of extra thinking. This is attractive because we have an MEU method of handling assessment errors in MEU; no new calculus is demanded.

5. ACTS

Shafer queries whether preferences among acts is really the basic idea. Many people have thought so. T. H. Huxley said, "The great end of life is not knowledge, but action." I agree with him. Action is all we have to go by. Why should we believe someone when they assert a probability of 0.8 or a utility of 12? But when they act, we can see them act, and ordinarily no doubts linger. Incidentally, this is one reason why I prefer the (d, θ) approach to that based on (s, c); decisions are primary, not derived as $f(s) = c$. It is a minor criticism of a stimulating paper that no mention is made of alternative axiomatizations, especially that of de Finetti whom Savage came to admire so much.

Comment

A. P. Dawid

I welcome Professor Shafer's interesting and thoughtful paper, not least for the stimulus it has given me to rediscover Savage's fascinating book and to ponder more deeply the place of axiomatic principles in statistics. I agree with much of Shafer's explicit criticism of Savage's work, but am not moved by his implied conclusion that the principle of maximizing expected utility needs modification.

THE NEED FOR AXIOMS

In his Preface to the Dover edition, Savage stated, "I would now supplement the line of argument centering around a system of postulates by other less formal approaches, each convincing in its own way, that converge to the general conclusion that personal (or subjective) probability is a good key, and the best yet known, to all our valid ideas about the applications of probability." This undogmatic, incremental approach to becoming a "Bayesian" describes well my own personal progress, and nails the axiomatic approach in place as one plank among many that form the Bayesian platform. Other arguments that have helped to sway me include: complete class theorems in decision theory; the quite distinct axiomatic approach via the likelihood principle (Berger and Wolpert, 1984); the unique success of de Finetti's concept of exchangeability in explaining the behavior of relative frequencies and the meaning of statistical models (Dawid, 1985a); the logical consequence of the Neyman-Pearson lemma that hypothesis tests in different experiments should use the identical indifference value for the likelihood ratio statistic (Pitman, 1965); the

internal consistency of a Bayesian approach, in contrast to the many unresolved inconsistencies of every other approach; the conceptual directness and simplicity of the Bayesian approach in many otherwise problematic cases, both highly theoretical (as in asymptotic inference for stochastic processes; Heyde and Johnstone, 1979) and more applied (as in the calibration problem; Brown, 1982); and the general success of Bayesian methodology in the many practical situations to which it has been applied (Dawid and Smith, 1983).

Above all, I have adopted the Bayesian approach because I find that it yields the most fruitful insights into almost every statistical problem I meet. This is not to belittle the insights that other approaches may throw up, although these can usually be further illuminated by a Bayesian spotlight; nor would I claim total success in understanding, from any standpoint, such conundra as the role of experimental randomization, or the principles which should underly model criticism (Box, 1980). I even believe (and believe I have proved, Dawid, 1985b) that no approach to statistical inference, Bayesian or not, can ever be entirely satisfactory. I do, however, currently feel that the Bayesian approach is the best we have or are likely to have.

The trouble with relying only on axiomatic arguments is that they stand or fall according as one finds their postulates intuitively acceptable or not. I will often have strong feelings that a particular postulate or principle is, or is not, intuitively obvious, or acceptable, or inevitable; but I find that these feelings are not universally shared, and I generally cannot easily turn my gut feelings into arguments that will move dissenters. (They may be equally exasperated by my refusal to see reason.) That is why we should not attach too much importance to any axiomatic development such as Savage's, nor to Shafer's arguments

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