

AN ACADEMIC QUALITY RANKING OF THE NORTH
AMERICAN CHIROPRACTIC SCHOOLS

By

HUGH ADAIR GEMMELL

Bachelor of Arts
Ottawa University
Ottawa, Kansas
1986

Master of Science
Oklahoma State University
Stillwater, Oklahoma
1987

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF EDUCATION
May, 1990

AN ACADEMIC QUALITY RANKING OF THE NORTH
AMERICAN CHIROPRACTIC SCHOOLS

Thesis Approved:

Of 1 letter

Thesis Adviser

Steven W. Edwards

Burton

Norman N. Durham

Norman N. Durham

Dean of the Graduate College

PREFACE

This study presents an academic quality ranking of the 18 North American chiropractic schools. Six objective criteria were chosen in the development of a multidimensional ranking.

I wish to express appreciation to my dissertation adviser, Dr. David S. Webster, for his guidance and assistance throughout this study. Appreciation is also expressed to the other committee members, Dr. Thomas A. Karman, Dr. Bert H. Jacobson, and Dr. Steven W. Edwards, for their invaluable assistance in the preparation of the final manuscript.

A special note of thanks is extended to Dr. Jacobson, with whom I participated in numerous research projects, for teaching me the scientific method and for developing within me a scientific attitude, and to Dr. Edwards, for instilling in me an excitement for statistics and for the time he spent in teaching me computer analysis.

I also wish to offer my thanks to the Foundation for Chiropractic Education and Research for its support of my graduate studies in the form of an educational fellowship.

Finally, special gratitude is expressed to my wife, Jennifer, our sons, Trey and Tristan, and our daughter, Caitlin, for their understanding, support, encouragement, and many sacrifices.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION.	1
II. REVIEW OF THE LITERATURE.	11
III. METHOD AND PROCEDURE.	37
IV. RESULTS	47
V. DISCUSSION.	57
REFERENCES	72
APPENDIXES	77
APPENDIX A - FACULTY PER CAPITA TABLE	78
APPENDIX B - COVER LETTER	80
APPENDIX C - QUESTIONNAIRE.	82

LIST OF TABLES

Table	Page
I. Faculty-Student Ratios	48
II. Publications in <u>JMPT</u> , 1983-1988.	49
III. Percentage of Nonchiropractic Faculty Members With Academic Doctoral Degrees	51
IV. Percentage of Chiropractic Faculty Members With Bachelor's Degrees.	52
V. Percentage of Chiropractic Faculty Members With Master's Degrees.	53
VI. Percentage of Chiropractic Faculty Members With Academic Doctoral Degrees	54
VII. Final Composite Ranking.	56
VIII. Faculty Per Capita Publications in <u>JMPT</u> , 1983-1988	79

CHAPTER I

INTRODUCTION

While the history of spinal manipulative therapy can be traced back to Hippocrates, modern chiropractic traces its origin to Davenport, Iowa in 1895 when Daniel David Palmer made a vertebral manipulation and improved the hearing of school janitor Harvey Lillard. Two years later, Palmer opened the first school of chiropractic in Davenport with 15 students, five of whom were medical doctors (1). Today in North America there are 18 chiropractic colleges.

Chiropractic doctors are the largest group of primary care providers after medical doctors, and they are a growing presence on the health care scene in North America (1). The definition of chiropractic practice, what a chiropractor is allowed to do and is prohibited from doing, differs substantially from state to state. Some statutes are broad and nonrestrictive, while others are narrow with detailed descriptions of what constitutes the practice of chiropractic (1). However, the definition of chiropractic, as suggested by DeBoer (2), is the most appropriate for the present, namely: "Chiropractors are musculoskeletal specialists who primarily treat patients with back or other musculoskeletal problems."

Quality is in vogue in chiropractic education, as in all of higher education (3). All types of educational institutions have shown a persistent interest in comparative quality ranking, as evidenced by the numerous rating studies (4). This seems to be a part of the general

American penchant for ranking everything, as the name of the game is to be number one (5, 6). However, it is incongruent to have this fascination with rankings while we cannot universally agree on the concept of quality. It may be that this interest is a part of our democratic society where competition and excellence are highly regarded (6).

The problem to be investigated in this study is straightforward. What are the levels of academic excellence of the North American chiropractic schools, and what is the comparative rating of these schools? Evaluation of chiropractic education, or any educational program, is made difficult because there is no consensus about what constitutes quality (6, 7). However, this problem is not limited to education, as Pirsig (9) observed:

Quality . . . you know what it is, yet you don't know what it is. But that's self-contradictory. But some things are better than others, that is, they have more quality. But when you try to say what the quality is, apart from the things that have it, it all goes poof! There's nothing to talk about. But if you can't say what quality is, how do you know what it is, or how do you know that it even exists? If no one knows what it is, then for all practical purposes it doesn't exist at all. But for all practical purposes it really does exist. What else are the grades based on? Why else would people pay fortunes for some things and throw others in the trash pile? Obviously, some things are better than others. . . but what's the better-ness? . . . So round and round you go, spinning mental wheels and nowhere finding any place to get traction. What the hell is quality? What is it?

Quality is thus abstract: someone's subjective assessment of value. In spite of the difficulty in defining precisely what academic quality is, nearly everyone has an opinion about which colleges are good and which are poor (6, 10). The bases for these judgments can range from the number of Nobel Prize winners on the faculty to the national rankings of the football and basketball teams. This is also true for academicians (3) as they are able to agree when asked to name the excellent institutions, hopefully based on more scholarly criteria.

Munson and Nelson (11) suggested that differences among the results of different rankings of the same programs are due to differences in the definition of quality (usually implicit) used in the different studies. Millard (12) agreed that different definitions of quality have been used in assessing academic quality, and he suggested that these can be categorized into four basic definitions. The first, a nondefinition, views quality as something that either exists or does not exist. It is recognized when seen, but cannot be described to others. The second definition, based on social consensus, states that quality is what all knowledgeable people agree upon. This definition tends to rely on tradition or on a popularity vote. The third definition involves the use of a paradigm to identify quality. This is basically the Platonic concept of "the Good." The major problem with this definition is the tendency to try to equate diverse institutions with the characteristics of the "best" institution when those characteristics may not be appropriate to some schools' missions or circumstances. The fourth definition uses the idea of a paradigm but places it within the activity or object itself. Quality thus becomes achievement in kind. The quality of an educational institution becomes a function of its effective use of available resources to achieve appropriate educational objectives.

While a clear definition of quality cannot be agreed upon, any system of assessing academic quality is better than no system at all (13). Astin and Solmon (14) expect that a multidimensional ranking, using different definitions of quality, will be able to produce an accurate list of top-ranked institutions. Tan (6) concurred with this multivariate approach and suggested that the use of multiple variables may be an indirect method of defining quality. A basic problem with the multidimensional approach is the difficulty in selecting the correct combination of

variables to indicate quality. However, the variables selected will indicate the investigator's theory and concept of academic quality. Important as these attempts to define academic quality are, a final, authoritative definition is elusive, if not impossible, because of the lack of consensus about this phenomenon and what it comprises.

The next logical step from a discussion of academic quality is to define exactly what an academic quality ranking (AQR) actually is. It is surprising that, with the exception of Webster (15, 16, 17), most authors have paid no more than passing attention to delineating what constitutes an AQR. Webster (15) defined AQR in general as an effort to rank order universities or departments in order of their supposed quality. Webster (16, 17) also delineated the necessary attributes of an evaluation to be considered an AQR. An evaluation must be a rank order of the schools under study, not just an undifferentiated list of schools or schools categorized into a few classes. Thus, as Webster (16) pointed out, early efforts by the American Medical Association's Council on Medical Education to categorize medical institutions into a few groups according to quality was not an AQR. The evaluation must also be based upon one or more factors related to the educational mission of the school, and not merely on size or endowment. So ratings based on a school's enrollment, its number of alumni, or the size of its endowment are not considered AQRs.

AQRs have many uses (18). Corporations use them in deciding on which campuses to concentrate their recruiting efforts. Faculty members may use them in deciding among job offers. Administrators use them for guidance in policy-making decisions or in allocating resources among departments (11, 18). Funding agencies use them in deciding what

institutions will receive grants. Prospective students use them to find good institutions.

Prospective students are less likely to make their choices of schools on casual hearsay and are more likely to be discriminating and avail themselves of rankings to help in their decisions (4, 14). Students show their concern for educational quality when they elect to apply to some schools rather than others (19). Students perceive the professional school as a critical first step in a career, opening or closing the door to future opportunities (19). The rating of quality of their school influences students' self-esteem and affects perceptions of their ability to function within their peer groups (10, 14, 19). In fact, Astin and Solmon (14) have found that attending a selective institution accentuates such attitudinal and personality changes as decline in religious activity, increase in self-criticism, political liberalism, and aspiration for advanced degrees. A student also benefits more from college when surrounded by high quality fellow students (10). The opportunity to interact with intelligent and motivated peers should enrich a student's college experience, and thus an AQR would be important in choosing a college.

Two factors face the prospective chiropractic student in deciding what chiropractic school to attend (20). The first is choosing a college best suited to prepare the student to practice in the manner the student anticipates he/she will want to practice. Unfortunately, students must make decisions about their education before they are completely certain of their practice philosophy. The decision based on practice philosophy is relatively simple; either a college affiliated with the Council on Chiropractic Education (CCE) or a college affiliated with the Straight Chiropractic Academic Standards Association (SCASA) will be chosen. An

SCASA accredited college will give a narrow scope of practice education, while a CCE accredited school offers a broad scope of practice education. These two chiropractic accrediting agencies have very different philosophies of what chiropractic should be. CCE espouses a more disease-oriented approach, while SCASA views chiropractic as more health-oriented. SCASA suggests correction of spinal subluxations to be an important component of health promotion and that chiropractors should limit their practices to correction of spinal subluxations. Whatever track is chosen, straight or broadscope, the final decision about a particular school may be made based on academic quality. Astin and Henson (27) also noted that perceived academic quality of an institution, compared to like institutions, interests prospective students of these institutions concerned about the value of the credential they will receive.

DeBoer (2) suggested that if the chiropractic profession does not establish goals for its scope of practice, the profession will continue to see 10% of the population, rather than the 50% or more that might seek chiropractic care for musculoskeletal complaints alone. It may be that the present chiropractic niche is already saturated, or oversaturated, by the present supply of chiropractors. From this standpoint of utilization, consideration must be given to the possibility that a sufficient supply of chiropractic doctors can be trained in a far fewer number of institutions than are in existence today. The idea of identifying the top-rated chiropractic colleges takes on more importance when these factors are considered. So, among other functions, AQRs help promote rivalry among the chiropractic schools.

A problem facing chiropractic schools is that of duplicate applications (22), where the applicant pool of inquiries to chiropractic colleges is one that is shared with a number of schools. The fact that

applicants submit multiple applications to several schools indicates that the applicant pool may be smaller than realized. If this applicant pool of potential chiropractic students evaporates, it will cause the lesser quality schools to wither and ultimately die. An AQR will not only determine the quality of schools in a systematic manner, it will also serve to help those of less quality to improve by studying the attributes of those schools ranked higher. An AQR could be seen as harmful to those not ranked at the top, but this view is only from the vantage point of the schools and their administrators and not from the perspective of prospective students, who are very much affected and need to know how schools compare in academic quality. Providing such a service could be seen as a public service.

Webster (23) stated that because college catalogs are often filled with self-serving rhetoric they are not a good source of information for prospective students about academic quality. Gregg and Sims (24) also agreed that the quality of an education one receives is not guaranteed by statements in a college catalog or by declarations of a board of trustees. A perusal of the chiropractic college catalogs reveals interesting statements. The president of Cleveland Chiropractic College in Kansas City stated: "Chartered in 1922 as a not-for-profit institution, we have a long and distinguished history of excellence in chiropractic education." The president of Palmer College wrote: "The heritage, the tradition, the reputation for excellence is here." In the catalog from Logan College a statement reads: "The learning experience embraces academic excellence, humanism and professionalism." Finally, the president of Life-West Chiropractic College has written: "We have attempted to create a learning environment that offers a student a superb educational opportunity. . . ." If for no other reason, AQRs are needed to test

claims like those cited above. If all schools claim to have nonpareil instructional programs, the consumer does not have a guide to the levels of quality in those programs.

With 18 chiropractic schools in North America, differences in quality of faculty and of programs are inevitable, and the position must be taken that these schools do actually differ in quality and that providing a ranking to consumers is a public service. A ranking may also be of service to administrators of the chiropractic schools. Administrators could use the results from such an evaluation to review their programs and to launch efforts to improve their offerings. The chiropractic institutions, with limited enrollments and inadequate resources, are confronted with the issue of optimizing and justifying resource allocation. Results from ranking studies may conveniently form the basis for discussion of program performance. A strong college is an asset not only because of opportunities it provides students but also because of its ability to attract intellectual leaders to the college (25). Regular ratings of the schools could be used by administrators, faculty, scientists, and others as an index of progress, or lack of it, from one ranking to the next (26).

Cost and admissions requirements are two variables used in differentiating colleges (27). Accreditation has equated the schools on the admission variable, and a perusal of the chiropractic college catalogs indicates that costs vary within a relatively narrow band, causing the schools to be equated on this variable as well. Another variable is therefore needed to enable the schools to be differentiated. AQR is such a variable which is a form of distinctiveness that will gain in appeal in the years ahead.

Very little previous work has been done on the ranking of professional schools (19), and in reviewing the literature, nothing was found that specifically related to chiropractic that could be considered an AQR. Therefore, nothing has changed since 1974 when the American Medical Association felt disturbed with the U.S. Commissioner of Education's decision to grant to the Council on Chiropractic Education of the American Chiropractic Association the right to accredit chiropractic colleges without any systematic study of the level of quality of the chiropractic schools (28).

There exists in higher education a kind of folklore regarding the best institutions (14). It is assumed that this folklore exists in chiropractic education as well, but it cannot be assumed that everyone knows what the best institutions actually are. An AQR is seen as a method of remedying such an unsystematic method of evaluation.

While an AQR may be useful, there are certain limitations to be aware of in the use and interpretation of such an evaluation. As Webster (29) has indicated, an AQR does not determine institutional effectiveness, as it would be difficult to specify concrete, measurable goals as universities generally attempt to be effective in many different areas at the same time. The "quality" of schools based on a single criterion is, in fact, merely perceived quality. It would be more accurate to use multiple indicators of quality (19, 30). However, due to the different goals of different programs, it would be difficult to develop a particular list of quality variables that would be adequate to predict quality across all fields and disciplines.

The clinical and basic science departments and the internship program within each chiropractic school were not assessed separately. This could lead to a rough overall estimate, as there may be extensive

variability in the quality of different departments within the same institution. Also, the rankings are not precise measurements. Differences in rank between adjacent schools are not necessarily substantively significant.

Even though a variety of criteria of quality were identified for this study, the true measure of quality, perhaps, would be to examine in a longitudinal study the educational and professional development of the students. Expertise-oriented approaches to evaluation such as accreditation and AQR emphasize the central role of expert judgment and human wisdom in the evaluative process (7). This focuses attention on the important issue of whose standards and criteria should be used in rendering judgments about educational programs.

While academic quality may be assessed, what this study did not attempt to consider is the presence of a form of systematic dysfunction called "suboptimization"; that is, a high degree of efficiency in the production of an undesirable or irrelevant output (5).

Finally, while more accurate measures of quality are desirable, there may be no accurate way to reduce quality to a set of explicit criteria. The movement from vague questions of undefined quality to quantified results in the final ranking may be a problem for some.

This AQR examined the academic side of the chiropractic colleges versus the political side and had as its purpose the development of an academic quality rank ordering of the North American chiropractic schools through the use of a multiple criteria methodology.

CHAPTER II

REVIEW OF THE LITERATURE

According to Tan (6), Raymond Hughes, then president of Miami University in Ohio, conducted the first AQR, due to his concern for the lack of information about graduate schools available to baccalaureate graduates of his institution who wanted to pursue graduate studies. Hughes set out to study the quality of graduate instruction in 38 out of 67 institutions then offering the doctoral degree. Tan suggested that Hughes was the first person to use academicians as evaluators, the first to emphasize the importance of reviewing programs at the graduate level, and the first to use faculty quality as a major criterion for evaluating program quality.

Webster (15, 31) suggested the belief in Raymond Hughes' 1925 study as the first AQR is a commonly held misconception. Webster (15, 17) indicated that only five comprehensive reviews of American AQRs have ever been produced, and only two studies before 1950 other than the work of Hughes have been cited. However, as early as 1911, an academic evaluation by the U.S. Bureau of Education existed in which hundreds of American colleges and universities were stratified into five levels according to their presumed quality (15). Due to its use of stratification, however, this would not be considered a true AQR.

Webster (16, 17, 29, 31) suggested that credit for actually inventing AQRs should go to James McKeen Cattell, who produced the first AQR 15 years before Raymond Hughes published his reputational ranking in

1925. Cattell, the distinguished Columbia University psychologist, was the founding editor of American Men of Science and the long-time editor of several important journals, including Science, Scientific Monthly, and Psychological Review (29). Cattell's interest in eminent people, in measuring individual differences, and in assigning objects and people to a rank according to the amount of some quality they possessed, led to his work in ranking scientists in order of their relative merit according to how leading scientists rated them relative to other scientists in their field (17). His investigation of the educational backgrounds and the current academic affiliations of eminent scientists ultimately resulted in the first AQR (17). James McKeen Cattell used scholarly peer assessments to rank the leading American institutions in 10 scientific disciplines and two in the social sciences (29), and equated a school's proportion of eminent scientists it employed with its quality (17). Cattell published this first AQR in 1910. His top five institutions were, in order: Harvard, Chicago, Columbia, Johns Hopkins, and Yale (17).

This AQR by Cattell in 1910 used scholarly peer assessment to rank the leading American institutions in 12 disciplines (29). Prominent researchers in the fields to be ranked were asked to rate the discipline of their expertise, and the results were aggregated to arrive at a ranking of the leading institutions based on scientific strength (29). Since then, reputational ratings using scholarly peer assessment as the criterion of quality have been the most common method of AQR used.

Tan (6) suggested that while the methodologies and opinions used in publications of AQRs are as varied as the concept of quality itself, reputational studies represent one of just three general approaches to

rating academic quality. Other categories would include objective indicator studies and quantitative correlate studies.

Reputational studies use peer evaluation to rate programs. They are based upon personal judgment and subjective opinions of knowledgeable persons. These studies use evaluations from faculty, department heads, or deans who are usually asked to list three or five schools, which, in their opinion, are the best in the discipline, and there are usually no criteria to guide them in their selection (4, 6). An advantage of reputational studies is that those who should know the most about academic quality in a particular discipline can be employed as raters. These ratings also have high face validity; their results match those which the educated general public hold concerning the best colleges and universities (17). A disadvantage is that these ratings can rate only departments whose members have established research reputations (4, 6, 17). Another criticism is that scholars from the leading universities serve in disproportionately great numbers as raters, and they tend to favor those departments with the same characteristics as departments in their own universities (6, 17).

Objective indicator studies assess programs through the use of objective variables such as faculty research output, financial resources, or student outcomes. While frequency and volume of professional publication by departments have been the most popular indicators used (4), any quantifiable measure could conceivably be used. A major limitation of these studies is that most have often used only one criterion in rating quality.

Quantitative correlate studies are not designed to measure quality but to identify variables that are correlated with high ranking programs (6).

Wong (4) classified most comparative ranking studies into four types: (1) studies using subjective opinions, (2) studies using objective opinions, (3) studies using a combination of several objective indicators, and (4) studies using results from other studies. Wong's subjective opinions are equivalent to Tan's (6) reputational studies, while his objective opinions and combination objective opinions are equivalent to Tan's objective indicator studies.

Webster's (17, 32) six methodologies would be more appropriately labeled as criteria for rating academic quality. These methods are as follows: reputational rankings; data based on faculty awards, honors, and prizes; ranking departments by the number of citations their faculties earn over a period of time in citation indexes; rankings based on students' achievements in later life; students' scores on standardized tests; and ranking institutions on institutional resources. Webster (17) suggested that while data based on faculty awards, honors, and prizes would be considered objective data, these awards, honors, and prizes were themselves conferred largely on the basis of subjective judgments. Also, a problem in using citation indexes as a criterion is that the indexes do not distinguish between good or bad citations. Webster (17) further suggested that rankings based on students' achievements in later life, such as measured by their incomes, occupations, or listings in publications like Who's Who in America, may be problematic in that the ratings are 30 or more years behind the times. He also indicated that another disadvantage is that students' later achievements depend more on the ability of the students a school attracts than on the quality of the institution. If students' scores on standardized tests are based on entering exams such as the SAT and ACT and not on exit tests such as the National Board of Chiropractic Examiners exam, then these rankings show

the academic ability of students a college is attracting and not the quality of education the students receive. Ranking institutions based on institutional academic resources such as faculty-student ratios, volumes in the library, and average faculty salaries may be inadequate by themselves in determining academic quality, as this information gives no rating of how well the faculty teaches or how well the students learn.

Gregg and Sims (24) have written that evaluation of institutions and departments of higher education fall into four broad categories: (1) rankings of graduate schools and departments, (2) development of criteria for the accreditation process, (3) ratings of undergraduate institutions, and (4) investigations of salaries, promotion policies, and tenure. However, Gregg and Sims stated that attempts to assess the differences in quality of institutions under these categories have utilized only two methodologies: objective and subjective measures.

To test the validity of past major studies that have used the opinions of deans and departmental chairmen as the basis for national rankings of education, law, and business schools, the academic senate of the University of California at Berkeley surveyed practicing scholars in a reputational rating of the above fields (35). The senate suggested that as long as leading institutions are generally judged along meritocratic lines, the use of peer judgments will continue to carry weight. Raters were asked to evaluate faculty quality of each professional school as distinguished, strong, good, acceptable, or marginal. The raters were also asked to evaluate educational attractiveness as very attractive, attractive, acceptable, or not attractive. The highly rated schools were those with the fewest low ratings. The senate decided that deans are not the best judges of current academic quality.

Johnson (36), in a reputational study to determine the leading American colleges and universities, used three criteria: (1) prestige, the degree to which an institution is admired by other institutions; (2) the ability of an institution to generate new ideas or programs; and (3) the degree to which other institutions follow the leading institution's example. Department chairmen, college presidents, and academic deans were asked to list five institutions under each category. The rating was developed by counting the number of times an individual institution was cited by the various respondents. Johnson (36) suggested, however, that American higher education is too complex to be evaluated with a simple reputational study.

A harsh critic of reputational rankings is Dolan (5), who suggested that the rankings probably measure something but doubts that it is academic quality. He described these studies as little more than quantified gossip or hearsay. Munson and Nelson (1) agreed with Dolan that a reputational rating is an opinion poll but stated that if the selected sample has adequate external validity, an opinion poll is able to provide a rough estimate of academic quality. They also suggested that the internal validity confound of history, related to publicity, can be a problem in reputational studies. Well known schools may be well known because of news coverage of other activities at their institutions, or because of their athletic programs, or because of the general reputations of the schools. These prominent schools are more likely to come to mind when raters are asked to name the top schools in their discipline. Munson and Nelson (11) also found that using a simple summation to calculate the composite score yields the same ranking as a complex weighted sum. They further suggested that a more general multicriteria study would be a more

accurate measure of quality, and that a comprehensive quality study has yet to be conducted.

An example of a study using objective indicators was that conducted by Astin and Solmon (14), who produced a ranking based on the college preferences of the highest scoring 6% among participants in the National Merit Scholarship Program. They suggested that a simpler way to rank institutions would be in terms of the sheer number of highly able students who enroll.

A methodology using objective indicators has been developed by the Council on Graduate Schools in cooperation with the Educational Testing Service (26). Thirty dimensions of quality were identified, such as research activity, student academic ability at entrance, and library resources. This methodology could produce a department profile in which the department's relative standing on each of the 30 dimensions could be plotted. This information could then be used by the department for diagnostic purposes and used in improving and strengthening its programs.

Objective indicators were also used by Knudsen and Vaughn (37) in a re-evaluation of the rankings of sociology departments in the Carter Report. The investigators used the departmental publication record as an objective index of academic quality, as they felt it represented the primary avenue by which any department attains national visibility and recognition. Effectiveness of the doctoral program was determined by the publication record of the 1955-1964 graduates of these programs. Quality of the graduate faculty was measured by the publication record of the departments' faculties for 1960-1964. Knudsen and Vaughn (37) found that while quality ratings of graduate faculty and effectiveness of the graduate program do not differ when using reputational ratings, there is a

disparity between quality of faculty and quality of programs when using publication measures.

In using objective indicators to assess the quality of educational programs, Millard (12) suggested that the relevant questions are not simply what the level of support is, what the salary levels of the faculty are, or the number of volumes in the library, but whether they are adequate and if they are used effectively to achieve the program objectives. Thus, there is an essential need for clear and accurate statements of the objectives of each program. What Millard (12) implied is that the standards for assessment of quality cannot be a simple quantitative analysis, but must be judgmental related to achievement of the objectives.

A quantitative correlate study of sociology departments in the Carter study by Oromaner (38) found that the least prestigious departments were the smallest in size, contained the oldest members, and recruited faculty from the least prestigious departments. He felt that creativity and productivity in sociology are related to the ages of department members. In this study, Oromaner used three measures of age: chronological age, age at time of earning Ph.D. degree, and professional age. Chronological age was obtained by subtracting each sociologist's birth year from 1964. Age at time of earning the Ph.D. degree was obtained by subtracting birth year from the year in which the degree was granted. Professional age was the difference between the age at which the Ph.D. degree was obtained and the chronological age. Using these measures it was found that the more prestigious departments were more likely to have faculty members with a younger professional age.

In another quantitative correlate study, Drew and Karpf (26) suggested that the American Council on Education rankings can be predicted

accurate ($r=.91$), with the determination of departmental rate of publication in highly cited journals. Astin and Solmon (3) also suggested that reputational ratings may be unnecessary as they are redundant with other known information about institutions such as prestige and selectivity. These investigators, using a quantitative correlate study, determined to what degree reputational ratings are related to a variety of other institutional characteristics such as faculty-student ratios, total enrollment, percentage of graduate students, selectivity, and prestige. They found, using regression analyses of seven fields, that it was possible to obtain a multiple correlation of 0.9 or higher with two variables: prestige and size. The results indicated that reputational ratings suffer from a considerable halo effect and that, in fact, quality is not measured, but is the reputation of the institution.

The field of ranking colleges, universities, and programs, according to their academic quality, must mature before the results of these studies become generally accepted (32). However, Webster (32, 33) suggested that steps can be taken to produce a rating that would be fairer, more comprehensive, and accurate. He called for a ranking that is both objective and subjective. The factors of a department should be able to be rated objectively. These factors would include such measures as faculty degrees, honors, publications, and quality of the students, library resources, and accessibility to these resources. Subjective information would include the number and quality of student interactions with each other and the faculty, how much students write, and a determination of the departmental climate. Therefore, Webster (32) suggested the ideal AQR should possess four qualities: (1) multidimensionality, (2) based on achievements of all or most of the faculty and students, not just a few

outstanding ones, (3) based on per capita, rather than aggregate figures, and (4) based on how much students learn.

While Abraham Flexner's Medical Education in the United States and Canada cannot be considered an AQR, it must be considered in any discussion of academic quality relating to health-related professional schools, due to its fame and supposed influence. Although in his report Flexner did not elucidate the criteria he used to judge the medical schools, Webster (17) stated that Flexner did describe them in later writings as follows:

First, the entrance requirements. What were they? Were they enforced? Second, the size and training of the faculty. Third, the sum available from endowment and fees for the support of the institution, and what became of it. Fourth, the quality and adequacy of the laboratories provided for the instruction of the first two years and qualifications and training of the teachers of the so-called pre-clinical branches. Fifth, and finally, the relations between medical schools and hospitals, including, particularly, freedom of access to beds and freedom in the appointment by the school of the hospital physicians and surgeons who automatically should become clinical teachers.

Flexner thus paid no attention to faculty research or to the quality of teaching, focusing instead on tangible qualities such as the physical plant and instructors' credentials.

Of the 155 schools that Flexner visited, only 10 enforced entrance requirements, and only 10 had libraries that were adequate. He also found that in 139 schools, laboratory courses were "deplorably equipped and poorly conducted" (39). After making whirlwind visits of each of the medical schools, Flexner listed each school and described in detail each school's entrance requirements, faculty, facilities and equipment, and income (17).

Gibbons (39) suggested that the Flexner report was essentially the response by establishment medicine and the Carnegie Foundation to the

overproduction of uneducated and ill-prepared medical practitioners. In fact, Flexner called for a dramatic reduction in the number of physicians and medical schools and voiced his hope that the proprietary medical school would disappear (17). Gibbons (39) stated that Flexner found "The crude boy or jaded clerk who goes into medicine . . . has been attracted by advertisements and school catalogues which abound in exaggeration, misstatement and half-truths."

A classification system which had the potential to become an AQR but did not was the listing by the Journal of the American Medical Association of various states' medical licensing board examinations and the percentage of various medical schools' graduates pass rates (17). The first such classification in 1902 stratified medical schools into five groups: (1) schools with less than 10% of its graduates failing, (2) schools with a 10-20% failure rate, (3) schools with a 20-30% failure rate, (4) schools with a 30-40% failure rate, and (5) schools with a 40% or higher failure rate.

From this nascent evaluation process the Council on Medical Education of the American Medical Association developed a 10-point classification system for assessing academic quality (17). Each of the medical schools was rated on a scale from 1 to 10 in each of the 10 areas after being visited by a member of the Council. The 10 areas were: success of graduates of the school before taking state licensing exams, the question of pre-professional education, type of curriculum, quality of medical school buildings, extent of laboratory facilities and instruction, quality of instruction in materia medica and dispensary facilities, hospital facilities and instruction, extent of research of faculty and whether faculty were part-time or full-time, extent to which the school was run as a medical school as opposed to a proprietary facility, and quality of

library facilities and equipment. Based on these 10 criteria, the Council stratified all medical schools into six classes. The A class were those scoring 90-100%; B (80-90%), C (70-80%), D and E (50-70%), and F (below 50%).

In 1912, the Council finished its third classification, and this time it raised the number of points in each category to 100 (17). It also reduced the number of classes to three from six, and instead of using alphabetical descriptors for each level, it gave each classification a descriptive heading. Class A schools became "Acceptable Medical Colleges"; class B schools, "Medical Colleges Needing Certain Improvements to Make Them Acceptable"; and class C colleges were "Medical Colleges Which Would Require a Complete Reorganization to Make Them Acceptable." A school needed to score 70% or higher to be in class A, a score of 50-70% for class B, and those scoring below 50% were placed in class C.

The Council's fourth classification was published in 1913, and using essentially the same criteria, developed a four-strata classification system (17). It added the grade of A+ to those A schools requiring a year or more of premedical science for admission. The Council on Medical Education discontinued this classification system in 1928 (17). Instead, it listed schools as either approved (class A) or unapproved (class B). Then, in the 1940s, the Council discontinued this procedure and issued only a single list of approved schools.

The best known AQRs of health-related professional schools are the reputational studies of medical, dental, and optometry schools by Margulies and Blau (40) and Blau and Margulies (41). Their first study (40) developed a ranking of the top five schools in 17 professional fields. The study asked 1,180 deans of professional schools to name the five most

outstanding schools in their own professions. The study encompassed all American professional schools that were both accredited and university-affiliated. As no North American chiropractic school is university affiliated, these institutions were not ranked.

Seven deans of dental schools participated, and six felt that the University of North Carolina had the best dental program, five listed the school at the University of Michigan, and three listed the schools at the University of Alabama, University of Kentucky, and University of Minnesota.

Eight medical school deans submitted ratings, and all eight included Harvard on their lists of the best medical schools, seven listed Johns Hopkins, and five included Duke, Stanford, and Yale.

The deans of four optometry schools participated, and all four included the University of California at Berkeley and Indiana University at Bloomington, three listed Ohio State University, and two included the University of Alabama and the University of Houston. The investigators explained that questionnaires were sent to only four optometry schools, as these were the only schools to be both accredited and university-affiliated.

A major problem with this study, apart from being a reputational study, was the low response rates for medical and dental schools and the low response rate of 36% overall. The authors attempted to explain the inadequate response rates from medical and dental schools by the fact that these are high prestige professions. However, this does not control for the fact that the sample was so small as to be worthless as a measure of academic quality of those schools.

Due to severe criticism of the previous study, Blau and Margulies (41) replicated their study in an attempt to increase the response rate.

As before, deans of all 1,181 accredited and university-affiliated schools in 17 fields were asked to name the top five schools in their professions. This time 79% of all deans responded. The rankings were based on the number of deans who mentioned a given school as one of the best, and nominations of schools by their own deans were excluded.

Although the rating of medical schools remained unchanged from the previous year's ranking, the rating of dental and optometry schools was quite different, and it is difficult to see how schools could change enough in only one year to affect ratings as dramatically as appeared in this study. In only one year, the University of North Carolina and Michigan traded places at the top of dental schools, Kentucky moved into third place, replacing Alabama which fell to fifth, while Minnesota fell to seventh place. In optometry, the University of California at Berkeley and Indiana University were joined by Alabama and Ohio State University at the top.

A rather tenuous assumption made in this study was that by measuring professional reputation among experts, one is able to determine professional quality. It is difficult to see how a single criterion as reputation can be extrapolated to indicate overall academic quality. Describing one aspect of a program cannot be interpreted as a true indication of overall program quality. To describe a car by its color would not give a clear description of the actual make and model. The more descriptors used, the better idea one gains of the type of car or the quality of a program.

Another reputational ranking of American medical schools was that of Cole and Lipton (19). The purpose of their study was to develop a rank ordering of medical schools based on perceived quality and to correlate this ranking with other organizational and structural factors such as

number of papers published in scientific journals in one year by members of the clinical and basic science faculty, eminence of faculty at each school, and amount of National Institutes of Health funds received.

All schools in the United States approved by the American Medical Association as of 1971-1972 represented the population from which a sample of 87 respondents was drawn. The full-time faculty members within all clinical and basic science departments in the 87 medical schools were sent a short questionnaire. The questionnaire was designed to elicit an evaluation of the faculty quality and the effectiveness of training in all 94 fully approved schools. The questionnaire had two parts. The first part asked the medical faculty to rate medical schools on two aspects of reputation: the perceived quality of its medical faculty and the perceived quality or effectiveness of its medical training program. The second part of the questionnaire requested information about the respondents such as their age, academic rank, and medical or scientific specialty.

Cole and Lipton (19) found a problem with their study in self-aggrandizement. Faculty members rated their own schools significantly higher than did others in the medical community. Interestingly, self-aggrandizement was more pronounced in rating the alma mater than in rating the school in which the rater was currently employed. They concluded from their study that medical schools in contemporary American society vary widely in terms of their reputations, perceived quality, and visibility.

This study had a response rate of only 30.3%, and it is difficult to believe that those responding were representative of the target population. The researcher disagrees with the authors' assessment that this response rate represents only a slightly unrepresentative sample.

A ranking of medical schools using only one objective indicator was that of Higgins and Bryll (42), in which the schools were evaluated based on the number of faculty members produced by the different medical schools. The investigators used two objective data collection methods. First, the schools were ranked by the number of alumni who were full-time faculty members at any U.S. medical school. Secondly, the schools were ranked by the fraction of graduates who had full-time faculty appointments at schools other than the graduating institution. Not surprisingly, this study found that the large and long-established schools produced the greatest number of graduates who became faculty members.

As an AQR, this study is very poor. It is difficult to see how the criterion selected relates in any way to academic quality. The longer an institution has been in existence and the more graduates it produces, the more likely it is that it will produce more faculty members.

In response to Blau and Margulies' rating of medical schools, Paxton (30) developed an AQR of the top 10 schools using multiple objective indicators. Paxton suggested that a reputational rating using a sample of deans is an inaccurate method of evaluation and doubted that the deans' 10 best medical schools are actually the best. He evaluated all 114 currently accredited schools using the following criteria: the top 10 in attracting applicants, the percentage of graduates who passed state licensing exams, producing board-certified specialists, producing medical faculty, producing medical school deans, and generating research grants from the National Institutes of Health. By adding up the first 10 rankings for each category, he produced a composite list of the 10 best medical schools which differed considerably from the Blau and Margulies rankings.

The strength of the study lies in its use of multiple objective criteria. Quality is multidimensional and requires a multidimensional analysis for accuracy. Paxton studied all accredited medical schools, allowing all schools an equal chance to be rated as opposed to reputational studies which, suffering from the halo effect, only rank prominent schools. Although the same criticism could be leveled against some of Paxton's criteria such as attracting applicants and National Institutes of Health research grants, when these are considered along with the other criteria this possible confounding is controlled by his use of multiple objective criteria.

In Abraham Flexner's famous 1910 report on medical education, he referred to chiropractors as "the chiropractics" and dismissed the profession as being unworthy of consideration, even as a medical cult (43). Flexner felt that chiropractors were best dealt with by the public prosecutor and a grand jury.

By 1915, chiropractic had grown to the point where it attracted the attention of the medical establishment. During the next two decades, a series of articles and editorials on chiropractic education appeared in the medical literature. The data for these papers were collected from chiropractic college catalogs, on-site inspections, letters written to college registrars claiming to be prospective students, and quotes from the developer of chiropractic, B. J. Palmer (43). These papers are notable for their unscientific, biased, and crude style, which reflected a medical profession only just emerging from its own dark ages. It is also important to note that today's chiropractic colleges have only their names in common with the schools discussed in the early medical literature.

The first paper ever published on chiropractic education was by John Shaller, M.D., in a Denver medical journal in 1911 (43). Dr. Shaller had adopted chiropractic and his overview of the profession was quite favorable, although he did call for a longer training period than the three months that was common at the time.

The results of an on-site inspection of three Iowa chiropractic schools (Palmer School, Davenport College, and Universal College) by a representative of the Pennsylvania Bureau of Medical Education and Licensure was published in 1915 (43). The evaluations were based on two criteria: subjects taught and physical plant and equipment. All three schools were found to be inadequate.

The next major study of chiropractic education was conducted by George Dock, M.D., in 1921 (44). Dr. Dock made an on-site inspection of the Palmer School and wrote what was an objective report based on the standards of that time. He made no attempt to hide his dislike for chiropractic due to his experience with former chiropractic patients, but he hoped to give an accurate and unbiased account of the school. He visited the school unannounced with a colleague familiar with medical study and medical schools. He was impressed with the osteological collection "containing many remarkably fine specimens of bone lesions. . . ." He found the classrooms to be large, with classes well attended; however, he stated that the only facility that could be considered a laboratory was the x-ray facility. He found a student body of over 3,000 who were friendly, earnest, and dedicated to chiropractic. However, he wrote that "the farm, the barber shop and hotel dining-room or kitchen would seem to be the more natural work places for a great many." Dock found the clinic to be very busy, serving 1,700 patients daily. For the most part, he indicated that many of the patients seemed remarkably well, quite

different from those seen in a typical medical school outpatient clinic. He also noted that the treatment must have given satisfaction, based on the expressions of the patients.

Dock's report lacked the hostility of most reports of this era and indicated a genuine interest in chiropractic practice. He concluded that he doubted chiropractic was an innocent business as some court decisions had suggested, due to the lack of adequate training to take care of sick people. He further concluded that the business of legislation should be left to the legal arena and not to physicians.

In 1922, a commentary appeared in the medical literature which discussed a series of six articles entitled, "Is It Chiro-Quack-Tic?" which appeared in Leslie's Weekly (45). The article emphasized the unscientific nature of the claims made by the early chiropractors and stated that chiropractors were working against public welfare. It was thought that the place of the old, low-grade proprietary medical school was being taken over by the chiropractic schools. B. J. Palmer was described as a long-haired, shrewd advertiser who, within a period of 20 years, by charging maximum fees for a minimum of education, had amassed millions of dollars. The article concluded that chiropractic was an unreliable system of healing due to the "manner in which chiropractors disclaim the need of diagnosis and flaunt the fundamental sciences of chemistry and bacteriology."

A tactic used by the early medical writers was to write false letters of interest to the chiropractic college registrars and publish the responses with comments. Such an article appeared in 1923 in the Journal of the American Medical Association (46), in which a letter written to the Carver Chiropractic College in Oklahoma City (no longer in existence) was discussed. The letter was obviously written by an uneducated,

semiliterate woman. The reply from the chiropractic school indicated that this uneducated woman was sufficiently educated to be admitted. Although this article lacks any credibility as an evaluation of chiropractic education, the author noted his objections to chiropractic education which, to a large extent, holds true to this day. The author stated that the objection to chiropractic and other such cults was that the students of these schools were not well-trained in the fundamentals on which the diagnosis and treatment of disease depends. Today, chiropractic students are well-trained in the basic sciences, but an argument could still be made that chiropractic school graduates are lacking in the necessary diagnostic skills due to inadequate clinical experience while in chiropractic college.

During 1927, on-site inspections were made by representatives of the Council on Medical Education and Hospitals of the American Medical Association (47) of ". . . schools existing in the United States for the teaching of peculiar methods of treating human diseases." The schools studied were schools of podiatry, chiropractic, naturopathy, osteopathy, optometry, and physical therapy. The chiropractic schools studied were those of the Palmer School of Chiropractic, National College of Chiropractic, Los Angeles College of Chiropractic, and the American School of Chiropractic. Brennan (43) suggested that this report is the best known document dealing with early chiropractic education.

The inspection team described chiropractic as "the older osteopathic concept slightly modified and renamed." They felt that the rapid growth of chiropractic was due to the fact that it offered a short cut to osteopathy, as the osteopathic schools had lengthened their curriculum. The report summarized time spent in chiropractic school as a matter of "doing

time," with the student being given the doctor of chiropractic degree as soon as the time limit expired.

The investigation of the Palmer School covered such areas as buildings, garden, spinography department, print shop, cafeteria, radio station, osteologic museum, epigrams covering walls throughout the school, library, climate of the school, size of the school, subjects taught, and the neurocalometer. The inspector found four buildings making up the school, with one of the four being the president's residence. "Much of the space in the other three is used for such display as one would expect to find in a museum but not in a professional school." He was impressed with the osteological collection, writing "Without doubt, this is the best collection of human spines in existence." Although the school catalog described a splendid library for use by the students, the inspector found it padlocked in the middle of the school day. When it was opened at his request, he found three 40-foot long bookshelves, a table, and a display of African swords. The books on the shelves consisted of old medical texts and a larger number of novels. On the table he found magazines, three of which were the Ladies' Home Journal, the Woman's Home Companion, and Detective Stories. He concluded that the library was locked to protect the swords. It was determined that the climate of the school in no way resembled a professional school, as the spirit of the students and instructors resembled that of a trade school. The investigator estimated the famous epigrams at Palmer to number between 500 and 1,000. One epigram read, "Physicians' associations would go on strike if they weren't afraid the people would soon learn to do without them." Another read, "Early to bed and early to rise - work like hell, and advertise - Makes a man healthy, wealthy, and wise." Inspired by the

epigrams, the inspector concluded that "as a salesman, B. J. is a success; as an educator, he does not even exist."

The visit to the National College of Chiropractic was made by an inspector whose purpose was not revealed to the administration, and it is stated that the school assumed him to be one of the patients. This inspector found the students at National to lack enthusiasm and to be lethargic, no doubt due to the fact that a majority of the school's recent graduates had failed to pass the state board examinations. The laboratories were found to be clean and in good order, with elementary equipment deemed to be for impressing visitors. No equipment was evident for use in advanced chemistry or physiology. The dissection room contained six cadavers that were dissected in such a crude manner as to make the experience worthless. The inspector found the X-ray room to be impressive, with "roentgen-ray equipment of the most modern type, such as any high-grade technician might be justly proud of." The chiropractic clinics, one for men and one for women, were empty, without patients or doctors, while the physiotherapy clinic contained a dozen or more patients. Like Palmer, the school catalog boasted of an excellent library containing over 1,000 volumes, but when the inspector asked to be shown the library, he was told "there ain't no library." The visitor was told that high school graduation or its equivalent was required of all students, but that one who had had no high school education could attend a quiz course and then take an examination in which nobody failed. The investigator also became a patient to determine the efficiency of the end product and was not impressed with the clinical performance of the doctors or the students. The final conclusion of this report read, "Such an institution is a disgrace, and it can best serve the public interest by quickly going out of existence."

The report on the Los Angeles College of Chiropractic was more brief than the other schools, and it appears to be added as an afterthought. The inspector was not overly critical of this school and found it to be ". . . the best equipped chiropractic school that the inspector has seen."

The last chiropractic school covered in this report was the American School of Chiropractic. The visitor to this school found it to be "a very sorry looking affair" with 20 students. Most instruction was didactic, and the dean was described as "deaf, nervous, and thick-headed."

This report, covering four chiropractic schools, is interesting as a biased look at the chiropractic colleges of the day. Despite derogatory statements, a comparison with previous reviews indicates that chiropractic education, while poor compared to today's standards, had progressed by new physical plants, better equipped classrooms and laboratories, and improvements in the coursework.

A reformation of chiropractic education was begun in earnest in 1935 through the efforts of John J. Nugent and C. O. Watkins (39, 48, 49). Gibbons (39) suggested, however, that the move towards reform in chiropractic by the Committee on Educational Standards of the National Chiropractic Association was prompted more by a bitter disagreement with B. J. Palmer than by reform movements of previous years. Gibbons stated that Nugent had become Palmer's nemesis while an undergraduate at the Palmer School. In fact, Nugent was expelled from Palmer for ". . . disloyalty, disrespect and insult to the President and circulating statements derogatory to the welfare of the institution." A few weeks later, however, he was reinstated by faculty action.

By 1938, Nugent had personally inspected every chiropractic college and recommended an accreditation process which would eventually lead to

the Council on Chiropractic Education and federal recognition of chiropractic schools. In response to criticism of chiropractic schools as mere trade schools, Nugent wrote (39):

No profession, particularly medicine, which has needed and received so much help from outside sources in the form of educational direction, philanthropy and state aid can afford to forget its lowly educational origins . . . nor can it afford to criticize those who by honest self-criticism are making a painstaking effort to correct their deficiencies.

While Flexner published a detailed account of his visits to medical schools, Nugent did not leave a school-by-school record of his inspections and visitations throughout the 1935-1960 period. He made only internal reports to the National Chiropractic Association.

When John J. Nugent began his quest for chiropractic reform in 1935, all but a few schools were unashamed proprietary enterprises (39). The abolition of these profit-making centers was the most difficult challenge which faced Nugent. Other areas which he challenged were entrance requirements, length of course, and the lack of a standardized curriculum. With these issues he became the "symbol of revolt against Palmer fundamentalism," and his call for reform became known as the hated Nugentism (39).

Watkins, a contemporary of Nugent, introduced the original resolution to create the Committee on Education of the National Chiropractic Association, which paved the way for Nugent's efforts to raise chiropractic educational standards (48, 49). Writing in 1944, Watkins (48) stated that the general public only knows one society, and it must place chiropractic in that social pattern where it looks to science for health. He felt that modern education should place chiropractic in this sphere; anything else would meet increasing resistance from the public. He also believed that chiropractic education was receiving proper emphasis but

that education in the "fundamentals, principles, methods, and attitudes of science" was lacking. In a recent commentary, Keating (49) suggested that, although chiropractic education has made improvements since Watkins' era, the development of scientific attitudes, research ability, and desire has not been achieved.

In 1974, an article appeared in Change magazine which attempted to evaluate chiropractic education at the Los Angeles College of Chiropractic by comparison to a medical school education (50). Erickson's slanted article is a tirade against chiropractic and is devoid of any attempt at legitimate evaluation of chiropractic education; her conclusion concerning the future of chiropractic has proven to be totally wrong. She stated that the profession would steadily decline as chiropractors realize they have "a diploma of no value to anyone outside their own cult." She gave no credit to the college for improving the library, upgrading entrance requirements, or for cooperating with medical physicians in the treatment of clinic patients, but implied that the changes were due to an oversupply of college-educated job seekers.

In a recent analysis of the first 36 issues of the Journal of Manipulative and Physiological Therapeutics, Keating et al. (51) may have inadvertently produced the first AQR of chiropractic schools. The first nine years (1978-1986) of the journal were surveyed, and only scientific articles were included; excluded were all advertising, news, author instructions, reprints of abstracts, and book reviews. Among many variables studied, the college affiliations of the authors were recorded. The number of articles published per institution over a nine-year period was aggregated to produce a rank ordering. Five schools were not represented and those that were included were, in order: National, Canadian

Memorial, New York, Palmer, Palmer-West, Los Angeles, Northwestern, Life, Western States, Cleveland-Kansas City, Logan, Texas, and Life-West.

As an AQR, this approach suffers from being one-dimensional, with all the faults associated with such a limited view of an institution. However, it is important in that it is the first known AQR of chiropractic schools. It is obvious that National and Canadian Memorial lead the field in research output, with the next-ranked school having 10 articles published in nine years, compared to 106 and 38 for National and Canadian Memorial, respectively. It is also important to note that the authors had no intention of producing an AQR, being more interested in the type of articles and sources of the articles (i.e., medical doctors, chiropractic doctors, college faculties, and private practitioners). Their aim was to determine the level of scientific activity and the loci of that activity.

CHAPTER III

METHOD AND PROCEDURE

The process of AQR can be corrupted by persons with ulterior motives. A rater may have a philosophical bent that would favor a particular school or group of schools and by the choice of a criterion in a one-dimensional analysis produce a ranking favorable to his/her philosophy. Raters can bend the ranking process to produce results that reflect their biases or self-interest. However, this problem can be controlled, somewhat, by the use of a multidimensional rating. Therefore, this study examined the academic side of the colleges versus the political or philosophical sides and presents an AQR based on six objective indicators. A bias existed in the selection of criteria towards research and away from the preparation of practitioners. Entirely different measures could have been used if a bias existed towards schools that eschew research and science but put all their effort into producing good working chiropractors.

A variety of multidimensional approaches have been utilized to evaluate the quality of faculties and educational programs of institutions of higher learning; however, this study was patterned after Paxton's (30) study of the best American medical schools. All 18 chiropractic schools in North America approved by the Council on Chiropractic Education or the Straight Chiropractic Academic Standards Association as of 1989 represented the population.

Data on the following six objective variables were collected indirectly: (1) publications in the Journal of Manipulative and Physiological Therapeutics (JMPT) from 1983 through 1988, (2) faculty-student ratios, percentage of chiropractic faculty with (3) bachelor's, (4) master's, and (5) academic doctoral degrees, and (6) percentage of non-chiropractic faculty with academic doctoral degrees. These data were collected from three sources: issues of the JMPT from 1983 through 1989, the most current chiropractic college catalogs, and the Chiropractic College Admissions and Curriculum Directory (52). If a discrepancy existed in the data from these sources, the school in question was telephoned, and the information was verified.

It should be noted that all chiropractic schools are good schools, and depending upon one's practice philosophy, whatever school is chosen, one will receive a good education. However, it is assumed that academic quality does vary from school to school and these variables were selected to measure and compare the quality of the 18 chiropractic schools.

A school's publication record is considered to be one objective index of academic quality and represents the primary means by which a school may attain national visibility and recognition (37). Publication rates also serve as a straightforward index of scholarly productivity and correlate closely with departmental reputations (26). Apart from citations in citation indexes, there is no widely acknowledged standard by which to measure the significance of any specific publication. At the present stage of development of research in chiropractic, citations are of little use in determining the significance of articles published in chiropractic journals. Therefore, the number of articles published is usually accepted as an adequate indication of scholarly contribution (37). Due to the importance of research to the reputation and quality of

the chiropractic schools, a comparison of research productivity of the various schools was made. While other AQRs based on faculty publication rates have used more than one journal, it was deemed appropriate for the present study to only use publications in the JMPT. The JMPT is the only indexed, refereed periodical in chiropractic in existence longer than three years. This journal is indexed in Current Contents, Index Medicus, Biosciences Indexing Agency, and by the Soviet State Academy of Science. It is also abstracted in Excerpta Medica. At the present, the JMPT is the only fully legitimate chiropractic science journal in North America, and it represents the best that the scientific literature in chiropractic has to offer (51). All articles in this journal were included for the six calendar years, from 1983 through 1988. Excluded from consideration were letters to the editor, commentaries, reprints of abstracts, and book reviews. For those articles with multiple authorships of differing institutional affiliations, fractional institutional values were reported in that points for each publication were divided among all the institutions represented. For an article with three authors from three different chiropractic colleges, each college was awarded .33 for the article. Authors of papers reviewed were also identified in terms of affiliation at the time of publication. The procedure followed here paralleled that used by Keating et al. (51) in their calculation of articles published in the JMPT.

Qualifications of the faculty is one of the factors that can influence the ranking of a professional school (40), and a competent, quality faculty is generally accepted as evidence of the strength of a department or college (24). Also, academic degrees held by chiropractic faculty members, other than the doctor of chiropractic degree, are viewed as enhancing the quality of chiropractic education (68). The academic

degrees held by chiropractic faculty were not differentiated according to field of study, as the area of study was not important, but the scholarly and academic attitude that the degree confers was considered to be an important contribution to academic quality. In this regard, Shoemaker (72) discussed Georgetown University Medical School and its curriculum, combining basic sciences, technological breakthroughs, and clinical arts, and instilling a broad knowledge of life, the humanities, and the social sciences. To train young doctors to reason constructively about ethical or moral choices, to ponder and to at least be aware of the implications of human life, Georgetown offers a poetry course in its medical curriculum. Thus, each college's catalog was completely reviewed and every chiropractic faculty member with a bachelor's, master's, or academic doctoral degree, and every nonchiropractic member with an academic doctoral degree was noted. If a chiropractic faculty member had all three degrees, as well as a D.C. degree, he/she was counted once in each category. To control for variation in size of faculties from school to school, a percentage for each academic degree was taken by dividing the total chiropractic or nonchiropractic faculty into the number with each academic degree. This percentage value was then used to rank the schools in these four categories.

Studies of sociology departments have found that, in respect to instruction and the development of a professional attitude, the best possible training may not be achieved, due to an inadequate faculty-student ratio (53, 54). It is also a commonly held belief that an increase in the faculty-student ratio will produce a decline in the quality of education (54). Using data obtained from the college catalogs and from the Chiropractic College Admissions and Curriculum Directory, the

faculty-student ratio for each school was determined. Both chiropractic and nonchiropractic faculty were used in the determination of the ratio.

To add to the multidimensional character of the study it was decided to send a questionnaire to the academic deans of each of the chiropractic schools. Data were to be collected on the following eight objective criteria and one reputation criterion: average faculty salaries across all ranks, mean GPA of last entering class, percentage of last entering class with bachelor's degrees, volumes in the library per student, total in external research grants received during the previous 12 months, total internal expenditure on research during the last 12 months, percentage of students passing part I and part II of the last National Boards exams, and a reputational rating of the chiropractic schools.

The ability to be licensed, or ranking programs on the basis of how well their graduates performed on licensing exams shortly after graduation, is one determining factor of quality of a professional education (31, 55). Paxton (30) suggested that the percentage of each school's candidates who pass National Boards is a good gauge of comparative performance as well as serving as an outcome measure of the education received. Further evidence in support of the use of National Board scores as an outcome measure was found by Kalthoff (55). He investigated the relationship between chiropractic student GPAs and scores on the National Board of Chiropractic Examiners' exams. It was concluded that the chiropractic curriculum properly prepares students for licensure.

Average academic ability of an institution's entering freshman class has been used as one gauge of an institution's quality (21, 40). The more selective institution is viewed as having higher academic standards than the less selective institution and, therefore, a higher quality educational program. Astin and Henson (21) suggested that both faculty

and administrators are inclined to view average test scores of their entering freshmen as an indication of institutional worth. In spite of the lack of validity of such views, evidence exists that an institution's selectivity is a good measure of its perceived quality (21). Therefore, the quality of a college can be viewed as being directly related to the quality of the students, and the colleges can control the quality of the students by their admission policies (55). For these reasons, information was sought on the mean GPAs of students entering chiropractic college, and the percentage of entering students with bachelor's degrees. The quality of the undergraduate institution from which the students graduated was not taken into consideration. Obviously, a 3.5 GPA earned at MIT or Berkeley may not be the same as a 3.5 GPA earned at a small regional school. However, it was assumed that students entering a chiropractic school would represent a cross section of schools of varying quality, and this would not confound an AQR using the GPA of entering students as a criterion. As information on GPAs was not provided by the chiropractic schools, this possible confound was not investigated.

Research is an important aspect of any institution of higher learning, and DeBoer (56) suggested that the chiropractic schools have yet to take this function seriously. In this regard, in a recent commentary, DeBoer quoted Irvin Korr, ". . . research is as much a specialty as surgery is, and to say there is not time enough or money enough to do research is like saying there is no time or money to hold classes." Cole and Lipton (19), in their reputational study of medical schools, found that medical faculty gave quality of research far greater importance than teaching and other features of schools. Further, the majority opinion in higher education today is that the most effective and stimulating teacher is the one who is active in research. This professor is the one who is

most likely to have a thorough knowledge and understanding of his/her field (71). For this reason, questions concerning external and internal research funding were included in the questionnaire.

An adequate library is important to any institution, particularly in relation to research. For this reason, and because library resources have been included in numerous AQRs, a question concerning the number of volumes in the library was included in the questionnaire. Also included under this criterion were books; journals bound as volumes; and serials other than journals, bound as volumes. The total volumes held by each library was to be converted to a per capita figure based on the student population. It was felt that this would help control for the differences in student populations from school to school.

Not only is the quality of a school determined, in part, by the students an institution attracts, but also by the faculty it can attract. It is felt that, at the current level of development of the chiropractic schools, the major factor responsible for attracting top level faculty members is the salary that is offered. Also, the salaries offered is one of the factors that can influence the ranking of a professional school (40). To consider this aspect of a school's academic quality, the deans were asked to list the average faculty salaries for assistant, associate, and full professors. These salaries were then to be averaged across all ranks to arrive at an average faculty salary for each institution.

A reputational ranking of the chiropractic schools was planned by asking the deans to list what, in their opinion based on faculty quality, educational preparation for practice, physical plant, and research, are the top five chiropractic schools in North America. The 10 schools most frequently named by the deans would have represented the reputational ranking.

The questionnaire, along with a cover letter which explained that the information sought was needed to enhance the multidimensional character of the ranking, and a stamped, self-addressed envelope were mailed to all the academic deans, who were asked to return the instruments within three weeks. Of the 18 chiropractic schools in North America, only four schools responded to the questionnaire (Western States Chiropractic College, Sherman College of Straight Chiropractic, Cleveland Chiropractic College of Los Angeles, and Palmer College of Chiropractic). It was later learned that the academic deans attending a meeting for another purpose decided not to participate in this study. Therefore, the criteria in the questionnaire were unable to be used in the ranking process.

Further, criteria such as faculty awards, honors, and prizes (32); citations (26, 32); students' achievements in later life (32); ability of schools to attract applicants (23, 30); National Institutes of Health research grants (30); and the intellectual climate of a college (32) have been used in previous academic quality rankings, but were rejected for the present investigation.

Faculty awards, honors, and prizes were rejected as a criterion for two reasons. First, unlike most colleges or universities, chiropractic schools do not have a set of awards or prizes recognized or used by all the schools. Secondly, as Webster (32) indicated, these awards, honors, and prizes are conferred based on subjective judgments, and represent an indirect reputational rating.

Citations closely linked to research productivity and publications reflect the impact of an author's publications upon colleagues (26). Rankings have been conducted which included the number of citations of professors in leading departments (32). However, citation indexes are required for this task, and as such, an index is unavailable for

chiropractic (due to its nascent research activity); therefore, this criteria was rejected for this study.

Students' achievements in later life, while possibly viewed as a true outcome measure, suffers as a criterion for a ranking study in that the ratings are, of necessity, many years behind the times. Also, as has been suggested by Webster (32), achievements of a school's graduates depend more on the ability of students it attracts than on the quality of the college itself.

Ranking medical schools based on ability to attract applicants was one criterion used by Paxton (30) in his ranking study. This was rejected as a criterion for this study, as it was felt that it measured a school's reputation and age and not necessarily academic quality. Also, with some schools being in existence longer than others, their larger alumni gave them an advantage in student recruitment, as most chiropractic schools still rely on referrals from the field. Further, Webster (23) suggested that it is erroneous to believe that size causes excellence, or smallness mediocrity.

Research is important for modern chiropractic schools, and ranking schools based on research grants from the National Institutes of Health is a valid objective measure of research activity and quality (30). However, as no chiropractic school has yet received a grant from the National Institutes of Health, this criterion was rejected.

Webster (33) suggested that in an ideal rating system, the intellectual climate of the college would be considered. He indicated that while the general campus environment is not the responsibility of the school, the actions and attitudes of the administration will have an effect on the climate. As the climate of a school affects the learning environment for the students, this should be included in the ideal ranking. Although

studies of institutional climate have been conducted without site visits, e.g., Jones and James' perceived climate questionnaire (74), this criterion was not included in this study as it is suggested that an accurate appreciation of an institution's climate requires on-site visits. Such visits were ruled out due to time and economic constraints.

Deciding whether and how to weigh the objectively measured criteria relative to each other presented great difficulty. Due to a lack of consensus on how quality should be measured, it is difficult to attribute more importance to one criterion than another. However, due to the importance of research and scholarly productivity to the quality and reputation of the chiropractic schools, and because four variables were included on faculty quality, it was decided to weight publications in the JMPT by counting the score for this criterion three times.

Each institution was ranked on each criterion, and a rating was developed for each of the six criteria. By averaging the ratings for each school across all criteria, a final composite ranking of the 18 schools was developed.

CHAPTER IV

RESULTS

The modal faculty-student ratio in chiropractic schools is 1:9; in medical and dental schools it is less than 1:5 (40, 50). The five chiropractic schools with the best faculty-student ratios were found to be Sherman College of Straight Chiropractic (1:4), Southern California College of Chiropractic (1:5), Life Chiropractic College-West (1:6), Pennsylvania College of Straight Chiropractic (1:6), and Canadian Memorial Chiropractic College (1:7) (Table I). Texas Chiropractic College (1:12), Life Chiropractic College (1:13), Palmer College of Chiropractic (1:14), and Los Angeles College of Chiropractic (1:18) had less desirable faculty-student ratios, compared to the other chiropractic schools, but better ratios than the average (1:20) for other professional schools (50, 53, 54).

Table II depicts the ranking according to publications in the JMPT. The majority of articles in this journal are written by professors at two schools: National and Canadian Memorial, with 26.33 and 17.08 publications, respectively. The next three schools were Northwestern (5.65 publications), Palmer-West (5.13 publications), and Los Angeles College of Chiropractic (4.58 publications). Four colleges contributed no articles (Cleveland-Los Angeles, Southern California College of Chiropractic, Pennsylvania College of Straight Chiropractic, and Parker Chiropractic College).

TABLE I
FACULTY-STUDENT RATIOS

School	Ratio	Rank
Sherman	1:4	1
Southern California	1:5	2
Life-West	1:6	3
Pennsylvania	1:6	3
Canadian Memorial	1:7	5
Western States	1:8	6
Cleveland-Kansas City	1:8	6
Cleveland-Los Angeles	1:8	6
Parker	1:9	9
Logan	1:9	9
Northwestern	1:9	9
National	1:9	9
Palmer-West	1:9	9
New York	1:9	9
Texas	1:12	15
Life	1:13	16
Palmer	1:14	17
Los Angeles	1:18	18

TABLE II
 PUBLICATIONS IN JMPT, 1983-1988

School	Publications	Rank
National	26.33	1
Canadian Memorial	17.08	2
Northwestern	5.65	3
Palmer-West	5.13	4
Los Angeles	4.58	5
Western States	4.00	6
Life-West	3.00	7
Palmer	2.50	8
Logan	2.00	9
Cleveland-Kansas City	2.00	9
Texas	1.50	11
Sherman	1.00	12
New York	1.00	12
Life	1.00	12
Cleveland-Los Angeles	0	15
Southern California	0	15
Pennsylvania	0	15
Parker	0	15

The highest ranked schools according to the percentage of nonchiropractic faculty with academic doctoral degrees are indicated in Table III. The ratings were as follows: Pennsylvania College of Straight Chiropractic (67%), Cleveland-Kansas City (63%), Texas (62%), Sherman (56%), and New York and Southern California were tied for fifth place with 55% of their nonchiropractic faculty members having academic doctoral degrees.

Table IV presents the ranking of schools according to the percentage of chiropractic faculty with bachelor's degrees. First was National (87%), then Logan (76%), Texas (75%), and Southern California and Palmer-West were tied for fourth place with 75% of their chiropractic faculty members with bachelor's degrees.

Pennsylvania College of Straight Chiropractic and Texas Chiropractic College were rated one and two according to percentage of chiropractic faculty having master's degrees, with 38% and 20%, respectively. Four schools (Life-West, Cleveland-Kansas City, Logan, and Western States) tied for third place, with 15% of their chiropractic faculty members having master's degrees (Table V).

Thirty percent of the medical faculty in medical schools have academic doctoral degrees (50), while in chiropractic schools the percentage of chiropractic faculty with academic doctoral degrees ranges from 14% at Southern California to 2% at Palmer-West, Life-West, and National. However, half of the chiropractic schools lack a chiropractic faculty with even a single academic doctoral degree (Table VI).

Sherman received a top rating with its faculty-student ratio. National produced number one rankings in publications in the JMPT and in the percentage of chiropractic faculty members with bachelor's degrees.

TABLE III
 PERCENTAGE OF NONCHIROPRACTIC FACULTY MEMBERS
 WITH ACADEMIC DOCTORAL DEGREES

School	%	Rank
Pennsylvania	67	1
Cleveland-Kansas City	63	2
Texas	62	3
Sherman	56	4
New York	55	5
Southern California	55	5
National	53	7
Life-West	50	8
Canadian Memorial	50	8
Logan	48	10
Parker	47	11
Northwestern	46	12
Palmer	42	13
Los Angeles	38	14
Cleveland-Los Angeles	33	15
Palmer-West	33	15
Life	26	17
Western States	22	18

TABLE IV
 PERCENTAGE OF CHIROPRACTIC FACULTY MEMBERS
 WITH BACHELOR'S DEGREES

School	%	Rank
National	87	1
Logan	76	2
Texas	75	3
Southern California	71	4
Palmer-West	71	4
Life	69	6
Western States	67	7
Life-West	64	8
Parker	63	9
New York	63	9
Pennsylvania	63	9
Palmer	59	12
Cleveland-Los Angeles	54	13
Canadian Memorial	53	14
Northwestern	53	14
Cleveland-Kansas City	50	16
Los Angeles	47	17
Sherman	32	18

TABLE V
 PERCENTAGE OF CHIROPRACTIC FACULTY MEMBERS
 WITH MASTER'S DEGREES

School	%	Rank
Pennsylvania	38	1
Texas	20	2
Life-West	15	3
Cleveland-Kansas City	15	3
Logan	15	3
Western States	15	3
Southern California	14	7
Life	14	7
Palmer-West	13	9
Canadian Memorial	12	10
National	11	11
Sherman	11	11
Palmer	8	13
New York	8	13
Parker	7	15
Los Angeles	7	15
Northwestern	5	17
Cleveland-Los Angeles	4	18

TABLE VI
 PERCENTAGE OF CHIROPRACTIC FACULTY MEMBERS
 WITH ACADEMIC DOCTORAL DEGREES

School	%	Rank
Southern California	14	1
Pennsylvania	13	2
Canadian Memorial	6	3
Life	5	4
Palmer	4	5
Logan	4	5
Los Angeles	4	5
Palmer-West	2	8
Life-West	2	8
National	2	8
Parker	0	11
New York	0	11
Northwestern	0	11
Sherman	0	11
Cleveland-Kansas City	0	11
Texas	0	11
Western States	0	11
Cleveland-Los Angeles	0	11

Pennsylvania earned top rankings with 67% of nonchiropractic faculty members having academic doctoral degrees, and 38% of chiropractic faculty members with master's degrees. Southern California was rated number one, with 14% of its chiropractic faculty members having academic doctoral degrees.

The final composite ranking is shown in Table VII. The top 10 schools, in order, were: National College of Chiropractic, Canadian Memorial Chiropractic College, Life Chiropractic College-West, Logan College of Chiropractic, Palmer College of Chiropractic-West, Pennsylvania College of Straight Chiropractic, Western States Chiropractic College, Southern California College of Chiropractic, Cleveland Chiropractic College of Kansas City, and Texas Chiropractic College.

TABLE VII
FINAL COMPOSITE RANKING

School	Weighted Composite Score	Rank
National	4.9	1
Canadian Memorial	5.8	2
Life-West	6.4	3
Logan	7.0	4
Palmer-West	7.1	5
Pennsylvania	7.5	6
Western States	7.9	7
Southern California	8.0	8
Cleveland-Kansas City	8.1	9
Texas	8.4	10
Northwestern	9.0	11
Sherman	10.1	12
New York	10.4	13
Los Angeles	10.5	14
Palmer	10.5	14
Life	10.8	16
Parker	12.5	17
Cleveland-Los Angeles	13.5	18

CHAPTER V

DISCUSSION

Using the data on the six objective indicators in this study, it was possible to determine the levels of academic excellence of the North American chiropractic schools and to rank order the schools according to academic quality. It was not the purpose of this evaluation to determine whether a school is good or worthwhile, as opposed to bad or worthless. The study's purpose was achieved in that a ranking of the schools according to a set of criteria, which represented the best available determinants of academic quality, was produced. Further, in the fields of evaluation, it was understood that a useful and well-designed AQR can be conducted without explaining what caused the program to be ranked high or low or how the school produces its effects (7). The results of this study confirmed the hypothesis that chiropractic schools differ in their levels of academic quality and that these differences can be used to produce an AQR.

All the chiropractic schools have better faculty-student ratios than the average for nonmedical professional schools such as business, education, journalism, and library science, but the average ratio for medical and dental schools is less than 1:5. Only Sherman (1:4) has an equivalent ratio to these schools; the other schools should determine if their present faculties are sufficient in size to train chiropractic students adequately.

While no data are available on the ideal ratio and the lore of the profession does not answer the question of what the ratio should be, the literature suggested, as would common sense, that the lower the ratio, the better. From the viewpoint of an administrator, it may be a more efficient use of school resources if the faculty-student ratio is kept high. However, it is suggested that a faculty insufficient to give individual attention to students is detrimental to the educational process.

With great variation in ratios from 1:4 at Sherman, to 1:18 at Los Angeles, longitudinal studies are required to determine if the graduates of schools with low ratios are more successful in practice than those graduates of programs with high ratios. It is the researcher's contention that faculty-student ratios have little impact on whether a practice will be successful or not, but the ratios do impact on the graduate's attitude toward his/her alma mater. It is suggested that graduates from schools with low ratios will have better attitudes toward their schools than will graduates from programs with higher ratios. This could prove to be a fertile ground for future research.

In calculating the faculty-student ratios, the college catalogs were used and all those listed as full-time faculty members were included. As some colleges may have listed administrators as faculty and others may not have, this may have impacted on the ratios, causing difficulty in directly comparing the ratios. In the future, either a standardized reporting system for faculty or cooperation from the individual schools to determine how they decide who is and who is not a faculty member is needed for more accurate determination of faculty-student ratios. This will allow ease of comparison among the schools.

A noteworthy finding of this study was that two schools exceeded all others in levels of research productivity: National and Canadian

Memorial, representing 56% of all papers published. To determine if a relationship existed between this criterion and the other variables used in the study, a correlation for ranks was calculated. A weak relationship was demonstrated, with percentage of chiropractic faculty members having academic doctoral degrees suggesting that some other factor(s) were responsible for the greater research productivity at these schools. The researcher suggests that the answer lies not in objective indicators, but in the affective domain. Apparently, these schools view research as important and have inculcated this belief in their faculty, while the other chiropractic schools have yet to take their research roles seriously.

A discouraging finding was that four schools, representing 22% of all schools, were not able to produce even one paper worthy of publication in the JMPT. Those schools must seriously reconsider their roles as doctorate-granting institutions. To be taken seriously, a professional school training doctors to care for sick people must be involved in research, and that research must be published in credible scientific journals.

While ranking studies of university departments using research and scholarly publications as a criterion have used numerous journals in determining productivity, chiropractic is different from arts and sciences disciplines in that the chiropractic schools have only recently begun to emphasize research, and at present the profession has only one fully legitimate research journal that has been in existence longer than three years. However, newer journals such as the American Journal of Chiropractic Medicine, Journal of the Canadian Chiropractic Association, Chiropractic Sports Medicine, and Chiropractic Technique adhere to blind peer-review of manuscripts and are in the process of gaining routine

indexing by scientific indexing sourceworks. When these journals reach the same stage of development that the JMPT has been able to achieve and when they continue to maintain high ethical standards, focus chiropractic research, and provide a forum for clinical and scientific debate, then they should be included in any academic quality ranking which uses research productivity as a criterion.

As this ranking did not include papers published by faculty members in nonchiropractic science journals, a number of articles which could be used in a ranking study have not been considered. As this was a study of chiropractic schools and not orthopedic training programs or microbiology programs, and as the number of papers in nonchiropractic science journals is considered to be small, it is suggested that this does not impair the validity of the particular methodology used.

In looking at the number of faculty members having other academic degrees, the relevance of the degree to the person's teaching assignment was not considered. It is suggested that at the present level of development of the chiropractic schools--they are not much more than trade schools--what is needed is the attitude of the scholar which those with degrees other than the D.C. degree will bring to the institution. The term "trade school" is not used pejoratively, but as a description of the perceived academic climate and development of the schools. Half of the schools have at least 50% of their nonchiropractic faculty members with academic doctoral degrees, and only two (11%) of the schools have more than 10% of their chiropractic faculty members with academic doctoral degrees. It is suggested that those schools with a high proportion of faculty members with academic degrees will be able to instill an academic attitude in their students to a greater extent than will those schools

with lower proportions. DeBoer (56) eloquently addressed this attitudinal influence of faculty:

What is the nature of these internal nagging problems? Especially, why is the faculty a problem? Basically, I think that it is because historically the chiropractic faculty has been out of the mainstream of academia. The academic virtues and traditions have not yet been incorporated in the warp and woof of the faculty like they have at most other universities. Having been cut off from the past, the faculty is unsure about the present. The role, the rights, and the duties of what a professor should do are unclear. The faculty have not conceived of their constituency and the administration has not really known how to treat the resulting mixture.

Although the Pennsylvania school had the highest proportion of non-chiropractic faculty members with academic doctoral degrees and the highest percentage of chiropractic faculty members with master's degrees, as well as the second highest proportion of chiropractic faculty members with academic doctoral degrees, the small size of its faculty must be taken into consideration. This school's catalog lists a total of 11 faculty members. Only two nonchiropractic faculty members have academic doctoral degrees, three chiropractic faculty members have master's degrees, and one chiropractic faculty member has an academic doctoral degree.

It is difficult to see how these few people could have a major effect on the academic climate of the school, and this has to be recognized as an anomaly in the objective ranking of the schools. On the other hand, in selecting its faculty, the school did not have to hire those people with advanced degrees and must be accorded some credit for selecting well-qualified instructors. However, it is suggested that a school such as National, with 53% of its nonchiropractic faculty members having academic doctoral degrees compared to Pennsylvania's 67%, must have a stronger influence on the intellectual climate due to its greater number of faculty members. This would also be true in comparing the schools

ranked on the percentage of chiropractic faculty members with master's degrees. Canadian Memorial was ranked 10th with 12%, while Pennsylvania was ranked first with 38%. Again, the criterion of percentage of chiropractic faculty members with academic doctoral degrees resulted in Pennsylvania being ranked second with 13%, while National is ranked eighth with 2%. The greater effect on intellectual climate by lower rated schools, compared to Pennsylvania, is borne out by one aspect of the intellectual climate--research productivity. While Pennsylvania's high ratings in these areas may be an anomaly, it is suggested that the ratings of the other schools are an accurate reflection of the contribution of each school's faculties to the development of a professional academic environment.

As suggested by Keating (49), the chiropractic schools have made great progress in the area of basic science training, which is confirmed by this study. Most of the schools have made a concerted effort to attract well-qualified basic scientists, which is borne out by the percentage of nonchiropractic faculty members with academic doctoral degrees. Unfortunately, this does not carry over to chiropractic faculty where eight of the schools (44%) do not have even one chiropractic faculty member with an academic doctoral degree. Thirty percent of the medical faculties in medical schools have academic doctoral degrees (50), while in chiropractic schools the average is only 3%, suggesting that the schools have yet to appreciate the importance of attracting doctors of chiropractic with academic doctoral degrees. The researcher suggests that this fact is partly responsible for the persistence of the claims making tradition in chiropractic, and for the lack of emphasis in research and the philosophy of science in the chiropractic curriculum.

Some criticism may be leveled at using percentage of chiropractic faculty members with bachelor's degrees as a criterion in this study, as some of the schools offer bachelor's degrees along with the chiropractic degree. This would be a disadvantage to those schools not offering a concurrent bachelor's degree only if a propensity existed for schools to hire their own alumni as faculty. In perusing the college catalogs it was noted that no such propensity existed, but that the schools have a fair representation of faculty from across the chiropractic schools.

A notable exception to this trend is Sherman College, where most of the chiropractic faculty members are graduates of its own program. This is probably an intentional bias designed to protect its unique approach to chiropractic philosophy, which graduates from other programs would threaten. Perhaps this explains Sherman's low rating in this area.

As has been noted in the discussion of each of the criteria used in this study, reliance on a single objective indicator may produce a problem of low face validity for the resultant ranking. However, by developing a final composite ranking from the six objective criteria, it is suggested that a rating with high face validity has been developed. Some may argue that Pennsylvania and Southern California should not be ranked as high as they are and that Los Angeles should be rated higher than it is, but as this ranking was based on objective indicators and not on perceived quality or reputation, the researcher supports the final ranking as an accurate indication of the academic quality of the chiropractic schools.

The final weighted composite scores do not represent fine measurements, and the differences between some of the schools in academic quality may not be great, or the methodology used may not be precise enough to determine larger differences. The difference between Logan and

Palmer-West in being ranked fourth or fifth is represented by a difference of only 0.1. Also, the scores for Western States, Southern California, and Cleveland-Kansas City are 7.9, 8.0, and 8.1, respectively, representing the seventh, eighth, and ninth places, only separated by a difference of 0.1.

This study looked only at the inputs of higher education: number of faculty, qualifications of the faculty, and research productivity of faculty. The study could be improved by including criteria that examine institutional differences as measured by outputs. However, higher education institutions are not yet at the level of preparedness to demonstrate institutional effectiveness (75). Most schools are at the stage of developing definitions of expected outcomes. A disadvantage of outcomes, however, is that they require collection of longitudinal data analyzed over an extended period of time.

Before Keating et al.'s (51) bibliographic analysis of articles in the JMPT, very little in the way of published material identifying the best chiropractic schools was available. However, this study was not intended as an AQR, and in order to encourage every chiropractic institution and its faculty to consider its role in the continuing development of chiropractic as a health profession, this researcher elected to venture into the ranking game. It was expected that outrage and indignation would be the principal harvest; however, it is hoped that those most outraged will recognize that others, with much more influence, will be advocates of accountability in chiropractic education.

At the present utilization level of chiropractic services, the chiropractic niche may already be full. While the future of the chiropractic schools in a period of economic difficulty and dwindling enrollments is uncertain, it is doubtful that the selection of an exclusive group of

excellent schools for support would be wise. Such a policy would inhibit the progress of chiropractic and prevent the entry into the field of new institutions. Entry should not be discouraged; mediocrity should be discouraged. Further, it is important to realize that any decline in support for the less prestigious schools will deprive them of crucial resources needed for upgrading their quality. Such action would represent a serious backward step in the effort to improve chiropractic education as a whole.

Also, never before in the history of chiropractic has there been such a challenge to chiropractic's pre-eminence in spinal manipulation from the physical therapy profession and certain groups in the allopathic and osteopathic professions. Therefore, the profession is now at a critical period of decision. Depending upon what decision is made, many great things can happen. The intellectual resources in chiropractic must effectively be exploited; this can only be done with strong educational institutions. Above all else, a purposely developed coherent set of principles which relate the practice of chiropractic to the totality of our educational programs is needed. The time is ripe for thoughtful analysis of our situation and for more aggressive action on the part of those organizations that should be looking out for the interests of chiropractic and its educational institutions. In implementing such a policy, it is of obvious importance to be able to identify those chiropractic schools which possess excellence or the potential for developing excellence.

This relationship between the school's program of study and what its students need to learn for the modern-day practice of chiropractic is one factor that is important to consider in any interpretation of an AQR. It is likely that this "fit" is not the same for all schools. It seems

reasonable, therefore, that future ranking studies should consider the "fit" between what a school teaches and what society says chiropractic students need to learn. Although chiropractic students pursue a four/five-year curriculum with emphasis on the sciences, perhaps the training received is inadequate for practitioners licensed to diagnose and treat a broad range of human illnesses.

What is needed is education for capability and willingness to complete the tasks for which qualified members of a profession are held responsible, and to be involved in continuing education. Many of the same educational questions faced by medical educators (73) are being faced by chiropractic faculty members. Changing the curriculum to include all that must be learned as biomedical knowledge continues to expand at a rapid rate, integrating preclinical and clinical components to provide a better educational experience, and determining the best methods for evaluating students, are decisions faced by both professions.

Inability to contend with the economic and social changes which are the inheritance of yesterday and which serve as the major shaping forces of today could prove devastating, as the day appears to be disappearing when the profession's leadership was the driving force and architect of the chiropractic educational system. A new partnership among consumers, insurance carriers, and government is taking over. If those within the chiropractic establishment do not respond to the calls for change, it is inevitable that these political forces will affect changes having popular support. Education is complex, and it is relatively easy to calm these external demands by instituting minor and insignificant changes. Excessive pressure from the outside often triggers defensive reactions which act as stumbling blocks to progress, and it is hoped that AQRs will act as a control for this response.

Continuing changes which are likely to characterize the educational programs offered by the chiropractic schools make it apparent that what is fact today about academic quality may not be a decade from now. It is warranted, therefore, that ranking studies be undertaken at relatively frequent intervals. Also, it is suggested that the history of chiropractic education has confused tradition with quality, and it is also equally important not to confuse quality with innovation. As Millard (12) indicated, both tradition and innovation are quality-neutral. An AQR allows an objective approach to assessment of educational quality, ignoring tradition and innovation.

It is also suggested that such studies be undertaken by a recognized professional agency, not necessarily within chiropractic, in order to avoid possible personal bias and to assure continuity and continuous improvement of methodology. This process may also be advantageous in that data not accessible to an individual investigator might be made available to such an agency.

Research is needed to determine why certain schools are able to fulfill their roles with distinction while others appear to be less successful in this endeavor. It is suggested that development of appropriate criteria for ranking the chiropractic schools will provide the base from which all the schools may approach this essential task of self-evaluation and self-improvement.

The institutions currently receiving high ratings should not ignore the need for continuing reappraisal and development, nor should those institutions whose ratings are less prominent dismiss the evidence that they have challenges to meet. Quality educational leadership is crucial in today's dwindling pool of chiropractic applicants; consequently, the

task of improving and maintaining the quality of chiropractic educational programs is of utmost importance.

As endowments for most of the chiropractic colleges are small and these institutions must rely upon tuition for significant portions of their operating budgets, it is understandable why administrators are sensitive to any change (results of an AQR) that could affect enrollment. As a result, quantity has been emphasized over quality in chiropractic education.

While administrators may view AQRs as an inappropriate means for assessing educational quality, they represent the best method for ranking schools according to academic quality until a more accurate alternative can be found. The present study presented a ranking of 18 chiropractic schools based on six objective criteria. The researcher suggests, considering the lack of cooperation from the schools, that these objective criteria are the best available measures of quality of sufficient breadth to permit such a ranking.

Since quality is a multidimensional entity, a strength of this study was the use of multiple variables. This researcher was surprised that few researchers have utilized this approach; most rely on a single criterion. Perhaps the problem has been the difficulty involved in selecting the "best" combination of criteria to determine academic quality, due to the lack of complete understanding of such quality. It is suggested that the best opportunity for a theory of academic quality to be developed is through the use of multiple criteria.

As no one is certain how "quality" should be defined, it is not certain that quality should be defined by characteristics of quality at the elite chiropractic schools as defined in this study. Quality is someone's subjective assessment, for there is no way of objectively

measuring what is a value judgment. Quality is what one thinks it is, based on the aims of education. There is clearly a lack of agreed-upon criteria, but when objective criteria are used, there is an attempt to make subjective assessment objective.

Are the students in highly rated chiropractic schools better prepared for practice than students in schools with mediocre or low rankings? In other words, while this researcher's definition of academic quality is delineated by the criteria chosen for the ranking study, those criteria may not be adequate for such a determination, and it would be difficult to confer special benefits for private practice on those students of highly ranked institutions. However, it is felt that the six criteria used are sufficient to judge the overall academic quality of the schools. If other criteria of preparedness for practice can be identified, either through additional AQRs or by means of longitudinal studies of students, then these could be used to add to the strength of any quality ranking. A workable definition of academic quality should be developed to guide those persons committed to enhancing the quality of chiropractic education.

It may be important in assessing the quality of any chiropractic program to look beyond the boundaries of the campus and to consider the wider educational environment in which the school is situated. For example, Cleveland-Kansas City has an affiliation agreement with the University of Missouri-Kansas City in which Cleveland's students have use of the university library, health facilities, recreational facilities, and dormitories. Availability of such resources must add to the educational experience of students and should be considered in any future ranking study of chiropractic schools.

It is accepted that the art and science of ranking colleges according to their academic "quality" has a great deal of developing to do before the results are generally accepted. Regardless of how one looks at the value of having academic rankings or the way such rankings are commonly used and misused, it is a fact that such rankings still matter. Reporting results of this ranking does not mean that the researcher approves all uses to which this study may be put. It is merely the researcher's obligation to report the results.

In conclusion, it is not claimed that this study is the ultimate in quality ranking methodology (particularly in view of the lack of cooperation from the chiropractic schools), but a study need not be perfect before its findings are worth disseminating. It is obvious that educational quality is of interest. Reactions to AQRs from academe and business alike indicate a demand for information in this area, as well as a fear that ratings will affect student applications.

In this Information Society, incomplete information is better than no information, but accurate measures of quality are desirable. There may be no way to reduce quality to a single dimension; instead, it may be necessary to define different components of quality. This way, different people may assign subjective values to each dimension in making judgments. Obviously, one study will not clarify the problems of measuring academic quality.

Quality can be measured by numerous indicators. No one measure will provide an accurate estimate of an institution's overall quality, and one-dimensional rankings should be abandoned in favor of multidimensional indicators of academic quality. The task remains to develop such multiple criteria of quality, to obtain and disseminate results that can

help students and administrators identify high quality, and to show administrators how to improve their schools.

REFERENCES

1. U.S. Department of Health and Human Services. State Licensure and Discipline of Chiropractors. Office of the Inspector General, 1989.
2. DeBoer, K. F. "The Future Role of the Chiropractor in the Health Care System." Journal of Manipulative Physiological Therapeutics, 9, 1986, 225-228.
3. Astin, A. W. and Solmon, L. C. "Are Reputational Ratings Needed to Measure Quality?" Change, 13, 1981, 14-19.
4. Wong, S. G. "Pecking Orders: Uses and Limitations." (Paper presented at the 17th Annual Forum of the Association for Institutional Research, Montreal, Quebec, May, 1977.)
5. Dolan, W. P. The Ranking Game: The Power of the Academic Elite. Study Commission on Undergraduate Education and the Education of teachers, Lincoln, Nebraska, 1976.
6. Tan, D. L. "The Assessment of Quality in Higher Education: A Critical Review of the Literature and Research." Research in Higher Education, 24, 1986, 223-265.
7. Worthen, B. R. and Sanders, J. R. Educational Evaluation: Alternative Approaches and Practical Guidelines. New York: Longman, Inc., 1987.
8. Borg, W. R. and Gall, M. D. Educational Research: An Introduction, 4th ed. New York: Longman, Inc., 1983.
9. Pirsig, R. Zen and the Art of Motorcycle Maintenance. New York: William Morrow & Co., 1974.
10. Solmon, L. C. "The Definition of College Quality and Its Impact on Earnings." Explorations in Economic Research, 2, 1975, 537-587.
11. Munson, C. E. and Nelson, P. "Measuring the Quality of Professional Schools." UCLA Educator, 19, 1977, 41-52.
12. Millard, R. "Assessing the Quality of Innovative Graduate Programs." New Directions for Higher Education, 12, 1984, 41-48.
13. Petrowski, W. R., Brown, E. L., and Duffy, J. A. "National Universities and the ACE Ratings." Journal of Higher Education, 44, 1973, 495-513.

14. Astin, A. W. and Solmon, L. C. "Measuring Academic Quality: An Interim Report." Change, 11, 1979, 48-51.
15. Webster, D. W. "The Bureau of Education's Suppressed Rating of Colleges, 1911-1912." History of Education Quarterly, 24, 1984, 499-511.
16. Webster, D. W. "James McKeen Cattell and the Invention of Academic Quality Ratings, 1903-1910." Review of Higher Education, 8, 1985, 107-121.
17. Webster, D. S. Academic Quality Rankings of American Colleges and Universities. Springfield, Illinois: Charles C. Thomas, 1986.
18. Webster, D. S. "How Not to Rank Universities." Higher Education, 14, 1985, 101-109.
19. Cole, J. R. and Lipton, J. A. "The Reputations of American Medical Schools." Social Forces, 55, 1977, 662-684.
20. Petersen, D. M. "Let the Student Beware." Dynamic Chiropractic, 7, 1989, 5.
21. Astin, A. W. and Henson, J. W. "New Measures of College Selectivity." Research in Higher Education, 6, 1977, 1-9.
22. Kern, D. P. "What Challenges Face Chiropractic Colleges?" Today's Chiropractic, November/December, 1988, 35-38.
23. Webster, D. S. "America's Highest Ranked Graduate Schools, 1925-1982." Change, 15, 1983, 14-24.
24. Gregg, R. T. and Sims, P. D. "Quality of Faculties and Programs of Graduate Departments of Educational Administration." Educational Administration Quarterly, 8, 1972, 67-92.
25. Magoun, H. W. "The Cartter Report on Quality in Graduate Education." Journal of Higher Education, 37, 1966, 481-492.
26. Drew, D. E. and Karpf, R. "Ranking Academic Departments: Empirical Findings and a Theoretical Perspective." Research in Higher Education, 14, 1981, 305-320.
27. Jencks, C. and Riesman, D. The Academic Revolution. Chicago: University of Chicago Press, 1977.
28. Huth, E. J. "Chiropractic as Higher Learning." Annals of Internal Medicine, 82, 1975, 843.
29. Webster, D. S. "Institutional Effectiveness Using Scholarly Peer Assessments as Major Criteria." Review of Higher Education, 9, 1985, 67-82.
30. Paxton, H. T. "The 10 Best Medical Schools. Or Are They?" Medical Economics, 53, 1976, 90-95.

31. Webster, D. S. "Ranking Academic Quality." Change, 18, 1986, 34-41.
32. Webster, D. S. "Advantages and Disadvantages of Methods of Assessing Quality." Change, 13, 1981, 20-24.
33. Webster, D. S. "A Brief History and Critique of Published Ratings of Graduate School Departments." Evaluative Report: EDRS, 1977.
34. Webster, D. S. "Who is Jack Gourman and Why is He Saying All Those Things About My College?" Change, 16, 1984, 14-19, 45-56.
35. "The Cartter Report on the Leading Schools of Education, Law, and Business." Change, 9, 1977, 44-48.
36. Johnson, R. R. "Leadership Among American Colleges." Change, 10, 1978, 50-51.
37. Knudsen, D. D. and Vaughn, T. R. "Quality in Graduate Education: A Re-evaluation of the Rankings of Sociology Departments in the Cartter Report." American Sociologist, 4, 1969, 12-19.
38. Oromaner, M. J. "A Note on Analytical Properties and Prestige of Sociology Departments." American Sociologist, 5, 1970, 240-244.
39. Gibbons, R. W. "Chiropractic's Abraham Flexner: The Lonely Journal of John J. Nugent, 1935-1963." Chiropractic History, 5, 1985, 45-51.
40. Margulies, R. Z. and Blau, P. M. "America's Leading Professional Schools." Change, 5, 1973, 21-27.
41. Blau, P. M. and Margulies, R. Z. "The Reputation of American Professional Schools." Change, 6, 1974-75, 42-47.
42. Higgins, E. J. and Bryll, T. "Major Sources of U.S. Trained M.D.s on U.S. Medical School Faculties." Journal of Medical Education, 57, 1982, 571-573.
43. Brennan, M. J. "Perspectives on Chiropractic Education in Medical Literature, 1910-1933." Chiropractic History, 3, 1983, 25-30.
44. Dock, G. "A Visit to a Chiropractic School." Journal of the American Medical Association, 78, 1922, 60-63.
45. "Leslie's on Chiropractic." Journal of the American Medical Association, 78, 1922, 115-116.
46. "The Menace of Chiropractic: Practically No Educational Qualifications Necessary for Matriculation in Chiropractic Colleges." Journal of the American Medical Association, 80, 1923, 715-716.

47. "Schools of Chiropractic and of Naturopathy in the United States: Report of Inspections." Journal of the American Medical Association, 90, 1928, 1733-1737.
48. Watkins, C. O. The Basic Principles of Chiropractic Government. (Available from Northwestern College of Chiropractic, 2501 W. 84th St., Bloomington, Minnesota, 55431.)
49. Keating, J. C. "Basic vs. Applied Science." Journal of Manipulative Physiological Therapeutics, 11, 1988, 438-440.
50. Erickson, B. B. "The Controversial Chiropractic Schools." Change, 6, 1974, 15-17.
51. Keating, J. C., Larson, K., Stephens, M., and Mick, T. J. "Journal of Manipulative and Physiological Therapeutics: A Bibliographic Analysis." Journal of Manipulative Physiological Therapeutics, 12, 1989, 15-20.
52. Magarian, K. and McNamee, K. P. Chiropractic College Admissions and Curriculum Directory: 1988-1989. Los Angeles: KM Enterprises, 1988.
53. Janes, R. W. "The Student-Faculty Ratio in Graduate Programs of Selected Departments of Sociology." American Sociologist, 4, 1969, 123-127.
54. Lavender, A. D., Mathers, R. A., and Pease, J. "The Student-Faculty Ratio in Graduate Programs of Selected Departments of Sociology: A Supplement to the Janes Report." American Sociologist, 6, 1971, 29-30.
55. Kalthoff, T. J. "National Board Scores Versus Student GPAs in Chiropractic Education." College and University, 61, 1985, 61-67.
56. DeBoer, K. F. "Notes From the (Chiropractic College's) Underground." Journal of Manipulative Physiological Therapeutics, 6, 1983, 147-150.
57. Lewis, L. S. "On Subjective and Objective Rankings of Sociology Departments." American Sociologist, 3, 1968, 129-131.
58. Jamison, J. R. "Educational Preparation for Chiropractic Clinical Research." Journal of Manipulative Physiological Therapeutics, 7, 1984, 109-117.
59. Keating, J. C., Nelson, J. M., and Mootz, R. D. "A Model for Clinical, Scientific and Educational Development." Research Forum, 2, 1986, 103-114.
60. Gay, L. R. Educational Research: Competencies for Analysis and Application. Columbus: Charles E. Merrill, 1981.
61. Dube, W. F. "Undergraduate Origins of U.S. Medical Students." Journal of Medical Education, 49, 1974, 1005-1010.

62. Webster, D. S. "Innovation in Ph.D. Programs and Scores in Reputational Rankings." In: Pelczar, M. J. and Solman, L. C., Eds., New Directions for Higher Education, 12, 1984, 31-39.
63. Peltason, J. W. "Federal Dollars: Providing the Margin of Quality." Change, 13, 1981, 26-27.
64. "Straight Colleges Form New Organizations." Chiropractic Journal, 3, 1989, 7.
65. Shichor, D. "Prestige of Sociology Departments and the Placing of New Ph.D.'s." American Sociologist, 5, 1970, 157-160.
66. Glenn, N. D. and Villemez, W. "The Productivity of Sociologists at 45 American Universities." American Sociologist, 5, 1970, 244-252.
67. Kirby, R. L. "The GPEP Report on Undergraduate Medical Education: Implications for Rehabilitative Medicine." American Journal of Physical Medicine, 66, 1987, 184-191.
68. Carbon, J. "Letter to the Editor." Journal of Manipulative Physiological Therapeutics, 11, 1988, 231-232.
69. Kaplan, W. A. The Law of Higher Education, 2nd ed. San Francisco: Jossey-Bass, 1986.
70. Lewellen, G. R. and Morter, H. B. "Anatomy at Chiropractic Colleges." Research Forum, 3, 1986, 23-26.
71. Clarke, D. H. and Clarke, H. H. Research Processes in Physical Education, Recreation, and Health. Englewood Cliffs, New Jersey: Prentice-Hall, 1970.
72. Shoemaker, D. "Taking Stock of Medical Education." Educational Record, 62, 1981, 58-62.
73. Nutter, D. O. "Medical Education in the People's Republic of China." Journal of Medical Education, 58, 1983, 555-561.
74. Lysons, A. and Ryder, P. "An Application of Jones and James' Perceived Climate Questionnaire in Australian Higher Educational Institutions." Higher Education, 18, 1989, 697-705.
75. Crosson, F. J. "The Philosophy of Accreditation." North Central Association Quarterly, 62, 1987, 386-397.

APPENDIXES

APPENDIX A

FACULTY PER CAPITA TABLE

TABLE VIII
 FACULTY PER CAPITA PUBLICATIONS IN
JMPT, 1983-1988

School	Publications	Rank
National	0.30	1
Canadian Memorial	0.20	2
Northwestern	0.09	3
Palmer-West	0.09	3
Los Angeles	0.08	5
Western States	0.07	6
Life-West	0.05	7
Cleveland-Kansas City	0.05	7
Texas	0.04	9
Sherman	0.04	9
Logan	0.03	11
Palmer	0.02	12
New York	0.01	13
Life	0.01	13
Cleveland-Los Angeles	0	15
Southern California	0	15
Pennsylvania	0	15
Parker	0	15

APPENDIX B
COVER LETTER

As a part of my doctoral program in higher education, I have developed an academic quality ranking of the top ten chiropractic colleges in North America based on faculty-student ratios, publications in the Journal of Manipulative and Physiological Therapeutics over the past five years, and the percentage of chiropractic faculty with bachelor's, master's, and academic doctoral degrees. However, I feel further variables need to be compared to arrive at a much more accurate and fairer ranking of your institution and the other colleges of chiropractic. The enclosed questionnaire is designed to gather data on these other variables.

I will call you in a few days to make sure you have received the survey, and to answer any questions you may have.

I would greatly appreciate it if you would complete the questionnaire and return it in the enclosed addressed, stamped envelope by December 4, 1989. I realize that your time is valuable and to express my appreciation for your assistance I will be pleased to send you the final ranking of the top ten schools.

By completing the questionnaire it is understood that you grant permission for your school's ranking, if ranked in the top ten, to be published in the dissertation itself, in University Microfilms, and in a referred journal.

The Foundation for Chiropractic Education and Research has supported my graduate study and believes in the importance of this research, and that this type of research needs to be conducted.

I sincerely thank you for your cooperation.

Hugh A. Gemmill, D.C., M.S.
Doctoral Student

APPENDIX C

QUESTIONNAIRE

ACADEMIC RANKING QUESTIONNAIRE

School: _____

1. What are your institution's average annual faculty salaries?

assistant professor _____
 associate professor _____
 full professor _____

2. What was the mean undergraduate grade point average of your last entering class? _____

3. What percentage of your last entering class had bachelor's degrees? _____

4. How many volumes does the school library contain? Include books, journals bound as volumes, serials other than journals bound as volumes. _____

5. What was the total in external research grants that your institution received during the past twelve months? _____

6. What was your institution's internal expenditure on research during the last twelve months? _____

7. What percentage of your students passed part 1 of the last National Board exams? _____

8. What percentage of your students passed part 2 of the last National Board exams? _____

9. What, in your opinion, based on faculty quality, educational preparation for practice, physical plant, and research are the top five chiropractic schools in North America?

Optional comments: Of the criteria which are used, which 2-3 do you think are the best? _____

Which 2-3 criteria which are not listed do you think should have been used? _____

VITA

Hugh Adair Gemmell

Candidate for the Degree of
Doctor of Education

Thesis: AN ACADEMIC QUALITY RANKING OF THE NORTH AMERICAN
CHIROPRACTIC SCHOOLS

Major Field: Higher Education

Biographical:

Personal Data: Born in Cowra, Australia, December 31, 1953, the son
of Mr. and Mrs. H. Gemmell.

Education: Graduated from Cowra High School, Cowra, Australia, in
December, 1972; Received Doctor of Chiropractic degree from
Cleveland Chiropractic College of Kansas City in 1977; received
Bachelor of Arts degree in Health Care and Administration from
Ottawa University in 1986; received Master of Science degree in
Higher Education from Oklahoma State University in 1987; com-
pleted requirements for the Doctor of Education degree at Okla-
homa State University in May, 1990.

Professional Experience: Private Practice of Chiropractic, Cowra,
Australia, 1977-79; Associate Chiropractor, Tulsa, Oklahoma,
1979-82; Private Practice of Chiropractic, Tulsa, Oklahoma,
1982-present; Editor, Journal of the Chiropractic Association
of Oklahoma; Member, Board of Directors of the Chiropractic
Association of Oklahoma; served as Secretary/Treasurer, North-
east District of the Chiropractic Association of Oklahoma.