Journal of Official Statistics
Vol. 2. No. 3, 1986, pp. 217–253
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The Codification of Statistical Ethics

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Abstract: The international statistical community managed to survive without a code of ethics for its first hundred years. Now, after six years of active discussion and detailed formulation, the International Statistical Institute has published a comprehensive declaration containing an inventory of widely held professional values, a discussion of the ethical and technical conflicts involved in sustaining those values and translating them into statistical work, and guidelines to further reading about such issues. The declaration is neither just a catalogue of unattainable ideals nor a set of rules, but an "educational code" with the aim of elucidating conflicts rather than enunciating on them. The paper rehearses the arguments that led to this new approach to code formulation and traces both the immediate and the earlier background to the process.

Key words: Code of ethics; code of practice; declaration on ethics; professional code; professional standards.

1. Introduction

At its Centenary Session in August 1985, the General Assembly of the International Statistical Institute (ISI) adopted overwhelmingly a Declaration on Professional Ethics (1986) – reprinted here as Appendix 1. This was an historic departure for the ISI, marking the end of about forty years of explicit resistance from eminent statisticians worldwide to the notion of codifying their professional ethics. At last, ISI members have agreed on the desirability of issuing a public declaration that contains many of their widely-shared but hitherto undocumented standards of professional conduct. Statisticians will no longer be out of step with their counterparts in other disciplines, most of whom had long since adopted codes of one sort or another. A few years earlier the American Statistical Association (ASA) had in fact tentatively adopted its own rather thin *interim* code (1980) – also after a long history of vain attempts. The ASA Code is, however, still officially "under review" some six years after its introduction. It would not be altogether surprising if the code did not survive in its present form except, perhaps, as a result of inertia rather than of intent (see, for instance, the excellent debate on this topic in The American Statistican (1983)).

The starting point of this latest attempt by the ISI to introduce a code of ethics was the 1979 (Manila) session when, conscious of a number of previous vain moves towards codification, the General Assembly resolved to tackle the issue afresh and to appoint an Ethics Committee[2]. The task of that Committee

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[2] The Committee, appointed in 1980 by the ISI bureau, consisted of R. Jowell (Chairman), W. Edwards Deming, A. Donda, H. Muhsam, E. Rapaport. Later cooptions were G. Motsemme, R. Padieu, E. Berumen-Torres. A drafting group of four (Jowell, Muhsam, Padieu and Rapaport) were given responsibility for devising the document.

was to consider whether a code of ethics for the ISI was desirable and, if so, to determine the nature and form of such a code and to devise a suitable draft in time for detailed discussion at the 1983 (Madrid) session, and then for possible adoption at the 1985 Centenary Session in Amsterdam.

In addition, a plenary meeting of all participants was set aside at the 1981 (Buenos Aires) session for a preliminary discussion of the issues. The introductory paper to that meeting (Jowell (1981))[3] – which also forms the main content of this article – argued that the ISI should finally abandon its longstanding resistance to a published code of ethics. It conceded, however, that the ISI had been sensible to reject the approaches to codification that had been widely adopted by other disciplines. Many of these codes, which consisted of little more than a catalogue of unworkable, unrealistic and uninformative messages, were unhelpful at best and often counterproductive.

The paper therefore recommended that the ISI ought to devise a new type of code (an "educational" code) whose aims would be to inform and guide professional practice rather than vainly attempt to regulate it; to acknowledge rather than conceal the numerous inherent conflicts in statistical work, not only between ethical and technical goals but also between one ethical goal and another; and to accept that ethical conflicts were matters for the individual, not for the profession, to resolve.

It was this approach to codification, strongly supported by members of the ISI and its sections at and between successive sessions, that guided the work of the Ethics Committee and led to the form of Declaration reprinted in the Appendix. This paper briefly touches on the background to attempts at codification over the last forty years and then retraces the arguments behind the new Declaration.

2. The Revival of Interest in Codification

The earliest specific reference to the subject of statistical ethics that I have located is a contributed paper by Eisenhart (1947) to the ISI. His paper touches on only one aspect of professional practice – the role and duties of the statistician vis-a-vis clients. At about the same time, Burgess (1947, p.282) suggested the formation in the USA of a special bureau of standards for statistics to ensure sound statistical practices. "Above all," he said, "better statistics depend... on more sensitive individual consciences and more statistical zeal."

Following a decision by the American Statistical Association in 1949 to formulate a code of practice, a later ASA Annual Meeting included a paper by Brown (1952, pp. 14–15) that presented six moral ideals for what he called "a better way of statistical living." He too advocated zeal as the principal quality of the good statistician, who must possess, above all, "a burning desire to find the truth; for unless... thus deeply stirred he will never measure up to the full stature of his calling." Armed with his six ideals, Brown felt that statisticians could "thence walk humbly and with God."

It was Freeman (1952), however, the discussant to Brown's paper, who can be said to have been the pioneer of a code of professional practice for statisticians. He produced "The Statistician's Principles," a list of 12 ideals that still provide an excellent starting-point for a code. In spite of that thoughtful start, and in spite of the formation of an ASA ad hoc committee in 1954 – charged with the development of a formal statement of ethical, technical, and procedural standards – the initiative faltered and was eventually abandoned. According to Gibbons (1973), there was simply insufficient interest from members, a state of af-

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fairs that continued, it seems, until recently, although there were some interruptions to the general silence, most notably the publication of an ESOMAR code in 1950 (now apparently out of print and unavailable), an AAPOR code (1960), a contribution from Deming (1965), and one from Muhsam to the ISI (1969).

It would be comforting to believe that the surge of interest in ethics and code formulation among statisticians during the 1970s and early 1980s (an interest shared, incidentally, by psychologists, sociologists, political scientists, anthropologists and others), stemmed from a new concern about improving our service to society, an altruistic acknowledgement that others are entitled to discover what we did and how we did it, a determination to open to public scrutiny the high ethical ideals to which we aspired. In reality, however, the interest was more self-serving, its principal objective appearing to be to deflect the growing suspicion among legislators and the public in many countries that statistics and improved methods of data manipulation threatened privacy and civil liberty. Data protection and privacy laws were becoming commonplace in Europe and America, some being passed with the acquiescence of the statistical community, some without. (In any case the statistical community rarely had the opportunity to offer *self*-regulation as a realistic alternative to legislation because it had failed to adopt models or codes that would convince others that it had a well-formulated and robust set of protective mechanisms.)

To assert that statisticians worked within widely accepted professional constraints was not enough; documentary evidence was required and was simply not available. Unlike other professions and disciplines, we had no codes or statements, merely protestations that our work was exemplary and threatened no one. Whether true or not, it was unconvincing.

The editor of *Amstat News* points out in his preamble to the Interim Code of Conduct of the ASA (1980), that it took over 30 years and several attempts for the American Statistical Association to produce an *interim* code. The ISI, which has also had its share of false starts, has now similarly produced its own code, albeit a very unorthodox one.

3. The Case for a Code

Collective self-interest is usually the principal motive for the development of a professional code. In our case, for instance, a code might serve to enlighten those who characterise statistics as a mischievous and meddlesome discipline that harms rather than promotes society's interests; it might demonstrate the profession's concern about spurious uses of data and unwarranted intrusions into private domains; it might serve as a defence against improper pressure from funders, employers or legislators.

There may also be wider motives for adopting a code. Perhaps the most obvious motive is the creation of a stronger professional identity among statisticians, despite their diversity of interests, loyalties and activities. A monolithic identity would clearly be unattainable, but other occupational groups – whose work is no less disparate than ours – have successfully developed pluralistic professional identities, partly through the binding mechanism of a common code. Indeed, one of the traditional functions of a code is to symbolize and consolidate a group's professional identity.

But if we do seek to promote greater professional identity among statisticians (with or without a code) we need to decide what we mean by the word "professional." The word has several meanings; two of them concern us here. On the one hand, it refers to the handful of highly regarded occupations traditionally referred to as "the professions," which derive their status partly from their well-established and estimable codes. The Hippocratic Oath, for example, is widely known for the stringent moral standards it invokes for medical practitioners. Indeed, it elevates a doctor's duty to serve the community almost to the level of a creed, implying that medicine is at least as much a cause as a career. A reader of the Oath would be forgiven for inferring that doctors throughout the world commonly work without reward, selflessly seeking to serve their communities at great personal cost. Granted that the Hippocratic Oath is over two thousand years old, its main practical force now seems to be to advance both the self-image and the public image of its signatories.

If the primary motive for developing a code of ethics for statisticians were to achieve this kind of status enhancement or occupational aggrandizement, it would almost certainly be spectacularly unsuccessful. And, even if successful, it would be counterproductive.

On the other hand, members of all occupational groups, humdrum or elite, can be described as being "professional" in their approach to work. Here, the word conveys skill, efficiency, a commitment to high standards, probity and, above all perhaps, a sense of pride in the work itself and in the occupational group that performs this move. Burgess and Brown were probably alluding to this combination of qualitites when they advocated "statistical zeal." If professional identity implies a commitment to these characteristics, it is clearly worth pursuing.

The collective and routine pursuit of high standards is, however, a very difficult cause for a code to advance. Even given the unlikely prospect of swift agreement on what constitutes high statistical standards, we would still be faced with the intractable problem of trying to reconcile individually acceptable but collectively conflicting standards. Take, for example, the pursuit of greater accuracy, or the propensity to undertake more and more refined analyses of available data. Such admirable zealousness may well be responsible for some of the most insensitive (even unethical) behaviour towards the subjects of research. The need for representativeness, for instance, is the usual justification for undue pressure or deception to secure high response rates in sample surveys. The desire for penetrating analyses may lead to linkages of data that threaten the privacy of those to whom they relate.

No code could legislate on the priorities inherent in such practices. Nor could it prevent deliberate breaches of accepted rules of "good practice" since too many statistical exercises present unique and complex ethical and technical problems that a generic code could neither predict nor cater for.

Nonetheless, by exposing and publicizing professional norms, by explaining ethical and technical conflicts, by providing a context within which newcomers might resolve their moral choices, and within which outsiders might understand the difficulties, a code would probably afford a modicum of protection to those who would otherwise be adversely affected by our potential excesses. In this respect professional interest and public interest coincide.

So a code of ethics for statisticians would be valuable as long as it was "an enabling rather than an intimidating medium of influence" (Levy (1974 p.208)). It should also be a distillation of experience, convention and collective wisdom that recognizes the inherent conflicts between goals and accepts the need for uneasy compromises. To serve this sort of purpose, a code must avoid oversimplifying and thus falsifying the world it refers to. On the contrary, it must portray the confused reality of professional life, enabling people to use the code as a source of information on ethical and technical conflicts and, where appropriate, on any professional norms that exist for dealing with them.

As Ladd (1979, p.155) has pointed out,

"being a professional does not automatically make a person an expert in ethics, even in the ethics of that person's own particular profession." Ladd goes on to argue that organized *rules* of ethics are an intellectual and moral absurdity, and that the proper function of a professional association is to encourage frequent discussion, debate and publication of ethical issues. As will become apparent, I share Ladd's aversion to the imposition of rules and sanctions to govern most professional responsibilities and regard the proper functions of a code as being explanatory and descriptive, not authoritarian or prescriptive.

4. What Type of Code?

Most professional codes – or the provisions within them – can be characterized as belonging to one of two broad classes: those that involve lofty ideals (which I will refer to as *aspirational codes*); and those that legislate on minute aspects of professional conduct (which I will refer to as *regulatory codes*). Diener and Crandall (1978) draw the same distinction but refer to the two classes as *wisdom* ethics and *content* ethics. The two types of provision are not mutually exclusive and, indeed, many codes contain both. They are, however, based on different premises.

Aspirational provisions are expressions of often unattainable ideals; they are guides rather than edicts. Consider, for example, the doctrine of informed consent, which broadly refers to the right of potential research subjects not only to refuse to participate but to know the material facts about the study before making their decision. An aspirational provision on informed consent might say that it is "the only honourable basis on which research among human subjects can be undertaken." It might go on to talk about the "dignity and individuality" of research subjects, and so on. It is widely known within the profession that informed consent is frequently neither sought nor obtained. Yet that sort of provision could still be adopted as an expression of ideals to which we would try to conform in the absence of overriding technical (or even other ethical) considerations.

Regulatory provisions, on the other hand, are rules to govern behaviour, based on the premise that there are universal (and enforceable) models of appropriate practice. A regulatory provision on informed consent would probably start unambiguously, for example that "informed consent must always be obtained when research among human subjects is being undertaken." But, to make it workable, the provision would almost certainly end with the insertion of a qualifying phrase, such as: "unless special circumstances make this undesirable in a particular case." Typically, therefore, regulatory codes tend to be casuistic and ambiguous on important issues, reserving the less ambiguous provisions for minutiae.

The case against an international *regulatory* model for statisticians is overwhelming. Not only are there obvious cultural and political differences among countries, but there are also major variations in practice and convention. A set of universal rules would be very difficult to formulate, still more difficult to implement. Even if these problems could be solved, a regulatory code would inevitably be so qualified that its utility would be destroyed. The result would probably be an aspirational code masquerading as a regulatory code. It would afford little protection to the subjects of research since it would contain little more than a collection of truisms. Yet it would have to be framed so as to convey a false impression of authority.

An international aspirational code could avoid these disadvantages, but its utility would be even more difficult to discern. Rhetorical or sanctimonious calls for moral fibre, altruism and high endeavour are hardly likely to induce more than a momentary inspirational glow. As Kultgen (1979) has argued, such an approach is unlikely to have any sustained effect on behaviour, and is of little practical value to those who legitimately look to a code for information about, and justifications for, professional norms or ethical conventions. These sorts of codes also generally portray a quite inappropriate aura of noblesse oblige designed to support the belief that the professional "is wiser as well as more altruistic than most."

If statisticians were to be involved in code-formulation they would thus do well to reject both the aspirational and regulatory models. They should, instead, look to a new model, which I will refer to as an educational code. Based on the twin premises that most ethical issues defy unambiguous regulation and that ethical decisions are matters for the individual rather than the group, an educational code would seek to describe and explain professional norms, expose inherent conflicts, and give guidance on possible approaches to their resolution. Its aim would be to ensure that individual ethical decisions are informed by professional experience, not governed by professional authority.

An educational code is not an entirely new departure. In fact, it could be described as an aspirational code with a major new element. There are elements of this approach in many existing codes. Some – such as the American Anthropological Association's Code (1971) – contain short discussions of ethical and professional dilemmas in their preambles; others – such as the (British) Market Research Society's Code (1976) – provide guidance in those matters that defy regulation. But none of the codes I have located sets out specifically to structure its provisions to illuminate issues rather than to pronounce upon them. Most take as their implicit starting-point the need to control malpractice. An educational code would start from the premise that deliberate malpractice is largely uncontrollable and that the main function of a code is to enable the conscientious professional better to understand the ethical components of his or her work. A strong indictment of the international statistical community is that it does not provide its newcomers with much or any systematic guidance on approaching the ethical problems and dilemmas that statisticians face sooner or later in their careers.

Such a code could naturally not be enforced, nor could sanctions be imposed for breaches of its provisions. The only requirement would be that its signatories should read it and refer to it when faced with an ethical problem. Consideration could also be given to inviting the main funders of statistical research (government, industry, foundations) to insist that recipients of grants or contracts should be signatories of the code or declaration. That would help to ensure that deviations from the guidelines where the result of individual deliberation rather than of innocence or ignorance.

5. The Coverage of a Code

Statisticians, in common with most other groups, are employed in a variety of institutional settings: within government, industry, commerce, consultancy, universities, research institutes. They are required to perform a variety of roles: to offer advice, to collect and assimilate data, to detect and interpret relationships, to identify and predict trends, to design experiments, and to develop analytical tools. A professional code ought to be framed with that diversity in mind.

At the same time, statisticians share common characteristics and concerns, perhaps primarily a concern with the tools of their trade, with methodological rather than substantive issues. But statisticians also share the problem of being faced with at least four competing allegiances:

to the individual sources of their data (respondents);
to their funders or employers;
to their peers (at their workplace, in the wider statistical community and in other disciplines);
to society at large.

It is with these four overlapping responsibilities that a professional code should largely concern itself.

In this paper I can barely touch on the variety of ethical considerations in each relationship. But I will deal most fully with the first relationship (statisticians and respondents), since it appears to present the most difficult problems of code formulation, and only sketchily with the other three. My concentration is on the problems of survey statisticians and human subjects in the knowledge that those in other branches of statistics will generally be able to draw appropriate analogies.

6. Statisticians and Respondents

Different writers classify the issues relating to the ethical treatment of respondents in different ways. Bower and de Gasparis (1978) list six issues; Diener and Crandall (ibid) list eight. I prefer to discuss much the same issues within the four categories: *intrusion and privacy, informed consent, anonymity and confidentiality, and potential harm to respondents*. Then, still under the heading of statisticians and respondents, I include a proposal for incorporating some of the principles into a *declaration for respondents*.

6.1. Intrusion and privacy

> "No one shall be subjected to arbitrary interference with his privacy... Everyone has the right to the protection of the law against such interference..."
>
> UN Declaration of Human Rights
> (As quoted in Dalenius (1977))

Do sample surveys "arbitrarily" interfere with privacy? To some extent they clearly do: samples are selected without the consent of their members, who then receive unsolicited letters, visits or telephone calls from determined interviewers. These may not be serious intrusions as long as we do not define privacy as the right to be left alone. According to the (British) Committee on Privacy (1972, p. 10), that interpretation would go "far beyond any right which the individual living in an organized society could reasonably claim."

On the other hand, excessive intrusion through surveys may occur. In a small university town, for instance, where successive cohorts of social science students are encouraged to conduct surveys as part of their practical work, they may routinely select, say, the town hall or the local trade union for interview. True, the officers are entitled to refuse co-operation, but they may still feel victimized by the constant attention they have received and uneasy about appearing obstructive. As anthropologists have discovered, researchers must always be sensitive to the possibility of oversurveying certain groups or areas. "Most people see decent obscurity as an important part of their personal freedom" (Barnes (1979, p. 56)).

A more important dilemma for research, so the argument runs, is that the individual's "right to privacy" needs always to be balanced against society's "right to know." A society needs accurate information about its collective characteristics and behaviour so that inequities can be exposed, changes monitored and policies subjected to scrutiny. Since the individual is necessarily the initial source of that information, he or she should not be allowed capriciously to withhold it. It follows from this argument that researchers should be entitled to employ subterfuge or deceive individuals for the benefit of society as a whole.

It is this crusading view of research as an instrument of social change that leads to the most dubious ethical decisions. It allows researchers to trivialize individual sensibilities, to regard their own work as overwhelmingly important and, by Benthamite sleight of hand, to justify almost any procedures they choose to use. Diener and Crandall (1978, p. 55) argue convincingly against this approach. "The very fact that people value the privacy of their thoughts as well as their behaviour is reason enough for social scientists to be careful about potential invasions. We respect other people's values for ethical reasons and also for the pragmatic reason that society will censure science if it tramples cultural values."

The difficulty researchers face is that there are no ready-made criteria for determining what approaches, methods or issues are likely to be sensitive, embarrassing or offensive to respondents. Individuals and cultures vary widely in their sensibilities. Even so, it is safe to assert, for instance, that people object to being spied on. Thus, observation studies (and other unobtrusive forms of research) need to be handled with particular care. The sharp distinction that some writers draw between observation of public behaviour (which, they argue, causes few problems) and observation of private behaviour is, in practice, very blurred, since private behaviour often takes place in public settings.

Observation studies give rise to a classic conflict of interest between technical and ethical values. It is indisputable that people tend to behave differently when they know they are being observed; that is the main reason that researchers want to measure unobtrusively *and* one of the main reasons that people object to their doing so.

It is also safe to assert, as the American Psychological Association does in its ethical guidelines (1973), that "religious preferences, sexual practices, income, racial prejudices, and other personal attributes such as intelligence, honesty and courage are more sensitive items than name, rank and serial number." That statement by no means precludes research in those areas but tries to alert researchers to some of the subjects that they must tread cautiously and seek advice from colleagues or, better still, from potential respondents (see Rapaport (1979)). For some types of data, mail surveys may seem more intrusive than personal interview surveys. In other cases, the information may be so sensitive that special techniques, such as randomized response, are required, where even the interviewer is prevented from knowing which question a response relates to.

Another dimension of privacy concerns the privileged access that statisticians sometimes have to private information, such as medical or police records, for sampling. In one sense this is not the statistician's responsibility, since he or she has been granted access by the custodian of the records. Nonetheless, the statistician is involved in the familiar conflict between technical and ethical considerations. The ethical requirement is surely that the custodian should seek explicit permission from each person before allowing access to his or her record, but the technical requirement is surely to avoid this potential source of bias and expense.

A code may refer to these and other issues concerning intrusion and privacy. It could conceivably give guidance on some of them. But it would be incautious, if not foolish, to attempt to legislate on them. No general remedy is available, despite the attempt in some data protection laws to impose one.

6.2. *Informed consent*

The doctrine of informed consent was first implicitly invoked in the Nuremberg Code (1947) as part of the judgement of the war crimes tribunal on defendants accused of crimes involving experiments on human subjects. It was later explicitly incorporated into the World Medical Association's Declaration of Helsinki (1964, revised 1975) on biomedical research. The doctrine now has a prominent place in most codes of research ethics.

The doctrine states that researchers should try to avoid both uninformed and misinformed participation by subjects in research. It also forbids actual or implied coercion, which is usually taken to include duress or excessive persuasion ("overreaching"). The adoption of the doctrine by medical researchers marked a reaffirmation of the Hippocratic principle that the interests of the patient were paramount in any conflict between them and the interests of science.

When social scientists borrowed the doctrine, however, they made no such affirmation about the interests of respondents vis-a-vis those of science and society. They adopted the doctrine's words and equivocated on its substance. That is still the case. Evidence of this equivocation can be found in much of the literature on research ethics and in many professional codes. Once again, it stems mainly from a widespread reluctance to admit that there is no generic answer to the question of whose interests should prevail. Indeed regulatory codes cannot admit that possibility, and aspirational codes need not admit it.

To cope with this problem, codes often treat "informed consent" as categorically separate from "deception." Thus, the Canada Council's generally trenchant guidelines (1977, pp. 6–8) say of informed consent:

> "...it is axiomatic that no research involving human subjects should be undertaken without their freely-given, informed consent, if possible in writing...The information given should be complete and presented in a way which takes into consideration the level of (their) comprehension. An exact description should be provided of all aspects of the research project ... Subjects should always be apprised of any considerations which might lead them to refuse to participate...Those participating in a research project should never, either before or after the experiment, have any reason for saying that they did not fully understand what was involved..."

They say later of deception, having first urged its avoidance "for reasons of principle and practice":

> "Deception of subjects as to the purpose of the research is often claimed to be indispensable to the methodology being employed, and therefore justifiable. We urge that before a particular methodology is decided upon, consideration be given to the kind of deception to be used and its relationship to the importance of the expected results, for the use of deception is not justified unless there is evidence that a significant scientific advance could result from the research..." (p.10)

So the guidelines seem to lurch from a resolute endorsement of the principle that respondents' interests are paramount, to a qualified endorsement of scientific predominance. Yet, that position too turns out to be unstable. The guidelines go on to insist that, having achieved its purpose, a deception should at once be revealed and explained to the subjects. Indeed, they say, if such disclosure is not provided for, "*a fortiori* deception should never be permitted" (p. 11). Thus the guidelines finally come to rest near to, but not quite at, their starting-point. In common with many other codes, they manage to achieve all this movement without even a passing reference to the uncomfortable journey.

I have not singled out the Canada Council's guidelines because they are especially deserving of criticism. On the contrary, they are among the most comprehensive and instructive of ethical guidelines to have appeared. Even so, predictable problems arise from their determination to formulate universal principles and moral absolutes.

In reality, both consent and coercion can be informed, uninformed or misinformed, giving rise to six points on a continuum between the extremes of "informed consent" and "misinformed coercion." In between are the categories of "uninformed" and "misinformed" consent, followed by "informed coercion" (the condition under which censuses are conducted), and "uninformed coercion" (the condition under which many observation studies are conducted, since the subjects are unaware of their participation and unable to exercise a right of refusal). In classifying studies on this continuum, it is surprising to discover how many fail to achieve the ideal of informed consent.

The ideal remains elusive partly because it is so vague. Levine (1975a) and the US Department of Health and Human Services (1981) have attempted to be specific. They have listed those items of information that ought to be revealed to respondents to ensure that their consent is genuinely informed. Levine's list contains 11 items and is not exhaustive. The specific components of consent are equally deserving of attention. Is a respondent's acquiescence sufficient? Do we need prior consent or can we ask respondents to legitimize the deception we have practiced after we have had their response?

Despite its lack of definition, or perhaps because of it, the issue seems to engender stronger feelings than almost any other aspect of research ethics: "I regard informed consent as the most frequently violated right of subjects...The subject is taught that he cannot trust those who by social contract are deemed trustworthy and whom he needs to trust" (Baumrind (1972, p.1085)). "Social research involving deception and manipulation ultimately helps produce a society of cynics, liars and manipulators" (Warwick (1975, p. 212)). "Anthropological research does not have subjects. We work with informants in an atmosphere of trust and mutual respect" (Mead (1969, p. 361)). In sharp contrast to this, Douglas (1976) argues boldly that the scientific pursuit of truth justifies the concealment of purpose from subjects, especially when the subjects are reluctant to reveal the truth. Dalenius (1974 and 1979) suggests that researchers would do better to assert the benefits of statistics than to emphasize the right of refusal.

The desire for decisiveness in most codes prevents a clear and open discussion of these complicated issues. Some codes fail even to admit circumstances in which the requirement of informed consent should be waived or circumscribed. In observation studies of crowd behaviour, for instance, informed consent is unworkable, as is subsequent "de-briefing" of the subjects. In secondary analyses it would be prohibitive to require each fresh analysis of an anonymized data set to require a fresh consent from the original respondents. In studies of publicly accountable individuals or organizations, there is a case (see Wax (1980)) for circumscribing the right of informed consent, especially when the aim is to investigate antisocial or unlawful practices by those in positions of influence. Thus, it is suggested, the unethical public servant is a legitimate target for unethical methods of investigation. An example of such dubious research ethics can be found in a study I was involved in, where bogus job applications were sent to employers from "matched" white and black applicants in order to measure the level of unlawful discrimination. Informed consent was not, and could not have been, obtained. "De-briefing" was considered and rejected on the grounds that it would have compounded the deception since we had no intention of granting subjects the right of veto over inclusion of their data.

Whether or not such studies are legitimate is inevitably a matter for individual judgements between competing ethical (or unethical) postitions. References to generic guidelines and principles can help, but are unlikely to be decisive. It is interesting, for example, that one US Government Department (HUD) was sympathetic to such studies while another (HEW) outlawed them (Duster et al. (1979)).

Those who adhere categorically to the doctrine of informed consent will find some of these arguments to be revisionist, at best, or heretical. Yet I would argue further that informed consent is not even a doctrine at all. It is no more than a qualified belief in openness and honesty that has to be balanced against other considerations, among which is the sometimes countervailing belief in accuracy and discovery. That is not to suggest that the ideal of informed consent should be dropped from codes or guidelines. On the contrary, in a later section of this paper I propose a measure (a declaration for respondents) that may increase the likelihood of its achievement. It does suggest, however, that we should reject the pious pretence that informed consent is the cornerstone of all research practice. In reality, Bok's "principle of veracity" (1978, p. 30) that "truthful statements are preferable to lies in the absence of special consideration," comes closer to describing the prevailing practice. The role of a code in this context should be to highlight rather than to conceal reality and, at best, to influence it. In the end, the individual researcher must "learn to live with an uneasy conscience but continue to be worried by it" (Barnes (1984)).

6.3. Anonymity and confidentiality

"There is a fundamental asymmetry in the relationship between the researcher (who gains a lot of personal – and sometimes private – information) and the respondent (who gives up this information for slight and rather intangible rewards)" Bulmer (1979, p.66). There is also asymmetry in the interests of researcher and respondent. The former often wants to make his or her name through the publication of the results; the latter's interests are best served if his or her name is forgotten.

Statistical data are, on the whole, unconcerned with individual identities. They exist to answer questions such as "how many?" or "what proportion?" not "who?" They must be distinguished from administrative data whose main concern is to identify individual characteristics. Yet, as the SCPR Working Party Report (1975) points out, this distinction is confounded by the fact that statistical analysis is often based on data initially collected for administrative purposes; and, even when it is not, the individual (or group or organization) is usually the initial source of data. Nonetheless, in statistical analysis, the link between name and characteristics can usually be dispensed with. Exceptions occur in longitudinal studies or when linkage with other identified data is planned.

Data protection laws are aimed primarily at administrative rather than statistical data. The report of the (British) Committee on Data Protection (1978), for instance, states positively that "the essential characteristic of statistical data is that they are concerned with groups of individuals and not with individuals themselves...It follows that the use of personal information for statistical purposes carries few risks for privacy...Where information cannot be related to an identified or identifiable individual, then the way it is handled, transferred, disseminated or published is not a matter of concern to us."

But the Committee was actually referring to confidentiality rather than privacy. In reality there can be no absolute safeguards against breaches of confidentiality – which I define as the release of identified data, or of data whose source can be inferred, when such disclosure would contravene an implicit or explicit obligation to the source. Many methods exist for preventing such breaches, from simple security measures to ever more sophisticated data processing techniques. One of these methods is anonymity – which I define as the condition whereby data travel incognito. Its virtue as a security system is that it helps to prevent *unwitting* breaches of confidentiality. But it is, of course, far from foolproof.

Fellegi (1975) pointed out that there were no adequate legal definitions either of "disclosure" or of "identifiability." That remains largely true. The likelihood of identities being unwittingly disclosed is influenced by several factors, among which are the size of the population, its heterogeneity, the size of sample and the depth of information about each case. Curiously, some data protection laws exempt from control small-scale psychological and qualitative studies simply because they do not involve automated data processing. In the British proposals for data protection this exemption was said to have been for reasons of practice rather than of principle (see Durbin (1979)). But this reflects an unfortunate and longstanding emphasis on the computer's unique ability to threaten privacy rather than on its impressive potential for protecting it. Once data have found their way into computers they may be fairly remote from their source (sometimes very remote, as in the case of "transborder flows"). In general, the more remote they are, the less serious are the consequences of inadvertent disclosure. Although, that does not necessarily apply when, say, the source is a multinational company rather than an individual.

Nonetheless, in sample surveys, the questionnaire itself and the interviewers who administer it tend to pose much greater problems of confidentiality. An interviewer working in a closely knit neighbourhood may be drawn into a casual conversation about a respondent (or, for that matter, a non-respondent). A questionnaire may be mislaid locally or get lost in the local post. Even without an identifier its origin may be apparent, from its particular combination of responses, to many people in the neighbourhood – the last people, perhaps, to whom the respondent would want his or her answers revealed. Yet interviewers remain the least likely members of a research team to be required to read or sign codes of practice. On the whole, field security measures, where they exist at all, remain by far the weakest link in the chain of measures employed to protect confidentiality.

People or organizations are mostly asked to participate in surveys as if the study was an end in itself, a self-contained exercise designed to advance knowledge within specified boundaries. This belief, associated with the knowledge that participation is confidential and anonymous, encourages respondents to divulge more or less private information about themselves. Indeed, unless respondents are so assured, response rates and response quality may suffer. A difficult question in this context is whether or not the spirit of this participation should allow statisticians subsequently to link identified data from one survey to identified data from another or to identified administrative data. This question (see Rapaport (1981)) cuts across the four categories of statistician-respondent interaction, relating partly to privacy, partly to informed consent, partly to confidentiality, partly to potential harm. There is no generic answer. Yet only if systems are relatively secure can statisticians confidently assert to respondents that their interests will be protected against unwitting misuse. And only then might statisticians be able to persuade civil libertarians that the benefits of archived data far outweigh the risks.

Flaherty (1979, p. 307), has argued persuasively that an "ultimate goal of public policy in every country should be to encourage custodians to disseminate data and researchers to use it." Provided that the individual is adequately protected, wider access to data will surely serve rather than threaten the cause of civil liberty and open government.

6.4. Potential harm to respondents

Respondents may be harmed by their participation in research either as individuals or as members of a group. As individuals they may be subjected to undue stress, loss of self-esteem or psychological injury. As members of a group they may suffer as a result of being stereotyped by research findings. Both Bower and de Gasparis (1979) and Diener and Crandall (1978) include excellent discussions of these risks, and I will not attempt to replicate them here. They also include vivid accounts of studies in which researchers have, to put it mildly, overreached themselves. One of these, quoted by Diener and Crandall, is worth repeating here because it illustrates what (I hope) is the extreme of a stress-inducing experiment. A study by Lindzey (1950, p. 301) embraced, in his own words, the following methodology:

> "The frustration experience involved subjecting the subjects to some 10 to 12 hours of food deprivation, inducing them to drink from a pint to a quart of water and preventing urination for approximately 3 hours, taking a blood sample with a sterilized spring lancet in such a way as to cause considerable pain, and, finally, forcing them to fail at an assigned task in a group situation...In addition to all this, (they were) subjected to approximately two hours of a long and tedious task in a tense atmosphere."

It is reassuring to note that the spring lancet was sterilized! Yet even this extreme example is not without its ethical conflicts. As long as participation is voluntary and informed, it may be argued, why should the scientist not measure the psychological effects of torture by simulating its conditions? An answer, perhaps, is that science has no special entitlement to measure all phenomena. Important as it is, the advancement of knowledge is not in itself sufficient cause for violating other values.

A much less dramatic conflict of priorities emerges from the requirement both to inform research subjects and to protect them from potential harm. Information that brings about self-revelation on the part of respondents may also damage their self-esteem. In a survey of aggressiveness, for instance, disclosure of purpose in advance of the interview would probably be ruled out on technical grounds. Its disclosure at the end of the interview may be considered inadvisable on ethical grounds. After all, the possessors of aggressive tendencies are not necessarily aware of their attribute and may not want to become so. Disclosure of purpose might enable them to infer what position they occupy on an aggressiveness scale, thereby advancing the cause of truth but endangering their self-esteem (and also, in this case, perhaps, the interviewers' self-preservation).

It is idle to attempt to legislate, as some codes do, against causing harm or distress to respondents. Questions in psychological studies that refer to self-image, anxiety, phobias and so on are predictably risky. But even seemingly innocent questions about domestic arrangements, job history, and income may inflame or upset people in certain circumstances. It is much more helpful to attempt, as Levine (1975b) has done, to produce guidelines for assessing in advance both the probability and the likely severity of harm in various research settings.

The risks of *collective* stress or harm are still more intangible. Information provided and collected in good faith may be used against respondents' interests, not individually but as members of society. Such circumstances may derive from purely descriptive tags that turn into negative stereotypes, such as: "District X has the highest incidence of crime in the country," or "Women over 60 are the most likely victims of street crime." Or they may derive from social action – based directly on research findings – that ultimately harms the interests of a group to which some respondents belong.

Statisticians may reasonably claim that, as individuals, respondents will not be victimized (or, for that matter, rewarded) as a direct result of participating in research. Such a claim is in any case implied in a pledge of anonymity. Yet they can rarely claim that respondents will be unaffected by the publication of statistical findings. To do that would be to disparage the value and influence of statistical work.

6.5. A declaration for respondents

Work by Singer (1978) and Jowell (1979) suggests that frankness with potential survey respondents about professional obligations towards them and about the nature of the study has no adverse effect on response rates or quality of response. In both experiments, written statements were devised for respondents to read before the interview explaining in much greater detail than is usual what their entitlements were and what they could expect from participation. The procedure went against received wisdom that had always suggested that introductions were best kept as short and as vague as possible.

Encouraged by these two studies and convinced that respondents are, on the whole, the best potential protectors of their own interests (given that they can become reasonably informed about general research conventions), we introduced within Social and Community Planning Research (SCPR) the following declaration, which interviewers are instructed to give to *all* respondents routinely – either before or after the interview, depending on circumstances. It is additional to an oral introduction containing much of the same information. Its aim is not only to ensure that we share our conventions with the public, but that we reinforce them to our interviewers too.

> The entitlements of those taking part (SCPR)
>
> Your participation is entirely voluntary. Once you have agreed to take part you may still change your mind during the interview and withdraw information you have already given. Also, if you prefer not to answer any question, you may simply decline to do so.
>
> You are entitled to know the general purpose of the study and the identity of the funder. Normally we prefer to give you these details before the interview but occasionally, for technical reasons, we may ask you to wait for them until the end of the interview. You may be assured, however, that we will never deliberately mislead you or hold back information that we think would make you uneasy about having taken part.
>
> Your privacy will be protected. The information you give will be used for research purposes only and will never be linked with your name or address for any other purpose.
>
> You will be given a letter about the survey and a telephone number in case you require further information.

Although such a declaration is difficult to employ in precisely this form in all surveys – for instance in studies of illiterate populations or in telephone interviews – its value lies partly in its long term and wider educational role. Whereas codes of practice are written by professionals for professionals, a routine declaration goes some way towards raising public consciousness of (and confidence in?) the value systems within which we work.

The declaration deliberately stops short of promising the recital of a predetermined catalogue of details about the study. Instead, it promises not to misinform or mislead respondents (by omission or commission) and to supply any general information wanted (though in some cases not immediately). The aim is to protect respondents from being misled, and, incidentally, from being gratuitously over-informed. Respondents vary in their desire for information, so it is somewhat patronizing when researchers insist on revealing every detail to them, however unimportant or uninteresting. In any case, the content of the interview often explains more about the purpose of a survey than any amount of prior description.

7. Statisticians and Funders or Employers

Deming's personal Code of Professional Conduct (1972) offers an admirable model of the obligations that statisticians and their funders or clients should meet in their dealings with each other. It is explicit in its division of responsibilities and uncompromising in its defence of the statistician's right to determine *statistical* matters. It is perhaps an appropriate code for a statistician of Deming's standing, but less eminent statisticians could hardly get away with such a code. Most are unfortunately subject to more pressure or undue influence from funders than is, perhaps, healthy for the maintenance of high standards. Moreover, unlike Deming, some statisticians see themselves as belonging essentially to a service industry where the tradition of the customer's infallibility is rarely questioned.

The reduction in funds for statistical work in many countries may place severe strains on standards of research. Even marginal diminutions in levels of quality control, or in sample sizes, or in budgets for research time, can have a cumulatively damaging (and possibly irreversible) impact on statistical practice. Moreover, in trying to sustain or restore programme budgets, statisticians may be tempted to exaggerate the explanatory powers of their data, or to accept contracts or grants that embrace dubious methodologies. The growth of these practices would harm the interests of funders and statisticians alike.

Arising partly from these financial pressures, statisticians in some fields, particularly perhaps in survey statistics, find they are being increasingly required to submit tenders for contracts (or to respond to "requests for proposals") for studies where such procedures are manifestly inappropriate. Tendering is a potentially harmful practice in statistical research, encouraging the production of rapid and vapid data sets at the lowest possible costs. A major professional concern should be the reinstatement of the role of the statistician as a designer of data collection methods and an interpreter of data, rather than as a slavish provider of data to predetermined specifications. A code might conceivably be a vehicle for reaffirming the principle (or aspiration?) that statistical research is concerned as much with ideas as with data.

Relationships with funders involve mutual responsibilities. The funder is entitled to expect statisticians to possess attributes such as probity and objectivity, a command of their discipline, and candour in relation to costs, the limitations of their data and the availability of alternative methodologies. The statistician is entitled to expect funders to possess most of these qualities too, but, in addition, to observe the boundaries of the statistician's technical and ethical domains, and to respect the integrity of the data.

Statisticians and their employers have a rather more complex relationship. Some of the same responsibilities apply but are complicated by the special factor of status. A junior statistician may believe, for instance, that he or she is being required to use methodology that is doubtful, either from an ethical or from a technical standpoint. Resignation is an ultimate option, but is hardly to be recommended in most circumstances. In the absence of reaching agreement on an alternative methodology, what options remain? The statistician can refuse to carry out the assignment, go along with it (perhaps on the grounds that it is someone else's responsibility), or "blow the whistle," thereby involving others in the argument. A code, even an educational code, could sometimes help to prevent such conflicts from becoming a crisis, simply by illustrating how similar problems have been faced and resolved before. But a code could not be used to arbitrate on fine ethical and technical choices. Nor should a code attempt to fulfil that role.

8. Statisticians and Their Peers

The obligations and rituals of what may be called professional citizenship are at the heart of many codes of ethics: determination of authorship, criticism of learned work, rules against advertising or competition, conventions of publication, establishment of review committees, and so on. Indeed, to judge from some codes, the professional often inhabits a world into which outsiders rarely intrude. So dominant are intraprofessional concerns that other considerations are only grudgingly granted entry.

Other codes attempt to fulfil the role of moral tracts, exhorting their members to display qualities such as honesty, courtesy, consideration and propriety. It would admittedly be more comfortable if all statisticians were, say, considerate and courteous, but from a professional point of view it is far more important that they should be competent and scrupulous. The advocacy of any of these qualities in codes of practice is absurd and demeaning.

Nonetheless, a statistician who blatantly breaches professional norms – say by fiddling data (and being found out), or by gratuitously inflicting harm on subjects – performs a potential disservice to others in the field. Ironically, it is partly for this reason that self-regulation of professions tends to be ineffective. Censure cannot erase the event and may well pollute the environment within which the remainder of the profession is attempting to operate. Thus, public criticism is only very reluctantly and rarely made.

Such closing of ranks is probably self-defeating in the long run, and is probably based on the erroneous view that public confidence in a profession is founded on awesome beliefs about the profession's uniformly virtuous and upstanding membership. The public's image of most professional groups is, I suspect, much less flattering. In any case, it is intellectually and ethically hazardous for a profession to behave as if it were an extended family, the members of which should jump to each other's defence come what may. Instead, as the ISI Declaration asserts, statisticians should direct any criticism of a statistical inquiry "at the methods themselves rather than at the individuals who selected or used them." The importance of this provision is that it facilitates open rather than secret resolution of professional conflicts.

If we refer to the purposes of an educational code, the scope of its provisions on professional relationships becomes clearer: a code should inform the uninitiated, describe professional norms, and highlight potential conflicts. So, in our case, a code should confine itself to norms such as the responsibility of statisticians to describe the limitations of their data, to disclose sufficient details of their methodology to permit informed academic scrutiny, to allow access to raw data within the constraints of confidentiality, to illuminate likely inaccuracies in their data, and so on.

9. Statisticians and Society

> "Some people hate the very name of statistics but I find them full of beauty and interest. Whenever they are not brutalized, but delicately handled by the higher methods, and are warily interpreted, their power of dealing with complicated phenomena is extraordinary. They are the only tools by which an opening can be cut through the formidable thicket of difficulties that bars the path of those who pursue the Science of man."
>
> Francis Galton (1889) (as quoted in Altman (1980, p. 1182))

Galton's eulogy encapsulates all that is best about statistics. Computer technology has made their power even more extraordinary, but also more threatening. Now they can be used to establish links and expose relationships that even the "higher methods" could never have approached.

The phrase "information is power" usually refers to unpublished data held within large corporations or by governments. These data, it is argued, are equivalent to a secret weapon in the hands of "the establishment" that can be used at any time against the public interest. The best defence, some claim, is to insist on openness and access. And there is certainly a strong case for all data collected at public expense to be publicly available.

As usual, however, there are counter-arguments. Since statistical data are concerned with groups and subgroups rather than with individuals, there is always a danger that a particular group will be stereotyped by those who deliberately or inadvertently confuse imperfect associations with perfect descriptions. Nonetheless, this danger should not be overstated and used as an excuse for suppressing innocuous material. I am convinced that the failure to publish unidentifiable data can only exceptionally be justified on the grounds of public interest. The exceptions may embarrass those statisticians who see themselves as disinterested scientists seeking to expose truth (or an approximation of it) without fear or favour. But, as Price (1979, p. 57) points out, "it is no longer possible for scientists to believe that their only ethical obligation is to the advancement of knowledge; the impact of scientific developments on society, and the dependence of research on public support, make the ideal of the ivory tower indefensible." Statisticians must surely always be deeply concerned about the impact of their work on society. On occasions (see Jahoda (1981)), that concern may lead them to resist publication, or at least to delay it.

In their relationships with society, statisticians also have to face three common public stereotypes of their profession. First, that they can prove anything, and frequently do, irrespective of their data. Second, that they are conspirators (with government or industry) in an attempt to invade the privacy or harm the interests of particular groups or individuals. Third, that they are glorified technicians, unaware of their influence on events, who treat the public as just another "object of measurement." Statisticians have to guard against these caricatures and to demonstrate that they are untrue. They have to correct the false impression that their overriding concern with objectivity and accuracy make them insensitive to society's values and fears.

10. Conclusion

It is tempting to believe that the arguments I have recounted here were the ones that finally persuaded ISI members to abandon their longstanding resistance to a code of ethics and to adopt the Declaration. The more plausible explanation, however, is that the time was ripe for such a departure. Statisticians in many countries had come to realize that protestations alone were not enough. We could no longer get away with just asserting that we had a well-established system of ethics, an arcane mixture of convention and unwritten rules that placed us beyond reproach as a body of professionals. Documentary evidence was required that provided tangible proof both of our concern with those issues and of the existence of strategies for dealing with them. To be effective such a document had to be comprehensive, comprehensible and, above all, credible. Thus it should not imply, for instance, that there was a "correct" solution to any particular ethical or technical conflict. Rather it should acknowledge and emphasize the complicated nature of these conflicts.

Two of the traditional models of professional codes were swiftly ruled out. On the one hand, statisticians should not adopt a purely aspirational code, the provisions of which would be vague and lofty and the purpose of which would be solely to advance our public image. To embark on such an exercise would not only be unedifying but counterproductive; its purpose as a public relations "puff" would surely be transparent. On the other hand, statisticians should not adopt a demanding regulatory code whose provisions would be either too intrusive or unenforceable, or conceivably both. Especially in an international context a dirigiste code of this kind would simply not work.

Between these unacceptable extremes, there remained two realistic options for the newly-formed Ethics Committee to consider. First, we could have attempted to devise an *undemanding* regulatory code of the type favoured by several other professional bodies and, incidentally, by the ASA – at least on an interim basis. That route would have led us to construct a code whose provisions were inherently so anodyne and uncontroversial that they were bound to be widely acceptable and unnecessary to police. Besides having almost no conceivable utility, however, such a code might well turn out to be counterproductive. Its selective coverage might, for instance, imply to the uninitiated that the issues it dealt with were, in fact, the only ones that mattered or, at any rate, that it endorsed those practices to which it did not refer.

The ASA Interim Code, for example, gives little or no hint to newcomers to statistics that most of the ethical dilemmas they are bound to face routinely during their careers are not even touched upon in that supposedly definitive document. It was partly for that reason, perhaps, that the ad hoc Committee of the ASA, charged with assessing the Code, appeared in the end to reject the regulatory model in favour of an "educational" model (see The American Statistician (1983, pp. 19–20)). Yet three years after this assessment, and six years after its formal adoption, the Interim Code remains in limbo. In reality, the document is so undemanding that its existence can easily be overlooked.

The ISI Ethics Committee, in contrast, decided to embark on the uncharted course of devising an educational code. Its aim was to distill from the "best" professional practice a number of ethical aspirations and attempt to explain why each one had to remain an aspiration rather than be converted into a universal rule of behaviour. As will be seen, the Declaration contains around twenty such principles or ideals, and in each case briefly tries to show why, in certain circumstances, clashes of values occur which necessitate individual resolution. Its purpose therefore is not to arbitrate on finely differentiated ethical options, but to promote an appreciation of ethical issues, to inform choices, to document professional wisdom and experience, and "to sensitize both... members and the public to the values affecting the development and use of professional knowledge" (Chalk, et al. (1980, p. 104)). The Declaration's only implicit requirement is that it should be read.

11. References

Note: This bibliography contains only those sources cited in the text. A longer list of publications is to be found in the Declaration itself (appended).

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Received October 1984
Revised October 1986

Appendix 1

International Statistical Institute Declaration on Professional Ethics[1]

Adopted: August 1985

Background note

The involvement of the International Statistical Institute in establishing a declaration on professional ethics has extended over seven years. The Bureau of the Institute, in response to representations by members and a proposal by the Institute's Committee on Future Directions, established a Committee on a Code of Ethics for Statisticians, in 1979, during the 42nd ISI Session in Manila. The Committee worked to prepare a plenary meeting at the subsequent Buenos Aires Session in 1981 during which a consensus in favour of drawing up a code developed: the 'code' was to be prepared for acceptance by the Institute during its Centenary Celebration in 1985.

The Committee was composed of Roger Jowell (Chairman), W. Edwards Deming, Arno Donda, Helmut V. Muhsam and Edmund Rapaport, and it subsequently co-opted Edmundo Berumen-Torres, Gilbert Motsemme and René Padieu.

The Declaration which has emerged is the result of an extensive process of drafting and redrafting, of consultation with the entire ISI membership and with the ISI's Sections, of open meetings and written consultations which occurred between December 1981 and August 1985. The drafting of the Declaration provoked much interest and genuine debate which continued into the week before it was to be placed before the General Assembly of the Institute for adoption.

After due consideration and deliberation the General Assembly adopted the following resolution on 21 August 1985:

'The General Assembly of the International Statistical Institute,

(a) *recognising* that the aim of the Declaration on Professional Ethics for Statisticians is to document shared professional values and experience as a means of providing guidance rather than regulation,

adopts the Declaration as an affirmation of the membership's concern with these matters and of its resolve to promote

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knowledge and interest in professional ethics among statisticians worldwide;

(b) *determines* to send the Declaration to all members of the ISI and its Sections and to disseminate it, as appropriate, within the statistical profession;

(c) *commends* the Committee responsible for developing the Declaration for its thorough, efficient and successful work during the last five years.'

In accordance with the spirit and letter of the resolution the International Statistical Institute is privileged to present to the reader the ISI Declaration on Professional Ethics with the hope and in the belief that this document will assist colleagues throughout the world in the pursuit of their professional goals and responsibilities.

Preamble

Statisticans work within a variety of economic, cultural, legal and political settings, each of which influences the emphasis and focus of statistical inquiry. They also work within one of several different branches of their discipline, each involving its own techniques and procedures and its own ethical approach. Many statisticians work in fields such as economics, psychology, sociology, medicine, whose practitioners have ethical conventions that may influence the conduct of statisticians in their fields. Even within the same setting and branch of statistics, individuals may have different moral precepts which guide their work. Thus, no declaration could successfully impose a rigid set of rules to which statisticians everywhere should be expected to adhere, and this document does not attempt to do so.

The aim of this declaration is to enable the statistician's individual ethical judgements and decisions to be informed by shared values and experience, rather than to be imposed by the profession. The declaration therefore seeks to document widely held principles of statistical inquiry and to identify the factors that obstruct their implementation. It is framed in the recognition that, on occasions, the operation of one principle will impede the operation of another, that statisticians – in common with other occupational groups – have competing obligations not all of which can be fulfilled simultaneously. Thus, implicit or explicit choices between principles will sometimes have to be made. The declaration does not attempt to resolve these choices or to allocate greater priority to one of its principles than to another. Instead it offers a framework within which the conscientious statistician should, for the most part, be able to work comfortably. Where departures from the framework of principles are contemplated, they should be the result of deliberation rather than of ignorance.

The declaration's first intention is thus to be informative and descriptive rather than authoritarian or prescriptive. Second, it is designed to be applicable as far as possible to different areas of statistical methodology and application. For this reason its provisions are fairly broadly drawn. Third, although the principles are framed so as to have wider application to decisions than to the issues it specifically mentions, the declaration is by no means exhaustive. It is designed in the knowledge that it will require periodic updating and amendment. Fourth, neither the principles nor the commentaries are concerned with *general* written or unwritten rules or norms such as compliance with the law or the need for probity. The declaration restricts itself as far as possible to matters of specific concern to statistical inquiry.

The text is divided into four sections, each of which contains principles or sets of principles followed by short commentaries on the conflicts and difficulties inherent in their operation. The principles are interrelated and therefore need to be considered together; their order of presentation should not be taken as an order of precedence.

At the end of each section, as here, a short annotated bibliography is provided for those who wish to pursue the issues or to consult more detailed texts.

General bibliography

Sjoberg (1967) though now somewhat dated, provides good historical background. Freund (1969) is written under the shadow of the biomedical paradigm, but includes a vigorous statement by Margaret Mead of the differences, on the ethical dimension, between biomedical and social science research. Diener & Crandall (1978) is a general discussion, particularly useful with reference to field experiments. Reynolds (1982) (which is a condensed and updated version of Reynolds (1979)) is a clearly written text aimed mainly at American university students. Bulmer (1979) contains reprinted and new articles on survey research and census taking in Britain and America. Barnes (1980) is an attempt to analyse sociologically why ethics has become a problem and has a full bibliography of work to 1978. Bower and Gasparis (1978) has a bibliography of works published between 1965 and 1976 with particularly full annotations. Bulmer (1982) contains a good bibliography on covert research and related topics. Jowell (1983) states the case for an educational, rather than a regulatory or aspirational, code, and has a bibliography with many items of special interest to statisticians. Burgess (1984) focusses on ethnographic research by sociologists in Britain. Barnes (1984) argues that ethical compromises are unavoidable in social inquiry. Other attempts have been made to formulate codes of ethics for statisticians: an earlier attempt (Deming 1972) is the outcome of the work of a Committee to Study Problems of Professional Ethics established in 1969 by the ISI; it relates mostly to the relations between the consulting statistician and his or her client. Another attempt (ASA 1980) is fully discussed by 16 authors under the title 'Ethical Guidelines for Statistical Practice: Historical Perspective, Report on the ASA ad hoc Committee on Professional Ethics, and Discussion (ASA 1983)'. More recently, French public statisticians have developed and adopted a code of ethics (AIS, 1984). Similarly, the British Government Statistical Service has produced its own Code of Practice (GSS, 1984).

1. Obligations to society

1.1. Considering conflicting interests

Statistical inquiry is predicated on the belief that greater access to well-grounded information is beneficial to society. The fact that statistical information can be misconstrued or misused, or that its impact can be different on different groups, is not in itself a convincing argument against its collection and dissemination. Nonetheless, the statistician should consider the likely consequences of collecting and disseminating various types of data and should guard against predictable misinterpretations or misuse.

No generic formula or guidelines exist for assessing the likely benefit or risk of various types of statistical inquiry. Nonetheless, the statistician has to be sensitive to the possible consequences of his or her work (see Clause 4.4), in the knowledge that society's entitlement to know about its collective characteristics sometimes conflicts with the individual's entitlement to protect his or her privacy.

All information, whether systematically collected or not, is subject to misuse. And no information is devoid of possible harm to one interest or another. Individuals may be harmed by their participation in statistical inquiries (see Clause 4.4), or group interests may be damaged by certain findings. A particular district may, for instance, be negatively stereotyped by a statistical inquiry which finds that it contains a very high incidence of crime. A group interest may also be harmed by social or political action based on statistical findings. For instance, heavier policing of a district in which crime is found to be high may be introduced at the expense of lighter policing in low crime districts. Such a move may be of aggregate benefit to society but to the detriment of some districts. Statisticians are not, however, in a position to prevent action based on statistical data. Indeed, to guard against the use of their findings would be to disparage the very purpose of much statistical inquiry.

1.2. Widening the scope of statistics

Statisticians should use the possibilities open to them to extend the scope of statistical inquiry, and to communicate their findings, for the benefit of the widest possible community.

Statisticians develop and use concepts and techniques for the collection, analysis or interpretation of data. Although they are not always in a position to determine the scope of their work or the way in which their data are used and disseminated, they are frequently able to influence these matters. In addition, they are in a position to devise more efficient uses of resources through, say, developing sampling techniques or introducing new uses for existing data (see Clause 4.3c).

Academic statisticians enjoy probably the greatest degree of autonomy over the scope of their work and the dissemination of their results. Even so, they are generally dependent on the decisions of funders on the one hand and journal editors on the other for the direction and publication of their inquiries.

Statisticians employed in the public sector and those employed in commerce and industry tend to have even less autonomy over what they do or how their data are utilised. Rules of secrecy may apply; pressure may be exerted to withhold or delay the publication of findings (or of certain findings); statistical series may be introduced or discontinued for reasons that have little to do with technical considerations. In these cases the final authority for decisions about an inquiry may rest with the employer or client. (See Clause 2.3).

Professional experience in many countries suggests that statisticians are most likely to avoid restrictions being placed on their work when they are able to stipulate in advance the issues over which they should maintain control. Government statisticians may, for example, gain agreement to announce dates of publication for various statistical series, thus creating an obligation to publish the data on the due dates regardless of intervening political factors. Similarly, statisticians in commercial contracts may specify that control over at least some of the findings (or details of methods) will rest in their hands rather than with their clients. The greatest problems seem to occur when such issues remain unresolved until the data emerge.

1.3. Pursuing objectivity

While statisticians operate within the value systems of their societies, they should attempt to uphold their professional integrity without fear or favour. They should also not engage or collude in selecting methods designed to produce misleading results, or in misrepresenting statistical findings by commission or omission.

Science can never be entirely objective, and statistics is no exception. The selection of topics for attention may reflect a systematic bias in favour of certain cultural or personal values. In addition, the employment base of the statistician, the source of funding and a range of other factors may impose certain priorities, obligations and prohibitions. Even so, the statistician is never free of a responsibility to pursue objectivity and to be open about known barriers to its achievement. In particular, statisticians are bound by a professional obligation to resist approaches to data collection, analysis, interpretation and publication that are likely (explicitly or implicitly) to misinform or to mislead rather than to advance knowledge.

Bibliography: Obligations to society

Many books or symposia on professional ethics contain discussions of the broad context in which social inquiry is carried on, but in most cases these discussions are scattered throughout the text. Beauchamp *et al.* (1982) contains, in Part 2, an explicit general discussion of how and when the practice of social inquiry can or cannot be justified. The social researcher's legal and formal social obligations are analysed, in the United States context, in Beauchamp et al. (1982), Part 5. Pool (1979 & 1980) argue the case for not imposing any formal controls. Douglas (1979) does the same, more vigorously. Wax & Cassell (1981) discusses the relation between legal and other formal constraints and the social scientist's own sets of values. Frankel (1976) refers more specifically to statistics.

1.1. Considering conflicting interests

BAAS (1974) discusses these conflicts in a British, but now somewhat out-of-date, context. Baumring (1972) contrasts the interest of scientists and research subjects, favouring the latter. Ackeroyd (1984), Section 6.3, deals with conflicts of interest in ethnographic inquiry. Muhsam (1985) discusses the conflict between the right to privacy and the right to know.

The usefulness of statistical information is rarely challenged and most of the relevant literature refers merely to ways and means of enhancing its usefulness. At the Centenary Session of the ISI a meeting was devoted to this subject with special reference to developing countries (see: Chakravarty, (1985); Nyitrai, (1985); Williams, (1985)).

1.2. Widening the scope of statistics

Diener & Crandall (1978), Chapter 13, discusses this topic with reference to psychological research. Crispo (1975) presents a discussion of public accountability from a Canadian standpoint. Johnson (1982) deals with the hazards that arise in publishing research findings. Jahoda (1981) demonstrates vividly the ethical and social considerations that limit the conduct of inquiry and the publication of results.

1.3. Pursuing objectivity

Stocking and Dunwoody (1982) outline some of the pressures against the preservation of objective standards that are exerted by the mass media. In more general terms, Klaw (1970) suggests that these standards can never remain untarnished.

2. Obligations to funders and employers

2.1. Clarifying obligations and roles

Statisticians should clarify in advance the respective obligations of employer or funder and statistician; they should, for example, refer the employer or funder to the relevant parts of a professional code to which they adhere. Reports of the findings should (where appropriate) specify their role.

2.2. Assessing alternatives impartially

Statisticians should consider the available methods and procedures for addressing a proposed inquiry and should provide the funder or employer with an impartial assessment of the respective merits and demerits of alternatives.

2.3. Not pre-empting outcomes

Statisticians should not accept contractual conditions that are contingent upon a particular outcome from a proposed statistical inquiry.

2.4. Guarding privileged information

Statisticians are frequently furnished with information by the funder or employer who may legitimately require it to be kept confidential. Statistical methods and procedures that have been utilised to produce published data should not, however, be kept confidential.

An essential theme underlying each of the above principles is that a common interest exists between funder or employer and statistician as long as the aim of statistical inquiry is to advance knowledge. (See Clause 1.3). Although such knowledge may on occasions be sought for the limited benefit of the funder or employer, even that cause is best served if the inquiry is conducted in an atmosphere conductive to high professional standards. The relationship between funder or employer and statistician should therefore be such as to enable statistical inquiry to be undertaken as objectively as possible (see Clause 1.3) with a view to providing information or explanations rather than advocacy.

The independent statistician or consultant appears to enjoy greater latitude than the employee-statistician to insist on the application of certain professional principles. In his or her case, each relationship with a funder may be subject to a specific contract in which roles and obligations may be specified in advance (see Deming 1972). In the employee's case, by contrast, his or her contract is not project-specific and generally comprises an explicit or implicit obligation to accept instructions from the employer. The employee-statistician in the public sector may be restricted further by statutory regulations covering such matters as compulsory surveys and official secrecy. (See Clause 4.4).

In reality, however, the distinction between the independent statistician and the employee-statistician is blurred by other considerations. The independent statistician's discretion to insist on certain conditions is frequently curtailed by financial constraints and by the insecurity of the consultant's status. These problems apply less to the employee-statistician, whose base is generally more secure and whose position is less isolated. The employee (particularly the government statistician) is often part of a community of statisticians who are in a strong position to establish conventions and procedures that comfortably accommodate their professional goals (see Clause 1.2).

Relationships with funders or employers involve mutual responsibilities. The funder or employer is entitled to expect from statisticians a command of their discipline, candour in relation to limitations of their expertise and of their data (see Clause 3.1), openness about the availability of more cost-effective approaches to a proposed inquiry, discretion with confidential information. Statisticians are entitled to expect from the funder or employer a respect for their exclusive professional and technical domain and for the integrity of the data. Whether or not these obligations can be built into contracts or written specifications, they remain preconditions of a mutually beneficial relationship.

A conflict of obligations may occur when the funder of an inquiry wishes to ensure in advance (say in a contract) that certain results will be achieved, such as particular findings or a minimum response level in a voluntary sample survey. By agreeing to such a contract the statistician would be preempting the results of the inquiry by having made implicit guarantees on behalf of potential subjects as to their propensity to participate or the direction of their response. To fulfil these guarantees, the statistician may then have to compromise other principles, such as the principle of informed consent. (See Clause 4.2).

Above all, statisticians should attempt to ensure that funders and employers appreciate the obligations that statisticians have not only to them, but also to society at large, to subjects, to professional colleagues and collaborators. One of the responsibilities of the statistician's professional citizenship, for instance, is to be open about methods in order that the statistical community at large can assess, and benefit from, their application. Thus, insofar as it is practicable, *methodological* components of inquiries should be free from confidentiality restrictions so that they can form part of the common intellectual property of the profession. (See Clause 3.2).

Bibliography: Obligations to funders and employers

2.1. Clarifying obligations and roles

Appell (1978), Section 8, presents examples from ethnographic inquiries.

Deming (1965 and 1972) specifies the roles of the consulting statistician and his or her client.

2.2. Assessing alternatives impartially

Many journal articles and chapters in books discuss this topic in general terms. Schuler (1982), Chapter 3, deals with the difficulties encountered in psychological research. Webb et al. (1966) is the popular source for alternative procedures of inquiry.

2.3. Not pre-empting outcomes

Barnett (1983) discusses this point, with reference to his own local context.

2.4. Guarding privileged information

SCPR Working Party (1974) is a general discussion of privacy in a British context, now somewhat out-of-date. Simmel (1908: 337–402) & (1952: 305–376) is the classic sociological analysis of constraints on the flow of information. Shils (1967) extends Simmel's work to more recent conditions; Tefft (1980) provides exotic case studies of perceptions of privacy and secrecy. Flaherty (1979) discusses the issues posed by the monopolization of data by governments, while Bulmer (1979) look more broadly at data obtained in censuses and large surveys. Carroll and Kneer (1976) looks, from the standpoint of political science in America, at official pressure on scientists to reveal sources of information. Appell (1979), Section 3, gives a range of dilemmas arising from various kinds of official pressure. Bok (1982) prescribes norms for concealment and revelation.

3. Obligations to colleagues

3.1. Maintaining confidence in statistics

Statisticians depend upon the confidence of the public. They should in their work attempt to promote and preserve such confidence without exaggerating the accuracy or explanatory power of their data.

3.2. Exposing and reviewing methods and findings

Within the limits of confidentiality requirements, statisticians should provide adequate information to colleagues to permit their methods, procedures, techniques and findings to be assessed. Such assessments should be directed at the methods themselves rather than at the individuals who selected or used them.

3.3. Communicating ethical principles

To conduct certain inquiries statisticians need to collaborate with colleagues in other disciplines, as well as with interviewers, clerical staff, students, etc. In these cases statisticians should make their own ethical principles clear and take account of the ethical principles of their collaborators.

Each of these principles stems from the notion that statisticians derive their status and certain privileges of access to data not only by virtue of their personal standing but also by virtue of their professional citizenship. In acknowledging membership of a wider statistical community, statisticians owe various obligations to that community and can expect consideration from it.

The reputation of statistics will inevitably depend less on what professional bodies of statisticians assert about their ethical norms than on the actual conduct of individual statisticians. In considering the methods, procedures, content and reporting of their inquiries, statisticians should therefore try to ensure that they leave a research field in a state which permits further access by statisticians in the future. (See Clause 4.1).

Statistical inquiries are frequently collaborative efforts among colleagues of different levels of seniority and from different disciplines. The reputations and careers of all contributors need to be taken into account. The statistician should also attempt to ensure that statistical inquiries are conducted within an agreed ethical framework, perhaps incorporating principles or conventions from other disciplines, and that each contributor's role is sufficiently defined. The World Medical Association's Declaration of Helsinki (1975), for instance, gives excellent guidance to statisticians working in the field of medicine.

A principle of all scientific work is that it should be open to scrutiny, assessment and possible validation by fellow scientists. Particular attention should be given to this principle when using computer software packages for analysis by providing as much detail as possible. Any perceived advantage of withholding details of techniques or findings, say for competitive reasons, needs to be weighed against the potential disservice of such an action to the advancement of statistical knowledge.

One of the most important but difficult responsibilities of the statistician is that of alerting potential users of their data to the limits of their reliability and applicability. The twin dangers of either overstating or understating the validity or generalisability of data are nearly always present. No general guidelines can be drawn except for a counsel of caution. Confidence in statistical findings depends critically on their faithful representation. Attempts by statisticians to cover up errors (see Ryten, 1981), or to invite overinterpretation, may not only rebound on the statisticians concerned but also on the reputation of statistics in general. (See Clause 1.1).

Bibliography: Obligations to colleagues

3.1. Maintaining confidence in statistics

Reynolds (1975): 598–604 discusses conflicts between, on the one hand, obligations to keep science objective and impartial and, on the other, values held as citizens about trying to change the world.

The problems involved in presenting the limitations on the accuracy of statistical data are discussed at length by Gonzales et al. (1975). A more controversial stance in relation to errors is expressed by Ryten (1981).

3.2. Exposing and reviewing methods and findings

Diener & Crandall (1978), Chapter 9, discusses the need for honesty and accuracy. Powell (1983) outlines the conflicts that arise when an academic merits censure from colleagues because of improper professional conduct.

3.3. Communicating ethical principles

Appell (1978) deals with how to alert ethnographers to ethical issues.

4. Obligations to subjects*

4.1. Avoiding undue intrusion

Statisticians should be aware of the intrusive potential of some of their work. They have no special entitlement to study all phenomena. The advancement of knowledge and the pursuit of information are not themselves sufficient justifications for overriding other social and cultural values.

Some forms of statistical inquiry appear to be more intrusive than others. For instance, statistical samples may be selected without the knowledge or consent of their members; contact may be sought with subjects without advance warning; questions may be asked which cause distress or offence; people may be observed without their knowledge; information may be obtained from third parties. In essence, people may be inconvenienced or aggrieved by statistical inquiries in a variety of ways, many of which are difficult to avoid. (See also Clause 1.3).

One way of avoiding inconvenience to potential subjects is to make more use of available data instead of embarking on a new inquiry. For instance, by making greater statistical use of administrative records, or by linking records, information about society may be produced that would otherwise have to be collected afresh. Although some subjects may have objections to the data's being used for a different purpose from that intended, they would not be adversely affected by such uses provided that their identities are protected and that the purpose is statistical, not administrative.

As Cassell (1982) argues, people can feel wronged without being harmed by research: they may feel they have been treated as objects of measurement without respect for their individual values and sense of privacy. In many of the statistical inquiries that have caused controversy, the issue has had more to do with intrusion into subjects' private and personal domains, or with overburdening subjects by collecting 'too much' information, rather than with whether or not subjects have been harmed. By exposing subjects to a sense of being wronged, perhaps by the method of selection or by causing them to acquire self-knowledge that they did not seek or want, statisticians are vulnerable to criticism. Resistance to statistical inquiries in general may also increase. (See also Clauses 3.1, 4.3c, 4.5 and 4.6).

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* This section of the declaration refers to *human* subjects, including individuals, households and corporate entities. For a set of guidelines on animals experimentation, for instance, see the Swiss Academy of Science (1983).

4.2. Obtaining informed consent

Statistical inquiries involving the active participation of human subjects should be based as far as practicable on their freely given informed consent. Even if participation is required by law, it should still be as informed as possible. In voluntary inquiries, subjects should not be under the impression that they are required to participate; they should be aware of their entitlement to refuse at any stage for whatever reason and to withdraw data just supplied. Information that would be likely to affect a subject's willingness to participate should not be deliberately withheld.

The principle of informed consent from subjects is necessarily vague, since it depends for its interpretation on unstated assumptions about the amount of information and the nature of consent required to constitute acceptable practice. The amount of information needed to ensure that a subject is adequately informed about the purpose and nature of an inquiry is bound to vary from study to study. No universal rules can be framed. At one extreme it is inappropriate to overwhelm potential subjects with unwanted and incomprehensible details about the origins and content of a statistical inquiry. At the other extreme it is inappropriate to withhold material facts or to mislead subjects about such matters. (See Clauses 4.3d and 4.4). The appropriate information requirement clearly falls somewhere between these positions but its precise location depends on circumstances. The clarity and comprehensibility of the information provided are as important as the quantity.

An assessment needs to be made of which items of information are likely to be *material* to a subject's willingness to participate. The following items are among those from which a selection might be made:

(i) purpose of study, policy implications, etc.;
(ii) identity of funder(s);
(iii) anticipated uses of the data, form of publication, etc.;
(iv) identity of interviewer/experimenter and organisational base;
(v) method by which subject has been chosen (sampling frame, etc.);
(vi) subject's role in study;
(vii) possible harm or discomfort to subject;
(viii) degree of anonymity and confidentiality;
(ix) proposed data storage arrangements, degree of security, etc.,
(x) procedures of study (time involved for participant, etc.);
(xi) whether participation is voluntary or compulsory:
    (a) if compulsory, potential consequences of non-compliance;
    (b) if voluntary, entitlement to withdraw consent (and when that entitlement lapses);
(xii) whether material facts have been withheld (and when or if such facts will be disclosed).

In selecting from this list, the statistician should consider not only those items that he or she regards as material, but those which the potential subject is likely to regard as such. Each party may well have special (and different) interests. As a means of supplementing the information selected, the statistician may choose to give potential subjects a declaration of their entitlements (see Jowell, 1981) which informs them of their right to information but leaves the selection of extra details in the subject's control.

Just as the specification of adequate information varies, so does the specification of adequate consent. A subject's participation in a study may be based on reluctant acquiescence rather than on enthusiastic co-operation. In some cases, the statistician may feel it is appropriate to encourage a sense of duty to participate in order to minimise volunteer bias.

The boundary between tactical persuasion and duress is sometimes very fine and is probably easier to recognise than to stipulate. In any event, the most specific generic statement that can be made about *adequate* consent is that it falls short both of implied coercion and of full-hearted participation.

On occasions, a 'gatekeeper' blocks access to subjects so that statisticians cannot approach them directly for their participation without the gatekeeper's permission. While respecting the gatekeeper's legitimate interests statisticians should still adhere to the principle of obtaining informed consent directly from subjects once they have gained access to them. In these cases, statisticians should not devolve their responsibility to protect the subjects' interests onto the gatekeeper. They should also be wary of inadvertently disturbing the relationship between subject and gatekeeper.

The principle of informed consent is, in essence, an expression of belief in the need for truthful and respectful exchanges between statisticians and human subjects. It is clearly not a precondition of all statistical inquiry. Nonetheless, the acceptability of statistics depends increasingly not only on technical considerations but also on the willingness of statisticians to accord respect to their subjects and to treat them with consideration (see Clause 4.1). Statisticians should attempt to ensure that subjects appreciate the purpose of a statistical inquiry, even when the subject's participation is required by law.

4.3. *Modifications to informed consent*

On occasions, technical or practical considerations inhibit the achievement of prior informed consent. In these cases, the subjects' interests should be safeguarded in other ways. For example:

(a) ***Respecting rights in observation studies.*** **In observation studies, where behaviour patterns are recorded without the subject's knowledge, statisticians should take care not to infringe what may be referred to as the 'private space' of an individual or group. This will vary from culture to culture.**

(b) ***Dealing with proxies.*** **In cases where a 'proxy' is utilised to answer questions on behalf of a subject, say because access to the subject is uneconomic or because the subject is too ill or too young to participate directly, care should be taken not to infringe the 'private space' of the subject or to disturb the relationship between the subject and proxy. Where indications exist or emerge that the subject would object to certain information being disclosed, such information should not be sought by proxy.**

(c) ***Secondary use of records.*** **In cases where a statistician has been granted access to, say, administrative or medical records or other research material for a new or supplementary inquiry, the custodian's permission to use the records should not relieve the statistician from having to consider the likely reactions, sensitivities and interests of the subjects concerned, including their entitlement to anonymity.**

(d) ***Misleading potential subjects.*** **In studies where the measurement objectives preclude the prior disclosure of material information to subjects, statisticians should weigh the likely consequences of any proposed deception. To withhold material information from, or to misinform, subjects involves a deceit, whether by omission or commission, temporarily or permanently, which will face legitimate censure unless it can be justified.**

A serious problem arises for statisticians when methodological requirements conflict with the requirement of informed consent. Many cases exist in which the provision of background information to subjects (say, about the purpose or sponsorship of a study), or even the process of alerting them to the fact that they are subjects (as in observation studies), would be likely to produce a change or reaction that would defeat or interfere with the objective of the measurement. These difficulties may lead statisticians to waive informed consent and to adopt either covert measurement techniques or deliberate deception in the interests of accuracy.

The principles above urge extreme caution in these cases and advise statisticians to respect the imputed wishes of subjects. Thus, in observation studies or in studies involving proxies, the principle to be followed is that mere indications of reluctance on the part of an uninformed or unconsenting subject should be taken as a refusal to participate. Similarly, in the case of secondary use of records, statisticians should have regard to any obligations already owed to subjects. Any other course of action in these cases would be likely to demonstrate a lack of respect for the subject's interests and to undermine the relationship between statistician and subject.

Statistical inquiries involving deliberate deception of subjects (by omission or commission) are rare and extremely difficult to defend. Clear methodological advantages exist for deception in some psychological studies, for instance, where revealing the purpose would tend to bias the responses. But, as Diener and Crandall (1978) have argued 'science itself is built upon the value of truth'; thus deception by scientists will tend to destroy their credibility and standing (see Clause 3.1). If deception were widely practised in statistical inquiries, subjects would, in effect, be taught not to 'trust those who by social contract are deemed trustworthy and whom they need to trust' (Baumrind, 1972).

Nonetheless, it would be as unrealistic to outlaw deception in statistical inquiry as it would be to outlaw it in social interaction. Minor deception is employed in many forms of human contact (tact, flattery, etc.) and statisticians are no less likely than the rest of the population to be guilty of such practices. It remains the duty of statisticians and their collaborators, however, not to pursue methods of inquiry that are likely to infringe human values and sensibilities. To do so, whatever the methodological advantages, would be to endanger the reputation of statistics and the mutual trust between statisticians and society which is a prerequisite for much statistical work. (See Clause 3.1.)

For these reasons, where informed consent cannot be acquired in advance, there is a case, where practicable, for seeking it post hoc, once the methodological advantage – of covert observation, of deception, or of withholding information – has been achieved.

4.4. Protecting the interests of subjects

Neither consent from subjects nor the legal requirement to participate absolves the statistician from an obligation to protect the subject as far as possible against potentially harmful effects of participating. The statistician should try to minimise disturbance both to subjects themselves and to the subjects' relationships with their environment.

Harm to subjects may arise from undue stress through participation, loss of self-esteem, psychological injury or other side effects. Various factors may be important in assessing the risk-benefit ratio of a particular inquiry, such as the probability of risk, the number of people at risk, the severity of the potential harm, the anticipated utility of the findings, few of which are usually quantifiable (see Levine, 1975).

When the probability or potential severity of harm is great, statisticians face a more serious dilemma. A statistician may, for instance, be involved in a medical experiment in which risks to subjects of some magnitude are present. If volunteers can be found who have been told of the risks, and if the statistician is convinced of the importance of the experiment, should he or she nonetheless oppose the experiment in view of the risks? In these circumstances, probably the best advice is to seek advice – from colleagues and others, especially from those who are not themselves parties to the study or experiment.

The interests of subjects may also be harmed by virtue of their membership of a group or section of society (see Clause 1.1). So statisticians can rarely claim that a prospective inquiry is devoid of possible harm to subjects. They may be able to claim that, as individuals, subjects will be protected by the device of anonymity. But, as members of a group or indeed as members of society itself, no subject can be exempted from the possible effects of decisions based on statistical findings.

4.5. Maintaining confidentiality of records

Statistical data are unconcerned with individual identities. They are collected to answer questions such as 'how many?' or 'what proportion?', not 'who?'. The identities and records of co-operating (or non-cooperating) subjects should therefore be kept confidential, whether or not confidentiality has been explicitly pledged.

4.6. Inhibiting disclosure of identities

Statisticians should take appropriate measures to prevent their data from being published or otherwise released in a form that would allow any subject's identity to be disclosed or inferred.

There can be no absolute safeguards against breaches of confidentiality, that is the disclosure of identified or identifiable data in contravention of an implicit or explicit obligation to the source. Many methods exist for lessening the likelihood of such breaches, the most common and potentially secure of which is anonymity. Its virtue as a security system is that it helps to prevent unwitting breaches of confidentiality. As long as data travel incognito, they are more difficult to attach to individuals or organisations.

There is a powerful case for identifiable statistical data to be granted 'privileged' status in law so that access to them by third parties is legally blocked in the absence of the permission of the responsible statistician (or his or her subjects). Even without such legal protection, however, it is the statistician's responsibility to ensure that the identities of subjects are protected.

Anonymity alone is by no means a guarantee of confidentiality. A particular configuration of attributes can, like a fingerprint, frequently identify its owner beyond reasonable doubt. So statisticians need to counteract the opportunities for others to infer identities from their data. They may decide to group data in such a way as to disguise identities (see Boruch & Cecil, 1979) or to employ a variety of available measures that seek to impede the detection of identities without inflicting very serious damage to the aggregate dataset (see Flaherty, 1979). Some damage to analysis possibilities is unavoidable in these circumstances, but it needs to be weighed against the potential damage to the sources of data in the absence of such action. (See Finney, 1984).

The widespread use of computers is often regarded as a threat to individuals and organisations because it provides new methods of disclosing and linking identified records. On the other hand, the statistician should attempt to exploit the impressive capacity of computers to disguise identities and to enhance data security.

Bibliography: Obligations to subjects

4.1. Avoiding undue intrusion

Boruch & Cecil (1979 & 1982) describe sampling and statistical techniques for preserving privacy. Hartley (1983) outlines the threats to privacy entailed by various sampling procedures. Michael (1984) is a journalistic account of the threats to privacy from all sources in Britain. Mirvis and Seashore (1982) is a general discussion of research in organisations, where questions about the appropriate extent of intrusion and intervention are particularly pressing. Reeves and Harper (1981) is a text on organisation research in a British industrial context.

The necessity of some intrusion into the privacy of respondents to collect information that can be obtained only by individual interviews is referred to by Bryant and Hansen (1976).

4.2. Obtaining informed consent

Wax (1979 & 1982) argues for the inappropriateness of requiring informed consent in ethnographic inquiry, while Capron (1982) defends the requirement. O'Connor (1976) discusses problems of interpreting consent, or lack of it, in hierarchical field settings such as prisons. Bulmer (1982) presents an extended case against covert social inquiry. O'Connor & Barnes (1983) makes a brief defence of some covert research. Singer (1978) and Jowell (1979) report empirical evidence about the differential effects of seeking informed consent from survey respondents.

The relevance of the principle of informed consent to statistical inquiries is critically discussed by Dalenius (1983) and questioned by Hansen (1983).

4.3. Modifications to informed consent

Douglas (1979) argues against formal requirements to obtain consent. Geller (1982) makes suggestions about how to avoid having to deceive research subjects. Form (1973) deals at length with relations between scientists and gatekeepers.

4.4. Protecting the interests of subjects

Baumrind (1972) is a plea for priority for the interests of research subjects. Klockars (1979) discusses how to handle these interests when they seem to be anti-social and/or illegal. Freidson (1978) argues in favour of the routine destruction of all identifiers of data about individuals. Okely (1984) discusses the hazards in publishing findings on an identifiable social group in Britain. Loo (1982) gives a case study of research aimed at promoting the welfare of a deprived community. Canada Council (1977) discusses the special problems that arise in research on captive populations and on children. Warwick (1983) examines the particular ethical issues that may arise in some developing countries.

4.5, 4.6. Confidentiality and disclosure of identities

Boruch & Cecil (1979 & 1982) provide technical answers. Hartley (1982) discusses the relation between sampling and concealment.

Legal and technical aspects of the protection of statistical data on individuals are presented by Dalenius (1979) and Durbin (1979) in the context of the laws and practices of their respective countries: Sweden and the U.K.

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