INFORMATION TO USERS

This was produced from a copy of a document sent to us for microfilming. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help you understand markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure you of complete continuity.

2. When an image on the film is obliterated with a round black mark it is an indication that the film inspector noticed either blurred copy because of movement during exposure, or duplicate copy. Unless we meant to delete copyrighted materials that should not have been filmed, you will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed the photographer has followed a definite method in "sectioning" the material. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For any illustrations that cannot be reproduced satisfactorily by xerography, photographic prints can be purchased at additional cost and tipped into your xerographic copy. Requests can be made to our Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases we have filmed the best available copy.

University Microfilms International

300 N. ZEEB ROAD, ANN ARBOR, MI 48106
18 BEDFORD ROW, LONDON WC1R 4EJ, ENGLAND

A TREND ANALYSIS OF ACADEMIC MEASURES OF MINORITY MATRICULANTS: MICHIGAN STATE UNIVERSITY, COLLEGE OF OSTEOPATHIC MEDICINE, 1974, 1975, AND 1976 ENTERING CLASSES

By

Darnell Eugene Cole

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Administration and Higher Education

1978

ABSTRACT

A TREND ANALYSIS OF ACADEMIC MEASURES OF MINORITY MATRICULANTS: MICHIGAN STATE UNIVERSITY, COLLEGE OF OSTEOPATHIC MEDICINE, 1974, 1975, AND 1976 ENTERING CLASSES

By

Darnell Eugene Cole

This study investigated the relationship between academic and demographic predictor variables and the performance of minority matriculants to Michigan State University College of Osteopathic Medicine (MSU-COM). The sample included 50 subjects, of whom 18 (12 males and 6 females) were admitted in 1974, 17 (11 males and 6 females) in 1975, and 15 (13 males and 2 females) in 1976. The ethnic breakdown of the sample consisted of 34 Blacks, 13 Chicanos, and 3 American Indians, and its age range was 20 to 43. There were 30 single and 20 married subjects.

The data for the study were collected from MSU-COM's Minority Support Program (MSP) yearly reports and academic folders of the subjects. Information was analyzed for the identification of predictor variables and the performance of minority matriculants in MSU-COM. Trend analysis was used to determine if there was a significant trend in the means of the variables addressed, either an increase or a decrease. This analysis showed an increase

only in the means of MCAT-science and MCAT-verbal scores of the years tested.

The chi square test was employed to compare characteristics of students on academic probation (AP) and students not on academic probation. This test also revealed the relationship between the variables and the percentage of courses taken which were passed (PP). Since whether a student is on academic probation depends on the percentage of courses passed, these variables applied to all subjects in the sample.

Discriminant analysis was utilized to identify predictor variables. The analysis identified the Medical School Application Test (MCAT)-science score and undergraduate grade point average (GAP) as the best predictor variables of minority matriculants in the sample.

Analysis of the data in relation to study hypotheses resulted in the following findings:

1. There was a nonsignificant relationship between socioeconomic background and success in medical school and parental education and success in medical school. (Because of lack of available data, these results are based on the Student National Medical Association and American Association of Medical Colleges study, 1974).

2. There was a nonsignificant relationship between AP and PP and: size and location of undergraduate college, marital status, sex, undergraduate major, and graduate work.

3. There was a nonsignificant relationship between ethnicity and PP and a significant relationship with AP.

Based on these findings, it was recommended that more subsidy programs like the Minority Support Program be instituted to promote recruitment and retention of minority students in medical schools; that admissions committee members be more representative of ethnic groups; and that medical schools employ the early admission process so as not to lose quality minority applicants to other medical schools.

To my parents, Laura and William,

I dedicate this dissertation.

ACKNOWLEDGMENTS

My parents have always believed people are generally good. The cooperation received from my committee, Michigan State University College of Osteopathic Medicine, family, and many others in the completion of my dissertation have confirmed this belief. Words could never express my gratitude for their time and consideration.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction and Background of the Problem

> We observe and emphasize in this connection that the University is not required to choose between a racially neutral admission standard applied strictly according to grade point averages and test scores, and a standard which accords preference to minorities because of their race.
>
> In addition, the University may properly, as it in fact does, consider other factors in evaluating an applicant, such as the personal interview, recommendations, character, and matters relating to the needs of the profession and society, such as an applicant's professional goals. In short, the standards for admission employed by the University are not constitutionally infirm except to the extent that they are utilized in a racially discriminatory manner. Disadvantaged applicants of all races must be eligible for sympathetic consideration, and no applicant may be rejected because of his race, in favor of another who is less qualified, as measured by standards applied without regards to race. We reiterate, in view of the dissent's misinterpretation, that we do not compel the University to utilize only "the highest objective academic credentials" as the criterion for admission (ABA National Institute on Equal Opportunity Law in Higher Education, James Wilson--Senior Assistant Attorney General, State of Washington).*

The above quotation delivered by the majority opinion in the Bakke v. Board of Regents, University of California case (1976) points to the major issue underlying the focus of this dissertation: that it is time for the detrimental effects of racial discrimination in the area of higher education to be rectified and a new direction in commitment adopted. In deciding against Alan Bakke's charge that

*See Appendix A for a further discussion of this case.

he as a white man had been discriminated against in the admissions process at the University of California's School of Medicine because he had been rejected on the basis of race in favor of the acceptance of minority applicants less qualified than he, the California court system was striking a progressive blow for minority educational aspirations and potential in this nation--particularly in the field of medicine.

It is no secret that in applicant pools at the university level--especially at professional and graduate school--minorities* historically have been underrepresented. The reasons for this situation are many and diverse, but all find their essential focus in the fact that equal opportunity has been afforded primarily to the members of the majority (Neitzes & Elkhanialy, 1976). The result has been the minority group member's inability to secure for himself the fruits of educational training and its resultant employment options. The effects of such inequity are particularly notable in the field of medicine. (Although 15 percent of the United States population is composed of Black, Mexican, and Native Americans, less than 3 percent of United States physicians are members of these groups [Wharton, 1970]).

Currently, in the wake of Congressional studies of the feasibility of National Health Insurance, there has been some intense

---

*The term "minority" is used throughout this dissertation to refer to Black, Spanish-speaking (Mexican), and Native Americans as a group. However, because the research literature on the latter two groups is so scarce, information on Black Americans will usually serve as the reference point.

criticism of the health care delivery system in America (Yerby, 1966). A segment of that criticism has stressed the deplorable lack of adequate health care available to the poor and to minority groups, both in rural and urban areas. And that lack of care is clearly related to the admissions procedures in the nation's medical schools. There is a great need for physicians in minority communities--and, preferably, physicians who are themselves minority group members attuned to the cultural backgrounds and unique needs of their patient populations. (In black communities, for example, there are approximately 3,500 patients for every physician, whereas there is one physician for every 721 patients in white communities (Evans & Jackson, 1976).

Yet this need cannot be met until new goals are set at the professional schools level in terms of active recruitment and admission of minority group individuals. The Bakke case (the ultimate outcome of which still awaits Supreme Court decision) points to an effort in this direction. Yet it is an effort fraught with conflict and misinterpretation. This effort brings with it resentment from those members of the majority who find themselves, as Allan Bakke has, being bypassed for school admission, job hiring, and promotion in order to serve the ends of Affirmative Action Programs. These programs are often labeled "tokenism" or "quota filling" (Black Faculty viewpoint, 1978).

Despite conflict, the effort must be made. And, in fact, the small representation of minority groups in the matriculant population at American medical colleges (both allopathic and osteopathic)

has become an issue of national concern (Coleman, 1976) which has caused a rapid growth of programs aimed at increasing opportunities for minority students applying to these schools (Johnson, 1975). In the late 1960's both medical educators and students, responding to the moral and educational implications of a decade of social change, recognized the need for such programs and have, since that time, been reevaluating their policies and goals relating to admissions (Johnson, 1975).

This reevaluation, along with programs geared toward increasing minority recruitment, has not been highly successful. Thus, though in 1948 there were at least 26 medical schools which would not admit black applicants and that number was reduced to five by 1964 (Sullivan, 1975), during the decade from 1951-52 to 1961-62, when many racial barriers began to be lowered in this nation, the number of black students enrolled at predominantly white medical schools grew by a mere two students, from 162 to 164 (Evans, Jones, Wortman, & Jackson, 1975). Clearly, the statistics do not bear out the much praised and publicized attempts made by medical educators during the 1960's to compensate for past discrimination in medical college admissions.

Do the 1970's promise new commitment to affirmative action? It is observed, decisions like the one made in the Bakke case and in the case of Frank v. Bowman Transportation Company (1976) wherein the Supreme Court, dealing with the problem of seniority awards to persons discriminated against because of race, awarded retroactive

"competitive status" seniority to the plaintiffs, seem to indicate new hope.

The United States Supreme Court through numerous constitutional interpretations has not ruled against programs developed to increase the representations of minority group students in medical school, based on comments by the New York Supreme Court.

The Problem

In the realization of such a hope, however, new dilemmas arise. Thus, though there has been an increase in applications submitted by minorities to predominantly white medical schools (Elam, 1969), attempts must now be made to insure the admission of the most qualified of these applicants and, once admitted, to retain and graduate them. The task is a complex one.

Contributing to this complexity is the fact that most of the minority applicants have been educationally and socioeconomically deprived during their pre-professional years (Marshall, 1973). As a result, their scores on professional school entrance examinations generally fall below those of their white counterparts. If admitted, most are generally ill-prepared for the rigorous curriculum ahead. The problem is further intensified by the competition among schools for talented minority applicants. In addition, the less demanding educational requirements and higher financial rewards of careers in business provide yet another attraction for minorities who might otherwise choose to enter the health professions. Finally, should they bypass the business world's lucrative offers and decide to

attend medical school, minority group applicants, constrained by their economic background, find the funding of their education to be a serious problem as a result of the current cutbacks in federal loans and scholarship funds available as evidenced by current financial aid legislation.*

Another facet of the issue surfaces when one considers the variables used to determine admission into medical school, such as Medical College Admissions Test (MCAT) scores and college grade point averages (GPAs). It has been observed that, on the whole, students from minority groups do not perform as well as nonminority students with regard to such objective criteria (Korman, Stubblefield, & Martin, 1968; Gough, Hall, & Harris, 1968; Krista, 1970). And, in fact, "traditional" criteria may not accurately evaluate the potential of minorities whose backgrounds have been "untraditional" (Johnson & Rosenear, 1977). Interesting to note is that minority students, despite in some cases having lower MCAT scores and undergraduate GPAs, perform well in the didactic phase of medical school--a finding which has encouraged medical school admissions officers and educators to examine the predictive value of other nontraditional (noncognitive) criteria such as motivation, self-image, and ego-defense (Johnson, Smith, & Tarnoff, 1975). And their actions are supported by studies which show that tests like the MCAT have no predictive value for creativity or practical performance (Price,

---

*Health Professions Educational Assistance Act of 1976 (P.L. 94-484) on medical student financing, on indebtedness levels, and on career plans.

Calvin, Richard, & Jacobsen, 1974), and that students showing a great potential in basic sciences (as measured by GPA and the MCAT) are often aloof and very unlikely to practice medicine in areas of great need, e.g., the inner city or outlying rural areas where the need for adequate health care is so acute (Gough, Hall, & Harris, 1963).

The challenge here is a great one: to actively recruit and then evaluate for admission, via relevant objective as well as subjective standards, minority group individuals desiring a medical school education. Once admitted, such students require programs aimed at providing support, both academic and financial. In this light, the following objectives seem appropriate (Kickema & Wilham, 1972):

1. To identify talented black and other minority students who either have an interest in becoming health professionals or who might be enticed into health fields by an awareness of opportunities in health careers and the need for minorities in the health fields.
2. To provide guidance, counseling and encouragement to such students to insure their eventual enrollment into health professional schools.
3. To provide each student with academic support, especially in those subjects basic to medical study.
4. To provide orientation and motivational experiences for students interested in pursuing health careers such as conferences, films, tours of professional school, meeting with health professionals and professional students.
5. To provide jobs and financial assistance when possible to needy pre-professional students.
6. To educate disadvantaged communities to the necessity for such recruitment efforts and to involve representatives from those communities in the efforts.
7. To assist each student in making applications to professional school by simplifying the process as much as possible and by waiving erroneous application fees.
8. To provide counseling and assistance to each student in his request for financial aid and academic support resources after admission.

Focus of the Study

Several of the above objectives are being met at Michigan State University. A statement made by former university president, Dr. Clifton R. Wharton, Jr. (1970), indicates the goals of the college in this area:

> A final and extremely important principle which has been adopted at Michigan State University is the aggressive recruitment of minority students for admission to and graduation from the medical programs. Added to the recruitment program in the past year has been a preparatory program for educationally deprived and economically disadvantaged students who show a desire and aptitude for becoming physicians but who need special assistance before entering medical school.

Especially successful in the past several years in exemplifying Wharton's statement through its Minority Support Program--and thus serving as an appropriate model for this study--is MSU's College of Osteopathic Medicine (MSU-COM) which became a component college of Michigan State by act of the state legislature in 1969. Because MSU-COM is committed to assisting in the solution of the growing public demand for physicians who can provide wholistic and continuing health care to all members of the family, its curriculum is geared primarily to the training of family physicians. Training in osteopathic medicine prepares physicians to maintain a personal relationship with the patient and family as well as interact with the community environment. Because of this emphasis, this author believes the practice of osteopathic medicine to be particularly suitable for minority students whose services--as <u>family</u> physicians rather than specialists--are so desperately needed in this nation's urban areas.

Study Purpose and Methodology

The primary purpose of this study was to investigate the underrepresentation of minority groups in medical school and the performance of minority matriculants to MSU-COM, in an attempt to evaluate the shortage of minority group physicians and make recommendations for improvement and further research. Toward this end, this study examined the undergraduate records, MCAT scores, size and location of undergraduate (U.G.) college, marital status, sex, ethnicity, U.G. major, graduate work, and age of minority students admitted to MSU-COM during the years 1974, 1975, and 1976. Markert and West's study (1978) and SNMA and AAMC (1974) agree that variables warrant consideration in addressing the concerns of the study.

From a total student body (minority and majority) admitted to MSU-COM during those three academic years, the sample of minority matriculants was chosen: total number for the three years--50 (18 from 1974, 17 from 1975, 15 from 1976).* Each member of the population was then evaluated and placed in one of two groups: the group identified as minorities on academic probation (AP)** or not on AP.

Objective and subjective variables (described above) were then used to further examine the members of each group in an effort to arrive at predictors for academic success. Discriminant analysis

---

*This study did not recognize Orientals as members of the minority population as their numbers in the health profession as physicians are more than representative of the total U.S. Oriental population.

**Percentage of terms on academic probation.

was the method employed to determine which factors differentiate minorities on AP from those not on AP. Chi-square aided in the grouping of similar characteristics among minority matriculants, and trend analysis was utilized to discover trends in the data over the study period, such as whether or not there was a progressive difference in the quality of students admitted to MSU-COM over the three-year time span (1974-1976). The following hypotheses were used to address these concerns:

A_1 Socioeconomic background is related to success in COM.

A_2 Socioeconomic background is not related to success in COM.

B_1 The size and location of a four-year college is related to success in COM.

B_2 The size and location of a four-year college is not related to success in COM.

C_1 Parental education is related to success in COM.

C_2 Parental education is not related to success in COM.

1_a There will be no relationship between marital status and AP or PP.*

1_b There will be a relationship between marital status and AP or PP.

2_a There will be no relationship between sex and AP or PP.

2_b There will be a relationship between sex and AP or PP.

3_a There will be no relationship between U.G. college and AP or PP.

3_b There will be a relationship between U.G. college and AP or PP.

---

*Percentage of courses taken and passed.

4_a There will be no relationship between ethnicity and AP or PP.

4_b There will be a relationship between ethnicity and AP or PP.

5_a There will be no relationship between U.G. major and AP or PP.

5_b There will be a relationship between U.G. major and AP or PP.

6_a There will be no relationship between graduate work and AP or PP.

6_b There will be a relationship between graduate work and AP or PP.

7_a There will be no relationship between U.G. college characteristics and AP or PP.

7_b There will be a relationship between U.G. college characteristics and AP or PP.

Limitations of the Study

Although this study addresses the academic circumstances of three minority groups (Black, Spanish-speaking, and Native Americans) with regard to medical school admission and retention, the majority of the study subjects were Black. Moreover, as mentioned previously, there is very little research literature available on the other two groups; thus, literature on Black Americans had to serve as the reference point for general statements made about minority groups/students in America.

In addition, the sample used for this study was quite small (50 minority students admitted to MSU-COM between 1974 and 1976), a fact which, in itself, points to the necessity for a study of this kind. As a result, the recommendations and conclusions reached by this author can serve only as guidelines in future recruitment, retention, and counseling of minority students.

Definition of Terms

The following terms are defined in the context in which they are used in this study.

Academic probation (AP): The researcher employed this variable to distinguish between subjects who had experienced academic difficulty and those who had not experienced such difficulty.

Percentage of courses passed (PP): This variable identifies the percentage of courses in which a subject had successfully met course requirements.

Medical College Admissions Test (MCAT): An admissions examination required of all medical school applicants.

Minority Support Program (MSP): A support program developed by the College of Osteopathic Medicine, Michigan State University, to identify, recruit, and admit minority group students who aspire to be Doctors of Osteopathic Medicine.

Outline of the Study

Following this introductory chapter, Chapter II will review the research literature pertinent to recruitment and retention and financial aid available to minority group applicants to medical school. The chapter will also provide a description of MSU-COM and its admission and counseling procedure carried out through its Minority Support Program.

Chapter III contains a discussion of the methodology employed in this study, while Chapter IV presents and analyzes study findings. Finally, Chapter V offers conclusions based on these findings and

suggests possibilities for further research in this area. This writer is of the belief that data compiled for this study can be used to (1) serve as a background for further research into the influence of nontraditional admissions criteria for admitting minority students into colleges of allopathic and osteopathic medicine, (2) develop nontraditional models and techniques to assist in the medical schools' recruitment and retention of minority students, and (3) suggest ways that medical colleges can continue to upgrade their admission procedure for minority applicants (Gains, 1975; Gough & Hall, 1976; Feldman & Burnett, 1973; Plagge, Sheverbursh, Smith, & Solomon, 1974).

CHAPTER II

REVIEW OF RELATED LITERATURE AND MSU-COM's MINORITY SUPPORT PROGRAM

Introduction

Movements toward equal opportunity in higher education date back to the Morrill Act of 1862, which, as Austin (1971) indicates, was the legislation underlying the development of land grant colleges. Yet America's most visible minorities (Blacks, Chicanos, Native Americans) have benefited little from such movements. This is not to say, however, that all minorities have been excluded; Austin addresses this issue:

> Bright and able students who could not afford to go to college, whether white, black, American Indian, Spanish-speaking or whatever, were being sought by a growing number of colleges. But those whose past academic performance was poor represented a risk that very few colleges were willing to take [Emphasis mine.].

The academic establishment's reluctance to risk admittance of students with disadvantaged backgrounds has taken its toll, too, at the professional/graduate school level. Especially in medical schools (both allopathic and osteopathic), there is a real hesitancy to recruit and then admit minority students whose MCAT scores and GPAs fail to meet the standards set by admissions committees, the members of which, for the most part, belong to the majority group in this country.

Yet this hesitancy must be overcome if we are to meet the health care needs of all our population. And those needs are not now being met. In fact, a study by the American Public Health Association (1974) points to the obvious difference which exists in the health services provided majority and minority groups, a difference reflected in the small number of minority physicians. Yerby (1977) also indicates his concern for the lack of physicians in poverty-plagued areas in this country such as urban centers. Obviously, a key variable in the quality of health care one receives--as well as in one's aspirations to enter certain career groups--is one's income, a fact supported by the findings of a HEW study (1971) in 19 large U.S. cities (Selected Vital and Health Statistics in Poverty and Non-Poverty Areas). In discussions with segments of the population receiving little or no medical or preventive services, researchers for this study found that minority group members received lower ratings in six of the seven identified areas of health services. Such a deficiency was discovered to be related to both poverty and minority group status, though the former seemed to be the major contributing factor.

Clearly, as Gray (1977) points out with regard to this HEW study, the inequalities that exist in the health care system are the problem of all Americans since adequate health care is a constitutional right. And one of the ways to alleviate this problem is to increase the number of minority group physicians willing to serve in poverty-stricken areas. A study by Neitzes and Elkhanialy concluded that the proportion of minority physicians should be

equal to (at a minimum) their proportion in the U.S. population. Yet, presently, though minority groups compose approximately 15 percent of the total population, only 3 percent of all physicians are minority group members.

This chapter addresses that startling underrepresentation by reviewing literature relevant to the recruitment and retention of minority students by U.S. medical schools, specifically schools of osteopathic medicine. It discusses the situation as it exists, suggests measures for change, and, finally, presents an example of a program which has proven successful in terms of increasing the number of minority members in the total pool of U.S. physicians.

Recruitment and Admissions

The Issue of "Reverse Discrimination"

The Alan Bakke case, cited at the beginning of this study, presents one of the most stubborn obstacles to the admission of minority students to any higher education program: the issue of majority reaction to affirmative action policies aimed at promoting recruitment and admission of minority groups, often at the expense of a majority group individual. This reaction has found its focus in the majority cry of "reverse discrimination," a charge which was rejected by the Michigan State University Black Faculty and Administrators Association in its response to the implications of the Bakke case:

> Thirdly, we question the validity of such a concept as "reverse discrimination," a term that has found its way into the American vocabulary. There is either discrimination or there is not. Though the concept of reverse

> discrimination preceded Bakke, this case has highlighted it. Reverse discrimination seems to be a disguised way of saying that the rights and privileges enjoyed by the majority of the population, which were often gained by devious and in some cases illegal methods, are beginning to be infringed upon by non-whites in our attempt to make this country live out the true meaning of democracy [For the complete text of the Association's statement, see Appendix B.].

In their refusal to be intimidated by what could be termed majority "backlash," MSU's Black faculty and administrators have pointed the way to a realistic appraisal of university admissions standards. The real issue, then, is not "racism in reverse," but the establishment of a recruitment program aimed at attracting minority students and, at the same time, controlling attrition (Johnson, 1968; Gaines, 1975). And Gaines (1975) notes the current efforts of medical school administrators to reexamine their admissions criteria and revise strategies which will allow programs geared towards minority recruitment to continue without infringing upon the legal rights of Caucasians who make up the majority of the applicant pool.

Relevance of Cognitive Variables

Any revamping of admissions criteria must encompass certain areas. First, there is the issue of whether or not the objective variables of MCAT score + undergraduate GPA are adequate predictors of success in the medical school curriculum. In fact, it has been shown that some minority students, though not possessing as high an MCAT score and GPA as their majority counterparts, perform exceptionally well in the didactic phase (i.e., clinical segment) of their curriculum. The question here thus becomes whether or not the

possession of certain cognitive traits is more indicative of success as a physician than possession of noncognitive traits. (In the family/patient-oriented emphasis of osteopathic medicine the answer to this question is especially meaningful.) D'Costa (1974) summarizes a simulated Minority Admissions Exercise developed by AAMC which speaks to such nontraditional (noncognitive) predictors of minority students' success. Below is a series of recommendations for the selection process which arose from that exercise:

A. There is usually a lack of information in minority applications. Either the applicant has no experiences of the type he is asked about, or he does not remember them as significant.
B. Letters of recommendation tend to be non-discriminating and therefore not useful in selection.
C. In the regular admissions situation, using GPA and MCAT scores to pre-screen applicants before interviewing them may be defensible. With minority applicants the reverse technique should be used and is feasible because of the smaller numbers: that is, pre-screen with an interview designed to look for certain characteristics, then select on the basis of GPA and MCAT.
D. The following variables have been suggested for pre-screening:
    1. POSITIVE SELF-CONCEPT of confidence. Strong self-feeling; strength of character, determination, independence.
    2. UNDERSTANDS AND DEALS WITH RACISM. Realistic based upon personal experiences of racism. Is committed to fighting to improve existing system. Not submissive to existing wrongs, nor hateful of society, nor a "cop out." Able to fight racism.
    3. REALISTIC SELF-APPRAISAL, especially academic. Recognizes and accepts his/her individuality.
    4. PREFERS LONG-RANGE GOALS TO SHORT-TERM OR IMMEDIATE NEEDS.
    5. AVAILABILITY OF STRONG SUPPORT PERSON to whom to turn in crises.
    6. SUCCESSFUL LEADERSHIP EXPERIENCE in any area pertinent to background (gang leader, sports).
    7. DEMONSTRATED COMMUNITY SERVICE.
    8. DEMONSTRATED MEDICAL INTEREST. Has experience to back his claims.

E. Final selection considerations could include the following:
   9. ACADEMIC CAPABILITY RATING by pre-medical faculty.
   10. ACADEMIC ATTAINMENT (GPA).
   11. ACADEMIC CAPABILITY (MCAT).

Class Size and Admissions Statistics

Another issue related to admissions criteria is class size; according to Nelson (1967), recruitment efforts must address this obstacle to realistic minority admissions. In fact, this author agrees with Nelson's suggestion to increase class size in order to increase admission opportunities for minority applicants (and majority applicants as well). Along this same line, Coleman (1976) has suggested that minority recruitment should progress each year at the rate of growth of general class size. It would seem that if this suggestion were implemented along with Nelson's there might be less confusion and reaction about supposed "reverse discrimination" and "quota" filling.

It is appropriate at this point to actually take a look at some figures on medical school admissions, specifically admissions to osteopathic medical schools. Although the figures are encouraging, they still do not represent a total effort in the area. Tables 1 and 2 provide information on applications to and freshman class composition of nine colleges of osteopathic medicine in this country for the years 1974-1977.* Table 3 furnishes

*U.S. Colleges of Osteopathic Medicine: Chicago College of Osteopathic Medicine, Chicago, Illinois; College of Osteopathic Medicine and Surgery, Des Moines, Iowa; Michigan State University College of Osteopathic Medicine, East Lansing, Michigan; Oklahoma College of Osteopathic Medicine and Surgery, Tulsa, Oklahoma; Texas

Table 1.--Minority applications to U.S. colleges of osteopathic medicine, 1975-1977.

Year	Total	Minority	% Minority
1975-76	3,875	168	4.3
1976-77	4,214	220	5.2

Source: American Osteopathic Association, Office of Special Opportunities, 1977.

Table 2.--Minority composition of freshman class at U.S. colleges of osteopathic medicine, 1974-1977.

Year	Total	Minority	% Minority
1974-75	960	34	3.4
1975-76	1,027	56	5.4
1976-77	1,052	64	6.0

Source: American Osteopathic Association, Office of Special Opportunities, 1977.

College of Osteopathic Medicine, Fort Worth, Texas; Kirksville College of Osteopathic Medicine, Kirksville, Missouri; Ohio University College of Osteopathic Medicine, Athens, Ohio; Philadelphia College of Osteopathic Medicine, Philadelphia, Pennsylvania; West Virginia School of Osteopathic Medicine, Lewisburg, West Virginia.

Table 3.--Minority enrollment (by ethnic breakdown) in U.S. colleges of osteopathic medicine, 1974-1977.

	1974-75		1975-76		1976-77	
	No.	%	No.	%	No.	%
First-Year Enrollment						
Afro-American	26	2.7	23	2.2	26	2.4
American Indian	1	0.0	7	0.7	6	0.6
Mexican American	6	0.6	10	1.0	11	1.0
Oriental American	7	0.7	15	1.4	15	1.4
Puerto Rican (Mainland)	0	--	0	--	1	0.0
Other	2	0.2	5	0.4	1	0.0
First-Year Minority Total	42	4.3	59	5.7	60	5.5
Total Enrollment						
Afro-American	46	1.5	57	1.7	70	1.9
American Indian	11	0.4	13	0.4	16	0.4
Mexican American	11	0.4	23	0.7	26	0.7
Oriental American	15	0.5	27	0.8	42	1.1
Puerto Rican (Mainland)	1	0.0	0	--	1	0.0
Other	5	0.2	9	0.3	6	0.2
Total Minority Enrollment	89	2.8	129	3.7	161	4.4

Source: 1974-75 Fall Enrollment Questionnaire; 1975-76 and 1976-77 LCOI Questionnaires.

With the preceding information in mind, it is interesting now to examine Table 4, which offers a comprehensive look at admissions criteria for the 1978 beginning class at the nine U.S. Colleges of Osteopathic Medicine. Here class composition with regard to sex, residence, and ethnic status is presented along with figures on the cognitive admissions criteria of GPA and MCAT score. Data reflecting recruitment efforts at Michigan State University's College of Osteopathic Medicine (MSU-COM) can be found in the column labeled E.

Table 4.--Significant data on applications of candidates applying for admission to class beginning 1978 (U.S. colleges of osteopathic medicine).

	College									Total	
	A	B	C	D	E	F	G	H	I	N	%
Applicants Total	1,313	1,179	1,169	1,259	1,397	2,059	2,072	1,269	1,979		
Men	1,109	977	1,002	1,072	1,132	1,787	1,771	1,078	1,679	2,916	82.8
Women	207	202	167	187	265	272	301	191	300	606	17.2
In-state	284	294	74	271	592	84	132	281	216		
Out-of-state	1,029	885	1,095	988	805	1,975	1,940	998	1,763		
Minorities											
Black American	33	33	29	46	63	30	47	47	53	112	
American Indian	6	6	6	8	11	9	11	7	9	18	
Mexican American	10	10	7	19	14	13	14	10	11	24	
Oriental American	26	21	14	25	17	26	32	20	30	59	
P.R.--Mainland	4	4	0	0	0	2	3	1	1	4	
P.R.--Commonwealth	1	0	0	0	1	0	1	1	1	2	
Cuban	6	6	5	2	0	4	8	3	5	8	
Total Minority	86	80	61	100	106	84	116	89	110	227	6.4
GPA											
Overall	3.14	3.14	3.09	3.12	3.19	3.17	3.16	3.14	3.16	3.16	
Science	3.07	3.04	3.01	3.05	3.12	3.09	3.08	3.05	3.08	3.09	
Nonscience	3.24	3.22	3.18	3.21	3.27	3.26	3.26	3.25	3.26	3.25	
MCAT											
Biology	8	8	7	7	8	8	8	8	8	8	
Chemistry	7	7	7	7	7	7	7	7	7	7	
Physics	7	7	7	7	8	7	7	7	7	7	
Science	7	7	7	7	8	7	7	7	8	7	
Reading	8	7	7	7	8	8	7	7	8	8	
Quantitative	7	7	7	7	8	8	8	8	8	8	

Source: American Association of Colleges of Osteopathic Medicine, Application Service, 1978.

Status of Recruitment Efforts

A study by the Student National Medical Association and the Association of Medical Colleges (1973-74)--Recruitment and Progress of Minority School Entrants 1972-72--addresses several issues related to the recruitment efforts which create the statistics just cited. Conducted in order to evaluate activities aimed at increasing the representation of minority medical students, the study reports the following findings:

1. Confirmation that the racial characterizations self-reported by medical school applicants have a high degree of accuracy and increasing degree of completeness.
2. An encouraging increase in the number of black premedical students who will potentially apply for entrance to medical schools.
3. Growth in the enrollment of low-income medical students, most of it explained by the increase in the numbers of minority group members who have been admitted in recent years.
4. More mobility among blacks than Caucasians with regard to attending medical schools in other than their region of legal residence.
5. A higher proportion of women, of older, and of married students among minority medical school matriculants than among Caucasian matriculants.
6. A slightly higher medical school retention rate for Caucasians than for students from underrepresented minority groups, possibly explained in part by the greater diversity in the socioeconomic and educational backgrounds of the latter.
7. A positive relationship for blacks between the size of undergraduate college attended and successful completion of the first year of Medical School.

Recruitment Advice to Minority Students

Number six in the list of seven findings above points to one final issue to be considered here in this section on recruitment and admission of minority students to medical school (in the case of this study, a school of osteopathic medicine). That issue relates to the

retention prospects for such students once they are admitted. Recruiters can play a vital role in increasing these prospects prior to a student's admission by making the following suggestions to him:

Prior to Entering Medical School

1. In the process of obtaining a solid background of knowledge, develop effective study techniques.
2. If any remedial work is necessary (such as the improvement of reading skills), obtain such help as early as possible.
3. Recognize the importance of such nonintellectual qualities as integrity, social skills, and the ability to remain emotionally stable under pressure.
4. Seek early opportunities to test motivation for a career in medicine by experiences in related roles such as laboratory assistant, hospital aide, worker with the handicapped, and the like.
5. If a woman or if older than the average premedical student, recognize the related conflicts and difficulties and prepare in advance to compensate for them.
6. In choosing an undergraduate college, consider the quality of its premedical offerings and the number of its alumni admitted to medical school.
7. Learn as much as possible about what realistically to expect in medical school through such channels as the "Admissions Requirements Book," medical school catalogs, talks with medical students, and visits to medical centers; avoid decisions based on unsubstantiated myth, rumor, or speculation.
8. In choosing a medical school, consider its attrition rate along with such other important factors as its objectives, staff, facilities, costs, student personnel services, and faculty-student relations.

Retention

Priorities in the Process

A task force study of the Association of American Medical Colleges, the American Medical Association, and the American Hospital Association (1974) has made some additional suggestions about expanding educational opportunities in medical school for minority groups.

1. Major efforts should be focused on the problem of retention of minority students in programs which prepare them for careers in the medical profession. The most important factors in retention during premedical education are the availability of financial aid at the undergraduate level and the student's perception of its availability at the medical school level.
2. Similarly, the main barrier today for minority students in attending medical schools is the inadequacies of financial aid. Coincident with increasing enrollment of minority students in medical schools, federal government and other sources of funds have been decreasing. The need is urgent for reversing this trend and establishing better mechanisms for utilizing available funds.
3. Another critical factor in retention in recruitment of minority students in medical education programs is the provision to students of accurate information and counseling on the medical profession. Counseling should be directed to the efforts which will help the student to realize fully his potential and to gain the confidence needed to pursue a career in medicine.

These suggestions point to some priorities which must be adopted if minority students who are successfully recruited and admitted to medical school are to pursue their education with success. Those priorities would seem to include: efforts to control academic attrition, provision of adequate financial aid, the availability of counseling. Effective recruitment involves making prospective students aware that such priorities and their related services exist. Indeed, as Johnson and Hutchins (1966) maintain, the acceptance of any student to medical school who fails to graduate is a disservice to society, to the school, to other applicants, and, most of all, to the respective student.

Efforts to Control Attrition

Each medical school has an obligation to create a supportive environment which aids the student in overcoming both personal and

academic problems. An abundance of literature exists concerning the medical student and his learning environment which addresses the issue of stress-induced unhappiness and dissatisfaction with medical education. Funkenstein (1975) has identified 11 problem areas for the student: difficulty orienting to the medical school environment, competition, lack of leisure time, loss of close student-faculty relations, decreased caliber of teaching, inflexibility of curriculum, lack of relevance of preclinical years, conflicting demands, teaching of anachronistic skills and values, prolonged dependency, and lack of adequate finances (see also Boyle & Coombs, 1974; Bloom, 1971; Rosenberg, 1971).

Such problems can be especially acute for the entering minority student. In fact, Hattenschiveller (1971) claims that when a majority student is admitted to college, if his initial experience is negative, he can effectively adjust due to his academic and social preparation. On the other hand, a minority student who, in many cases, is the product of inadequate preparation will find the adjustment process much more difficult. It is essential that there be a sensitivity to this fact among medical school administrators and faculty, and that sensitivity should lead to the development of a climate which equalizes learning resources. This climate becomes a reality in several ways.

One way is through the establishment of advisement/assistance programs responsive to the special concerns and needs of minority students. These programs can include tutorials and informal study groups. In addition, there should be a close monitoring on a daily,

weekly, and monthly basis of the academic progress of minority students, and counseling services, for personal as well as academic problems, should be readily available to them. Of significance, too, is the need for an increased number of minority role models at predominantly white institutions (Franklin, 1974), i.e., an increase in the hiring of minority faculty/staff to serve as objects of identification for minority medical students.

Another way to improve a medical school's learning environment so as to promote retention of students is to encourage the student himself to take certain steps. D'Costa (in press) gives the following advice:

1. Give medical school a fair trial; recognize that it is normal to have occasional doubts as to whether one is in the right field or whether one will be able to meet successfully the demands of a medical education. Do not make a premature decision to drop from the program.
2. Devote adequate time and effort to your medical studies, with the knowledge that there will be little opportunity for part-time employment or extracurricular activities in most medical schools particularly in the first year.
3. Organize as balanced a life as possible, insuring adequate rest and relaxation to maintain your physical and emotional health.
4. If difficulties are encountered, take the initiative and be persistent in seeking help from the faculty, administration, or supporting services such as tutoring, counseling, and financial aid.
5. If the opportunity to repeat a year presents itself, take advantage of it in the knowledge that a high proportion of repeaters finally receive the D.O. degree.

The Dilemma of Financial Aid

One of the most serious problems confronting the medical student--minority and majority member alike--is the securing of financial support. Indeed, with the increased costs of medical

education, medical schools, both allopathic and osteopathic, are being forced to raise tuition, and financial aid for all students, and, specifically, for minority and disadvantaged students, is becoming a critical issue. The economic position of minority groups in this society has made it difficult for minority families to finance their children's medical education. In fact, Neitzes and Elkhanialy (1976) point out that with the increase in the number of minority medical students there has been a decline in the percentage of those relying on personal or family funding and a corresponding rise in the number and percentage of students who had to rely on government funds or on sources other than the family. And this in a period of time when government is cutting back in its funding efforts.

Clearly, the situation is serious. And medical schools have an obligation to alleviate it. There are several ways to do so. First, it is suggested that medical schools adopt a policy of waiving application fees for those in need. It is no secret, as Johnson, Smith, and Tarnoff (1975) point out, that the more medical schools the student applies to, the greater the likelihood of his acceptance. Also no secret is the fact that to apply to several schools becomes a very expensive process; precious financial resources should not be so wasted.

Once past this barrier and admitted to a medical school, the student should be made aware of all possible sources of monetary support: Public Health Service scholarships, Equal Opportunity Program fellowships, guaranteed student loans, etc. And he should be discouraged from incurring unnecessary debts.

MSU-COM: A Case Study in Success

MSU-COM's History

The College of Osteopathic Medicine at Michigan State University is quite unique when compared to the three other Michigan-based schools training physicians in that it is the first college of osteopathic medicine to be state supported and located at a university. The Michigan legislature established this institution in 1969, which makes MSU-COM the first osteopathic school developed in 50 years. Prior to settling on the MSU campus, the college was based in Pontiac, Michigan. It had been established there as the result of an effort to address the shortage of physicians within Michigan; during this initial period COM was privately chartered by the Michigan Association of Osteopathic Physicians and Surgeons.

In 1971 MSU-COM enrolled its first class in a program designed to train individuals able to provide comprehensive health care. Upon completion of the COM curriculum (which comprises three years instead of the traditional four), these physicians are awarded the Doctor of Osteopathic Medicine degree. For surrounding hospitals and clinics the college has been a source of medical manpower. Many of these facilities serve as cited for clinical rotations, the major activity of the third year of study. Myron S. Magen, D.O., past president of the American College of Osteopathic Pediatricians, has served in the capacity of Dean since the development of this college.

MSU-COM shares teaching and laboratory facilities with the allopathic College of Human Medicine also located on the Michigan State University campus. COM classes generally number 100 in size and

its faculty is comprised of Ph.D.s in various scientific areas (i.e., biochemistry, anatomy, etc.) and practicing D.O.s and M.D.s who teach on both a part- and full-time basis.

See Appendix C for a listing of MSU-COM's admissions requirements, a summary of admissions criteria and policies, a description of the evaluation and selection process, and a sample three-year curriculum.

MSU-COM and Affirmative Action

> Freedom is not enough. You do not wipe out scars of centuries by saying "Now you're free to go where you want and do as you desire." You do not take a person who for years has been hobbled by chains and liberate him, bringing him up to the starting line of a race and say "You're free to compete" and justly believe that you are completely fair. All of our citizens must have the ability to walk through those gates; and this is the next and most profound stage of the battle for civil rights.

These words by the late President Lyndon B. Johnson spoken in 1975 at Howard University point to a goal MSU-COM has set for itself: to eliminate discriminatory practices that had become historical obstacles to equal admission opportunities for minority group individuals desiring to pursue their education. In order to reach this goal, the College formally established an Affirmative Action Committee* on July 11, 1973, with the following objectives:

1. Advise the Dean with respect to the adoption and implementation of policies designed to bring about or maintain equal opportunity in education and employment within the College. This aspect of the mission is premised upon the candid admission that much remains to be accomplished before women and members of ethnic minorities can routinely expect such opportunity.

---

*In 1976 MSU-COM dissolved the Affirmative Action Committee.

2. Advise the Dean with respect to measures to be taken to recruit representative numbers of these groups as student, faculty and staff within the College; and with respect to measures to establish and maintain equal opportunity for those already within the College family. The Committee will function within the policies set forth by the College of Osteopathic Medicine and Michigan State University. It is not the intent of the Committee to usurp the prerogatives of the department chairpeople but to aid and assist them in a meaningful affirmative program. In those instances where the Committee can be of assistance to various units within the College, they stand ready to be of use.
3. Investigate complaints which allege denial of equal opportunity because of membership in or of these groups; inform all parties to the complaint promptly as to the nature of the complaint; prepare preliminary findings, and recommendations for remedial action by the Dean.
4. Conduct periodic conferences with the principal Departments and Committees of the College, for the purpose of exchanging information and opinions relative to achievement of equal opportunity throughout the College.
5. Record minutes of meetings; prepare an annual report for distribution throughout the College.

Opposed to such objectives, of course, has been the majority cry of "reverse discrimination." The statement by Wicker (1975) below is a response to such a cry, a response which reflects the attitude of this author.

> White males once shut out women and minorities from faculties and student bodies in a deliberate, systematic, discriminatory manner. It cannot reasonably be said that white males are being shut out in anything remotely resembling the same manner or approaching the same numbers. They must finally share the opportunity to access to those institutions, and compete fairly; for the access is not "racism in reverse" or "sexism in reverse," but simple justice, long overdue.

The Minority Support Program (MSP)

A primary objective in the development of MSP was to select a diverse student body which would increase the enrollment of minority students (Blacks, Chicanos, Native Americans). In addressing this

objective, the MSP* was developed in 1974 and charged with the task of making minority communities aware of the osteopathic profession and its commitment to community service. A major emphasis was placed on recruitment, but, as indicated by Coleman (1977), this was only one element of the support services provided by the MSP.

Historical perspective of the MSP.--MSU-COM was allocated financial support (1969-1976) from the Special Project Grants for purposes of increasing and diversifying its student body, enlarging its faculty, and curriculum improvement.

The fifth year (1974-75) constituted a change in priorities, which was a commitment to increase the underrepresentation of minority matriculants. This commitment spoke to recruitment, counseling, and creating alternatives to the regular curriculum; e.g., shortening the time period in which the program could be completed.

MSU-COM, with an institutional commitment and financial support, implemented a program which spoke positively to the need for minority physicians--the MSP. Its accomplishments summarize the recruitment, counseling, and admissions success experienced through these efforts. The counseling aspect served to increase opportunities for minority matriculants within COM.

In Chapter II the writer has provided additional information regarding the success of MSP.

---

*The MSP was operative for the 1974-75, 1975-76, and 1976-77 academic years. During 1977-78 its services are being integrated into the total college program of student services.

Recruitment.--As stated, a primary goal of MSP was to develop a mechanism which would identify and recruit minority students to the profession of osteopathic medicine. To achieve this goal, minorities residing in communities having a large minority population were invited to attend presentations and were sent numerous mailings concerning the profession. (See Appendix D for sample mailings.) Additional activities listed below aimed at meeting this objective involved a tremendous amount of written and verbal communication:

1. Contact minority pre-medical organizations to arrange presentations and provide literature.
2. Contact pre-medical advisors at state and out-of-state colleges and universities having a large minority population.
3. Contact minority D.O.s.
4. Supply health organizations with literature.
5. Involve COM matriculants.

In line with such recruitment efforts, MSU-COM staff actively sought to recruit minority applicants. In fact, in MSP's three-year existence 70 visits were made to Michigan institutions for this purpose. The first of the two tables below (Table 5) gives general information about the number of visits made to public and nonpublic institutions during 1975, 1976, and 1977; the second table (Table 6) identifies the institutions specifically.

Table 5.--Michigan institutions visited by MSU-COM for recruitment purposes, 1975, 1976, 1977.

Year	Public Four-Year Institutions	Public Two-Year Institutions	Nonpublic Institutions	Total Visits
1975	12	4	16	32
1976	11	3	9	23
1977	11	1	3	15
Total	34	8	28	70

Admissions.--As a result of recruitment objectives and efforts discussed above, MSU-COM increased the number of minorities in its applicant pool. Although the College does not operate with a defined quota system, it does use as a guideline for equitable representation of minorities in its entering classes the portion of minority individuals in the state relative to the Michigan population at large. (Example: If 15 percent of the population is composed of minorities, the College should make every effort to admit that same percentage of minority students.)*

*The following breakdown of Michigan's population by ethnic group was reported in the 1970 Michigan Census report:

Total Michigan Population	White	Total Minority Population	Black
8,875,083	7,833,474	1,041,609	991,066

Other Races					
Total	Native Amer.	Japanese	Chinese	Filipino	All Other
50,543	16,854	5,221	6,407	3,657	18,404

Table 6.--Frequency of recruitment visits made by MSU-COM to Michigan institutions, 1975, 1976, 1977.

	Visited in:		
	1975	1976	1977
Public Four-Year Institutions			
Central Michigan University	x	x	x
Eastern Michigan University	x		x
Ferris State College	x	x	x
Grand Valley State Colleges	x	x	x
Michigan State University	x	x	x
Oakland University	x	x	x
Saginaw Valley College	x	x	x
University of Michigan--Ann Arbor	x	x	x
University of Michigan--Dearborn	x	x	x
University of Michigan--Flint	x	x	x
Wayne State University	x	x	x
Western Michigan University	x	x	x
Public Two-Year Institutions			
C. S. Mott Community College	x	x	
Highland Park Community College	x		
Kalamazoo Valley Community College		x	
Wayne County Community College	x		x
Schoolcraft College		x	
Nonpublic Institutions			
Adrian College	x		
Albion College	x	x	
Alma College	x	x	
Aquinas College	x	x	x
Calvin College	x		
Cleary College	x		
General Motors Institute	x		
Hillsdale College	x	x	
Hope College		x	
Madonna College	x		
Mercy College	x	x	x
Nazareth College	x		
Northwood Institute	x		
Olivet College	x		
Shaw College	x	x	
Siena Heights College	x		
Spring Arbor	x	x	
University of Detroit		x	x

Tables 7, 8, and 9 below present actual admissions figures for MSU-COM. Table 7 gives class composition figures for 1971-1976, while Table 8 breaks down the actual ethnic composition of minorities enrolled in the College from 1971-1975. Table 9 furnishes an indication of how many minority students were actually admitted from the available minority applicant pool from 1974-1977.

Table 7.--MSU-COM majority-minority enrollment, 1971-1976.

	1971-72	1972-73	1973-74	1974-75	1975-76	Total
Majority students	35	63	68	67	79	312
Minority students	2(5%)	6(9%)	8(10.1%)	18(21%)	17(17%)	51
Total	37	69	76	85	99	367

Table 8.--Ethnic enrollment breakdown, MSU-COM, 1971-1975.

	Black American	American Indian	Chicano	Total
Male	21	3	9	33
Female	13	0	2	15
Total	34	3	11	48

Table 9.--Minorities applying versus minorities admitted to MSU-COM, 1974-1977.

School Year	# Minorities Applying	# Minorities Admitted	Total Students Admitted
1974-75	70	18	85
1975-76	80	17	99
1976-77	103	15	100
Total	253	50	284

Of the 253 minority applicants who applied to MSU-COM, 50 (20 percent) were admitted. Of the 284 students admitted during this three-year period, minority students (50) represented 17 percent of the MSU-COM class.

Retention and financial aid.--MSU-COM's MSP backed up its recruitment and admissions policies with a program aimed at retaining and successfully graduating the minority students it admitted. This program was oriented around meeting the following objectives:

1. Provision of academic advisement/assistance programs responsive to special concerns, needs, and problems of ethnic minorities.
2. Institution and development of a tutorial assistance program to aid students in improving learning skills.
3. Organization of informal study groups to facilitate a sharing of strengths to resolve academic weaknesses.

4. Monitoring of daily, weekly, and monthly academic progress of students to evaluate every aspect of student performance.
5. Improvement of the learning environment along with insistence on academic excellence and the need to work with the system.

The counseling component of MSP, implied in the first objective above, was designed in an effort to minimize the feeling of alienation experienced by a number of minority matriculants. This component used a buddy system to assist incoming students through the critical adjustment period. In essence, it was this system that helped the students develop an awareness of available resources necessary to meet the academic expectations of MSU-COM. Coleman (1975) claims that in counseling minority students the MSP staff stressed the importance of (1) class attendance, (2) completion of all course assignments, (3) effective use of study time, and (4) a balance of study and leisure time.

In line with these emphases was the early entrance programs established by MSP to provide incoming minority students with motivational and psychological support. Staff and faculty members made presentations relative to their areas of responsibility and addressed the College's grading and testing procedures and academic expectations. The program also utilized educational consultants, who directed workshops on study skills. First- and second-year students

organized the program around areas of concern which affected them when first admitted.

Finally, students experiencing academic difficulty were able, through MSP, to receive free tutorial assistance. And, most important, this service was made available without being stigmatized as an indication of failure (Coleman, 1976). In addition, MSU-COM, through MSP, attempted to alleviate any financial problems experienced by its minority students by providing them with all the necessary information on aid available through Public Health Services scholarships, Equal Opportunity Program fellowships, guaranteed student loans, etc.

Program Successes and Areas for Improvement

As a result of its commitment to affirmative action, MSU-COM achieved several milestones in the three years during which the Minority Support Program was in operation under the leadership of Don Coleman, Ph.D. These included the following:

1. Fifty ethnic minority students were admitted to MSU-COM from 1974 to 1976.
2. The College has maintained a 15 percent minority enrollment since its inception.
3. The College has provided survival mechanisms such as counseling, academic advisement, and tutorial services for minority students.
4. Of the 50 minority students admitted from 1974 to 1976, only six have been recessed because of academic reasons.

5. Basic and clinical science faculty and college administrators were involved in various aspects of program development and implementation.
6. Community groups, such as the Michigan Osteopathic Society, were supportive of financial, recruitment, and retention efforts.
7. Minority legislators were involved in monitoring progress of the program.
8. The College's commitment to provide a physician pool for diverse groups in Michigan and the larger society was the "foundation stone" of its program.

Such successes should not overshadow the need for improvement in certain areas, however. First of all, the MSP was discontinued in September 1977 due to budget restraints within the College itself and the Department of Health, Education, and Welfare's refusal to extend the project grant for the program. Although MSP services have been incorporated into the services provided all MSU-COM students by the College's Division of Student Affairs, it is important that the College not lose sight of MSP's goals and accomplishments.

Second, in terms of the need for minority students to have role models in positions of authority and influence, MSU-COM is lagging far behind. In fact, Coleman (1977) reports that during the past four years, the faculty has been expanded from 55 to 112 full-time members; of that number, only four are minorities (two employed solely by the College and two on joint appointment with another department in the university at large). There are no minority

D.O.s among the 250 unpaid osteopathic physicians who donate approximately 16,000 hours annually for supervision of off-campus clinical education. (See Table 10 below.)

Table 10.--MSU-COM faculty appointments, full and part time.

	Solely[a] and Jointly[b]	Solely Only	Jointly Only	D.O.[c]
Total faculty	112.5	69.07	43.48	31
Female faculty	20.5(18%)	13.50(19%)	7.00(17%)	1(7%)
Minority faculty	4.0(.035%)	2.00(.028%)	2.00(.046%)	0(0%)

[a]Solely: appointed by MSU-COM alone (full time).

[b]Jointly: shares appointment with other department at MSU (part time).

[c]D.O.: osteopathic physician employed full time.

CHAPTER III

STUDY DESIGN AND METHODOLOGY

Study Design

The primary purpose of this study was to determine whether the recruitment and retention services provided by MSU-COM's Minority Support Program contributed to minority students' successfully completing their graduate program. Toward this end, this researcher examined the undergraduate records, MCAT scores, undergraduate GPAs, size and location of undergraduate college attended, marital status, sex, ethnicity, undergraduate major, graduate work, and age of the 50 minority (Black, Chicano, Native American) students serving as the study sample (the total number admitted in 1974, 1975, and 1976) and divided them into two groups: those who were successful in the program and those who were not. These groups and their characteristics then served as a basis from which to ascertain predictors for student success and failure at MSU-COM. The following hypotheses were used to address these concerns:

A_1 Socioeconomic background is related to success in MSU-COM.

A_2 Socioeconomic background is not related to success in MSU-COM.

B_1 The size and location of a four-year college is related to success in MSU-COM.

B_2 The size and location of a four-year college is not related to success in MSU-COM.

C_1 Parental education is related to success in MSU-COM.

C_2 Parental education is not related to success in MSU-COM.

1_a There will be no relationship between marital status and AP or PP.

2_a There will be a relationship between marital status and AP or PP.

2_a There will be no relationship between sex and AP or PP.

2_b There will be a relationship between sex and AP or PP.

3_a There will be no relationship between undergraduate college and AP or PP.

3_b There will be a relationship between undergraduate college and AP or PP.

4_a There will be no relationship between ethnicity and AP or PP.

4_b There will be a relationship between ethnicity and AP or PP.

5_a There will be no relationship between undergraduate major and AP or PP.

5_b There will be a relationship between undergraduate major and AP or PP.

6_a There will be no relationship between graduate work and AP or PP.

6_b There will be a relationship between graduate work and AP or PP.

7_a There will be no relationship between undergraduate college characteristics and AP or PP.

7_b There will be a relationship between undergraduate college characteristics and AP or PP.

Sample Selection

The sample for this study included all minority matriculants to the Michigan State University College of Osteopathic Medicine (MSU-COM) during the 1974, 1975, and 1976 school years. From a total

population of 85 students in 1974, 99 students in 1975, 100 students in 1976, a total of 50 ethnic minority students were selected for study. All minority matriculants admitted during the period of this study were included in the sample in order to assure a large enough sample (minority matriculants make up less than 17 percent of the total student body). The sample of ethnic minority students was further divided into male and female categories.

Table 11 provides detailed recruitment results for MSU-COM over the three-year study period. Thirty-four Blacks, 13 Chicanos, and 3 Native Americans were admitted from 1974 to 1976, figures which, though small, cannot be matched by any other U.S. college of osteopathic medicine.

Table 11.--The sample by ethnic breakdown, 1974, 1975, 1976.

Ethnic Group	1974			1975			1976		
	M	F	T	M	F	T	M	F	T
Black	8	6	14	5	4	9	9	2	11
Chicano	4	0	4	4	1	5	4	0	4
Native American	0	0	0	2	1	3	0	0	0
Total	12	6	18	11	6	17	13	2	15

The mean age of the total sample, 27 years, can be noted in Table 12, which clearly reveals that the older minority student is looked upon favorably (the low age is 20, the high, 43). Clearly, the age factor does not affect MSU-COM's decision to admit an older minority student. The concern for the college is the length of time between a student's application and the last time he was enrolled as

a full-time student. The table also points out that minority women are generally older than men at the time of admission.

Table 12.--Age statistics for minority matriculants, 1974, 1975, 1976.

Group	Count	Mean	Standard Deviation	Minimum	Maximum
1974	18	27.9444	6.5031	20	43
1975	17	25.0588	4.6834	20	40
1976	15	27.1333	6.0694	20	39
Total	50	26.7200	5.8241	20	43

Table 13 furnishes information on the residency status of the 50 admitted minority students. In fact, the residency requirement was an important factor in determining recruitment priorities since these ethnic groups are underrepresented in the Michigan medical profession and their communities unserved as a result of this shortage.*

Table 13.--Minority residency status, 1974, 1975, 1976.

	Black		Chicano		American Indian	
	In-state	Out-state	In-state	Out-state	In-state	Out-state
1974	10	4	2	2	0	0
1975	8	1	2	3	3	0
1976	5	6	1	3	0	0
Total	23	11	5	8	3	0

*Because MSU-COM is part of a state institution, it has a responsibility to the citizens of Michigan to admit primarily Michigan residents. In fact, it is the trend among all state-supported medical schools to make the majority of their admitted students state residents.

Thirty-one of the 50 students were legal residents of Michigan. Chicanos are the only group represented by a larger out-of-state number, and this is due to the fact that within the state of Michigan the drop-out rate at the secondary level (high school) is so high (Knickerbocker, 1978).

Measures of Academic Performance (AP and PP)

In attempting to divide the sample group into successful and unsuccessful students in terms of academic performance, this writer utilized two measures: percentage of academic quarters on probation (AP) and percentage of courses passed (PP). To determine percentage of courses passed, the total number of classes taken was divided into classes in which a pass grade was earned. When total number of quarters enrolled in MSU-COM was divided by the number of quarters on academic probation, the percentage of quarters on probation was attained.

It is interesting to note at this point with regard to retention rates that MSU-COM employs a pass-no grade system in an effort to create a more relaxed atmosphere. The philosophy behind such a procedure is based on the College's belief that if students are not concerned with class ranking there is a greater likelihood of their working together as a family (Boyle & Coombs, 1974). Such a notion clearly reflects MSU-COM's wholistic approach to education and its concern that a student not be hampered in his efforts to perform by fierce competitiveness and fear of failure. The belief is that:

1. A pass-no grade system will not give students a numerical rank, which seems to be important to high academic achievers.
2. A numerical grading system seems to warrant more individual and less group studying, a general lack of sharing information.

The key word in defining the pass-no grade system is competency level. This can best be explained by the following protocol for Anatomy 565, outlined by course coordinator Allen W. Jacobs, Ph.D.:

A. Medical students will receive the grade P or N upon completion of all examinations in Anatomy 565.

   P = a final course average of 85% (340 points) on all examinations and no score less than 75% (60 points) on any unit examination.
   N = a final course average of less than 85% (60 points).

B. A specific remedial program will be recommended for a student who receives the grade N. This may include enrollment in a directed studies (special problems) course or re-enrollment in ANT 565.

The following tables (Tables 14 and 15) furnish statistics on the results of such an approach for the 50 minority students admitted to MSU-COM in 1974, 1975, and 1976.

Table 14 distinguishes among members of the minority sample by using percentage of terms on academic probation (AP). There were 24 students who were never on academic probation during the period of this study, which accounts for 48 percent of the sample. The remaining 52 percent were on AP at least 8 percent of their quarters in attendance. The number of quarters enrolled in MSU-COM divided by the number of quarters on AP will compute the percentage of

quarters a student was on AP. Since the distribution "broke" in this manner, it was decided to dichotomize the AP variable and subject it to a discriminant analysis. (This technique is described on page 51.)

Table 14.--Percentage of terms on academic probation (AP).

% of Terms on Academic Probation	Frequency (# of Students)	Relative Frequency (% of Sample on AP)
0	24	48
8	2	4
13	2	4
17	3	6
20	2	4
25	1	2
33	1	2
40	1	2
42	1	2
50	1	2
58	1	2
67	2	4
75	2	4
80	1	2
90	1	2
91	1	2
100	4	8
Total	50	100

Table 15 distinguishes among members of the minority sample by using percentage of courses passed (PP). There were 27 students who passed 94 percent of their courses, which accounts for 54 percent of the sample. The remaining 46 percent passed less than 94 percent of courses taken; two of these passed less than 50 percent of courses taken. The number of classes passed divided by the total number of

Table 15.--Percentage of courses passed (PP).

Percentage of Classes Passed	Frequency (# of Students)	Relative Frequency (% of Sample Passing Courses)
14	1	2
47	1	2
63	1	2
71	1	2
73	2	4
75	1	2
76	1	2
80	1	2
81	1	2
84	1	2
85	1	2
87	1	2
87	1	2
88	1	2
88	1	2
89	1	2
90	1	2
91	1	2
91	1	2
92	1	2
92	1	2
93	1	2
94	1	2
94	1	2
94	1	2
94	2	4
95	1	2
95	1	2
95	1	2
95	1	2
97	1	2
97	2	4
98	1	2
98	1	2
98	1	2
98	1	2
100	11	22
Total	50	100

classes taken will compute the percentage of courses passed (PP) by a student. In order to make the analysis of PP consistent with that of AP, it was decided to dichotomize this variable as well. In fact, in the case of both variables, AP and PP, such dichotomizations will make the data analysis more immediately comprehensible in that the mean differences on the predictor variables will be coefficients (in a regressions analysis).

Analysis Procedures

Certain statistical techniques were applied to the data just cited. Those techniques are described below, and the rationale for their use in this study is provided as well.

Chi-Square

The chi-square technique tests the statistical significance of the relationships between discrete variables and looks at the difference between the actual count in the respective cell and the count which is expected purely on the basis of chance. If there is no relationship between the variables, these counts should be almost equal, and the chi-square value in this case would be small. However, if there is a relationship between the variables, the count should differ and the chi-square value should be large.

The writer used chi-square to best determine the significance of the variables tested. For example, Table 38 in Chapter IV indicates the number of males and females who were or were not on AP. The chi-square value of .01924 and the associated significance level

of .8877 show that sex and academic probation are not significantly related. In contrast, a large chi-square value and a small significance level would indicate a statistically significant relation between the variables.

A similar comparison identified differences between minority matriculants. The two most important assumptions of the chi-square test for contingency were:

1. Observations should be randomly sampled from the population of interest.
2. Observations should be independent.

In this study the entire population was sampled, and the observations on all variables were independent of each other. When characteristics being considered are continuous variables that have been categorized, as in this study, the chi-square test will yield the best results. Borg and Gall (1973) also point out that this method is probably the most frequently used in casual comparative studies.

Discriminant Analysis

Another statistical technique used to examine the data and define relationships among the variables listed at the beginning of this chapter was discriminant analysis in which predictor variables that differentiate between two or more groups are determined. Here the analysis was conducted to establish which predictor variables best discriminated between the 26 matriculants who were on AP for one or more terms and those who were not. This method will also

yield discriminant weights which can then be used to multiply an applicant's scores on the admissions variables. By substituting discriminant weights:

C_1 = discriminant weight for MCAT-science (Medical College Admissions Test science score)

C_2 = discriminant weight for U.G. GPA (undergraduate grade point average)

C_0 = a constant term

An equation was developed to predict academic success of minority group matriculants.

$$Z_{D.F.} = C_1 \text{ (MCAT-Sci)} + C_2 \text{ (U.G. GPA)} - C_0$$

$Z_{D.F.}$ = Discriminant function score

When the above equation was employed, a discriminant function was computed for each student in the sample. Next the student was classified in the group with the mean discriminant score which was closest to the score of that student. For example, if the student's score was closer to the mean of the AP group, the student was classified in that group.

Table 16 gives the discriminant weights for MCAT-science (.927) and U.G. GPA (.293) used in predicting academic success. The standard discriminant weight column provides this information as it relates to the other variables listed. The writer notes that the weights for MCAT average, U.G. science GPA (undergraduate science grade point average), and age could not be computed as their significance was small. Consequently, these variables were of little

significance; as Klecka (1975) states, the size of the weights is proportional to the predictive value of the variables receiving consideration.

Table 16.--Results of discriminant analysis of percentage of terms on academic probation (AP).

Predictor Variable	Difference	(Univariate) F Ratio	Sig.	Std. Discrim. Weight	Sig.
MCAT Science	104.00	18.17	.01	- .927	.00
U.G. GPA	0.14	2.35	N.S.	- .2930	.10
MCAT Quantitative	69.00	9.03	.01	- .211	N.S.
MCAT General	50.00	4.93	.05	- .154	N.S.
MCAT Verbal	43.00	3.56	.10	.077	N.S.
U.G. Non-Sci. GPA	0.17	2.84	.10	- .072	N.S.
MCAT Average	67.00	14.06	.01	--	--
U.G. Science GPA	0.13	1.71	N.S.	--	--
Age	-2.00	1.29	N.S.	--	--

Key: MCAT = Medical College Admissions Test
U.G. = Undergraduate
GPA = Grade Point Average

The difference column in Table 16 shows the difference in the means for the two groups of minority students in the sample. For example, students not on AP scored an average of 104 points higher on MCAT-science than students on AP. Univariate F ratio tested the significance of difference between the mean of both groups. The next column addresses the statistical significance of this difference (e.g., the difference in mean scores on MCAT-science is significant

at the .01 level). The third and fourth columns give the discriminant weights and their levels of statistical significance.

Trend Analysis

A trend analysis was utilized to determine if there was a significant difference in the means of the variables. This analysis identified any such trends that might predict student performance. Table 17 is an example of a curvilinear trend (illustrated in Figure 1) of the sample's undergraduate (U.G.) science GPA; that is, the mean of each entering class did not increase as compared to the same mean for the prior class.

Table 17.--Trend analysis: Science GPA, 1974, 1975, 1976.

Group	Count	Mean	Standard Deviation
1974	18	2.6978	.2952
1975	17	2.9688	.4134
1976	15	2.8160	.2800
Total	50	2.8254	
Total Group			3.487
Group	1974	1976	1975
Mean	2.6978	2.8160	2.9688

Figure 1 illustrates a curvilinear trend.

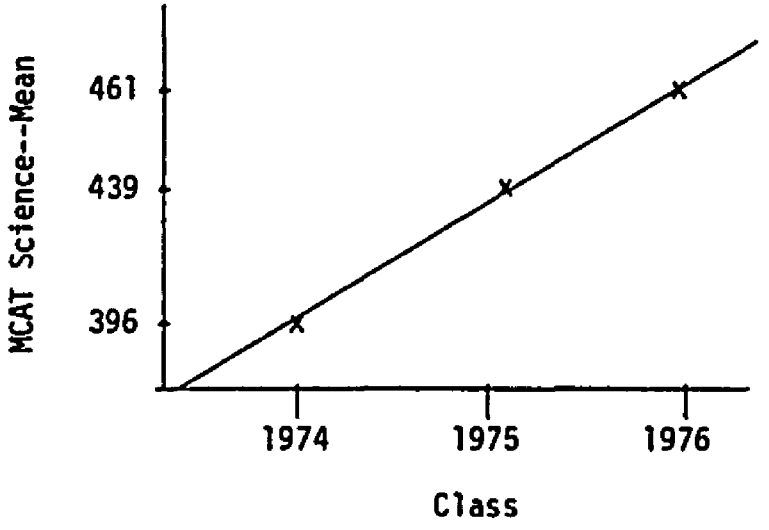

Figure 1.--Curvilinear trend.

If the trend were linear, on the other hand, the mean score of a variable would increase with each class. An analysis of the sample's MCAT science score gave such a trend. Table 18 furnishes MCAT science score means of the respective classes.

Table 18.--Trend analysis: MCAT-science score mean, 1974, 1975, 1976.

Group	Count	Mean	Standard Deviation
1974	18	396.1767	73.6352
1975	17	438.5294	113.8497
1976	15	461.0667	105.9814
Total	50	430.0436	
Total Group			100.3178

Group	1974	1975
Mean	396.1767	438.5394

Figure 2 illustrates a linear trend.

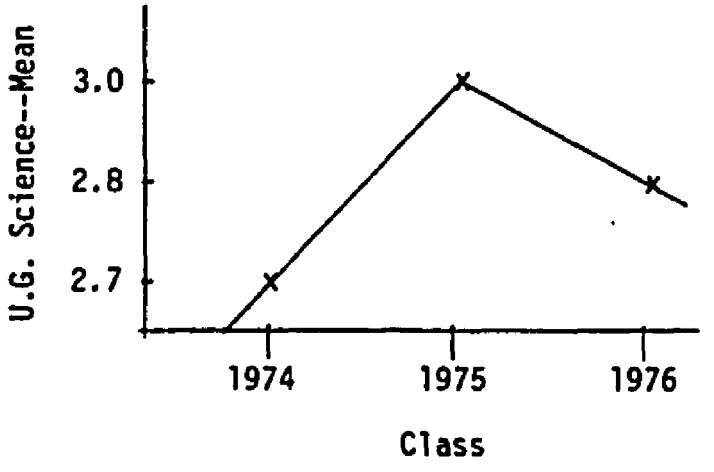

Figure 2.--Linear trend.

The writer had originally hypothesized that the academic preparation of students at the undergraduate level should improve from year to year. With reference to the undergraduate science mean (Table 23), it is obvious this did not occur over the three years of the study.

Summary

The purpose of these methods was to provide an accurate comparison of data on the study variables among the respective classes and thus determine the best predictor variables for academic success for a minority matriculant in MSU-COM.

CHAPTER IV

ANALYSIS OF THE RESULTS

Introduction

The focus of this investigation has been the relationship between academic and demographic predictor variables and minority matriculant success or failure at MSU-COM. These students were admitted as a result of efforts by the Minority Support Program, a program charged with the task of increasing the representation of minority groups in the physician population by recruiting and then admitting quality minority students to the College of Osteopathic Medicine. The sample was divided in several ways: by sex, ethnicity, year admitted, and percentage of terms on academic probation and percentage of courses passed, in order to make comparisons of the students on AP and those not on AP. (AP and PP are strongly related because whether a student is on AP naturally depends on PP.) Additional hypotheses were formulated pertaining to the relationships between academic and demographic predictor variables and minority students.

In this chapter all hypotheses are discussed by variables as they relate to AP and PP. The chi-square test was employed to determine the statistical significance between variables, and discriminant analysis was employed to determine predictor variables that differentiate between the two groups, students on AP and those

not on AP. Finally, trend analysis was utilized to determine if there were significant trends in the means of the variables over the period of the study; for example, whether or not the variable performance level increased with each entering class. Data were collected from MSP project reports and students' academic folders.

In an effort to more effectively address the study hypotheses, the analysis was then conducted to determine if there existed a significant difference between the two groups. The .05 level of significance was adopted for statistical decisions in this investigation, the level commonly chosen by researchers in education.

Original Study Hypotheses

The following were the three original hypotheses believed to identify the academic and demographic measures related to minority matriculants' success at MSU-COM. However, data on the subjects of these hypotheses were not available. As a result, the writer had to rely on the findings of two related studies: The Markert and West study (1978), conducted at MSU-COM, and the Student National Medical Association and the American Association of Medical Colleges study (1974). These studies provided the researcher with the material discussed below.

1. Socioeconomic background is related to success at MSU-COM.

In the design of this study, based on the SNMA and AAMC study, this factor seemed to be of major significance and warranted consideration. However, since MSU-COM students are processed by the Central Financial Aids Office, which services the total MSU population

(approximately 40,000), and because of the Student Privacy Act, the only information available related to the students' financial need was a "Yes, I did" or "No, I did not" receive aid. Nevertheless, of the 50 matriculants in the population it was determined that only three received less than 25 percent of the medical school expense through financial aid (MSP annual report).

2. The size and location of a four-year college is related to success in MSU-COM.

Based on the SNMA and AAMC study, this variable also seemed to warrant consideration. However, a number of students had taken courses at community colleges, which would mean the four-year colleges were not the only structure providing academic preparation for medical school. This study did reveal that students experiencing academic difficulty had taken courses at community colleges. Therefore there was no relationship between (a) size and AP or PP and (b) location and AP or PP.

3. Parental education is related to success in MSU-COM.

No information was available to test this variable. However, the assumption made from discussing this variable with matriculants was that in future classes this will be a factor as their siblings will have the benefit of a family with an educational exposure. The majority of the parents of minority matriculants at MSU-COM are employed in a nonprofessional job requiring limited education.

Tables 19, 20, and 21 indicate the results dealing with Hypothesis 2.

Table 19 shows that 13 students, approximately 45 percent of the sample who attended Michigan colleges, had been on AP. Of the total sample, 26 had been on PP. There was a nonsignificant relationship between AP and location of undergraduate college attended.

Table 19.--AP by location of undergraduate college attended.

Undergraduate College	Probationary Status		Row Total
	Academic Probation	No Probation	
Michigan	13 44.8	16 55.2	29 58.0
Central[a]	3 60.0	2 40.0	5 10.0
South West[b]	6 66.7	3 33.3	9 18.0
Other[c]	4 57.1	3 42.9	7 14.0
Column total	26 52.0	24 48.0	50 100.0

Chi-square = 1.57572
P < .6649

[a]Illinois, Ohio, Wisconsin.

[b]California, Florida, Texas.

[c]Alabama, Kansas, Mississippi, Nebraska, New York, North Carolina, Virginia.

Tables 20 and 21 indicate a nonsignificant relationship between (population) and AP or PP, respectively.

Table 20.--AP by size of undergraduate college.

Undergraduate College Size	Probationary Status		Row Total
	Academic Probation	No Probation	
GT 5,000[a]	19 50.0	19 50.0	38 76.0
LE 5,000[b]	7 58.3	5 41.7	12 24.0
Column total	26 52.0	24 48.0	50 100.0

Chi-square = .2537
P < .60

[a]GT = greater than 5,000.

[b]LE = less than 5,000.

Table 21.--PP by size of undergraduate college.

Undergraduate College Size	% of Courses Passed		Row Total
	LE 94[a]	GT 94[b]	
GT 5,000	21 55.3	17 44.7	38 76.0
LE 5,000	4 33.3	8 66.7	12 24.0
Column total	25 50.0	25 50.0	50 100.0

Chi-square = 1.7544
P < .18

[a]Less than 94 percent of courses taken passed.

[b]Greater than 94 percent of courses taken passed.

Table 20 shows that 50 percent of the 38 students who attended undergraduate colleges greater in size than 5,000 students had been on AP, and approximately 58 percent of the 12 students attending colleges of less than 5,000 had been on AP. Of the 26 students experiencing AP, 19 attended colleges greater in size than 5,000. There was a nonsignificant relationship between AP and undergraduate college size.

Table 21 reveals that of the 38 students who attended colleges greater in size than 5,000, 21 had passed less than 94 percent of courses taken. Four of the 12 students who attended undergraduate colleges with less than 5,000 students passed less than 94 percent of courses taken. There was a nonsignificant relationship between PP and undergraduate college size.

Trend Analysis

Trend analysis was used to evaluate time series data because it will best determine if time has had a significant effect on the pouplation regarding admission. The researcher believed that each year the academic quality of the minority pool had increased: The following variables address this belief. Each variable was compared by a trend analysis to the same variable in the three entering classes. The linear term tests for an increase or decrease in the means on the dependent variable as a function of the year. Deviations from linearity test for a curvilinear increase or decrease in the means on the dependent variable as a function of the year.

Entering Characteristics of Minority Matriculants

Table 22 shows that the science grade point average was not linearly related to year. However, a significant curvilinear trend was found ($P < .036$). Table 23 reveals that the undergraduate science grade point average mean did not increase with each class. In fact, the 1975 class had the highest mean in relation to the variable and the 1974 class, the lowest mean.

Table 22.--Analysis of variance of undergraduate science GPA.[a]

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	F-Prob.
Linear term	1	.1144	.1144	.939	.337
Dev. from linear	1	.5298	.5298	4.686	.036
Within groups	47	5.3142	.1131		
Total	49	5.9584			

[a]GPA = grade point average.

Table 23.--U.G.[a] science mean by year.

Group	Count	Mean	Standard Deviation
1974	18	2.6978	.2952
1975	17	2.9688	.4134
1976	15	2.8160	.2800
Total	50	2.8254	
Total group			3.4870

Group	1974	1976	1975
Mean	2.6978	2.8160	2.9688

[a]U.G. = undergraduate.

Table 24 indicates that undergraduate nonscience grade point average was not linearly related to year. However, the curvilinear trend approached significance ($P < .095$). Table 25 shows that undergraduate nonscience grade point average mean did not increase with each class in that the 1975 class had the highest mean in relation to the variable and the 1974 class, the lowest mean.

Table 24.--Analysis of variance of U.G. nonscience GPA.

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	F-Prob.
Linear term	1	.0564	.0564	.399	.531
Dev. from linear	1	.3943	.3943	2.899	.095
Within groups	47	6.3936	.1360		
Total	49	6.8443			

Table 25.--U.G. nonscience mean by year.

Group	Count	Mean	Standard Deviation
1974	18	2.8783	.2497
1975	17	3.1035	.3826
1976	15	2.9613	.4623
Total	50	2.9798	
Total group			.3737

Table 26 illustrates that undergraduate grade point average was not linearly related to the year, though a significant curvilinear trend was found ($P < .048$). And Table 27 reveals that the undergraduate grade point average did not increase with each class: The 1975 class had the highest mean in relation to the variable, and the 1974 class, the lowest.

Table 26.--Analysis of variance of U.G. over-all GPA.

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	F-Prob.
Linear term	1	.0495	.0495	.452	.505
Dev. from linear	1	.4248	.4248	4.128	.048
Within groups	47	4.8367	.1029		
Total	49	5.3110			

Table 27.--U.G. GPA mean by year.

Group	Count	Mean	Standard Deviation
1974	18	2.7889	.2754
1975	17	3.0188	.3600
1976	15	2.8667	.3245
Total	50	2.8904	
Total group			.3292

Table 28 shows that the MCAT-verbal score approached a linear relationship to the year ($P < .142$), but a nonsignificant linear trend was found. Table 29 confirms this finding by indicating that the MCAT-verbal score mean did increase with each class. The 1976 class had the highest mean in relation to the variable and the 1974 class, the lowest mean.

Table 28.--Analysis of variance of MCAT-verbal.

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	F-Prob.
Linear term	1	15141.8667	15141.8667	2.229	.142
Dev. from linear	1	106.7049	106.7049	.015	.902
Within groups	47	326010.9804	6936.4038		
Total	49	341259.5520			

Table 29.--MCAT-verbal mean by year.

Group	Count	Mean	Standard Deviation
1974	18	412.6472	78.0294
1975	17	429.1172	92.5378
1976	15	455.6667	78.1452
Total	50	431.1530	
Total group			83.4535

The figures in Table 30 illustrate that the MCAT-quantitative score was not linearly related to the year despite the fact that a significant curvilinear trend was found ($P < .054$). And Table 30 shows that the MCAT-quantitative score mean did not increase with each class in that the 1975 class had the highest mean in relation to the variable and the 1974 class, the lowest mean.

Table 30.--Analysis of variance of MCAT-quantitative.

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	F-Prob.
Linear term	1	24450.9091	24450.9091	3.385	.072
Dev. from linear	1	26589.5223	26589.5223	3.903	.054
Within group	47	32016.5636	6811.9483		
Total	49	371202.0000			

Table 31.--MCAT-quantitative by year.

Group		Count	Mean	Standard Deviation
1974		18	405.0000	79.7053
1975		17	478.5294	91.3743
1976		15	459.6667	74.9158
Total		50	445.4000	
Total Group				87.0376
AP:	Group	1974	1976	
	Mean	405.0000	459.6667	
Non-AP:	Group	1976	1975	
	Mean	459.6667	478.5394	

Table 32 indicates that the MCAT-science score approached a linear relationship to the year ($P < .064$). Yet a nonsignificant linear trend was found. The figures in Table 33 indicate that the MCAT-science score mean did increase with each class: The 1976 class had the highest mean in relation to the variable and the 1974 class, the lowest mean.

Table 32.--Analysis of variance of MCAT-science.

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	F-Prob.
Linear term	1	45561.2808	34451.2808	3.605	.064
Dev. from linear	1	1854.7773	1854.7773	.191	.664
Within group	47	456813.6392	9719.4391		
Total	49	493119.6974			

Table 33.--MCAT-science by year.

Group	Count	Mean	Standard Deviation
1974	18	398.1767	73.6352
1975	17	438.5294	113.8497
1976	15	461.0667	105.9814
Total	50	430.0436	
Total Group			100.3178
Group	1974	1975	1976
Mean	396.1767	438.5394	461.0667

Chi-Square Analysis of Performance Variables

Chi-square analysis addressed the performance of minority matriculants at MSU-COM by evaluating performance as it related to PP and AP.

There was a nonsignificant relationship between entering characteristics of minority matriculants and the percentage of terms on academic probation (AP) and the percentage of courses passed (PP).

Table 34 shows that 50 percent of the 18 admitted to the 1974 class passed less than 94 percent of their courses, as did 41 percent of the 17 admitted to the 1975 class, 60 percent of the 15 admitted to the 1976 class, and 25, or 50 percent of the total sample. The figures in Table 35 indicate that 60 percent of the 18 admitted to the 1974 class had been on AP, as were 47 percent of the 17 admitted to the 1975 class, 46 percent of the 15 admitted to the 1976 class, and 26, or 52 percent of the total sample.

Table 34.--PP by year.

Year	% of Courses Passed		Row Total
	LE 94	GT 94	
1974	9 50.0	9 50.0	18 36.0
1975	7 41.2	10 58.8	17 34.0
1976	9 60.0	6 40.0	15 30.0
Column total	25 50.0	25 50.0	50 100.0

Chi-square = 1.12941
P < .6263

Table 35.--AP by year.

Year	Probationary Status		Row Total
	Academic Probation	No Probation	
1974	11 61.1	7 38.9	18 36.0
1975	8 47.1	9 52.9	17 34.0
1976	7 46.7	8 53.3	15 30.0
Column total	26 52.0	24 48.0	50 100.0

Chi-square = .93588
P < .5685

The original hypotheses were not effective in identifying characteristics of the successful and unsuccessful minority matriculant since the points focused on by the hypotheses were generally addressed with a "yes" or "no" in MSU-COM records, as a result of the Student Privacy Act. However, through the use of the data that were available, a set of additional hypotheses, which are critical to the general questions of the study, were developed. These hypotheses are listed here in their research and null form followed by tables and discussion of data in those tables.

1_a: Research Hypothesis--There will be a relationship between marital status and AP and PP.

1_b: Null Hypothesis--There will be no relationship between marital status and AP and PP.

The marital status of minority students is a variable which addresses the amount of financial aid needed. If the spouse is working, the need may be less, whereas if the spouse is taking care of children, the need may be greater. The spouse may also be a support person (emotional), especially if the medical school is in a community with a small minority population. The SNMA and AAMC study supports these assumptions; moreover, the most significant result of that study was that a greater percentage of minority students were married in comparison to majority students when entering medical school.

There is a nonsignificant relationship between marital status and AP and PP.

Table 36 shows that 14, or 16 percent of the sample were single students on AP, while 12, or 10 percent of the sample were married students on AP. The total sample included 30 single students and 20 married students, with the greatest division of students in the single, not on AP category.

Table 36.--AP by marital status.

Marital Status	Probationary Status		Row Total
	Academic Probation	No Probation	
Single	14 (15.6)	16 (14.4)	30
Married	12 (10.4)	8 (9.6)	20
Column total	26	24	50

Chi-square = .855
P < .300

Table 37 indicates that 16, or 15 percent of the sample were single students who passed less than 94 percent of their courses, whereas 9, or 10 percent of the sample were married students who passed less than 94 percent of their courses.

Table 37.--PP by marital status.

Marital Status	% of Courses Passed		Row Total
	LE 94	GT 94	
Single	16 (15)	14 (15)	30
Married	9 (10)	11 (10)	20
Column total	25	25	50

Chi-square = .333
P < .600

2_a: Research Hypothesis--There will be a relationship between sex and AP or PP.

2_b: Null Hypothesis--There will be no relationship between sex and AP or PP.

The SNMA and AAMC study pointed out that there is a greater number of female matriculants among minority students than among majority students. A major factor contributing to this finding was that in two of the ethnic groups in question the educational level of the mother was consistently higher than that of the father. In the third group, the Chicano group, the father had attained a higher education level. The SNMA and AAMC study did not specifically address performance in relation to sex, whereas the Markert and West

study (1978) stated that there was a nonsignificant relationship between academic performance and sex for the MSU-COM classes of 1977 and 1978.

There is a nonsignificant relationship between sex and AP or PP.

Table 38 illustrates that 7, or 50 percent of the females had been on AP, along with 19, or 52 percent of the males and 26, or 52 percent of the total sample.

Table 38.--AP by sex.

Sex	Probationary Status		Row Total
	Academic Probation	No Probation	
Female	7 50.0	7 50.0	14 28.0
Male	19 52.8	17 47.2	36 72.0
Column total	26 52.0	24 48.0	50 100.0

Chi-square = .01924
P < .8897

Table 39 shows that 7, or 50 percent of the females passed less than 94 percent of their courses, whereas 18, or 50 percent of the males and 25, or 50 percent of the total sample passed the same number.

Table 39.--PP by sex.

Sex	% of Courses Passed		Row Total
	LE 94	GT 94	
Female	7 50.0	7 50.0	14 28.0
Male	18 50.0	18 50.0	36 72.0
Column total	25 50.0	25 50.0	50 100.0

Chi square = .09921
P < .7528

3_a: Research Hypothesis--There will be a relationship between undergraduate college and AP or PP.

3_b: Null Hypothesis--There will be no relationship between undergraduate college and AP or PP.

The Markert and West study (1978) indicates that there is a nonsignificant relationship between academic performance and the undergraduate college which granted the matriculant's Bachelors degree. It does appear, however, that in the case of MSU-COM, minority students experiencing academic difficulty had taken course work at community colleges where the population consisted of a number of part-time students. The author points out that a factor to be considered in this finding may be the level of difficulty of courses offered at a four-year institution (MSU); educators generally agree the community college curriculum is less demanding.

There is a nonsignificant relationship between undergraduate college and AP or PP.

Table 40 shows 13, or 44 percent of the 29 students attending Michigan undergraduate colleges had been on AP, as were 25, or 50 percent of the sample. And Table 41 indicates that 14, or 48 percent of the 29 students attending Michigan undergraduate colleges passed less than 94 percent of their courses, as did 25, or 50 percent of the sample.

Table 40.--AP by location of U.G. college.

U.G. College	Probationary Status		Row Total
	Academic Probation	No Probation	
Michigan	13 44.8	16 55.2	29 58.0
South West	6 66.7	3 33.3	9 18.0
Other	4 57.1	3 42.9	7 14.0
Central	3 60.0	2 40.0	5 10.0
Column total	26 52.0	24 48.0	50 100.0

Chi-square = 1.57572
P < .6649

Table 41.--PP by location of U.G. college.

U.G. College	% of Courses Passed		Row Total
	LE 94	GT 94	
Michigan	14 48.3	15 51.7	29 58.0
South West	4 44.4	5 55.6	9 18.0
Other	5 71.4	2 28.6	7 14.0
Central	2 40.0	3 60.0	5 10.0
Column total	25 50.0	25 50.0	50 100.0

Chi-square = 1.63131
P < .6523

4_a: Research Hypothesis--There will be a relationship between ethnicity and percentage of terms on AP or PP.

4_b: Null Hypothesis--There will be no relationship between ethnicity and AP or PP.

For the classes of 1977 and 1978 the Markert and West study (1978) articulates a significance at the .001 level. Majority students performed an average of 1.29 standard deviation points higher than minority students in the class of 1977 and 1.043 standard deviation points higher than minority students in the class of 1978. The author points out these figures do not necessarily mean that minority students are unsuccessful but merely provide a basis for comparison between the two groups. This factor may be an indication of the

quality of one's preprofessional education, according to the SNMA and AAMC study.

There is a significant relationship ($P < .0333$) between ethnicity and PP and a nonsignificant relationship between ethnicity and AP.

The figures in Table 42 illustrate that 21, or 62 percent of the 34 Black students passed less than 94 percent of their courses as did 4, or 30 percent of the Chicanos; 3 American Indians passed greater than 94 percent of courses taken. Fifty percent of the sample passed less than 94 percent.

Table 42.--PP by ethnicity.

Ethnicity	% of Courses Passed		Row Total
	LE 94	GT 94	
Black	21 61.8	13 38.2	34 68.0
Chicano	4 30.8	9 69.2	13 26.0
American Indian	0 0.0	3 100.0	3 6.0
Column total	25 50.0	25 50.0	50 100.0

Chi-square = 6.80543
P < .0333

Table 43 shows that 19, or 60 percent of the 34 Black students and 7, or 54 percent of the Chicanos had been on AP,

whereas of the American Indians, none had been on AP. Fifty-two percent of the entire sample had been on AP.

Table 43.--AP by ethnicity.

Ethnicity	Probationary Status		Row Total
	Academic Probation	No Probation	
Black	19 55.9	15 44.1	34 68.0
Chicano	7 53.8	6 46.2	13 26.0
American Indian	0 0.0	3 100.0	3 6.0
Column total	26 52.0	24 48.0	50 100.0

Chi-square = 3.47307
P < .1761

5_a: Research Hypothesis--There will be a relationship between undergraduate major and AP or PP.

5_b: Null Hypothesis--There will be no relationship between undergraduate major and AP or PP.

The Markert and West (1978) study finds no significant difference in the performance of minority matriculants as it relates to one's undergraduate major. In fact, the author would like to point out that students have been admitted to MSU-COM with majors outside the field of science; examples include journalism, business, and education, to name a few. Since the minority student is generally older, the study emphasizes an undergraduate degree program

may be completed before the student even decides to apply for admission in medical school. Consequently, the majority of the student's coursework will be in his/her original area of concentration, while the science courses completed will meet only the minimum admissions requirements (science discipline). The SNMA and AAMC study claims that the choice of an undergraduate major reveals information regarding a student's interest and personality. This study also cites more minority students completed majors in the biological sciences, though major does not appear to be a factor in admission decisions.

There is a nonsignificant relationship between undergraduate major and AP and PP.

Table 44 indicates that 17, or 58 percent of the sample whose undergraduate major was biology had been on AP, whereas 4, or 44 percent of those with health-related majors; 1, or 33 percent of those with non-biological science majors; and 4, or 44 percent of those majoring in behavioral sciences and other areas had been on AP.

Table 45 shows that 15, or 58 percent of the sample whose undergraduate major was biology passed less than 94 percent of their courses, as compared to 5, or 55 percent of those with health-related majors; 1, or 33 percent of those with non-biological science majors; and 4, or 44 percent who majored in behavioral sciences and other areas. Fifty percent of the sample had passed less than 94 percent of their courses.

Table 44.--AP by U.G. major.

U.G. Major	Probationary Status		Row Total
	Academic Probation	No Probation	
Biology	17 58.6	12 41.4	20 48.0
Health-related	4 44.4	5 55.6	9 18.0
Non-biological science	1 33.3	2 66.7	3 6.0
Behavioral sciences and other	4 44.4	5 55.6	9 18.0
Column total	26 52.0	24 48.0	50 100.0

Chi-square = .59004
P < .7197

Table 45.--PP by U.G. major.

U.G. Major	% of Courses Passed		Row Total
	LE 94	GT 94	
Biology	15 51.7	14 48.3	29 58.0
Health-related	5 55.6	4 44.4	9 18.0
Non-biological science	1 33.3	2 66.7	3 60.0
Behavioral sciences and other	4 44.4	5 55.6	9 18.0
Column total	25 50.0	25 50.0	50 100.0

Chi-square = 1.33977
P < .8987

6_a: Research Hypothesis--There will be a relationship between graduate work and AP or PP.

6_b: Null Hypothesis--There will be no relationship between graduate work and AP or PP.

The author emphasizes that less than 30 percent of the sample population had taken graduate courses. Generally, grades received from graduate courses were higher, a fact based on MSU-COM data addressing this issue. Thus, limited consideration (points) was given to graduate work as compared to undergraduate courses.

There is a nonsignificant relationship between graduate work and AP and PP.

Table 46 indicates that 17, or 47 percent of the sample completing no graduate courses had been on AP, as were 9, or 64 percent of the sample completing graduate courses.

Table 46.--AP by graduate work.

Graduate Work	Probationary Status		Row Total
	Academic Probation	No Probation	
No	17 47.2	19 52.8	36 72.0
Yes	9 64.3	5 35.7	14 28.0
Column total	26 52.0	24 48.0	50 100.0

Chi-square = .59158
P < .4418

The figures in Table 47 reveal that 18, or 50 percent of the sample completing no graduate courses passed less than 94 percent of courses taken, as did 7, or 50 percent of the sample completing graduate courses.

Table 47.--PP by graduate work.

Graduate Work	% of Courses Passed		Row Total
	LE 94	GT 94	
No	18 50.0	18 50.0	36 72.0
Yes	7 50.0	7 50.0	14 28.0
Column total	25 50.0	25 50.0	50 100.0

Chi-square = .09921
P < .7528

7_a: Research Hypothesis--There will be a relationship between undergraduate college characteristics (size and location) and AP or PP.

7_b: Null Hypothesis--There will be no relationship between undergraduate college characteristics (size and location) and AP or PP.

Seventy-six percent of the sample have been identified as alumni of colleges with a population greater than 5,000 (Table 19). The SNMA and AAMC study reveals that a large number of Blacks attended schools throughout the United States with an enrollment under 25,000. The study also shows that predominantly white colleges provide preprofessional training for a greater proportion of minority

matriculants than do colleges having a predominantly minority population.

There is a nonsignificant relationship between undergraduate college characteristics (size and location) and AP or PP.

Discriminant Analysis

To identify clearly which admission variables best discriminated between students (1) on AP and (2) students not on AP, discriminant analysis was employed. This analysis divided the sample into two groups: (1) 26, or 52 percent who had been on AP and (2) 24, or 48 percent who had not been on AP.

With discriminant analysis the researcher calculated the effects of the previously mentioned variables as they related to the sample. In this study the results identified two variables, MCAT-science score and undergraduate grade point average, that were academic predictors of students on AP and students not on AP, although research points out MCAT-science score was the dominant predictor variable of success.

Table 48 illustrates that other variables tested were nonsignificant in predicting academic success. In dividing the sample, the writer selected discriminating variables that were expected to differ within the sample. The discriminant weights for MCAT-science score (.927) and undergraduate grade point average (.293) identified these variables as predictors of academic success. The standard discriminant weight column gives data as they relate to the weight assigned standardized variables to predict success. The writer notes

that the weights for MCAT average, undergraduate science grade point average, and age were not computed as their significance was small. Consequently, these variables were of little significance; as Klecka (1975) states, the size of the weight is proportional to the predictive value of the variables receiving consideration. Column two gives the significance of the respective weights assigned each variable. Table 48 outlines the results of the discriminant analysis and indicates four of the six variables tested show a nonsignificant relationship to success.

Table 48.--Results of the discriminant analysis: AP.

Variable	Std. Discrim. Weight	Sig.
MCAT-science	-.927	.0
Undergraduate GPA	-.293	.10
MCAT-quantitative	-.211	N.S.
MCAT-general	-.154	N.S.
MCAT-verbal	.077	N.S.
Undergraduate nonscience GPA	-.072	N.S.

The variable, AP, as Table 49 illustrates, could be measured against each member of the sample, and the results were the difference of means between the groups. The difference column speaks to the difference in the performance level of the groups. For example, students not on AP scored an average of 104 points higher on the MCAT-science segment than students on AP. Univariate F-Ratio tested

the significance of differences between the means of both groups. The third column addresses the statistical significance of this difference; e.g., the difference in mean scores on the MCAT-science segment is significant at the .01 level.

The writer employed discriminant analysis after the initial computation, which divided the sample into students on AP and students not on AP.

Table 49.--Differences in means between groups.

Variable	Difference	(Univariate) F-Ratio	Sig.
MCAT-science	104.00	18.17	.01
Undergraduate GPA	0.14	2.35	N.S.
MCAT-quantitative	69.00	9.03	.01
MCAT-general	50.00	4.93	.05
MCAT-verbal	43.00	3.56	.10
Undergraduate nonscience GPA	0.17	2.84	.10
MCAT-average	67.00	14.06	.01
Undergraduate science GPA	0.13	1.71	N.S.
Age	-2.00	1.29	N.S.

Summary

In this chapter the results of the study have been presented as they pertain to the research hypotheses and related questions about the relationships between academic and demographic predictor variables and minority students' performance at MSU-COM. To test the hypotheses, a sample was selected which included all minority

students admitted during the period of this study (Blacks, Chicanos, American Indians).

This chapter has analyzed data which have been generated from statistical tests of:

Location and size of undergraduate college

Undergraduate science grade point average

Undergraduate nonscience grade point average

Undergraduate over-all grade point average

Medical College Admissions Test--verbal, quantitative, science

Marital status

Sex

*Ethnicity ($P < .03$)

Undergraduate major

Graduate work

Age

Based on the results of this study, the Markert and West study (1978), and the SNMA and AAMC study, the above variables appear to be factors which warrant consideration by medical school admissions committees in selecting members of prospective classes. The findings presented in this chapter appear to indicate that a majority of the sample was performing satisfactorily with respect to AP and PP in MSU-COM, and that the MCAT-science score and undergraduate grade point average best predicted success of the sample. There will be an additional summary and a discussion of the data in Chapter V.

---

*Significant relationship between ethnicity and PP.

CHAPTER V

SUMMARY AND DISCUSSION, CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS FOR FURTHER RESEARCH

Summary Discussion

Gabriel Smilkstein, M.D. (1975) best summarizes the attitude of this researcher and hopefully the medical schools when addressing the concern of underrepresentation of minority groups in medical school:

> . . . Simply to increase the number of minority students . . . of itself does not improve the lot of the medically underserved. Studies show that despite the increase in the number of ethnic minority students admitted to medical schools, physician shortages in medically deprived areas continue to grow. . . .

The major objectives of this study dealt with this issue by addressing the relationship between academic and demographic predictor variables and the performance of MSU-COM minority matriculants in classes entering 1974, 1975, and 1976. The study examined the following subquestions:

1. Do variables outlined in this study have a significant effect in predicting academic success?
2. Is there a significant difference in the academic and demographic characteristics of the successful and non-successful minority matriculant?
3. Does the development of programs, such as the Minority Support Program, address the underrepresentation of minority groups in medical schools?
4. What has been the nature of performance of minority matriculants to MSU-COM?

Thus, the study was designed to evaluate the performance of minority group students, predictor variables, and MSP as a support program in measuring MSU-COM's efforts to curb the physician shortage noted by Thompson (1974). Forty-nine of the 50 sample subjects had had prior contact with MSP before being granted admission to the program. One member of the population did not receive minority consideration; this applicant was a foreign student. Eligibility for minority consideration was granted to U.S. citizens and foreign students holding permanent visas. Each student admitted who received minority consideration met two criteria:

1. They were members of one of the following ethnic groups: Black, Chicano, American Indian, or Oriental. (As previously stated, Orientals were not considered in this study as the writer addressed HEW guidelines and in comparing academic and financial records questions if this group was indeed educationally or financially disadvantaged.)

2. At the time of admission the students expressed a strong interest to work in an underserviced area.*

To insure that there existed no great differences between one's academic preparation and financial status, with respect to ability to perform, the writer used as the population only minority matriculants admitted during the period of this study.

---

*The Lezotte study indicated that minority medical students would be more likely to locate and practice in the inner-city portion of urban areas in Michigan.

The study took as its criteria of effectiveness, educational achievement, attrition rate, number admitted, and potential of minority matriculants. Educational achievement was measured by the percentage of terms on academic probation (AP) and percentage of courses passed (PP). Attrition rate was measured by the number of students dismissed, while the underrepresentation of minority group students in medical schools is indicated by the small number admitted. Finally, potential of matriculants was measured by academic preparation.

To test the original and new hypotheses formulated for this study, the matriculants were separated into two groups, those on AP and those not on AP. The next step was to make comparisons to identify characteristics of the two groups within the sample.

The findings from this study indicate that minority matriculants can meet academic expectations in medical school. However, it appears that supportive services provided through vehicles like MSU-COM's Minority Support Program are significant factors in assisting the candidates to succeed. Using these criteria, the writer can state this program was a success, but it would be impossible to measure the true effectiveness of efforts by MSP.

Similar to the results of the Markert and West study (1978), the best predictors for academic success were found to be the MCAT-science score and the over-all undergraduate GPA.

The results from this study support the writer's belief that early intervention, which is the MSP concept, through recruitment and

retention efforts, can effectively address the underrepresentation of minority groups in medical schools and their retention.

Conclusions

Within the limitations of this study, and on the basis of the statistical analysis employed, the following conclusions are based upon the data collected and reported in Chapter IV.

Socioeconomic Background

Forty-nine members of the sample received some form of financial assistance from the university. The one matriculant receiving no aid was not eligible, as this individual was classified as a foreign student; however, this applicant was awarded a graduate assistantship. All but three members of the sample received more than 25 percent of their educational expenses through financial aid. These figures outline an obvious need for financial support among sample constituents.

Undergraduate College

There appears to be no relationship between undergraduate college attended and performance in medical school. However, the researcher points out that a significant number of minority students experiencing academic difficulty had completed course work at community colleges.

Over-all, Undergraduate Science, and Nonscience GPA

There appears to be no significant relationship between applicants' (science-nonscience) grade point average and acacemic success. However, in the development of an equation predicting academic success of minority group applicants, the over-all undergraduate GPA was identified as one of the two factors best predicting success.

Marital Status

As stated, marital status of minority matriculants appears to play a nonsignificant role in predicting one's success. However, this variable will affect one's financial aid request, depending on the spouse's status. A working spouse will decrease the amount of the student's financial request, while a nonworking spouse will reverse this trend. This study also defines the spouse as a possible support person, a very important designation especially if the medical college is located in a community with a small minority population.

Sex

There appears to be a nonsignificant relationship between sex and success in medical school. Although MSU-COM has a larger minority male than female population, the national trend as outlined in the SNMA and AAMC study is toward a greater minority female population in medical schools. This study also pointed out in defining

MSU-COM matriculants that the Chicano group was the only ethnic group that has a smaller female representation.

Ethnicity

To measure accurately a relationship between ethnicity and success in medical school, a study would have to compare these variables to majority as well as minority students. The Markert and West study (1978) does articulate that majority students, with regard to the variables of this study, generally performed at a higher level. Learning in an environment designed for and by those who have enjoyed the full benefits of our society, the student who is disadvantaged may require a special curriculum schedule, more individualized teaching and tutorial programs, and a flexible means of evaluation in order for the medical school to achieve the goal of producing a larger number of fully qualified minority graduates. The writer emphasizes that the underrepresentation of minority groups supports the difficulty minority students have experienced applying for admission to medical school.

Undergraduate Major and Graduate Work

There appears to be no significant relationship between undergraduate major and graduate work and success in medical school. However, the SNMA and AAMC study does reveal that the largest number of minority group applicants majored in the biological sciences. Less than 30 percent of the sample had graduate work experience.

Parental Education

No data were available to measure this variable accurately, except to indicate that a number of the sample constituent parents were employed in areas requiring little education; the SNMA and AAMC study did point out that a large number of minority fathers were not high school graduates, while the minority mothers were competitive with their counterparts.

MCAT-Verbal, General, Quantitative, and Science Scores

There appears to be no significant relationship between MCAT-verbal, general, and quantitative scores and success. The MCAT-science score appears to be a significant variable in the prediction of academic success.

Recommendations

Considering the findings, limitations, and conclusions of this study, the following recommendations are presented:

1. Ethnic, racial, and sex-related imbalance should be rectified with appropriate subsidy programs, similar to MSU-COM's Minority Support Program (MSP).

2. Active recruitment should be used to insure that an adequate pool of applicants from all segments of society be educated as physicians; this researcher suggests that the number of minority group applicants admitted should be determined by the percentage of the respective minority group in the U.S. population.

3. Membership of admissions committees should be more broadly based and should include women, racial and ethnic representatives, and consumers of medical care.

4. Medical colleges interested in increasing minority representation should employ the early admissions process in special cases so as not to lose quality minority group applicants to other medical schools. Also, this would prevent the student from having to pay deposits to other schools, when accepted by rolling admission. Traditionally, MSU-COM sends all acceptance letters for the total incoming class at the same time.

Implications for Further Research

The findings of this study suggest further research, and accordingly, it is recommended that the following questions be delved into:

1. What psychological factors are associated with the minority student dropout?

2. How can cognitive and noncognitive factors in the admissions process be more accurately measured?

3. What effect have relationships with peer group, faculty, and administrators had on the success/failure experienced by minority students?

4. What institutional characteristics aided or prevented success?

5. What social and historical attitudes aid or hinder minority students?

APPENDICES

APPENDIX A

THE BAKKE CASE AND REVERSE DISCRIMINATION

APPENDIX A

THE BAKKE CASE AND REVERSE DISCRIMINATION

The Alan Bakke "reverse discrimination" case now before the U.S. Supreme Court has produced an emotional controversy among the nation's educators. The results of this case will determine whether minority group students will have access to opportunities in higher education that in the past were denied them. The Bakke case challenges programs aimed at increasing the underrepresentation of minority groups in U.S. medical schools in that Bakke claims such programs represent reverse "discrimination" and a denial of "the equal protection of the law" for nonminority applicants.

The writer points out that special admissions are not new, a fact supported by William Raspberry (1977), syndicated columnist for the Washington Post. Raspberry articulates that approximately 80 percent of the minority matriculants enrolled in medical and law school, excluding those in predominantly black schools--Howard University of Meharry College, etc.--would not be there if it were not for special programs. And that 80 percent is still a small proportion, since less than 3 percent of the total physician population are ethnic minorities (Wharton, 1970).

In a "Meet the Press" interview, Joseph A. Califano, Secretary of Health, Education, and Welfare, maintained that preferential

treatment can be given to minority groups without infringing on the legal rights of majority students. The writer agrees, as this study has pointed out that a number of cognitive variables used for admission selection are nonsignificant. If medical schools would implement additional variables (noncognitive health-related activities, extracurricular activities, work-related activities) in the admission process, variables considered by Markert and West (1978), predictor variables for minority matriculants could be implemented into the admission process. The writer agrees with Markert and West (1978) that the evaluation of these noncognitive variables should be employed only after students are identified as academically sound.

The over-riding issue of the Bakke case is the effect a ruling for Bakke will have on institutions actively addressing the underrepresentation of minority groups in higher education through special programs. As Jordan (1977) indicates, there is one obvious fact that U.S. history points out: Minority groups have experienced discrimination. To rectify this situation the writer recommends that where equitable representation of minority groups can not be developed through normal admission activities, such programs are indeed necessary. Nevertheless, he also warns against special programs being a vehicle to admit students who have not demonstrated potential for success. (Generally, recommendations for such decisions will be made by directors of support programs and the results will speak to the creditability of such programs.)

It appears that the Bakke case will be a deciding factor as to the continuation of such special programs; to discontinue

them would be a step backward for individuals and institutions addressing this critical issue. Here the writer agrees with Califano (1977):

> It would be a bizarre society--a Catch-22 society--that judged a person's potential for success by the credentials and experience denied to that person by past discrimination. Arbitrary quotas will not be part of our enforcement program; we want to rely on the good faith and special effort of all who join in the final march against discrimination.

APPENDIX B

STATEMENT BY THE BLACK FACULTY AND ADMINISTRATORS ASSOCIATION OF MICHIGAN STATE UNIVERSITY CONCERNING THE ALAN BAKKE vs. THE BOARD OF REGENTS OF THE UNIVERSITY OF CALIFORNIA CASE

APPENDIX B

STATEMENT BY THE BLACK FACULTY AND ADMINISTRATORS ASSOCIATION OF MICHIGAN STATE UNIVERSITY CONCERNING THE ALAN BAKKE vs. THE BOARD OF REGENTS OF THE UNIVERSITY OF CALIFORNIA CASE

Viewpoint: Bakke Case

Bakke's Claims Held Groundless

The Black Faculty and Administrators Association of MSU has closely followed the national and local reactions to the Alan Bakke vs. the Board of Regents of the University of California case, and would like to voice our views. National publications and local ones like The State News and People's Choice have all carried various opinions. These opinions have spanned the gamut from feelings that Bakke was discriminated against to feelings that he was not.

We would like to emphasize some things which have not been given general coverage. First, Alan Bakke was rejected by several other medical schools, including his alma mater, the University of Minnesota. This needs to be pointed out because of the belief that Bakke was a "superior" student and hence not admitted solely because he is white.

Such a view is as erroneous as believing that the specially admitted students were admitted solely because they are part of a minority. At MSU medical colleges, all successful candidates meet basic admission standards. This is true at most medical schools. Secondly, there is evidence to suggest the strong possibility that Bakke would not have been admitted even if there were no affirmative action program. At least 10 other medical schools rejected him and doubtless his age worked against him. Since very few middle-age applicants were accepted by the medical schools which rejected him, Bakke could have sued for age discrimination. It is highly unlikely that the many organizations which have supported him in his claim of racial discrimination would be supportive if he were claiming that younger white students were given preference over him.

Thirdly, we question the validity of such a concept as "reverse discrimination," a term that has found its way into the American vocabulary. There is either discrimination or there is not. Though the concept of reverse discrimination preceded Bakke, this

case has highlighted it. Reverse discrimination seems to be a disguised way of saying that the rights and privileges enjoyed by the majority of the population, which were often gained by devious and in some cases legal methods, are beginning to be infringed upon by non-whites in our attempt to make this country live out the true meaning of democracy.

In a recent presentation by Rev. Jesse Jackson, National President of People United to Save Humanity (PUSH), he indicated that he was not as concerned with Bakke as with "Bakkism." That is, a retreat from giving the issue of equal opportunity and equal access top priority. We too share that concern on a national and local level. Locally, we hope that MSU does not join in the retrenchment process. We have been encouraged by some recent actions on the part of the University that indicate this may not happen.

The appointment of Dr. Ralph Bonner as Director of Human Relations, and the resolution recently introduced by Dr. Blanche Martin and passed by the Board of Trustees strongly endorsing a commitment to equal opportunity as embodied in the affirmative action concept, are two examples. Though we have been encouraged we are far from pleased. A commitment to affirmative action must in the end be measured by results.

As an association, we will continue to fight for, and speak in favor of, aggressive and creative approaches for bringing non-whites into the mainstream of MSU and the nation. We hope the Supreme court sees the flaws and false assumptions in the Bakke vs. Board of Regents of the University of California case and rules against Bakke, but regardless of the outcome, aggressive affirmative action must continue. The continued viability of the University and the nation demands it.

APPENDIX C

MICHIGAN STATE UNIVERSITY COLLEGE OF OSTEOPATHIC MEDICINE: ADMISSIONS CRITERIA AND PROCESS AND CURRICULUM GUIDE

APPENDIX C

MICHIGAN STATE UNIVERSITY COLLEGE OF OSTEOPATHIC MEDICINE: ADMISSIONS CRITERIA AND PROCESS AND CURRICULUM GUIDE

Minimum Requirements*

The College will accept application for admission from all qualified candidates without regard to age, sex, creed, race, or national origin. Preference is given to Michigan residents. All applicants must be able to ensure meeting the minimum course requirements outlined below no later than June, 1978. Science and over-all grade-point average requirements indicated below must be met at the time your application is filed.

1. Completion of

   a. A four-year high school course or its equivalent acceptable for matriculation in a college or university accredited by a Regional Accrediting Commission of Higher Education;

   b. At least three years (90 semester or 135 quarter-hours) of college training in a college or university accredited by a Regional Accrediting Commission of Higher Education, by no later than June, 1978;

   c. A full academic year (generally 8 semester or 12 quarter-hours), with no grade below C (2.0 on a 4-point scale), by no later than June, 1978, in each of the following:

      (1) English, (2) biology, (3) general chemistry, (4) physics, (5) organic chemistry, (6) psychological-social-behavioral sciences; and

   d. The Medical College Admission Test, no later than the October, 1977, administration.

---

*Subject to change after 1979.

2. At the time the application is filed, a pre-professional
   a. science grade-point average of at least C+ (2.5 on a 4-point scale) and
   b. over-all grade-point average of at least C+ (2.5 on a 4-point scale).
3. A secondary application is completed only by those (approximately) three hundred candidates invited for interviews.
4. Be available for an on-campus interview with the College's Admissions Committee or their designates at the Committee's request.
5. Suggested electives: biochemistry, physiology, anatomy.

Summary of Admissions Criteria and Policies

The Admissions Committee developed and effected the following admissions criteria and policies:

RESIDENCY Because of MSU-COM's state-supported status, at least 80 percent of the class was to contain Michigan residents. If an applicant's residency changed during the admission process all remaining admission processing was relative to the applicant's new residency classification. Residency status was determined by University regulations.

AGE There were no maximum or minimum age restrictions and all decisions were made independent of the applicant's age.

SEX In accordance with the guidelines of the University and the Department of Health, Education and Welfare all decisions were independent of the applicant's sex.

ETHNIC BACKGROUND In accordance with the Affirmative Action Program of COM and the guidelines of the Department of Health, Education and Welfare, minority applicants were recruited. All minority applicants processed were required to meet the minimum standards for admission established for all candidates.

MEDICAL COLLEGE ADMISSION TEST All applicants were required to take the Medical College Admission Test (MCAT). If the MCAT was taken more than once, scores for the four categories (verbal, quantitative, general, and science) were averaged for each test, then the test with the higher or highest average score was used.

LETTERS OF RECOMMENDATION Two letters of recommendation were accepted but not required. If they were submitted, it was suggested one come from a pre-professional advisory committee or academic advisor and the other from an Osteopathic physician. Letters of recommendation were considered only at the Admissions Committee screen.

INTERVIEWS Interviewers were not allowed to interview applicants who were either their acquaintances or their relatives. Female applicants were interviewed by at least one member of the Minority Subcommittee. All applicants interviewed had to be invited by the Admissions Office. No interviews were granted upon request.

DEVIATIONS FROM ADMISSIONS COMMITTEE POLICY Requests for waivers due to extenuating circumstances were presented to the entire Admissions Committee. The Committee either took action on the request or deferred the request to the Director of Admissions for administrative action.

REAPPLICANTS Reapplicants were required to reapply through the regular admissions process. Reapplicant status in no way affected the processing or the selection procedures.

FACULTY DEVELOPMENT Limited opportunities were provided for holders of advanced degrees to participate in an assigned curriculum leading to a D.O. degree.

TRANSFER APPLICANTS Applicants for transfer admission were considered on an individual basis and in accordance with the policies of the American Osteopathic Association. Preference was given to Michigan residents with strong academic records and with previous programs which facilitated transfer to MSU-COM's curriculum. Transfer students have to complete at least one year (four quarters) at MSU-COM.

ACADEMIC BACKGROUND The following criteria were selected for evaluation of each applicant's academic background:

1. Undergraduate science grade-point average
2. Undergraduate non-science grade-point average
3. Graduate grade-point average
4. MCAT scores
5. 3.5 undergraduate science GPA
6. 1.0 undergraduate grade-point progression

LEADERSHIP AND SOCIAL DIMENSIONS Recognizing the desirability of accepting applicants who have demonstrated leadership and other desirable social characteristics, the following criteria were selected for evaluation of each applicant's non-academic background:

1. Work (employment while attending school)
2. Health-related activities
3. Extracurricular activities

Evaluation and Selection Process

GPA SCREEN The GPA Screen consisted of applicants' grade point average. Those applicants who met the minimum grade point requirement were advanced to the Application Screen.

APPLICATION SCREEN The Application Screen consisted of rating several criteria. The first five criteria rated the academic background of the applicant and the rest of the criteria rated the leadership and social dimensions of the applicant. If the applicant received a competitive Application rating, the applicant was advanced to the Secondary Application/Interview Screen.

The criteria in the Application Screen were rated as follows:

	Maximum Rating
Undergraduate GPA	36
Graduate GPA	6
If 3.5 Undergraduate Science GPA	1
If 1.0 Undergraduate Grade Point Progression	1
MCAT	6
Activities	12
Work Experience (4.5)	
Health-Related Experience (4.5)	
Extracurricular Activities (3)	
Maximum Application Rating	62

SECONDARY APPLICATION/INTERVIEW SCREEN The Secondary Application consisted of rating each of the four questions found on the Secondary Application.

Maximum Secondary Application Rating	14

All applicants who took the Secondary Application and accepted the invitation to be interviewed were rated at two separate interviews.

	Maximum Rating
First Interview	12
Second Interview	12
Maximum Interview Rating	24

ADMISSIONS COMMITTEE SCREEN The interview ratings were then totaled with the Application rating and the Secondary Application rating. The total of the three ratings was called the Total Applicant Rating.

Application Rating	62
Secondary Application Rating	14
Interview Rating	24
Maximum Total Applicant Rating	100

COM CLASS OF 1980--CURRICULUM

Approved by the COM Curriculum Committee 4/15/77

Term 1--Summer 1977

ANT 560	Medical Histology	4(3-4)
ANT 565	Introduction to Human Gross Anatomy	6(4-6)
BCH 501	Medical Biochemistry	3(3-0)
C M 510	Health, Medical Care and Society	2(2-0)
OST 530	Comprehensive Patient Evaluation 1	5(var)
		20

Term 2--Fall 1977

ANT 563	Osteopathic Medical Neuroanatomy	4(3-4)
BCH 502	Medical Biochemistry	2(2-0)
PSL 500A	Introductory Physiology for Medicine	5(5-0)
OST 551	Systems Biology--Hematopoietic System	4(var)
OST 531	Comprehensive Patient Evaluation 2	5(var)
		20

Term 3--Winter 1978

MPH 521	Medical Microbiology and Immunology	6(5-4)
PHM 520B	Principles of Pharmacology	4(4-0)
PTH 502	Human Pathology I	3(2-1)
OST 520	Normal Endocrine Structure and Function	2(var)
C M 512	Epidemiology & Biostatistics	2(1-3)
F M 632	Principles of Family Practice I	1(0-4)
O M 532	Clinical Science III	1(0-3)
OST 611	The Osteopathic Examination II	1(0-4)
		20

Term 4--Spring 1978

PHM 521B	Pharmacodynamics	4(4-0)
PSC 520	Introduction of Psychiatry	2(2-0)
OST 553	Systems Biology III--Neurosciences	10(var)
C M 513	Medical Jurisprudence	2(1-3)
F M 642	Principles of Family Practice II	1(0-4)
O M 533	Clinical Science IV	1(0-3)
OST 612	The Osteopathic Examination III	1(0-4)
		21

Term 5--Summer 1978

OST 558	Systems Biology VIII--Growth & Development	15(var)
F M 652	Principles of Family Practice III	1(0-4)
O M 534	Clinical Science V	1(0-3)
OST 613	The Osteopathic Examination IV	1(0-4)
C M 514	Topics & Issues in Health Care Delivery I	2(1-3)
		20

Term 6--Fall 1978

OST 554	Systems Biology IV--Cardiovascular	15(var)
OST 614	The Osteopathic Examination V	1(0-4)
F M 662	Principles of Family Practice IV	1(0-4)
O M 535	Clinical Science VI	1(0-3)
C M 515	Topics & Issues in Health Care Delivery II	2(1-3)
		20

Term 7--Winter 1979

OST 555	Systems Biology V--Respiratory	8(var)
OST 556	Systems Biology VI--Urinary	7(var)
PSC 521	Psychopathology I	1(1-0)
C M 516	Field Experiences in Community Medicine I	1(var)
F M 672	Principles of Family Practice V	1(0-4)
O M 536	Clinical Science VII	1(0-3)
OST 615	The Osteopathic Examination VI	1(0-4)
		20

Term 8--Spring 1979

OST 557	Systems Biology VII--Gastrointestinal & Metabolism	13(var)
OST 552	Systems Biology II--Integumentary	2(var)
PSC 522	Psychopathology II	2(2-0)
F M 682	Principles of Family Practice VI	1(0-4)
O M 537	Clinical Science VIII	1(0-3)
OST 616	The Osteopathic Examination VII	1(0-4)
		20

Third Year

Hospital rotations (clinical clerkships) are presently scheduled in the following areas for each student: Medicine, Ob-Gyn, Pediatrics, Surgery, Anesthesia, Emergency Room, Orthopedics, Neurology, ENT, Psychiatry, Junior Partnership, and electives.

APPENDIX D

MSU-COM: SAMPLE RECRUITMENT LETTERS

APPENDIX D

MSU-COM: SAMPLE RECRUITMENT LETTERS

Michigan State University
College of Osteopathic Medicine
Office of Admissions--C110 East Fee Hall
Telephone: (517) 353-7740

Dear Prospective Student:

It is indeed a pleasure to assist you in your career selection by making you aware of the many opportunities which Osteopathic Medicine has to offer. I am sure you are aware of the job market and its unlimited demand for qualified minority group members. The demand for minority Doctors of Osteopathic Medicine is even greater and with infinite rewards.

If you have not thoroughly investigated the profession of Osteopathy as a career alternative let's make an appointment to meet and discuss these possibilities.

Enclosed you will please find some information that will assist you in your preparation efforts. If you need any other or additional information do not hesitate to contact the Minority Support Program office (517-355-9625) for further assistance. I welcome the opportunity to assist you in any way I can.

Sincerely,

Darnell Cole
Assistant Director/Recruiter
Minority Support Program

DC/ksb

Enclosures - 3
What is Osteopathy?
Requirements
Survey Form (please return at your earliest convenience)

Michigan State University
College of Osteopathic Medicine
Office of Admissions--C110 East Fee Hall
Telephone: (517) 353-7740

Dear Prospective COM Student:

I am sure after reviewing the article "What Is Osteopathy?" that you are aware of the many opportunities that are available in this challenging profession. As mentioned Osteopathy is a minority profession that is presently experiencing growing pains and for those who successfully complete this program there are infinite rewards and success will truly be yours.

I hope that by now you have successfully completed the MCAT. If you have not, it is important that you register immediately for the April exam. Also would you please inform me of your status regarding the testing registration.

Enclosed you will please find an article pointing out the obvious need for more minority physicians. Also some information concerning the Armed Forces Health Profession Scholarship.

If you have not done so already would you please fill out the short enclosed survey form and return it to my office as soon as possible.

Thank you.

Sincerely,

Darnell Cole
Assistant Director/Recruiter
Minority Support Program

DC/ksb

Enclosures

SELECTED BIBLIOGRAPHY

SELECTED BIBLIOGRAPHY

Alexis, Carlton. "Minority Admission, Retention and Graduation From College of Medicine." Urban Health (February 1977): 14.

American Public Health Association. "Minority Health Chart Book." Annual Meeting, October 1974, New Orleans, La.

Andrus, L. H. "Dwindling Services: Crisis in Rural Health Care." U.S. Medicine 7 (1971): 34.

Bartlett, J. W. "Medical School and Career Performance of Medical Students With Low Medical College Admission Test Scores." Journal of Medical Education 42 (1967): 231-37.

Begun, Martin S. "Legal Considerations Related to Minority Group Recruitment and Admissions." Journal of Medical Education 48 (June 1973): 556-59.

Birch, J. S., and Wolfe, S. "An Enrichment Program for Minority Students." Journal of Medical Education 50 (1975): 1059-60.

Black, Bernard. "Students' Needs and Orientation Directors' Aspirations." The Journal of College Student Personnel 6 (December 1964): 102-108.

Bloom, S. W. "The Medical School as a Social System." Millbank Memorial Fund Quarterly 49 (1971): 1-196.

Boyle, B. P., and Coombs, R. H. "Personality Profiles Related to Emotional Stress in the Initial Year of Medical School." Journal of Medical Education 46 (1974): 882-87.

Clapp, T., and Reid, J. "Institutional Selectivity as a Predictor of Applicant Selection and Success in Medical School." Journal of Medical Education 41 (October 1976).

Coleman, Don E. "Minority Comprehensive Support Program Special Project Grant Program Report." 1975-76, 1976-77, 1977-78.

David, K., and Marshall, R. Primary Health Care Services for Medically Underserved Populations. Papers of the National Health Guidelines: The Priorities of Section 1502. DHEW Publication No. (HRA) 77-641.

Davis, Virginia C. "Recruitment and Retention: Perspectives and Prospectives." The Black Bag, Vol. 5, No. 1, p. 4.

D'Costa, A. G., et al. Simulated Minority Admissions Exercises: An Approach to the Appraisal of Nontraditional Applicants to Medical Schools. Washington, D.C.: Association of American Medical Colleges, in press.

DeCesare, A.; Sedlacek, W. E.; and Brooks, G. C., Jr. "Non-Intellectual Correlates of Black Student Attrition." Journal of College Student Personnel 13 (1972): 319-24.

Douglas, Frank L. "Retention: A New Myth, The Black Bag." Student National Medical Association 5 (1976).

Dube, W. F., and Johnson, D. G. "Study of U.S. Medical School Applicants, 1972-73." Journal of Medical Education 49 (1974): 849-68.

Dummett, C. "Recruitment and Retention of Minority Students for the Health Profession."

Dykema, J. Anthony, and Hilton, J. William. "The Medical Opportunities Program: An Approach Toward Increasing Minority Enrollment in Health Professional Schools." College and University 47 (Spring 1972): 201-10.

Edwards, Marc T., and Zimet, Carl N. "Problems and Concerns Among Medical Students." Journal of Medical Education 51 (1976): 619-25.

Elam, Lloyd C. "New Resources for Medical and Health Manpower." In Medicine in the Ghetto. Edited by John C. Norman. New York: Appleton-Century-Crofts, 1969.

Estes, E. H. "Medical Education and Medical Care in Underserved Rural Areas." Journal of Medical Education 48 (1973): 118-20.

Evans, D.; Jones, P.; Wortman, R.; and Jackson, E. "Traditional Criteria as Predictors of Minority Student Success in Medical School." Journal of Medical Education 50 (October 1975).

Feldman, L., and Burnett, F. "Students for Medicine: A Program for the Preparation of the Disadvantaged Student." Journal of Medical Education 48 (October 1973).

Fields, Cheryl M. "Educators Doubt Doctors Will Stay in Remote Areas." Chronicle of Higher Education (October 25, 1976).

Fry, J. "The Agonies of Medicine in the U.S.A." International Journal of Health Services 3 (1973): 501-506.

Funkenstein, D. H. "The Learning and Personal Development of Medical Students and the Recent Changes in Universities and Medical Schools." Journal of Medical Education 43 (1968): 883-97.

Gaines, Victor P. "Minority Recruitment and Retention." Journal of Medical Education 50 (April 1975): 416-17.

Geertsma, Robert H. "A Special Tutorial for Minority Medical Students: An Account of a Year's Experience." Journal of Medical Education 52 (1977): 396-403.

Goodwin, James C. "Minorities in Science." Lecture delivered at the American Association for the Advancement of Science, 1976.

Gordon, Travis L., and Dube, W. F. "Medical Student Enrollment, 1971-72 Through 1975-76." Journal of Medical Education 51 (February 1976): 144-46.

Gough, H. G.; Hall, W. B.; and Harris, R. E. "Admissions Procedures as Forecasters of Performance in Medical Training." Journal of Medical Education 38 (1963): 983-98.

Gray, L. "The Geographic and Functional Distribution of Black Physicians: Some Research and Policy Considerations." American Journal of Public Health 67 (1977): 519-26.

Haettenschiviller, Dustan L. "Counseling Black Students in Special Programs." Personnel and Guidance Journal 50 (October 1971): 29-35.

Harrold, Roger. "College Orientation and the Black Student." The Journal of College Student Personnel 2 (July 1970): 251-55.

Jason, Hilliard. "The Admissions Process in Medicine."

Johnson, D. G. "Medical Student Admission, Attrition and Activism." New Physician 17 (September 1968): 219-44.

_____, et al. "Minority Medical School Entrants." Journal of Medical Education 50 (July 1975): 271-72.

Johnson, D. G., and Hutchins, E. B. "Doctors or Dropouts?" Journal of Medical Education 41 (1966): 1099-1292.

Johnson, D. G., and Sedlacek, William E. "Retention by Sex and Race of 1968-1972 U.S. Medical School Entrants." Journal of Medical Education (October 1975): 932.

Johnson, D.; Smith, U.; and Tarnoff, S. "Recruitment and Progress of Minority Medical School Entrants." Journal of Medical Education 50 (1975).

Johnson, G. D., and Rosevear. "Traditional Admissions Variables as Predictors of Minority Students' Performance in Medical School--A Cause for Concern." Journal of the National Medical Association 69 (1977): 551-54.

Jones, M. W., and Hamburger, B. "Physician Supply in California." Western Journal of Medicine 123 (1975): 250-52.

Kaufert, J.; Martinez, C., Jr.; and Quesada, G. "A Preliminary Study of Mexican-American Medical Students." Journal of Medical Education 50 (1975): 856-66.

Kickema, A., and Wilham, H. College and University (Spring 1972).

Korman, M.; Stubblefield, R.; and Martin, L. W. "Patterns of Success in Medical School and Their Correlates." Journal of Medical Education 43 (1968): 405-11.

Krista, Ludinia. "Academic Prediction and the Marginal Student." Ph.D. dissertation, Missouri University, 1970. ED 045-040.

Lavin, David E. The Prediction of Academic Performance. New York: Russell Sage Foundation, 1967.

Leonard, W. "Affirmative Action at Harvard." Chronicle of Higher Education (March 1975).

Levine, H.; Williams, L.; and Bruhn, J. "Six Years of Experience With a Summer Program for Minority Students." Journal of Medical Education 51 (September 1976).

Mammsen, Kent G. "Black Educators in White Colleges." Journal of Higher Education.

Markert, R., and West, D. "Predictors of Academic Achievement at MSU's COM." 1978.

Michigan Department of Education. 1975-76 Directory of Michigan Institutions of Higher Education. Lansing: Department of Education, 1976.

Moore, William, Jr., and Wagstaff, Lonnie H. Black Educators in White Colleges. San Francisco: Jossey-Bass Publishers.

Neitzes, D., and Elkhanialy, H. "Black Students in Medical School." Journal of Medical Education 5 (1976): 1001-1005.

Nelson, B. W.; Bird, R. A.; and Rodgers, G. M. "Expanding Educational Opportunities in Medicine for Blacks and Other Minority Students." Journal of Medical Education 45 (1970): 731-36.

Nelson, H. "Decline in Negro Dental School Applicants Seen." Los Angeles Times, August 10, 1967.

Norman, J. C. Medicine in the Ghetto. New York: Meredith Corp., 1969.

Pauli, H. G. "Undergraduate Medical Education and Health Care." Journal of Medical Education 48 (1973): 51-56.

Pfeifer, C. M., Jr., and Sedlacek, W. E. "The Validity of Academic Predictors for Black and White Students at a Predominantly White University." Journal of Educational Measures 8 (1971): 253-61.

Plagge, J.; Shiverbush, R.; Smith, N.; and Solomon, L. "Increasing the Number of Minority Enrollees and Graduates: A Medical Opportunity Program." Journal of Medical Education 49 (August 1974).

Pondrom, Cyrena N. "Setting Priorities in Developing an Affirmative Action Program." Journal of Medical Education 50 (May 1975): 427-34.

Price, P. B.; Calvin, T. W.; Richards, J. A.; and Jacobsen, T. L. "Measurement of Physical Performance." Journal of Medical Education 43 (1968): 405-11.

Rosenberg, P. P. "Students' Perceptions and Concerns During Their First Year in Medical School." Journal of Medical Education 46 (1971): 211-18.

Selected Vital and Health Statistics in Poverty and Nonpoverty Areas of 19 Large Cities, United States, 1969-71. Vital and Health Statistics Series 21, No. 26. DHEW Publication No. (HRA) 76-1904.

Simon, Harold J., and Covell, James W. "Performance of Medical Students Admitted via Regular and Admission-Variance Routes." Journal of Medical Education 50 (March 1975): 237-41.

Smilkstein, G. "Ghetto America and Developing World Health Care Delivery." California Medicine 118 (1973): 94-97.

_____. "On Minority Student Programs in Medical Schools." Presentation to the California Legislature, Senate Select Committee on Health Science Education, Los Angeles, December 1975.

Smith, Paul. "Some Implications for Freshman Orientation Activities With New College Students." The Journal of College Student Personnel 5 (March 1964): 177-84.

Sowell, Thomas. Black Education: Myths and Tragedies. New York: David McKay Co., Inc., 1972.

Staveren, Anne M. "The Bicentennial: A 200-Year Illusion of Progress." The Black Bag, Vol. 5, No. 1, p. 2.

Sullivan, Louis E. Testimony Presented to U.S. Senate Subcommittee on Health. SNMA News 5 (November 1975): 11.

Teitelbaum, Howard S. Position Paper and Research Proposed for the Research Activities of the College of Osteopathic Medicine, Michigan State University, December 1975.

Thompson, T. "Curbing the Black Physician Manpower Shortage." Journal of Medical Education 49 (October 1974).

_____. "Selected Characteristics of Black Physicians in the United States, 1972." Journal of the American Medical Association 229 (1974): 1758-61.

Townsend, P. "Inequality and the Health Service." Lancer 1 (1974): 1179-90.

Weymouth, R., and Wergin, J. "Pilot Programs for Minority Students." Journal of Medical Education 51 (August 1976).

Wharton, Clifton R., Jr. "The Black Physician in the 1970's." Journal of the National Medical Association 62 (1970): 421-25.

Wingard, J. R., and Williamson, J. W. "Grades as Predictors of Physician Career Performance: An Evaluative Literature Review." Journal of Medical Education 48 (1963): 311-16.

Yerby, Alonzo S. "Black Physicians and Black Communities." American Journal of Public Health 67 (June 1977): 511-12.

_____. "The Disadvantaged and Health Care." American Journal of Public Health 56 (1966): 5-9.