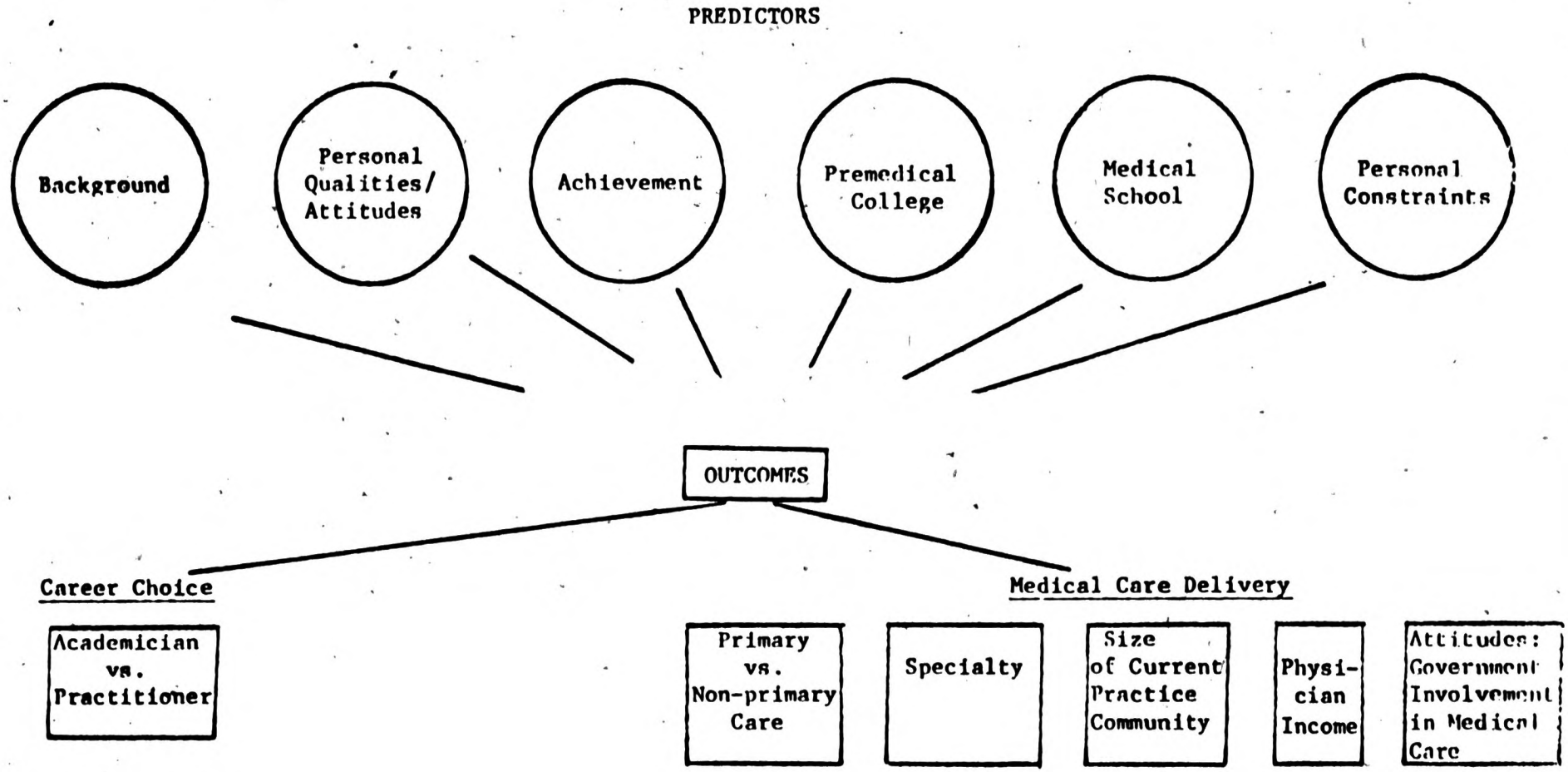

Figure 1. Summary of predictors and outcomes examined.

It needs to be emphasized that this conceptual division was more than just a convenience. Rather than seeking quite specific and perhaps isolated findings, it was judged to be of far greater value for research if the findings of this study could help focus future exploration. It seemed that this could best be accomplished if *classes* of variables rather than specific variables were the object of the study's conclusions. Rather than simply pointing to the perhaps trivial usefulness of any single index, refinements of existing measures and development of new ones could be concentrated in the areas indicated as having special promise. The analyses, of course, had to deal with specific variables but the authors were concerned throughout with the significance of the findings for the class of measures studied rather than any one specific measure.

The general plan involved randomly dividing into two files the records of the 1,850 physicians for whom data from the 1976 Follow-up were available. In addition to the 1976 data, each of these files (N=925) was expanded to include the extensive data acquired earlier.

The first file was used for purposes of general exploration and development of hypotheses. Two stages of the research process were involved: construct development and model development.

Construct development refers to a series of activities directed toward (1) sharpening the definition of the outcomes measured (e.g., a cluster of attitudinal items regarding government involvement in medical care delivery was formed through factor analysis); (2) deciding on appropriate subsamples to be used in the analyses of certain outcomes (e.g., medical care delivery outcomes were analyzed using only a "practitioner" segment of the cohort); and (3) narrowing and refining the list of "predictor" variables to be examined more closely in relation to the six outcomes (e.g., reduction of the listing of nearly 900 items of information contained in the data bank to the 49 variables eventually retained in the present study).

Model development refers to an empirically-based approach to hypothesis formulation. The specific activities at this stage involved the use of hierarchical regression analysis to explore the ways in which several predictor variables relate to a particular outcome measure.

Hierarchical regression analysis is a multivariate statistical technique which allows the development and testing of a specific prediction model by entering predictor variables in a prescribed sequence. At each stage a test can be performed to ascertain if the information represented by the predictor variable or set of predictor variables just entered *adds* to the overall prediction of variation in the outcome measure. Thus, while a specific predictor variable may be related to an outcome measure on an individual basis, it may not add significantly to the prediction of that outcome once other factors have been considered.

Consistent with the overall philosophy of the approach, predictor variables were entered into the regression models as *sets*. Not all possible predictor variables were used in the definition of any one set. The predictor variables chosen differed depending on the outcome measure. Variables were selected on the basis of preliminary analyses. Regression models consisting of two or more sets were developed also on the basis of preliminary analyses.

After these stages of the research plan were completed, the second sample (N=925) was introduced. The purpose of this sample was to provide a test of the stability of the preliminary findings from the first sample. Insofar as the research process included the development of conceptual bases for the preliminary findings, the analyses performed on the second sample were also tests of these ideas. The results presented are based on the second sample, since this is the "test" sample that allows confirmation of preliminary findings. The testing and replication of the regression models comprise the major analyses reported.

Findings

Outcome 1. Career Choice: Academician vs. Practitioner

In this outcome, five classes of predictor information were suggested as useful following explorations with the first sample: background, personal qualities/attitudes, achievement, type of premedical college, and type of medical school.

The first model tested involved the entering of predictor sets in their developmental sequence, viz., background, personal qualities/attitudes, type of premedical college, and type of medical school. Achievement measures were not included in this model since they were not found to contribute independently to the prediction of career choice in the first half-sample.

A total of 22% of the variation in the choice between academic and practice careers was found to be predictable from the combined information of the student's background, personal qualities, and type of medical school he attended. It is noteworthy that data collected early in the professional development of the physician can be quite effective in distinguishing between those choosing an academic or a practice career and persisting in this choice 15 to 20 years later.

Personal qualities provided the largest contribution to the prediction of career choice, accounting for 11% of the total variance explained. The results portray the academic physician as having early theoretical and aesthetic values but relatively lower pragmatic and religious orientations as measured by the Theoretical, Economic, Aesthetic, and Religious scales of the Allport-Vernon-Lindzey Study of Values (AVL). Complementing these qualities is a comparatively lower need for social support as measured by the Deference scale of the Edwards Personal Preference Schedule (EPPS). Rounding out the early profile of the academician was a clear preference for Intellectual Challenge as measured by the Career Attitudes Questionnaire (CAQ).

The usefulness of information regarding type of premedical college was not supported by the results from the second half-sample.

Information regarding the type of medical school accounted for an additional 9% of the variance in Career Choice. This predictor set was defined by a cluster of variables reflecting the nature of institutional support (public-private), the size of the faculty, the levels of research and research training support available, and the perceived emphasis of the academic program on internal motivation and scientific inquiry.

The failure of academic achievement measures to contribute independently to the prediction of Career Choice was given attention by Model II. This model introduced a variation in the sequence of predictor sets in order to address

this question. When entered as predictors before personal qualities, achievement measures were found to be not only significant but rather substantive (8%) predictors. Nevertheless, in this model, personal qualities still made a major, although somewhat reduced (7%), contribution.

The two models, when contrasted, revealed rather pointedly the degree of overlap between personal qualities and achievement, and also suggested that, at least in relationships with Career Choice, personal qualities are more basic. Achievement predicts Career Choice by virtue of the personal qualities it implies, (e.g., an intellectual orientation, low valuation of economic rewards) and thus may serve as a convenient "proxy" for these qualities. However, if such qualities are used in prediction, achievement measures have little, if anything, to add on their own.

Similarly, Model III helped to understand the contribution of information on type of medical school in Career Choice. When entered as the first set of predictors, the variance attributable to type of medical school increased substantially (to 16% of variance). The contribution of personal qualities was reduced to 5% of the variance (from 11% in Model I), indicating that the medical school cluster can serve as a proxy for a sizeable component of this predictor set. The conclusion drawn was that certain schools attract and select students with certain personal qualities. In other words, private schools with research orientations admit more students with characteristics conducive to academic careers.

Thus, clear evidence was obtained that attention to either the goal of developing manpower projections or the goal of influencing the distribution into academic vs. practice choices must simultaneously consider both the domains of personal qualities and medical school characteristics. Each of these types of predictors makes a sizeable contribution to predicting the outcome and neither can serve as a satisfactory proxy for the other.

Outcome 2: Primary vs. Non-Primary Care

In the study of this and the remaining outcomes only the practitioner subgroup was used.

As a result of preliminary analyses conducted on the first half-sample, three classes of predictor information were found to be relevant: background, personal qualities, and type of medical school. The background variables, deciding to study medicine at a later age and having lived most of one's early life in a small community are associated with entering primary care. In the personal qualities/attitudes set, a desire for patient contact (CAQ), and a need to interact with persons in a way that pleases them (EPPS-Deference) are used to describe those entering primary care. Finally, the primary care physician group is depicted as coming from schools with MCAT averages at the lower end of the range. Also, the students perceive these schools as providing an educational environment that encourages relying on external structures for guiding and facilitating learning (MSEI-Extrinsic Motivation) rather than on one's own motivation and direction (MSEI-Intrinsic Motivation). The three predictor sets found useful in distinguishing primary from non-primary care physicians were juxtaposed vis-a-vis one another in two different ways.

In Model I, predictors were entered in their "natural" order: background, then personal qualities. Medical school information was not used in this model,

since it did not contribute significantly to the prediction of the outcome when exploratory analyses were conducted on the first half-sample. In order to investigate if characteristics of medical school, while making no unique contribution, had any predictive value, information on the type of medical school was entered first in the sequence of predictors in Model II, followed by background and personal qualities.

The most striking result is the relatively low degree of predictability of the primary vs. non-primary care choice. Only 6% of the total variance was accounted for by the combination of all classes of predictor information used in this study. A question was raised whether this somewhat disappointing finding reflected a problem with the criterion definition. The suggestion was made that the two groups defined by legislative guidelines (primary care was defined as general/family practice, general internal medicine, and general pediatrics) were not sufficiently distinctive to admit of better prediction.

In Model I, background predicted 2% of the variance and personal qualities an additional 4%. When the sequence of predictor sets was altered to introduce characteristics of medical school first (Model II), information on the type of medical school was found to be significantly predictive, albeit to a small degree (2%). It was observed that the *three* sets of predictors, taken together, do no better (6%) than background and personal qualities *without* information on the type of medical school. Thus, it was concluded that the type of medical school is related to production of primary care physicians by virtue of selection and self-selection of particular kinds of students, and not by any direct influence on their choice of career.

In connection with this outcome, the attrition in primary care choices was analyzed using three points in time: 1960, 1965, and 1976. As has been found elsewhere, there is a greater shift from primary care to non-primary care than the reverse.

Outcome 3: Specialty

In analyzing the relationships of Specialty to the various predictors, it was necessary to follow a procedure different from the hierarchical multiple regression/correlation scheme employed throughout the rest of the study. Specialty as a multi-category variable does not lend itself to direct application of the multiple regression analysis method.

Accordingly, a multivariate synthesis of predictor relationships with medical specialty was attempted by means of multiple discriminant function analysis applied to the two half-samples. The method defines a parsimonious set of major dimensions along which designated groups (in this case, specialty groups) may be maximally discriminated.

Four discriminant functions emerged on which specialty groups are significantly differentiated. Three of these were clear replications of functions obtained on the first half-sample.

The first of these was defined primarily by the Pressure scale of the Career Attitudes Questionnaire (CAQ). The scale includes such items as "frequently required to meet emergencies," "important decisions made rapidly," "on call at all hours." Secondarily, this function was defined by lower MCAT Verbal scores of individual students, lower AVL Aesthetic Values, and a personal

constraints variable of having already started a family prior to graduation from medical school. Basically, the dimension can be viewed as one of personality and describes persons who prefer challenges to their energy, stamina, and decisiveness vs. intellectual challenges and pursuits. The dimension was termed Active vs. Reflective Orientation. This dimension discriminated obstetricians/gynecologists at one extreme (Active) from psychiatrists at the other (Reflective).

The second dimension, also nearly perfectly replicated, was defined almost exclusively by the CAQ scale, Patient Contact, and was assigned that label. Secondarily, it was defined, in both analyses, by having grown up in a small community. This dimension differentiated a cluster of general/family practice, pediatrics, and psychiatry from the cluster of radiology, pathology, and anesthesiology. The remaining three specialties (obstetrics/gynecology, surgery, internal medicine) were lodged near the center of this dimension.

The two major discriminant functions were viewed as jointly discriminating among most specialties, i.e., most specialty groups were spatially separated in the plane defined by the two dimensions. Only the pairs of radiology and pathology, and of obstetrics/gynecology and surgery, appeared to be too close together, possibly requiring further discriminants.

These results, in general, were viewed as more explanatory than predictive. The best "predictors" of medical specialty are the self-assessments of senior medical students as to their preferences and interests within the medical profession. The stability of those choices between 1960 and 1976 was examined. General/family practice and obstetrics/gynecology (approximately 50% each) have the highest attrition rates and radiology the lowest (20%). Both radiology and anesthesiology have high gain rates (proportion switching into a specialty after 1960) while general/family practice has the lowest. On the average, 59% of senior year choices correspond to their practice specialties 16 years later.

Outcome 4: Size of Current Practice Community

Previous research on size of community indicated a clear relationship between medical specialty and the ultimate choice of location to practice. In view of this, it seemed that the study of practice community should be focused on determining what, if any, variance could be accounted for by variables other than specialty. It was decided, therefore, that the variation in the Size of Practice Community selected that could be accounted for by Specialty would be systematically removed first. The major interest then would be in determining how much of the remaining variation could be accounted for by other classes of predictor variables.

Findings from preliminary analyses of the first half-sample resulted in the inclusion of three classes of predictor information: background, personal qualities/attitudes, and type of medical school.

The primary model of analysis considers these three predictor sets in the "chronological" order, after first entering Specialty as a control factor. Clearly, the most striking aspect of the results was that practice community size is predictable to a very small degree regardless of what predictor information is used. Once specialty differences are taken into account, only background factors (particularly the size of community lived in most of life) are significantly related to location choice. Beyond background, neither personal qualities nor the type of medical school was confirmed on the second half-sample

as useful additional predictors. Even when characteristics of the medical school were entered first in the analysis (Model II), their contribution to the prediction of practice location was minor (2%).

It was concluded that neither the data from this study nor the findings presented in the literature identified a single variable or class of information that can account for a sufficient amount of variation in the choice of practice location to justify targeted policy action.

Outcome 5: Physician Income

It was immediately noted that any unadjusted measure of income reflects the amount and kind of work that the practitioner does. It thus becomes a rather complex index and one that is difficult to interpret. If income is to be taken as a measure of "economic orientation," then variations in the amount and kind of work (specialty) need to be controlled.

For this reason, Specialty and Hours Worked were introduced into the models of analysis as statistical controls. Two models of prediction were analysed. Model I introduced personal qualities and information on the type of medical school as predictor sets, in that order. Model II entered medical school characteristics as the first predictor set.

It should be noted at the outset that 15% of the variance in level of Income was accounted for by knowledge of the specialty to which the physician belongs. This clearly reflects the different opportunities within the specialties to attain varying levels of Income.

The Hours Worked, introduced as a second control variable, made a small, although significant, addition to the explained variance.

The results of Model I showed that prediction of Income was possible only to a small degree when specialty differences and intensity of practice (Hours Worked) are first taken into account. The only class of information significantly predictive of Income was that of personal qualities (3% of variance).

When the specific variables comprising this predictor set were examined, the picture provided was a rather classic characterization. The profile was one of an economically motivated (AVL-Economic), power-desirous (AVL-Political), aggressive (EPPS), dominant (EPPS) person who shows relatively little insight or concern for the feelings and behavior of others (EPPS-Intraception), and relatively little interest in cultural and artistic expression (AVL-Aesthestic).

Model II introduced information on the type of medical school directly after the control variables. The results showed no significant predictive effect and therefore did not corroborate the tentative finding in the first half-sample of a relationship between the type of medical school and Income.

It was suggested that short of some kind of "affirmative action" in selecting candidates with low economic motivation, the medical education community is not likely to affect directly the economic aspects of the system of medical care delivery. Much more far-reaching are the potential indirect influences through policies and programs, that would affect the distribution of specialties.

Outcome 6: Orientation toward Government Involvement in Medical Care

This outcome was defined for the study on the basis of the cohort's endorsement of a variety of attitudinal statements relating to various aspects of the medical care system. Two clusters of items were empirically identified, one called Professional Control and the other, External Quality Review. Because of conceptual and empirical support, the two sets of items were combined into one scale to define this outcome.

Four classes of predictor information were found to be of value in attempting to account for the liberal vs. conservative Orientation of physicians toward Government Involvement in Medical Care. These included: personal qualities/attitudes, achievement, type of premedical college, and type of medical school.

The primary model of analysis considered the sets of predictor information in the order of assumed developmental precedence: personal qualities, achievement, premedical college, and medical school. Implicitly, therefore, the model hypothesized that each class of variables added new, independent and significant information predictive of attitudes toward government involvement in medical care.

Two other models were also used, for the specific purpose of determining if the type of medical school attended might be a good overall predictor of attitudes, since selection and self-selection to medical schools certainly includes considerations of personality, achievement, and premedical college preparation. Thus, these models were testing the possibility that the type of medical school attended "carried" information about the student's personal qualities, achievement, and prior educational experience, and in this way acted as a useful "proxy" for prediction.

The overall results were noteworthy from two aspects. First, relatively little variance (9%) of attitudes is accounted for by all the predictors collectively, regardless of their sequence. The second noteworthy aspect was that regardless of the sequence of predictor sets, the amounts of variance accounted for by a specific set remained almost identical (personal qualities, 5%; premedical college, 1-2%; medical school, 3%). This suggested that in explaining Orientation toward Government Involvement in Medical Care these sources of influence are essentially independent of each other.

When considering the specific indices included in the personal qualities set, the overall picture that emerges portrays the medical liberal as high on aesthetic values (AVL), having a need to support and help others (EPPS-Nurturance), seeking the stimulation of intellectual problems (CAQ-Intellectual Challenge), and desirous of sharing responsibility with others (CAQ-Teamwork). On the other hand, the physician with a conservative orientation tends to welcome situations requiring quick and decisive action (CAQ-Pressure), places primary importance on the usefulness and practicality of things (AVL-Economic), and tends to enjoy attacking contrary points of view and criticizing others (EPPS-Aggression).

It was proposed on the basis of first half-sample results that achievement measures provided information that was predictive of liberal vs. conservative orientation and was independent of personal quality indices. This failed to be replicated.

The type of premedical college attended did add a significant although small contribution to the explained variance. It appears that an undergraduate college with a large proportion of its students planning careers in engineering and related fields rather than in social fields was more likely to produce a graduate who is conservatively oriented, than the school whose students have, on the whole, high academic aptitudes and are planning careers in science or the arts.

Characteristics of the medical school attended provided unique information that is not shared with personal qualities and/or premedical college domains. A private school, with more selective admissions and with the resources necessary to support research and research training, is more likely to graduate a physician with an orientation reflecting less opposition toward government involvement in medical care.

The results with the secondary model suggested that the medical school's role in influencing the formation of liberal vs. conservative attitudes is not in the personal qualities of the students it attracts or selects but more directly in terms of its educational environment and programs that are of course related to kind and size of faculty.

Conclusion

The overall findings of the study are highlighted graphically in Tables 1 and 2. Table 1 summarizes the relationships between each outcome and each set of predictors, with predictors taken one at a time and without any regard to any other predictor. Each predictor is related to an outcome separately, not considering whether it might overlap, duplicate another predictor, or might itself be determined by some other variable. On this basis, for example, it can be seen that characteristics of medical schools have a great deal to do with the choice between an academic and practice career, but that medical school characteristics are not significantly related to physician income. Similarly, entering a primary or non-primary field of care is definitely related to certain personal qualities, but not significantly related to any achievement measure.

Table 2, on the other hand, summarizes the results of the analytic procedures in which the sets of predictors are entered in the order of developmental precedence (background first, then personal qualities, etc.). In this method of analysis, overlap of content between and within sets of predictors is taken into account, and only unique, independent contributions of particular predictors are displayed as significant. Thus, for instance, it was found that, when background and personal qualities are considered first, achievement measures add nothing significant of their own to the prediction of any of the outcomes.

Given this overview of the analyses of the six major outcomes, the following are among the observations that were offered.

1. There is an impressive difference between physicians who choose an academic career and those who embrace the practitioner role. Undoubtedly, there is a great deal of individual variation within both groups, but, as aggregates, they are very distinct. Career academicians have different sets of life values (more often theoretical, aesthetic, as against economic), tend to be more achievement-oriented and of higher scholastic ability, go to more select schools, and have different attitudes toward the governance of their profession and the

Table 1

Summary of Individual Relationships

Between Predictor Variables and Outcome Measures

Predictors	Academician vs. Practitioner	Primary vs. Non-primary Care	Size of Current Practice Community	Physician Income	Orientation toward Government Involvement in Medical Care
	Outcomes				
Background	•	•	••		
Personal Qualities/ Attitudes	••	••	•	••	•
Achievement	••		•	•	••
Type of Premedical College	•	•	•		••
Type of Medical School	•••	•	•		••
Personal Constraints	•	•			

Key: • indicates one or more significant bivariate correlation(s) less than .15.
•• indicates one or more significant bivariate correlation(s) between .15 and .25.
••• indicates one or more significant bivariate correlation(s) greater than .25.

Table 2

Summary of Hierarchical Regression Results,

With Predictors Entered in the Order Listed

Predictors	Outcomes: Academician vs. Practitioner	Primary vs. Non-primary Care	Size of Current Practice Community[a]	Physician Income[b]	Orientation toward Government Involvement in Medical Care
Background	▲	▲	▲		
Personal Qualities/ Attitudes	▲▲▲	▲		▲	▲▲
Achievement					
Type of Premedical College					▲
Type of Medical School	▲▲[c]				▲
Personal Constraints					

Key: ▲ indicates significant increase in explained variance of between 1 and 5 percent.
▲▲ indicates significant increase in explained variance of between 5 and 10 percent.
▲▲▲ indicates signficant increase in explained variance of more than 10 percent.

[a] Analysis performed controlling for Specialty.
[b] Analysis performed controlling for Specialty and Hours Worked.
[c] Interpretation modified by the presence of a significant interaction between type of medical school and personal qualities/attitudes.

regulation of professional practice. While physicians involved in academic work comprise only about one-sixth of the total, they have direct impact on *all* future physicians.

2. Personal qualities emerge as a significant and often substantial determinant of physician careers, professional styles, activities, and attitudes. Even within the more homogeneous cohort segment of the practitioners (with academicians excluded), personal qualities as assessed in the early stages of career development are predictive of what the physician will do (primary care, specialty choice), what rewards will be sought (economically oriented or otherwise motivated), and what he or she will believe (attitudes toward professional governance and control). The most telling dimension of these personal qualities seems to be the seeking (or avoidance) of patient contact. This dimension is at once central to the very nature of medical care, and is also broadly linked to major constructs in the study of personality. It therefore seems to be the crucial anchor for the understanding of both the development and the implementation of careers in medicine, and as such deserves greater attention in further studies.

3. Throughout the results of the study, the practitioner's specialty looms as a most conspicuous variable, related as it is to almost every aspect of the medical career, both in its formulation and its implementation. The choice itself is predictable at an early stage in training, particularly on the basis of personal qualities. In turn, specialty is a powerful indicator of what rewards the physician prizes, what he earns, where he is likely to practice, and what attitudes he holds on professional issues. What may not have been previously appreciated is the ubiquity of the variable in the developmental context. For some purposes, it is a good predictor; for some, an outcome; for others still, a variable to be controlled, or an intervening variable to be called upon for explanation of a phenomenon. In whatever way it is viewed, it seems necessary to include it in any equation that is applied to medical careers.

4. The influence of medical school on the outcomes of medical careers might have been expected to be more richly documented by the results. Clearly, type of medical school makes a significant difference in certain outcomes through direct influence on the student. Such seems to be the case with the choice of an academic vs. practice career, and, to a lesser extent, in the formation of attitudes on professional issues. In other instances, medical school makes a difference through the type of student it selects, as appears to be the case with the size of community in which the physician is likely to practice. Even where direct influence is demonstrable, this selectivity effect is also clearly present.

5. At first glance, the failure of achievement measures to relate more substantively to any of the outcomes may appear noteworthy. It would seem sensible to expect that work styles and attitudes of the "super-star" students would be distinctive. When achievement measures are considered outside the context of the rest of the information such relationships are suggested.

Rather than pursuing the tenuous associations between ability and outcomes it would appear to be much more fruitful to consider the extent to which the highly competitive basis for admissions to medical school, on the grounds of ability, might be counterproductive in that certain undesirable personality patterns are unwittingly overincluded contrary to long term interests both of society and the profession.

In addition to these analyses, which are presented and discussed in Part I of the final report, background data for them is presented in Part II. This latter part also presents annotations on each of the major items of the 1976 Follow-up Survey. Part III provides a detailed explanation of the methodology employed along with a description of each of the variables incorporated in the Part I analyses.