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The CAGE Questionnaire: Validation of a New Alcoholism Screening Instrument

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The CAGE questionnaire, a new brief alcoholism screening test, was administered to all patients (N = 366; 39 percent alcoholic) admitted to a psychiatric service over a one-year period. The authors indicate that the CAGE questionnaire is not a sensitive alcoholism detector if a four-item positive response is the criterion; however, if a two- or three-item criterion is used, it becomes a viable rapid alcoholism screening technique for large groups.

A NUMBER of investigators have attempted to devise a viable screening questionnaire for the detection of alcoholism (1, 2). None of these questionnaires meets all the requirements of brevity, ease of administration, sensitivity, and validity desired in such an instrument. Ewing and Rouse (3) have developed a questionnaire that promises to correct many of the shortcomings of previous alcoholism screening instruments. The CAGE questionnaire, consisting of four questions of a nonincriminating nature, appears in preliminary studies to be a sensitive indicator of covert problem drinking. We conducted the following study in order to further evaluate the usefulness of the CAGE questionnaire.

At the time this work was done, the authors were with the Veterans Administration Hospital, Durham, N.C., where Dr. Mayfield was Assistant Chief, Psychiatry Service, and Mses McLeod and Hall are staff social workers. Dr. Mayfield is now Chief, Psychiatry Service, Veterans Administration Hospital, Providence, R.I. 02908, and Professor of Psychiatry, Brown University Program in Medicine, Providence.

METHOD

The study was conducted on the Psychiatric Service of the Veterans Administration Hospital, Durham, N.C., a 500-bed university affiliated general hospital. The Psychiatric Service is an 80-bed acute inpatient facility with no specifically designated program for alcoholics, but alcoholic patients are regularly treated on an individual basis intermixed with the general psychiatric population.

After admission, patients receive diagnostic evaluation by a team of staff and resident psychiatrists, social workers, psychologists, nursing personnel, and personnel from a variety of other disciplines, plus medical and social work students and psychology trainees. Social workers routinely collect information from family or other informant sources and incorporate this information into the work-up and treatment plan. Length of stay varies from one week to six months, averaging approximately six weeks.

Each patient admitted to the Psychiatric Service over a one-year period was interviewed by a psychiatric research technician one to seven days following admission. The interview consisted of a standardized introduction and a series of 16 questions of a benign and indifferent nature (education, marital status, etc.), with the CAGE questions included. The CAGE questions are: "Have you ever felt you should *cut* down on your drinking?" "Have people *annoyed* you by criticizing your drinking?" "Have you ever felt bad or *guilty* about your drinking?" "Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hang-over (*eye-opener*)?" Two

other alcohol-related questions, asked before the CAGE questions, were: "Do you ever drink?" "Does your wife ever drink?"

Following discharge, each patient's name was placed on a list maintained by the social worker (G.M., P.H.) covering that patient's ward area. The social worker categorized the patient as alcoholic or nonalcoholic on the basis of diagnostic formulations by the multidisciplinary team from the information collected from the patient and from informant sources. The alcoholic/nonalcoholic categorization was subsequently correlated with the CAGE responses. The alcoholism designation was correlated with the response to each of the CAGE questions and with the questionnaire as a one-, two-, three-, or four-item instrument. The statistical analysis was accomplished by using the phi coefficient of correlation for correlation of a true dichotomy with a dichotomized variable (4).

TABLE 1
Comparison of Positive CAGE Responses of Alcoholic and Nonalcoholic Patients, in Percents

CAGE Questions	Alcoholic Patients (N = 142)	Nonalcoholic Patients (N = 224)	Correlation Coefficient
Number of positive responses			
4	37	0	.65
3	30 (67*)	2	.89
2	14 (81*)	9 (11*)	.89
1	9 (90*)	10 (21*)	.85
0	10	79	.85
Type of question			
Cut down	87	16	.88
Annoy	50	8	.60
Guilty	76	7	.89
Eye-opener	63	4	.83

*Cumulative percent.

RESULTS

Three hundred sixty-six patients were evaluated over the one-year period. The patients were predominantly male (99 percent), white (77 percent), and middle-aged (63 percent between 35 and 55 years), ranging in age from 19 to 75 years. Lower socioeconomic classes (5) were overrepresented (classes IV and V = 73 percent), and upper classes were underrepresented (classes I and II = 7 percent). Sixty percent of the subjects were married, 16 percent separated or divorced, 2 percent widowed, and 22 percent single.

Of the 366 patients, 79 percent were alcohol users and 21 percent were abstainers, while 33 percent of their spouses were alcohol users and 67 percent were abstainers. Of the 366, 39 percent were categorized as alcoholics and 61 percent as nonalcoholics. Table 1 shows the responses of the alcoholic and nonalcoholic patients to the CAGE questionnaire. Used as a complete four-item questionnaire, there were no false positives, but only 37 percent of the alcoholics were appropriately identified, and the correlation was rather unimpressive (r = .65). Using two or three positive responses as criteria, however, yielded a rather impressive correlation coefficient (r = .89).

The question "Have people annoyed you by criticizing your drinking?" had substantially lower power as a predictive criterion than did the other three CAGE questions, primarily because 50 percent of the alcoholics failed to answer it affirmatively.

We carefully examined the individual records of those patients who were most clearly misidentified by their CAGE responses (alcoholics who scored zero or one positive response and nonalcoholics who scored three positive responses). Fourteen patients categorized as alcoholics gave negative responses to all CAGE questions. Of these, seven were psychotic—four with functional psychoses (three schizophrenic and one manic patient) and three with organic brain syndromes. The other seven patients manifested competent mental status.

Twelve patients categorized as alcoholics gave positive responses to only one CAGE question. Of these, six were psychotic (two schizophrenic and two manic patients and two patients with organic brain syndromes). The mental status of the remaining six alcoholics was not remarkable.

Five nonalcoholic patients gave positive responses to three CAGE questions. All of these patients were clearly incompetent to give valid responses because of psychotic status at the time of the interview. (Four were schizophrenic, and one had an organic brain syndrome.)

COMMENT

The CAGE questionnaire is brief and easy to administer, comparing quite favorably in this regard with the Michigan Alcoholism Screening Test (MAST) (1) and a shortened version of the MAST (2). The CAGE questionnaire also appears to be less intimidating to the respondent than either version of the MAST.

Our work indicates that the CAGE questionnaire is not a sensitive detector of alcoholism if a complete, four-item response is the sole criterion. Its sensitivity is impressive, however, if a two- or three-item positive response is accepted as the criterion. Elimination of those subjects who are clearly incompetent to give a valid response (schizophrenic and manic patients and those with organic brain syndromes) would further strengthen the sensitivity and validity of the CAGE as an indicator of alcoholism. Development of a weighted scoring system would probably also improve the validity of the questionnaire.

Our delineation of alcoholism, based on a comprehensive multidisciplinary evaluation of the patient over a period of time and using available informant sources, seems to be a practical criterion against which to validate an instrument for the detection of alcoholism or problem drinking. The questionnaire needs further evaluation in

different populations and different settings, but it appears to be a very promising technique for rapid screening of alcoholism in large groups.

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To Drink or Not To Drink: An Experimental Analysis of Group Drinking Decisions by Four Alcoholics

BY MARK S. GOLDMAN, PH.D.

The author reports on a study that examined the effects of social influence on the initiation, maintenance, and termination of drinking in a group of four men who were chronic alcoholics. These men made decisions in a group setting about alcohol and cigarette use for which they earned reinforcement points redeemable for drinks and cigarettes during the study or for money at its end. Decision making delayed the initiation of drinking and tended to lower overall alcohol consumption during a period of prolonged drinking but was not effective in inducing early termination of the drinking episode. Mood disturbances, physical symptoms, and psychopathology became more pronounced when the amount of alcohol consumed increased. The extent of decision making changed during times of high motivation for drinks or cigarettes; these decisions were mainly a function of individual leadership. In the light of these findings, the author discusses the possible utility of the group decision-making model as a tool for the treatment of alcoholism.

THE PRESUMPTION that social factors play a major role in the etiology and maintenance of chronic alcoholism is now well supported in the literature on alcoholism (1-3). However, most efforts to clarify the role of social factors in alcohol addiction to date have depended on field observations in natural settings. Recently, two groups of laboratory-based experimenters have begun to examine the effects of social behavior on consequent drinking behavior, but these have not yet focused on the reciprocal relationships between drinking and interpersonal behavior (4-7).

The extensive experimental literature on small-group dynamics offers methods by which reciprocal relationships between drinking behavior and small-group phenomena can be explored. In particular, the work of Wallach and associates (8, 9), which explored the effects of group decision making on willingness to come to risky decisions, and that of Schachter (10), which studied communication patterns between regular and deviant group members during decision making, seem to offer appropriate models for this purpose.

The study on which this paper reports examined the behavior of four male chronic alcoholics who lived together in a laboratory environment for 25 days. At certain times during the study, their drinking and smoking behavior depended on group decisions; drinking and smoking at other times were a function of individual decisions. The study was undertaken to explore reciprocal relationships between group behavior and the social, affective, and drinking behavior of the four chronic alcoholics who participated in the study. Because group decisions to initiate, maintain, and terminate a period of prolonged drinking were required, group behavior during an entire episode of drinking could be subjected to detailed examination.

Based in part on a dissertation submitted to Rutgers University, New Brunswick, N.J., in partial fulfillment of the requirements for the Ph.D. degree in psychology.

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