A Question of Ethics

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A substantial proportion of the statistics profession is now engaged as suppliers of ammunition for issues of public debate. Some statisticians are retained by institutions or groups at least nominally independent of the issues in these debates, but many are employees of the protagonists. In discharging such duties, the statistician may face a conflict of interests between the responsibilities to his employer and to his profession.

The purpose of this paper is to point out to members of the statistical profession some of the important areas in which conflicts can arise because the statistician is under pressure to play the role of an advocate. Presumably, the unarticulated ideal among statisticians is that their job should be a neutral one. Does the nonstatistician acknowledge and respect this position? As long as the ideal is not articulated, is the neutral role a defensible posture to groups or employers who hire the statistician for the purpose of producing ammunition for their side of a debate? Unwritten laws have little persuasive power when pressure is exerted. In a society in which the numbers game is big business because of an increasing dependence upon quantitative arguments in all debates, even written laws may not be sufficiently protective. It is submitted that the ideal should be formally stated and elaborated by the American Statistical Association, so that a member can plead professionalism in an effort to avoid taking sides in an advocacy debate.

The formulation of such a statement could be separate from, or a part of, a code of official standards of professional ethics for statisticians. Other professions which have encountered conflict of interest problems, notably law and medicine, have recognized the need for guidelines of conduct, to protect each member and the group as a whole. While the primary subject of this paper is the present necessity for a statement of neutrality in advocacy debates, this is related to and a part of the need for some general statement of standards for professional statisticians.

The general issue of standards involves many aspects, which can basically be divided into (1) standards for competence of professional statisticians, and (2) standards for performance and behavior of professional statisticians. For example, certification of statisticians falls in the first category, while ethical standards belong in the second. The history of the concern of ASA with all aspects of professional standards will be traced briefly later in this paper.

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THE STATISTICIAN'S ROLE TODAY

Civilization can be viewed as one long effort to cultivate an increasing rationality in human decision-making. Our own society purports and attempts to be a rational one. This is particularly evident in the continual search for objective bases for all kinds of decisions. In our fact-oriented culture, sufficient evidence for rational decisions is not provided by a sign from the heavens or advice from the Delphic oracle. Rather, there is an increasing tendency to rely on quantitative evidence in making all manner of decisions, including the most important questions of public policy.

By way of illustration, recall the occasion when Judge G. Harrold Carswell of Florida was denied the Senate's approval to the Supreme Court. In an attempt to avoid questions of regional prejudice, the opponents of his nomination argued essentially that he was not sufficiently capable. The main evidence offered in support of this contention was that he had a higher rate of reversals of his decisions on appeal than some other judges in his circuit. This quantitative study came to have great importance in the debate, and may have been the decisive factor in his close defeat. Such an analysis may or may not be a desirable thing as an independent matter. However, empirical data of this nature cannot be considered a good measure of the intelligence, capability, wisdom, fairness or ability of a judge. Whatever your opinion of Judge Carswell, the moral of the tale is that even in a matter so obviously a reflection of personal judgment, and so overtly political, a presentation of simple data played a prominent role in the ultimate decision.

Quantitative studies, whether enumerative or analytical in nature, are in prevalent use in advocacy by individuals and groups in debates concerning a great variety of social, political, economic, and environmental problems. This is particularly the case in propaganda dealing with crime, divorce, welfare, drug abuse, pollution, consumer protection, and equal employment opportunities. While decisions involving these great economic, political and societal issues are often emotion-laden, they are strongly influenced by empirical studies. Consequently, institutions and groups with an interest at stake in the debates are induced to acquire the services of persons with some statistical training. It is inevitable that the statistician is called to the fore as a quantitative expert.

Statisticians are needed and courted by the antagonists in these debates. Regardless of its pertinency or accuracy, the special language of statistics is desired to lend an air of scientific respectability to

the positions of the participants in these debates. In short, statisticians have become indispensable cogs in the advocacy industry.

When the Food and Drug Administration investigates the safety of cyclamates, tunafish, or birth control pills, the manufacturers of the product in question require evidence supporting their side of the debate. In government-regulated industries, such as communications and airlines, individual firms and their associations need persuasive quantitative arguments to be permitted rate increases. When the Federal Trade Commission brings action against a company for false or misleading advertising claims, both sides perform empirical studies to fortify their positions. The advocates require ammunition for these debates. Substantial "research" expense is not too great when the prior investment is large and the reputation of a company or industry is at stake. The statistician is often the fabricator of the ammunition.

Should our role be considered an ignoble one? Definitely not. A munitions expert occupies a respectable station in any conflict. Advocacy can be a noble profession, as any lawyer will contend. However, it places an additional burden on the practitioners, and that is to avoid conflicts of interest and reconcile them when they arise. The results of empirical studies, when properly conducted and analyzed, are indispensable aids to the formulation of principled opinions on these topics. Unfortunately, often the data are poor, the procedures are questionable and the results are misinterpreted. Statistics has indisputably been employed to sensationalize, politicize, inflate, confuse, oversimplify or mislead the public in many instances. It is distressing when, as private citizens, we find ourselves in agreement with a particular reform proposal, but, as statisticians, we are unhappy with the quantitative argument used in its advocacy.

Statisticians are under pressure from their employers to supply the type of data, and inferences therefrom, that will lend a seemingly objective type of support to the employers' side of the debate. The employer frequently views the statistician as not only a provider of facts and figures, but also as a "hired gun" with a duty to gather and/or manipulate data to uphold and further the employer's interests. More important, undoubtedly a large proportion of the public shares this conception of the role of the statistician, a factor that has helped to propagate the notion that "statisticians are liars." In becoming the ammunition providers for the numerical side of public policy disputes—the "hired guns" of the advocacy industry—we risk providing our own contribution to the sullying of the statistics profession.

Pressures like these, whether real or implied, produce ethical problems for members of our profession. These ethical issues can arise at any or all of the three usual stages of an investigation, i.e., the collection or selection of data, the presentation or description of data, and the formation of interpretations and conclusions based on the results of the study. The statistician is trained to perform each of these functions, but his judgment can and does enter into each phase. Some of these judgments involving ethical questions come readily to mind.

In any study relating to debatable issues, data can be found which both deny and support each position. Scientific evidence can well support diametrically opposite points of view in the behavioral, social, and health sciences. When the statistician is responsible for producing the data, whether from a primary or secondary source, to what extent should he be influenced to select or present only those data which best represent the employer's position? In designing an experiment, should he submit to pressures to choose a method which may bias the results in the employer's favor? Is he justified in disregarding other lines of inquiry? If two different statistical tests lead to opposite conclusions, can the ethical statistician present only that finding which his employer seeks? When a test results in the desired conclusion, but its inherent distribution assumptions are highly suspect, should the statistician be a party to the presentation of inferences without appropriate qualifiers? Should there be standards to limit the extent of inferential but nonstatistical determinations by statisticians? That is, when asked to make judgments which are outside the realm of our abilities and training, or inferences relating to a target population which is inappropriately represented by the actual population sampled, should he cooperate?

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"While your scientific integrity is commendable, Hopkins, I might remind you that around here Brand X never tests out ahead of our product."

If a statistician enters a public debate in the employ of an interested party, is he to act as an independent expert witness, a hired advocate, or a judge? How does he reconcile his own personal biases with the bias of his employer and with the statistical evidence on the question? *

These examples point out only a few of the many situations in which ethical problems can arise. The fact is that, despite its mathematical base, statistics is as much an art as it is a science. A great many shadings, manipulations, and even distortions are possible within the bounds of propriety. When these boundaries are exceeded too frequently, the reputation of our entire profession may suffer. The employer may not be concerned with "unprincipled decisions". To him, the decision itself is far more important than any arcane reasoning which may justify it, especially if his public applauds. The statistician may dislike what he is forced to do, but—he who pays the piper calls the tune. How can the statistician refuse to satisfy his employers' needs and still retain his job?

THE PRESENT NEED

The only type of countervailing power in sight which holds any promise of being effective against improper pressure by employers is the power of professionalism. Statisticians should agree that certain practices should be avoided, not only as a private ethical matter, but also that their use is unethical on an express professional basis. A statistician should be in a position to deny pressure by employers to ignore inconsistent data, shade inferences, or make unprincipled judgments, secure in the knowledge that his professional organization and his colleagues officially support his stand. Employers of statisticians must learn to respect a refusal based on avowed professional ethical limitations.

The accomplishment of the objective of respect for the statistician's professional integrity would be considerably improved if the professional ideals and limitations were clearly enunciated. The present need as regards advocacy debates is a statement of the statistician's neutral position on all nonstatistical aspects of any quantitative study, whether enumerative or analytical. The statistician's interpretation of the results of the study should be officially limited to statistically valid procedures, and should be tempered by whatever qualifiers are statistically necessary for validity. Even if the results of the study are contrary to those desired by his employer, or contrary to the prevailing contemporary social, political, or economic doctrines or mores, the statistician should present his statistical conclusions honestly and completely and refuse to make any nonstatistical conclusions. While he cannot control what happens to his analysis later, he has done his best to protect the profession.

It is essential that the statistician inform his employer of his neutral position on all strictly nonstatistical aspects of the study before agreeing to undertake an investigation, as his position as an independent agent is considerably weaker once the study commences. A statement similar to the following should suffice:

> The statistician is an independent professional expert who does not make judgments or decisions outside of the area of his expertise, which is specifically and solely statistical theory and techniques. In any study relating to debatable issues, the statistician does not take sides in the design of the experiment, on the analysis of data, or on the presentation or interpretation of the results. Further, he will not be a party to manipulations and analyses which are, in his honest opinion, not statistically proper.

While the demand for statistical services in the short run may not depend on providing answers to societal problems which are of scientific value, the credibility and long run viability of statistical analysis is at stake. The task of bringing the full potential of statistics to bear on the problems and needs of our society is one which demands considerable integrity. By developing a sense of professionalism among statisticians in advocacy debates, we promote the ethical standards in the quantitative advocacy process, raise the qualitative level of advocacy, and advance the status of the science and art of statistics.

The need for professionalism is not justified simply on the grounds of enhanced prestige and rewards for us as statisticians, although such a consequence would be welcome. It is instead justified on the grounds of public need. Sound reasoning is crucial to the accommodation of rival interests, especially in times of rapid social change. The public must care about principled judgments and decisions, and learn to recognize an argument which rests on reasons with respect to all the issues in the case. By improving the quality of debate on the issues of our time, both great and small, we aid our country and our civilization in its quest for increasing rationality.

THE CONTINUING NEED

While a statement of neutrality similar to that above may solve some of the immediate problems of conflicts of interest in advocacy debates, the bigger problem of setting general standards of professional conduct in a wide variety of recurring contexts remains. There is and always has been a need for a general code of professional ethics for statisticians.

* If a lawyer states in court that he personally believes in his client's cause, a mistrial results. This rule is to protect lawyers from their clients. If the rule were otherwise, all clients would demand that their lawyers state this belief.

The purpose in formulating a code of ethics should not be to provide grounds for disciplining those who violate the standards set. Rather, the intention is to develop a sense of professionalism among statistical practitioners. The byproducts of this effort are perhaps even more important. The ultimate goal is to preserve the role of statistics as a viable instrument in decision-making processes, to promote the status of statistics, and to keep the probity of statisticians from being badly undermined.

What should this code of ethics include? How should it be formulated? The ethical statistician clearly seeks more than profit and security, but it is still unclear just how far society or his employers may expect a professional statistician to depart from these traditional goals. Initially the standards might be few in number, narrow in scope and difficult to define. Ingenuity and patience will be required. Drafting boundaries on artistic license requires the judgment of a Solomon. Determining just where principles should surpass employer demands is a delicate task, and in the beginning must be done with a solemn eye to the practical problems of the lone statistician who incurs risks in asserting these principles. However, in order to be effective and to be protective, the standards must be formally articulated.

The statement of neutrality in advocacy debates can only be considered the first step in a job which, although formidable, should be of vital concern to all professional statisticians.

HISTORICAL PERSPECTIVE

The American Statistical Association and similar other societies are the logical official organs for encouraging a sense of professionalism among statisticians, and for developing and enunciating a sense of standards of ethical conduct for its members.

This is not the first time a plea has been made for ethical guidelines for members of our profession. Previously in 1949 the American Statistical Association charged the Commission on Statistical Standards to develop a code of ethical practices. The first recognition of this subject in *The American Statistician* was a publication [1] of three papers and discussions presented at an ASA annual meeting in December 1951, apparently prior to the Commission's beginning a study. Some standards of performance and guides of conduct were presented by A. H. Court and M. H. Hansen. T. H. Brown discussed the three alternatives of a Hippocratic-type of oath, a code of ethics, and a statement of ideals. He rejected the first two alternatives as unworkable, for rather curious reasons. Against an oath, he argued that "... in statistics, some want to do [or have done for them?] poor or fraudulent work" ([1], p. 17). He rejected a code of ethics because "... it will either be forgotten, go unobserved, or will serve to narrow the habits of the statistician to a rigid conformity" ([1], p. 17). A statement of ideals, however, was recommended, and six ideals specifically enumerated. In discussion, W. W. K. Freeman presented twelve guidelines of conduct called "The Statistician's Principles" ([1], p. 20). a statement reached after considerable unofficial deliberation by the Boston Chapter of ASA.

An Ad Hoc Committee on Statistical Standards was subsequently appointed by the Commission. This group published its report [2] in 1954, recommending the development of a formal statement of ethical, technical, and procedural standards for the publication and analysis of statistical problems. This report was accepted and the Committee discharged. An Ad Hoc Committee to Explore Opinion on Standards was then appointed to investigate members' feelings toward developing standards. As a preliminary survey, mail questionnaires were distributed to members of the Boston Chapter in late 1954. The results [3] were not encouraging, as only one-third of the nonfollow-up respondents were strongly in favor of a code of ethics. This survey represented the opinions of only one Chapter and was conducted without ample opportunity for debate of the issues. Hence the results were acknowledged by the Committee as inconclusive and not necessarily representative of the entire Association membership. In 1956, this Committee published its final report [4], after charging all of the 34 individual Chapters to conduct surveys regarding the advisability of developing standards for ethical, technical and procedural practices. All Chapters responded, with 21 in favor, and 13 opposed or uninterested. As the proponents were not necessarily those Chapters with the largest membership, the Committee felt that the interest exhibited was insufficient to warrant pursuit of a formal, national set of standards for all members of the Association. The issue was then dropped as a formal matter, although activities on standards by individual Chapters and groups were encouraged.

As no further activities were reported in *The American Statistician*, the issue apparently lost its momentum. Since 1956, only one pertinent article has been published in this journal. This paper by Freeman [10] was presented at the annual ASA meeting in 1963. Here he discussed three aspects of the problem of maintaining professional integrity and the reputation of the profession. These are developing high moral standards, using diplomacy in refusing to compromise these standards, and altering the attitude of the public toward the profession and the field. The twelve "Statistician's Principles" from [1] were repeated in this paper.

The history of a movement towards developing ethical standards was traced through *The American Statistician*, as the most likely organ for publication and publicity for such activities. Some other journals have published isolated papers relating to the

subject, but no group in ASA seems to have revived the issue formally after the first movement abated in 1956. S. Paul Chambers' paper [7] in the *Journal of the Royal Statistical Society* was a printing of the Inaugural Address of the President in 1964, and was concerned principally with the dangers inherent in statistical applications in other sciences where the integration of knowledge and skill is incomplete or insufficient. A 1965 article by Dr. W. Edwards Deming [8] was a special invited address presented at a meeting of the Institute of Mathematical Statistics in Boston in 1958. It gave some specific suggestions for principles of statistical practice and presentation and guidelines for a proper, workable understanding of division of responsibilities between the statistician and his client or employer in implementing these principles. Some other papers addressing the problem of standards are by Burgess [6] and Eisenhart [9]. As a consultant in statistical surveys, Dr. W. Edwards Deming has compiled for his own use a lengthy 32 point Code of Professional Conduct. These explicit statements inform his clients of the full responsibilities, obligations and limitations of both parties so that an understanding is reached before he agrees to undertake a study. Dr. Deming's Code is not identified with the whole profession and relates specifically to practice in sampling and the design of experiments, which are his fields. A similar code could be adapted to the needs of other individuals.

The recent Study of Future Goals of ASA included an examination of many of the relevant issues by a Task Force on Standards. Their Report was part of a 1971 publication [5] of the Board entitled *A Study of Future Goals of A.S.A.* The task of developing guidelines of classification for statisticians employed by all levels of government was scheduled for 1972. The Task Force selected this area for action since it seemed the one most likely to lead to concrete results and to be effective. ASA has also established advisory comittees to some of the major federal statistical agencies and helped sponsor "Users' Conferences" for government employees. When requested, ASA will provide names of competent statisticians from which panels can be selected to consider individual problems. However, ASA has elected not to attempt to formulate a statement of ethical standards at the present time.

Since 1956, when ASA formally abandoned the issue at the national level, the Association, the profession and the discipline have grown, developed, matured, and diversified. More fields of study have come to rely on quantitative methods of analysis, and more sophisticated and efficient techniques for collecting and processing data have made quantitative studies more prevalent. The measurement of social forces—their directions, patterns, interactions, changes, implications, and effects—creates problems for statisticians which, although not entirely new, have assumed new significance. While the needs and demands of society increase, the ethical problems faced by the statistician become more important and complex. Equally important perhaps is the fact that our society is at present much more openly concerned generally with problems of social ethics than in the fifties.

The problem of developing and administering general guidelines is admittedly a formidable one, but one that is important to our profession and its members. Members of the Association who have concrete ideas for action should be invited and encouraged to formulate them specifically and use the publications of ASA as forums for presentation.

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