

## MEASURING DRINKING PATTERNS AND PROBLEMS: THE EXPERIENCE OF THE LAST HALF CENTURY<sup>1</sup>

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Surveys on drinking behaviour are not a phenomenon only of the last half century. To pick a couple of earlier examples, as part of the investigations of the Committee of Fifty to Investigate the Liquor Problem, a survey of “drinking among brain workers of the United States” was carried out by John Billings (1903); and a survey of drinking by children in Bochnia, Poland was carried out in 1913 (Swiecicki, 1972).

Two main features differentiate the modern tradition of surveys of drinking behaviour from earlier efforts. Before the study by Straus and Bacon (1953) of drinking among U.S. college students, drinking surveys focused only on the fact of drinking at all, or on the frequency of drinking. Surveys of illicit drug use today still conventionally ask only about the fact of use or frequency of use. Straus and Bacon’s broadening of the scope of questioning and analysis about drinking thus marked a decisive break with the focus in and after the temperance era on alcohol use per se as the problem. Straus and Bacon’s extension of the scope was in two main ways: by using a typology of drinking patterns, with attention to the amount of use per occasion; and by going beyond questions about drinking behaviour to ask also about problems related to drinking.

The second feature which marks the modern tradition of drinking surveys was the shift to probability sampling methods. Fully probabilistic sampling methods made their way into U.S. public opinion polling gradually, since they raised the expense of conducting in-person household surveys (U.S. response rates with mail surveys are unacceptably low, and too few houses had telephones until recent decades). The process was helped along by debacles such as the Literary Digest poll’s prediction that Roosevelt would lose the 1936 election, which he won by a huge margin (probed in an early publication by Don Cahalan -- Cahalan and Meier, 1939). Earlier adult general population surveys such as those of Mulford and Miller (1960a) in Iowa used “modified quota samples” and other methods short of full probability sampling, and such methods can still be found in use in some U.S. alcohol surveys in the early 1970s (Harris, 1971; Johnson et al., 1977). The use of sampling quotas, typically to replace the last link in the chain of area-probability sampling, tended to overrepresent those in the population more likely to be found at home, and thus, for instance, to overrepresent abstainers. In the U.S., full probability sampling methods were first applied in a community drinking practices survey by Genevieve Knupfer and associates (Knupfer et al., 1963), and in a U.S. national sample by Don Cahalan and associates (Cahalan, Cisin and Crossley, 1969).

By the mid-1970s, surveys of adult drinking behaviour had been carried out and reported in a number of societies. In addition to surveys in the U.S. -- some already mentioned -- there had been

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<sup>1</sup> For presentation at the 25<sup>th</sup> Annual Alcohol Epidemiology Symposium, Kettil Bruun Society for Social and Epidemiological Research on Alcohol, Montréal, PQ, Canada, 31 May - 4 June, 1999.

surveys in Finland (Mäkelä, 1971) and more generally in the Nordic countries (Jonsson and Nilsson, 1969), in Britain (Edwards et al., 1972; Dight, 1976), France (Sadoun et al., 1965), Canada (Cutler and Storm, 1973), Australia (Encel et al., 1971), the Netherlands (Gadourek, 1963), and Switzerland (Wütrich and Hausheer, 1979).

There was some cross-fertilization of ideas between the research groups working in different countries from the start, in the form of joint publications, correspondence, and in some cases study visits. The Drinking and Drug Practices Surveyor, initiated in 1970, provided a venue for methodological work and discussions. Even more, the advent of the annual Alcohol Epidemiology meetings in 1975, initially as a section of the International Council on Alcohol and Addictions, provided a meeting-place for exchanges on ideas and methods.

## DEVELOPMENTS IN ASKING ABOUT DRINKING

Despite the cross-fertilization, substantial differences have persisted in national traditions of asking about drinking behaviour. A major division has been between the tradition of asking about recent drinking occasions, on the one hand, and asking for the respondent's summary of his or her customary drinking behaviour, on the other. The former tradition has been more often used in European studies, and the latter in north American studies (Alanko, 1984, Room, 1990). Recently, there seems to have been some convergence of thinking about ways of asking about amounts of drinking (e.g., Dawson, 1998, Stockwell et al., 1999). First, it can be agreed that there is no single best way of asking about drinking behaviour -- the optimum method will depend on the purpose for which the data is being collected. Second, if a recent-occasions method is being used, an adequate characterization of an individual's drinking requires information stretching over several drinking occasions. Thus, unless frequent drinking is characteristic in the cultural situation, collecting data only on drinking occasions in the last week will result in considerable misestimation and misclassification, particularly for less-frequent drinkers. Third, if a respondent's-summary method is being used, "usual quantity" is not sufficient as the method of asking about quantities consumed on an occasion (Rehm et al., 1999). In particular, for most purposes questions need to be asked about drinking larger amounts on an occasion, even if they are not a "usual" amount.

There are several factors which have kept the national traditions, once established, divergent. Analysts are used to working with a particular set of questions, and there may also be a substantial investment in computer code for converting responses to summary measures. More importantly, keeping questions comparable with earlier surveys allows for analysis of trends over time, an aspect of the literature that has become increasingly important as survey datapoints cumulate. A particular set of questions may also be attuned to the particular drinking customs of the culture. This point was underlined by the experience of the WHO 3-country Community Response Study in the 1970s: the last week's drinking was an adequate way of asking about drinking in Scotland, where drinking occasions are relatively frequent, but was very unsuited to the infrequent drinking which is common in Mexico (Rootman and Moser, 1985). While these factors make it likely that the divergent questions in the national survey series will continue to be asked, it may be possible to bridge the gaps between national traditions with a short selection of cross-culturally comparable questions to be asked in addition.

## DEVELOPMENTS IN SUMMARIZING DRINKING PATTERNS

Once the questions on drinking behaviour have been asked, the researcher faces the task of aggregating and summarizing them in the analysis. Earlier surveys of drinking in the United States summarized the patterning of drinking in terms of typologies, combining frequency of drinking and

summary dimensions of quantity per occasion in various ways. Although they were composed from two and sometimes three dimensions of drinking behaviour, the typologies were often treated in analysis as a single ordered dimension, one which implicitly gave special weight to heavier drinking occasions. However, an alternative tradition, starting with Knupfer et al. (1963) and continuing with the Volume-Variability measure of Cahalan et al. (1969, Appendix 1) and later typologies of frequency of drinking and of drinking 5+ drinks (Room, 1990), clearly distinguished a dimension of frequency (or in which frequency was important) from a dimension centred on whether or not the respondent sometimes drank larger quantities. A methodological article by Knupfer (1966) emphasized how different the correlates of frequent light drinking and less frequent heavy drinking were, although the two patterns might result in about the same volume of drinking. As she wrote in a 1965 letter, "I have been carrying the torch for the importance of 'quantity'.... The essence of the point might be put this way: we want an index that is more related to the blood alcohol level of the drinker than to the profit level of the alcoholic beverages literature" (quoted in Room, 1990). In line with this theme, an article a few years later by Kettil Bruun (1969) used a measure of frequency of intoxication based on calculations of times respondents were above a threshold blood-alcohol level.

For a considerable period, this emphasis was swamped by a shift in the literature to a single-minded focus on summarizing drinking behaviour in terms of overall volume of drinking, in terms of an average amount consumed per unit of time. There were probably several reasons for this shift in focus. First, the literature became self-conscious about issues of validity (e.g., Pernanen, 1974), and in this context the proportion of alcohol sold which could be accounted for a survey became the "gold standard" for the validity of drinking measures; volume of drinking was the most direct equivalent of the sales figures, expressed as units of ethanol per member of the drinking-age population. Second, the Ledermann model became important in the literature. Since it focused on hypotheses about the distribution of volume of drinking in a population, in the course of controversies over its validity much energy was spent on computing distributions of drinking volumes in different populations (e.g., Bruun et al., 1975, p. 33). In this light, complaints were voiced at Alcohol Epidemiology sessions about the habit in U.S. surveys of using categorical typologies which could not be converted into the volume dimension. Third, volume of drinking was in principle a single continuous and quantifiable dimension, and because of this was readily used in a variety of multivariate statistical techniques which assumed a dependent variable of this type. The fact that all the respondent's drinking was included in a volume measure made it seem like the obvious choice as a summary measure of amount of drinking. Last, as medical epidemiological studies began to pay more attention to drinking, they used a volume of drinking measure as a matter of course (Edwards et al., 1994, p. 45), by analogy with other measures of diet and behaviour; the influence of this prestigious literature filtered back into the drinking patterns literature.

While the tradition of describing the drinking pattern in terms of two or more dimensions never entirely disappeared, the main emphasis for some years has been on volume of drinking. Recently, however, there has been a new emphasis on the importance of the patterning of drinking, accompanied by critiques of the adequacy of approaches focused only on volume of consumption (e.g., Single and Leino, 1998). While this emphasis has sometimes been regarded as a new departure, in reality it represents a return of a perspective which would have seemed self-evident to such researchers in the earlier days of drinking surveys as Genevieve Knupfer or Kettil Bruun.

With the return to thinking of and characterizing drinking patterns in terms of two or more dimensions, however, the field has still not reached any consensus on methods of summarization, and particularly on how to handle drinking patterns in multivariate analyses. Categorical typologies remain awkward to use in such analyses. On the other hand, the problem of collinearity may hinder the solution

of introducing two or more dimensions of drinking patterns as separate variables. Introducing interaction terms can result in difficulties in interpreting the results. It is time for the field to get beyond conceptual arguments re-emphasizing the importance of patterns in characterizing drinking, and on to concrete discussions about ways of characterizing and summarizing patterns, particularly in the context of multivariate analysis.

#### AREAS FOR DEVELOPMENT IN CHARACTERIZING DRINKING PATTERNS

Driven in part by the medical epidemiological literature's focus on volume of drinking, a major methodological focus has been on developing questions which are convertible more and more exactly into an absolute metric of grams of ethanol consumed per time period. But one cannot get meaningful responses by asking respondents how many grams of ethanol they drink on an average day. Most surveys ask instead about something like "drinks" -- the units in which alcoholic beverages are customarily consumed. Obviously, for a conversion from a "drink" to grams of ethanol, one needs to know the strength of the alcoholic beverage, and how much of the alcoholic beverage was poured into the drink. Both of these may vary from one occasion to another. Methodological analyses showing how much "a drink" may vary by occasion, by respondent, and by society (e.g., Turner, 1990) have fueled a search for an international "standard drink".

The survey researcher's quandary about these matters of measurement has sometimes reflected back into social policy and programming. Since it was developed by Susan Dight for a Scottish survey (Dight, 1976), the "standard unit" has been a feature of British surveys. The unit was a researcher's construction to deal with the problem that the predominant Scottish beverage, beer, was sold primarily in two different drink-sizes, a half-pint and a pint. Dight chose the smaller size as the "standard unit", although an ordinary male drinker in Scotland would think of "a drink" in terms of a pint -- two standard units. When British governments then moved to promoting "sensible limits" on drinking, the Dight unit took on a new role as the metric for stating these limits. Not surprisingly, in view of the ordinary drinker's definition of "a drink", the British "sensible limits" are often misinterpreted.

From the point of view of survey methods, the emphasis on standard units or drinks seems to me misplaced. Our basic job in asking respondents about their drinking is to attune the questions to ways the respondent can comfortably answer, not to try to impose some standard unit on them. The problem, of course, is that in respondent's-summary approaches the analyst would like respondents to summarize in terms of equal levels of ethanol intake. But this problem is probably best solved by allowing the respondent to answer in terms of the respondent's preferred units, but with the level specified in terms of those units.

From the point of view of understanding drinking behaviour itself, and also of understanding relations between drinking and social and health harm, I would put first priority not on a more exact calibration of grams of ethanol intake, but rather on paying more attention to aspects of the cultural definition and social meaning of drinking. Whether one drinks at all, whether one takes a drink on a particular occasion, whether one gets drunk and how drunk one gets are all structured by and hold implications for how people think of and define themselves and others with respect to drinking. But the survey research literature has only fitfully visited this territory of the social meaning of drinking -- most commonly, probably, by asking questions about "reasons for drinking". As Bacon noted about American Drinking Practices (Bacon, 1969), the most common mode of analysis has been basically a "demographic analysis", which "does *not* describe the styles, procedures and qualities of the drinking activity,... and only considers the sociocultural settings in broad, almost abstract categories".

Since American Drinking Practices, indeed, the field may have somewhat regressed in terms of

what Bacon was looking for. For instance, Cahalan and his coworkers (1969) did pay attention to type of beverage consumed, but it is only recently has the literature returned to paying sustained attention to the rather different profiles of harm associated with beer, wine and spirits drinking (Room, 1976). A couple of factors have turned our attention away from such matters. In the first place, drinking surveys have most commonly been done in cultures where for some, at least, drinking at all, and particularly drinking more than a little, has been a morally questionable activity. To ask about socially defined categories, researchers feared, was to invite responses oriented to social desirability. And in fact, cross cultural surveys have found evidence of such an effect. In societies with a temperance tradition, a substantial fraction of people define themselves as abstainers even though they had taken a drink at least once in the last year; conversely, in very "wet" societies, some people who had not taken a drink in the last year nevertheless define themselves as drinkers (Lindgren, 1973; Nelker, 1973).

Second, meanings and definitions of drinking are diverse. Excursions into classifying drinking into socially meaningful categories have often ended up with many types varying on many dimensions (e.g., Martin et al., 1992). Once these typologies have been described, analysts do not find them easy to use further in multivariate analysis.

Third, the methodological individualism of most survey research means that our attention has mostly focused on the individual's drinking patterns, rather than on the drinking occasion as a collective social context (but see Simpura, 1991). The collective pattern of drinking in a particular type of occasion may well have a stronger relation to harm or other outcomes than the individual drinking patterns participants bring to the occasion.

Measuring amount of ethanol consumed on an occasion, or as a drinking pattern, is obviously important in characterizing an individual's drinking and understanding its relation to potential harms. But it is far from the full picture. Other parts of the picture include how the respondent and bystanders defined the drinking, both in terms of the occasion and in terms of patterns. Did the respondent consider him/herself drunk, and did others? Was the consumption and comportment while and after drinking expected, allowed or disapproved of in the situation? These matters of the social definitions surrounding drinking and intoxication need to be measured alongside the grams of ethanol.

## DEVELOPMENTS IN ASKING ABOUT DRINKING-RELATED PROBLEMS

Asking general-population respondents about adverse consequences of their drinking, like asking them detailed questions about drinking patterns, really begins with Straus and Bacon's study of college students (1953), and has continued for the intervening half century. But issues of measurement and aggregation in this area have received less sustained collective attention by researchers than the area of drinking practices.

Studies have varied greatly in the number of items asked concerning drinking problems, but not very much in terms of the areas about which questions are asked. Usually, respondents are asked about adverse reactions of others to their drinking. The occurrence of casualties and physical health problems related to drinking are commonly included in the list of questions. Respondents are also often asked about problematic drinking comportment: arguments or fights while drinking, drinking-driving, going to work with a hangover. Also asked in one survey or another are a wide variety of drinking-related behaviours or occurrences considered symptomatic of addiction: such items as use of alcohol for coping, drinking to relieve withdrawal, gulping drinks when noone is looking, and drinking longer or more than intended. Many of these items date back to the Grapevine survey constructed by members of Alcoholics Anonymous and analyzed by Jellinek (1946) in terms of phases in the natural history of alcoholism. While surveys with problem items across this kind of range have perhaps been most

common in the United States, similar lists of “types of experiences related to drinking” can be found in studies elsewhere, for instance, in Nordic surveys (Mäkelä, 1981).

A new kind of item entered into use as psychiatric epidemiology became more involved in measuring alcohol problems. In constructing survey items, survey researchers usually try to keep items as simple as possible, and avoid “double-barrelled” questions. The criteria for the psychiatric diagnoses in the field, however, often deliberately combine different conceptual areas into the same criterion. A criterion like “continued drinking despite knowledge of adverse consequences”, for instance, combines behaviour (continued drinking), cognition (knowledge of...) and the occurrence of adverse consequences. In seeking to operationalize such criteria, those constructing questionnaires have felt forced to construct items which are difficult to understand and to answer, and to which responses are difficult to interpret.

Questions about drinking problems in early drinking surveys were often phrased in terms of lifetime occurrence -- “did this ever” occur? Phrasing the question in such terms obviously has the greatest chance of picking up positive responses. Asking questions on a lifetime basis was also encouraged by the clinical tradition of regarding alcoholism, along with other psychiatric conditions, as lifelong once incurred. Those of us engaged in longitudinal studies quickly realized that such questions greatly hindered studies of changes in drinking problem status over time -- with lifetime question, respondents could never get better, they could only become invalid. In early studies, the time period specified for “current problems” varied, from 6 months, in studies based on the DIS, to as long as three years (Cahalan and Room, 1974). The sporadic nature of many problems discouraged short time-periods; in the end, the literature has settled down to 12 months as the usual time-period for “current” problems.

This often raises problems for analyses of the relation between drinking patterns and drinking problems. It would usually be desirable to have the two domains measured on the time-period, but some drinking-patterns measures have been based on shorter periods -- the last seven days or two weeks or 30 days. On the other hand, measuring drinking patterns on a twelve-month base raises the issue of whether and how to measure and analyze variability in patterns within the period. A variety of expedients have been used to deal with this issue, but there has been no agreement on a particular solution.

It should be noted that the alcohol survey tradition operates on a quite different epistemology from general medical epidemiology in terms of the relation of alcohol consumption to social and health problems (Edwards et al., 1994, pp. 48-50). Whereas the classic problem in medical epidemiology is to demonstrate causation by correlating two conceptually unrelated phenomena, in the alcohol survey tradition the causal connection is built into the question a-priori. Often the respondent him/herself is asked whether there is a problem and to make the causal connection (“did your drinking have a harmful effect on your marriage or home life”). In other questions, the respondent is being asked about problematization by others (“a friend’s feelings about your drinking threatened to break up your relationship”). In a third type of question, the problematization comes from the researcher. On its face, “I have often taken a drink first thing when I get up in the morning” or “I find I have to drink more now to get the same effect as before” do not describe problems; they become problematized only in terms of the researcher’s interpretation of the behaviour. (The researcher’s interpretation does reflect general clinical and cultural interpretations, raising the complication that the respondent, too, is likely to know s/he is giving an answer that will be seen as signalling a problem.)

These issues of imputation of cause and of problem-ness deserve wider discussion in the international alcohol research community.

## DEVELOPMENTS IN SUMMARIZING DRINKING PROBLEMS

From the first, U.S. general-population surveys sought to aggregate drinking-problems items into one or more summary scales. Mulford and Miller (1960b), for instance, constructed one scale for “troubles due to drinking”, and another on “preoccupation with alcohol”; in later work Mulford came to see the latter as more or less an operational measure of alcoholism concepts. Genevieve Knupfer, trained both in psychiatry and in sociology, took a pragmatic and eclectic view of what should be measured under the rubric of “problem drinking” in the general population when she turned to this issue in the mid-1960s (Knupfer, 1967). Knupfer’s approach was to identify different conceptual areas of “problems from drinking”, and construct subscales in each area. Some of these areas reflected interpersonal problems, e.g., job problems, spouse problems, and problems with the police. Along with physical health problems from drinking, this group of problems were sometimes called “tangible consequences”. Other problem-areas described aspects of drinking behaviour which were defined by the analyst as problematic -- e.g., “binge drinking”, “use of alcohol for coping”, “symptomatic drinking”, “loss of control”. A “serious problem”, a “moderate problem” and a “no problem” level was defined in each problem-area, either by a-prior decision (e.g., job loss was defined as more serious than complaints at work), or by the number of positive responses given to items in the area.

This basic system of about a dozen problem-area scores was used in a series of publications by members of the Berkeley group. Analysts differed, however, in how the problem-area scores were presented in analysis. While Knupfer (1967) and Cahalan (1970) presented prevalence rates for the individual problem-area scores, their main attention tended to be on an “overall problems score” which added together scores from all the problem-areas. Clark (1966), on the other hand, kept the problem-area scores separate, focussing on the extent of overlap between a positive score in one problem-area and a positive score in another -- an approach Room (1977) also applied to problems from opiate use. A third approach, used by Cahalan and Room (1974), used a typology distinguishing “tangible consequences” from binge drinking and other problematic consumption.

In later work in the same tradition, Hilton (1991) primarily analyzed drinking problems in terms of two domains, one identified as “dependence” and the other as “consequences”. A similar division between “personal” and “social” consequences was used in analyzing a set of items in the WHO study of Community Response to Alcohol Problems (Rootman and Moser, 1985).

Psychiatric epidemiology’s entry in the alcohol epidemiology field affected summarizations of alcohol problems in a number of ways. In the first place, the tradition’s orientation to psychiatric nosology meant that drinking-problem items were now to be aggregated in terms of the dichotomy of “making” or “not making” a diagnosis for the particular respondent. Initially, the questionnaires and analyses were oriented to DSM-III, a classification with two main diagnoses, “alcohol dependence” and “alcohol abuse”. Given the fact that the latter diagnosis could only be made in the absence of the former, and that the two diagnoses were not conceptually very distinct, most publications in the initial wave reported only a combined dichotomy of those qualifying or not qualifying for either alcohol dependence or abuse.

Currently, psychiatric epidemiological studies in the alcohol field usually measure whether a respondent qualifies for a diagnosis on four main diagnoses: “alcohol dependence” and “alcohol abuse” in DSM-IV, and “alcohol dependence syndrome” and “harmful use of alcohol” in ICD-10. The two alcohol dependence measures are close but not identical. In principle, ICD-10 “harmful use” (and, in view of overlap in criteria, ICD-10 dependence) are supposed to include harm to physical and psychological health, but not to include social and interactional consequences of drinking. On the other

hand, DSM-IV “alcohol abuse” is unambiguously a measure of legal and other external and social consequences of drinking.

Given its orientation and epistemology, the psychiatric epidemiology tradition has been little interested in the issues of causal relationship and conceptual clusterings that have concerned the social epidemiological tradition of measuring alcohol problems. On the other hand, the psychiatric epidemiology tradition has been much more oriented to psychometric traditions of measurement and of establishing the scientific respectability of measures with test-retest reliability studies (Kirk and Kutchins, 1992). Studies in both traditions tended to find that, applying large assortments of “problem” items to a non-clinical population, a strong general factor tended to emerge in principal components factor analysis. The psychiatric epidemiology tradition has tended to regard this as evidence for the validity of a single generalized dependence concept (e.g., Hasin et al., 1994). The social epidemiology tradition has tended to take a more limited view of the significance of this finding, regarding the underlying commonality indicated by the factor as simply a willingness to get quite drunk (or to acknowledge getting quite drunk).

The psychiatric epidemiology tradition, on the other hand, is having considerable trouble fitting the findings for “alcohol abuse” or “harmful use” into its paradigm. Again, both traditions report the same findings: items from abuse/harmful use load into a single common factor with dependence items in factor analyses (e.g., Hasin et al., 1994), but the commonality among items tends to be least for indicators of social reactions and other problems related to drinking. From the point of view of psychiatric epidemiology’s psychometric traditions, this has led to questioning of the viability of a separate arena of harmful use or abuse (i.e., tangible consequences of drinking).

In my view, these developments suggest the limitations of the standard psychometric paradigm as a guide to conceptualization and aggregation in measuring alcohol problems. The general factor underlying the items can be interpreted in terms other than a unified dependence syndrome. On the other hand, the fact that two items do not have strong positive correlation does not indicate much about their conceptual relationship. If they are conceptualized as alternative manifestations of the same phenomenon, they might even have a strong negative correlation, and still belong in the same measure. I suspect also that the psychometric paradigm has driven the adoption of conceptually mixed criteria in the nosologies, noted above as resulting in a need to create technically problematic survey items. It may be hard to know what responses to the resulting “portmanteau” or double-barreled items indicate, but it certainly tends to increase the alphas and other scale-construction statistics if the different scale items all reach across component conceptual domains.

In recent years, a further tradition has strengthened its position in the field of drinking problems measurement, with the development and application of brief screening instruments in nonclinical populations. Given its pragmatic purposes, a screening instrument makes no claims to be measuring diagnoses, or about the conceptual status of its component items. The criterion for including items in a screening instrument are firstly the extent to which, as scored together, they approximate an underlying condition which is of clinical interest, and secondly, that “false negatives” be kept to a minimum. In this context, conceptual clarity is irrelevant, and screening measures often combine items across a range of conceptual domains, frequently asked on a lifetime basis. The two screening measures which are probably now most widely used in population surveys, CAGE and AUDIT, thus both include items on drinking behaviours, on cognitions about drinking, and on the reactions of others; responses across these different domains are simply summed to yield an overall score on the measure.

WHERE DO WE GO IN MEASURING DRINKING PROBLEMS?



The field is currently in a confused state with respect to the measurement of drinking problems. On one side of the literature, the development in psychiatric epidemiology has culminated in very lengthy sets of questions, designed to map as exactly as possible the DSM-IV and ICD-10 diagnostic criteria and specifications. The AUDADIS questionnaire developed by Bridget Grant and her coworkers (Stinson et al., 1998) may represent the furthest likely elaboration of this tradition, with the number of questions needed for the diagnostic algorithms threatening to take over the entire interviewing time. In terms of the standards of the psychiatric epidemiology literature, such a questionnaire is undoubtedly state-of-the-art, both in terms of the detailed coverage of the diagnostic specifications and in terms of the impressive psychometric underpinnings such as cross-cultural reliability testing (Chatterji et al., 1997). But instruments like AUDADIS are beyond the scope of a multipurpose or monitoring survey.

At another boundary of the literature is the kind of analysis represented by studies by Mäkelä and Mustonen (1988) of the relation of drinking problems to alcohol intake, in which each of a number of drinking problem items is analyzed separately, with no aggregation at all. Such an analysis avoids entering the psychometric entanglements of aggregating across drinking problems (although the question of the validity of responses of course remains). This strategy also has the advantage of relating more immediately to contextual and environmental approaches to preventing drinking problems, since the contextual and environmental issues tend to vary from one kind of problem to another.

A third direction in the literature is the search for relatively limited lists of items which can measure a fair representation of alcohol problems, and usable summary measures, in multiple-purpose questionnaires. A common recourse for this purpose at the moment is a screening measure such as the AUDIT, which has the advantage of a considerable track-record of use and of psychometric testing. For purposes such as a general tracking measure to be used in repeated surveys in a national population, a measure like the AUDIT may indeed be suitable.

But if the study's purposes include a better understanding of interactions -- for instance, of the relation between drinking patterns and alcohol-related problems -- a measure like the AUDIT, which reaches across these dimensions, is useless unless dissolved into its component parts. Here what are needed are usable measures with a clear separation of domains of meaning -- at a minimum, there is a need to return to a separation between drinking behaviour, cognitions about drinking, and adverse consequences of drinking. Alternatively, a DSM-IV-based split between drinking behaviour, "alcohol dependence", and "alcohol abuse" would be serviceable, although with a recognition that both drinking-behaviour and consequences ("abuse") elements are hidden within the dependence construct.

At the moment, the market is fairly open for relatively short measures which cover such domains of meaning. In the area of cognitive experiences of craving and impairment of control, scales developed and initially subjected to psychometric testing in clinical environments, such as the 25-item Alcohol Dependence Scale, are probably serviceable. An alternative, with less psychometric testing so far, would be a short summary scale measuring the criteria of ICD-10 dependence, such as has been used at the Alcohol Research Group in Berkeley and ARF in Toronto, and for marijuana at the Sydney centre (Swift et al., 1998).

In the area of tangible consequences of drinking -- legal, social, interactional and health problems -- there may be a need to start again. Discussion is needed about the question of causal attribution -- whose attribution we should be depending on, for what analytical purposes. Work is needed on building and testing new measures in each specific area of tangible consequences of drinking.

To a considerable degree, the task is to undertake an updating of the kind of thinking done by Genevieve Knupfer in building her problem-area scales, with attention to defending the results in the light of the current psychometric literature. An area which needs particular attention is family, relationship

and other interactional problems. This area bulks large in social concerns about drinking, but we have almost no alcohol-specific social statistics for this area, and monitoring population levels and trends in problems in this area will depend on developing adequate survey measurements.

Also needed is thinking and collective discussion about the bases for and methods of aggregation across problem-areas in terms of such constructs as “tangible consequences” of drinking. Here current thinking about revising the International Classification of Impairments, Disabilities and Handicaps (WHO, 1997; see <http://www.who.ch/icidh>), and associated work on developing disablement assessment instruments, may provide some useful leads.

## CONCLUSION

In the light of the foregoing, the conclusion to this discussion will be no surprise. Much has been done and learned in the last half-century in measuring and analyzing drinking patterns and problems. But, particularly with respect to drinking problems, we have reached the point of seeing that there are substantial problems with all the approaches common in the literature. We are far from reaching the stage of mature science. There is thus plenty of thinking and research about these issues to be done in the new millenium.

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