

Pp. 156-165 in: Griffith Edwards, John Strang and Jerome H. Jaffe, eds., *Drugs, Alcohol and Tobacco: Making the Science and Policy Connections*. Oxford: Oxford University Press, 1993.

RESEARCH, POLICY AND THE PROBLEMS SET BY RAPID SOCIAL, ECONOMIC AND POLITICAL CHANGE¹

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My fundamental intellectual interest is in the study of change. But when I first got a job in alcohol studies, in 1963, the field seemed very far from these interests. At that time, the underlying epistemological assumption about drinking in America was that things didn't change much; that what you found out about patterns at one time would be equally valid 10 years later. In fact, if some indicator like the Jellinek formula was showing evidence of change, that was presumed by one well-known scholar to be evidence that the indicator was no longer working, that it needed to be fixed. This underlying assumption actually was a fairly good fit to drinking in the U.S. of the 1950s, when the level of percapita consumption stayed more or less level; it might be argued that the assumption also reflected something about American society more generally in the 1950s.

Some years later, after Jerry Jaffe and I had become acquainted here in London in 1972 at a meeting hosted by Griffith Edwards and David Hawks ("Epidemiology", 1973), I was precipitated by Jaffe into the literature on illicit drug epidemiology. Here, I found, there was the opposite underlying epistemological assumption: everything was always changing, what had been true last year could not be assumed to apply this year, and new data was collected not so much for what it could tell us about the present status as for what it could tell us about trends. It might be added that for U.S. society generally, by the early 1970s there had been a number of rude awakenings from the apparent changelessness of the 1950s.

CHANGE AND SCIENTIFIC LAWS

We live in a world which is both ever-changing and unchanging. Whether we see change or constancy depends considerably on where and how we look at the world. The habit of mind of science is to look for what is constant, even amid apparent change. In this habit of mind, variability and change are often seen as surface "noise", potentially obscuring the unchanging

¹Revised from a paper presented at a conference, "Drugs, Alcohol and Tobacco: Making the Science and Policy Connections", 16-19 July 1991, organized by the Addiction Research Unit, Institute of Psychiatry, London. Preparation was supported by a National Alcohol Research Center grant (AA05595) from the U.S. National Institute on Alcohol Abuse and Alcoholism to the Alcohol Research Group, Medical Research Institute of San Francisco.

mechanisms below. The research questions are posed in absolute, timeless terms: what is the dependence potential of this benzodiazepide, what are the metabolic pathways of ethanol, what is the action and effectiveness of this potential remedy? The scientific enterprise is seen in terms of discovery, in the most literal meaning of the term: unwrapping the timeless secrets of the natural world.

I am not implying, of course, that this frame of mind ignores change. Change is often, indeed, the object of study: the motions of the planets, the evolution of life forms, the natural history of a disease are all classical matters for scientific study. But the aim of the scientific enterprise is to find and specify the unchanging laws which underlie and explain the observed changes. The recurrent habit of thought is to assume that when such a regularity is found it will be universally applicable. It has often been a long and painful process for science to recognize that there may be limits on a law's universality. The classic resolution at the end of this process is to discover a new, more general law. With this discovery, order is again restored to the universe: now there is a new universal law, at a new level of generality, within which the old law is nested as an application in limited conditions. The consistent concern of the scientific enterprise, then, is to find universal and unchanging laws that underlie and explain observations of change.

This search for the unchanging and universal is a large part of the appeal of the scientific enterprise for our kinds of societies, and the promise of discovery of universal laws is an important part of the implied social contract between science and the society. The idea that something can be discovered, and after that it more or less stays discovered, means that science can be seen as producing durable goods, both in the sense of permanent intellectual property and, our societies hope, in the sense of permanently useful inventions. The idea that the discovery is universally applicable means that it has been made and paid for once and for all, so that every new circumstance does not require further research. Paying for science, in this perspective, is not a mere running cost for today, like providing clinical or social services, nor even just an upkeep cost for the near future, like teaching the young, but instead is an investment which will pay permanent dividends. Even if new discoveries eventually supersede the scientific knowledge, they will be built on its base. No other societal investment promises this kind of permanence, uncorrupted by moth, rust, or shifting fashion. If the scientific promises of permanent advances and of substantial generality wear thin, it becomes much harder to argue for a special societal investment in science: science retreats to being one more branch of knowledge, alongside the humanities and vocational knowledge, whose adepts are mainly paid to pass on this form of cultural capital by teaching the young.

CHANGE, SCIENCE AND HUMAN DRUG USE

This frame of reference of cumulative and generalizable scientific knowledge has been the primary frame of reference for modern medical research. In Britain and the U.S., at least, alcohol and other drug research has primarily been conducted under such a medical research rubric. And in some aspects of alcohol and drug studies, work pursued in this frame can point to great and permanent success, in terms of the advancement of knowledge. What we have learned in the last forty years about tobacco and lung cancer, about opiates and brain receptors, or about the detailed effects of drinking on performance decrement, for instance, will be reflected in the textbooks of

the next century, even if only as a base underlying further advances.

But when we try to transfer this general scientific epistemology to the practical prevention of drug, alcohol and tobacco problems, we find ourselves in trouble. The application of the cumulative and generalizing frame of physical and biological science to human society and behavior was precisely the ambition of nineteenth century social science. But the search for universally applicable laws of human behavior that were not trivial proved a humbling experience. By and large twentieth century social science has retreated from this ambition to more modest aims. The problem is that human social behavior is too complex, multilayered and multidetermined. Our predictions of the future from a particular set of observations may be quite good for the next moment, but their accuracy tends to decay fairly rapidly over time. Human behavior cannot be predicted in detail as solar eclipses can, hundreds of years in advance.

With respect to any science of prevention and intervention, the problem of prediction is further complicated by the fact of human cognition and ingenuity. If policymakers raise an obstacle to a desired behavior, commodity or event, some minds are likely to set to work on the task of overcoming the obstacle. The long-term net effect of the intervention, then, does not simply consist of its immediate and direct effect, but rather of this effect less any neutralization of it that ingenious minds have managed.

These problems do not invalidate efforts to build a scientific base for prevention policies and programs, but they do suggest starting with modest aims and a certain degree of humility. There are in fact some generalizations that can be made about the human response to particular policies and interventions, but they are often of limited specificity, and of bounded applicability. Indeed, part of the scientific task involved in cumulating knowledge about the effects of specific measures is not only to specify the relationship involved but also to specify the boundaries of its applicability.

These general points can be illustrated with the particular example of the effect of changes in taxes -- which translate into changes in prices -- on levels of alcohol consumption in a population. This is one of the most frequently studied potential prevention measures; there are numerous estimates of the price elasticity of demand for alcoholic beverages. A few general conclusions can be made from this literature.

- * There is some negative elasticity in the demand for alcoholic beverages; that is, if the price goes up, the consumption will go down.

- * But in economist's terms the demand tends to be relatively inelastic -- that is, a 10% rise in price will usually cause a fall in consumption of less than 10%.

- * The elasticity for the main alcoholic beverage in a culture -- for instance, beer for Britain, wine for Italy -- tends to be less than the elasticity for other alcoholic beverages.

- * Heavy drinkers as well as light drinkers show some price elasticity -- their drinking behavior is not immune to price (we still need wider range of evidence concerning this point).

The generalizations that can be made beyond these would be relatively few. And even the generalizations that can be made have hidden boundaries, which need to be made explicit. As an outer limit, discussions of elasticity assume a market economy, where alcoholic beverages have an exchange value relative to other goods and services. The estimates tend to be based on relatively small-scale variations in the price of alcohol, and it may well be that the effects of drastic changes in price cannot be extrapolated from the effects of small changes. Elasticity

estimates are abundant for a small group of industrial countries with a strong historic concern with alcohol issues, and much sparser in other industrial countries; this may affect the generalizability of the conclusions from the literature. Elasticities often vary over time in a given society, so that a set of elasticities computed on the basis of the immediate past cannot be assumed to be good for the indefinite future. I am not aware, indeed, of any model or theory of variations in a particular society in the price elasticity of alcoholic beverages, and neither is there a clear theory of the determinants of cross-cultural variations in elasticity. There is also the issue that conventional econometric estimations of elasticity assume that the effects of rising prices are simply the reverse of falling prices, while an addiction concept would make the opposite assumption. In this connection, we need more detailed studies of changes in the buying behavior of different classes of drinkers when prices go up and down.

This example, drawn from the literature on a relatively well-studied measure, suggests how limited is the base from which we are starting if we set out to develop a scientific basis for policymaking and prevention programming -- that is, if we wish to understand how rates of drug-related problems change and can be subjected to change.

So what are some of the steps forward we need to take in building such a base of knowledge? The tasks we face can usefully be divided into two parts: building knowledge on how to manage and if possible reduce alcohol and drug problems in a relatively stable situation and society; and building knowledge on how to understand, respond to and if possible bring about large-scale change. These issues are not really distinct, of course: large-scale changes are often the result of the aggregation of small changes. But the distinction is still worth making, from two points of view: the methods of study of the two kinds of situation tend to be distinct; and policymakers and professionals tend to play a larger role and have more control over the situation in a case of incremental change than in the case of large-scale change.

STUDYING SMALL-SCALE PURPOSIVE CHANGE

Most of the systematic literature which we have available deals with the small-scale change end of the spectrum. This is the home territory of the classical quantitative outcome evaluation study, with prior and post measurements in the study site and in a control site. Three major types of such studies have emerged. One type, full-scale experimental policy studies where a control measure is changed in one community or set of communities but not in another, has primarily been a specialty of Nordic countries experimenting with alcohol policies. A second type, "natural experiment" or "legal impact" studies, differs in that the policy change or intervention is not under the control of the researchers. Frequently, researchers have to scramble to find the resources to carry out the prior measurements. A subclass of this tradition consists of "strike studies", studies of sudden perturbations in the supply of a drug, for instance from a strike of employees of state liquor stores (see review by Smith, 1988).

The third type of evaluation study is the community intervention study. This type of study compares the effects of a program or programs in one or more target communities with trends in matched control communities. In this type of study, there is typically a professionally-provided intervention or set of interventions: it may be a mass media campaign, school or after-school education programs, or training or brief therapy for heavy users. Less typically, the intervention may be a community organizing effort around local tobacco, alcohol or drug policies.

Full-scale evaluation studies take considerable time and effort -- particularly the community intervention studies. They tend to be carried out in a relatively small roster of countries -- primarily, the Nordic and Anglophone countries. Well-done studies of this type provide some of the most convincing evidence we have on which measures have what effects under what circumstances. But the boundary around their generalizability must remain quite tight, in a global perspective, so long as they are confined to such a restricted range of countries. It would be a brave planner indeed who would predict, on the basis of Saturday-closing experiments in Norway and Finland, what would happen if alcohol sales were halted on Saturday in Italy or Nigeria.

According to the usual scholarly norms, only the outcome results from such studies typically find their way into the abstracted literature. But from the point of view of cumulating the results of the studies into a broader picture of the conditions of a measure's effectiveness, the outcome results of a study often constitute only a single case in what is, as a result, a rather small population of case studies. Usually, however, the researchers involved in the study learned a great deal more about the potential for and hazards in introducing change in the course of the study. Our understanding of the conditions for success of purposive change efforts is potentially greatly enhanced when the process data on the studies also becomes broadly available. This was the major rationale behind a 1989 conference on evaluated community action projects in the alcohol field (Giesbrecht et al., 1990), and a follow-up conference to be held early in 1992.

So far, efforts to cumulate the knowledge from these experimental and quasi-experimental studies have primarily taken the form of review articles, usually dealing with one drug class at a time. While there are probably not enough cases yet for a formal meta-evaluation, it would be interesting to examine the variation by drug in results with a given intervention. For instance, it seems that educational approaches in U.S. schools in the current era more often can show positive effects, compared to control sites, for tobacco than for alcohol.

From the point of view of making this literature more broadly useful to policy discussions, the primary need is to increase the number and particularly the spread of cases studied. One avenue for increasing the case file is to reach back into the past. An alternative to prior/post evaluation studies is the use of autoregressive time-series methods (ARIMA) to study the effect of some policy change on indicators of drug use or of drug-related problems. Such analyses still require a substantial investment of energy; one case study can take the time of an experienced analyst for three months. But this is still a small investment of resources compared with carrying out a full experimental study. And usable social and health statistics data are available for a considerably broader spread of time and of societies than can be covered with experimental studies. As we move towards a greater number of scholars being competent in ARIMA and related analytical techniques, it would be worthwhile to open discussions internationally on developing a list of interesting cases for study.

Even where data are probably insufficient for formal ARIMA techniques, collecting case studies of change is a worthwhile effort. It would be particularly interesting to study variations in the effects of the same policy change in different subpopulations -- for instance, the Muslim and wine cultures as well as spirits cultures of the Soviet Union.

It must be recognized that there are limits to what can be concluded from studies of small-scale purposive change. Designers of experimental studies face a Hobson's choice between testing a single intervention and testing a package of interventions. While testing a single measure gives

the most determinative results, there is good reason to believe that measures are often mutually reinforcing, so that measures which individually are ineffective may become effective as an aggregation. Evaluation methods are also inherently better attuned to measuring short-term change than to measuring long-term change. In the long run, history has a way of intruding or at least happening, and the long-term effects of a particular change in policy become progressively harder to separate out as time passes.

STUDYING BIG CHANGES

Despite my presumptions as a beginning alcohol researcher, big changes do happen in the use of and problems from legal drugs as well as illicit ones. Although tobacco smoking has been well entrenched in Europe for about four centuries, cigarette smoking, which we now know hugely increased the morbidity and mortality associated with tobacco use, is largely a phenomenon of this century. The 1830s and early 1840s saw a truly big change in alcohol consumption in the U.S., with very little government involvement: it is estimated that per-capita consumption for those aged 15 and over fell from about 17 to about 7 litres (Rorabaugh, 1979, p. 233).

Some big changes, particularly big declines in consumption, happen in a situation of national crisis -- in wartime, as a result of a revolution, or during a major depression. Government action is frequently involved, as in the swingeing increases in spirits taxes in Denmark in 1917, but the spirit of national crisis validates and provides support for the action that would not have been there in normal times. Otherwise, big declines in use of deeply entrenched drugs tend to have been borne by major social or religious movements. The decline in alcohol consumption in the 1830s and early 1840s in the U.S. was associated with a religious revival called the Second Great Awakening. In countries like Finland and Iceland, temperance became caught up with social movements for national independence and nationbuilding. Big increases in use, on the other hand, are often a generational phenomenon. The carriers of the rise in U.S. alcohol consumption after the 1920s were middle-class youth, in revolt against their parents' Victorian morality, just as counter-cultural youth of the late 1960s and 1970s were major carriers of an upsurge in illicit drug (as well as alcohol) consumption.

As we study big changes in drug use and problems, then, with attention to policymakers' particular interest in what governments can do to help or hinder them, there is a need to adopt a broad perspective, with attention to a range of social trends in the society. At the moment, the study of big changes is at the stage of compiling case studies; thus Esa Österberg, Norman Giesbrecht and Jacek Moskalewicz are currently compiling a book of such studies for alcohol, under the auspices of the Kettil Bruun Society. The skills of historians as well as social scientists will be needed to increase our stock and range of case studies. It is not too early, too, to begin making comparisons -- across societies, across historical epochs, across drugs.

A PROGRAM OF RESEARCH WITH A GLOBAL SCOPE

What I am proposing, then, is that we undertake two very ambitious programs of work. In both cases, the challenge is to be comparative, on at least three dimensions.

(1) across cultures and populations: From this we can get some sense of how similar or different outcomes can be under different conditions.

(2) across time: Looking at different time periods in the same society to some extent

controls for the kind of hidden variation built into cross-cultural comparisons.

(3) across drugs: here we are examining not only differences in the psychopharmacology of the drugs but differences in their social definition and position. I am struck by how different the assumptions and epistemologies often are in separate discussions of the science and policy connections for nicotine, alcohol, illicit drugs, and licit psychotropic drugs.

I have proposed the studies of small-scale purposive efforts at change and of big changes as separate efforts, but we also need explicit attention to the relation between the two. When and under what circumstances do small-scale change efforts cumulate into a big change, and when may they have perverse effects, setting off a generational rebellion against the "nanny state"?

How are these programs of work to be carried out? The most likely answers are probably both true in a way, though they contradict each other: they won't be carried out, and they are already being carried out. They are already being carried out in the sense that we are beginning to build up a substantial literature of studies of the effects of policy and prevention efforts, and a substantial historical literature on big changes in drug use and in societal responses to drug use. They won't be carried out, on the other hand, in the kind of systematic way suggested here, without some substantial innovations in the way we carry out research.

The problem is severalfold. Ironically, much of the work involved is presently seen as too far from policy significance to be fundable, at least with alcohol- and drug-specific funds. Historical work has thus largely depended on the passion or self-sacrifice of individual scholars, or has been carried out in little protected niches of the funding structure for research. On the other hand, evaluations of purposive change efforts are often too much under the thumb of their policy significance. Frequently the funding agency can suppress the results if it doesn't like them, or the results are buried in the fugitive literature of project reports and conference presentations.

The most serious problem with the current literature is its narrowness of coverage. As I have noted, the currently available work is heavily bounded -- by time and to some extent by type of drug, but in particular by societal setting. The bounds are multidetermined. Does the society have a tradition of evaluation studies and of strength in the requisite research traditions? Does it problematize the drug enough to have a specific research tradition in it? Is it rich enough to support a substantial research base? All of these are true for the societies which have contributed the bulk of the current literature. With a few exceptions, the present pattern is for explicitly policy-attuned studies to be carried out only in the society which is funding them. The main literatures where a scholar often works on a society outside his or her own have been anthropology and history, where the tradition of the small-scale enterprise of the individual scholar still holds sway.

It is important that we find ways to transcend these limitations. Interesting changes, big and small, are going on all around us, and going unstudied or less than fully studied. Much can be learned, for example, from studying the huge transitions in Eastern Europe, from studying the rise of markets for drugs and attempts to control the markets in developing societies, and from studying community control efforts in village societies. Work of this sort will need to be carried out collaboratively with the participation of local scholars, but it is going to take some commitment of resources by societies with the resources and the interest to undertake the kinds of research here discussed.

The proposed program of research is of clear practical significance. But in my view it is

important to be modest and realistic about what we are likely to be able to offer the policy process. We cannot expect to end up with scientific laws which apply in general across the sway of time and circumstance. Instead we can hope for conditional probabilities for particular sequences of events under specific conditions: if X happens, Y is very likely to follow, particularly if Z is also true. Part of the researcher's task, as I earlier noted, is to specify the boundaries within which we have evidence for these generalizations.

Lastly, it should be kept in mind that science is always potentially inconvenient and even subversive (Gusfield, 1975). It may establish relations that from an immediate practical point of view are useless. For instance, while recent studies have suggested that alcohol rationing systems cut down the drinking of heavy drinkers, rationing of alcohol as a public health intervention is presently politically inconceivable in most industrial societies. It is likely that researchers will insist on including within the scope of their studies dimensions that policymakers are uneasy about subjecting to scrutiny -- notably including the actions of the policymakers themselves (Bruun, 1973). And the findings of the research may well be disconcerting. Those involved in the policy process are well advised to keep in mind that the true heroes, for scientists, tend to be those who succeed in disproving what they set out fervently believing in.

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