

"HOW STATISTICS CAN CONFUSE THE ISSUE" - A Response

(These thoughts represent a response to some of the points raised in John Bibby's article, circulated with the RS₂ mailing, last May.)

1. The Research Process: Is there any area other than mathematical statistics where someone trained purely in statistics could do a competent piece of research? So what are the boundaries to the statisticians role in a piece of research; why couldn't the "substantive" researcher accomplish these things? Undergraduates, in statistics at least, are forever being told that a statistician "must be involved in the research project from the beginning"; other than in cases of complicated designs, why? Many statisticians seem to play the role of "research conscience" telling people what they cannot do - for various reasons (?), - rather than, say, calculating a new sampling distribution for the particular statistics that the researcher may feel it's appropriate to use.
2. "State Statistics": Clearly someone with a knowledge of sampling theory needs to be involved in theories; do we need statisticians to organise interviews, rather than, say, sociologists? (What is the actual division of labour in the Civil Service?)
3. Implications for Teaching: Perhaps some of the above questions can be answered by asking what a "statistician" should be, and how (s)he should be educated. As far as the content of degrees goes, I agree with John Bibby that statistics could be taught either as a brand of mathematics, or as related to the philosophy (and sociology?) of science, as a technique somewhat analogous to logic, say. It clearly must also be taught as part of the techniques used by practitioners in one or several disciplines (cf. C.R. Rao in Int. J. Math. Educ. Sci. Technol., 1971, who goes much further in the statistics degree he describes). How much mathematical statistics needs to be taught to under-graduates in each of these three types of degree?

As for teaching strategy, why not start offright away with "mini-projects" of the students' choice? I have tried this with first-term social scientists: of course they "make a lot of mistakes", but - I mean therefore - they learn a great deal. But, you will say, they have to do mostly exams for their finals. First, to what extent does a "statistician's" competence need to be "certificated" to protect society; secondly, are sat, timed, unseen exams the appropriate way to do this for whatever you thought a "statistician" should be able to do, at the beginning of this section.

Finally, as for institutional arrangements, the three different sorts of degree seem to suggest respectively that statisticians should be: in the Maths Dept., in the Philosophy Dept., or in the "substantive" department they are servicing. Why not all three, and/or more joint appointments?

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