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Alcohol Dependence Syndrome: Measurement and Validation

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The alcohol dependence syndrome proposed by Edwards and Gross in 1976 is a central concept in the World Health Organization classification of alcoholism. The present study focused on the measurement and validation of this syndrome using a sample of 225 individuals with alcohol-related problems. A brief 29-item Alcohol Dependence Scale was derived that exhibited substantial internal consistency reliability (.92). Scale scores conformed quite closely to a normal distribution, which supports a quantitative (existing in degrees) interpretation of the syndrome. Higher levels of alcohol dependence were associated with social consequences from drinking as well as with greater quantities of alcohol consumed. As alcohol dependence increased, clients were less likely to show up for their first treatment appointment. The degree of alcohol dependence was directly related to psychopathology (thinking disorder, hypochondriasis, persecutory ideas, anxiety, depression) and also to physical symptoms of the nervous, cardiovascular, and digestive systems. Given the high correlation between alcohol dependence and adverse consequences from drinking, the Alcohol Dependence Scale provides important information for treatment planning and may be especially relevant when deciding between goals of total abstinence versus controlled drinking.

A persistent problem in alcoholism research is the lack of consensus on concepts and terminology. Indeed, Bacon (1976) lamented that we "seem to be talking about different things under the same label and talking about the same things under different labels" (p. 59). Several attempts have been made to standardize terminology. The National Council on Alcoholism (NCA; 1972) criteria are important for emphasizing both biomedical and psychosocial factors related to excessive drinking. However, the NCA criteria have been criticized because they lead to a unitary diagnosis of alcoholism (Pattison, 1981), and considerable redundancy among the criteria is evident (Ringer, Kufner, Antons, & Feuerlein, 1977). The new diagnostic system, *Diagnotic and Statistical Manual of Mental Disorders/III* (DSM-III), of the American Psychiatric Association (1980) recognizes two disorders: alcohol abuse and alcohol dependence, where the latter condition is evidenced by either alcohol tolerance or withdrawal. Alternatively, a World Health Organization (WHO) task force differentiated between a core dependence syndrome and disabilities that either result from or are related to excessive drinking (Edwards, Gross, Keller, Moser, & Room, Note 1).

The WHO classification has several important features (Figure 1). A cardinal element of the *alcohol dependence syndrome* is the extent to which impaired control over alcohol is manifested (Edwards & Gross, 1976). Other aspects of the syndrome include salience of drink-seeking behavior, increased tolerance to alcohol, repeated alcohol withdrawal symptoms, and awareness of a compulsion to drink excessively. *Alcohol-related disabilities* involve physical, psychological, and social disorders that stem directly or indirectly from excessive drinking. Both the alcohol dependence syndrome and alcohol-related disabilities are viewed as existing in degrees rather than in an all-or-none state (Edwards et al., Note 1). This emphasis on quantitative variation among individuals is a significant departure from the categorical diagnoses of the NCA

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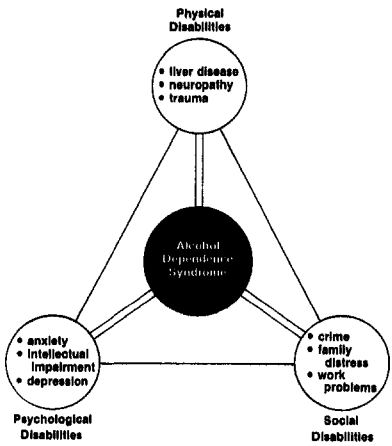

Figure 1. Differentiation of the alcohol dependence syndrome from alcohol-related disabilities.

(1972) and American Psychiatric Association (1980).

A distinction between the core dependence syndrome and alcohol-related disabilities has implications for assessment and treatment planning. For instance, an individual may present an alcohol-related traumatic injury at a hospital emergency department and receive help only for that injury (Holt et al., 1980). No attention at the time or subsequently may be given to the person's alcohol dependence, which may be a key determinant of the traumatic injury. An adequate assessment must consider both the dependence syndrome and alcohol-related disabilities. Then, treatment may focus on altering patterns of excessive alcohol use, disabilities related to drinking (e.g., marital conflict), or both.

Although the alcohol dependence syndrome has not escaped criticism (Shaw, 1979), there is evidence to support the predictive validity of the syndrome. The degree of alcohol dependence has been found to be correlated with failure to achieve a controlled-drinking goal as well as with the priming effect of alcohol in experimental studies (Hodgson, 1980b; Hodgson, Rankin, & Stockwell, 1979). Other investigators have examined the unidimensionality of the syndrome (Chick, 1980b), the sequential development of symptoms (Chick & Duffy, 1979), and the ability of the syndrome to differentiate among clients in various inpatient and outpatient treatment programs (Skinner, 1981b). In a factor analysis of 16 primary scales on the Alcohol Use Inventory (Horn, Wanberg, & Foster, 1974; Wanberg, Horn, & Foster, 1977), an Alcohol Dependence factor was identified by Skinner (1981c) that correlated with chronic social debilitation and psychopathology. Subsequently, a 29-item Alcohol Dependence Scale was derived.

The present study focused on the measurement and validation of the alcohol dependence syndrome as assessed by the Alcohol Dependence Scale. The specific aims were (a) to examine item characteristics, reliability, and influence of response styles on the Alcohol Dependence Scale; (b) to determine concurrent validity with respect to drinking patterns and consequences of alcohol abuse; (c) to evaluate predictive validity for client show rate at treatment; and (d) to explore relationships between alcohol dependence and physical symptoms, demographic variables, intellectual functioning, and psychopathology.

Method

Subjects

The sample consisted of 225 individuals who voluntarily sought assistance for alcohol problems at the Clinical Institute of the Addiction Research Foundation, Toronto, Ontario, Canada. Clients were assessed on an outpatient basis before entry to specialized treatment programs. An individual was not assessed if he or she appeared intoxicated. Clients' ages ranged from 15 to 66 years with an average of 38 years (SD = 12). Eighty percent were male. With respect to education level, 26% completed elementary school (Grades K–8), 38% finished some high school, 16% graduated from high school, 18% completed some or obtained a degree from a university, and 2% attended special education classes. The usual occupations were laborer (41%), skilled laborer(21%), clerical worker (15%), proprietor (6%), professional (10%), and housewife, student, or pensioner (7%). About half of the clients were divorced, separated, or widowed (42%), and there were equal proportions of persons who had never married (29%) and who were cohabitating or married (29%). On the average, clients had been drinking for 20 years, with a range from 1 to 49 years. Not one reported a cross addiction to drugs. With the exception of two individuals, every client scored above 5 on the Michigan Alcoholism Screening Test (MAST), a suggested cutoff point for a diagnosis of alcoholism (Selzer, 1971). An extensive range of alcohol problems is apparent from the wide distribution of MAST scores (M = 29; SD = 10). At the time of assessment, 64% drank on a daily basis, 22% were binge drinkers, 8% drank primarily on weekends, 5% were occasional drinkers, and 1% reported no drinking. The

average daily consumption was 11.1 standard drinks or approximately 150 g of absolute alcohol, and there was a wide variation in consumption levels (SD = 11.4).

Instruments

Alcohol-related measures. The 29 items that form the Alcohol Dependence Scale[1] (Table 1) were taken from the Alcohol Use Inventory (Horn et al., 1974). The scale encompasses four key aspects of the dependence syndrome: (a) loss of behavioral control (e.g., blackouts, gulping drinks), (b) psychoperceptual withdrawal symptoms (e.g., hallucinations), (c) psychophysical withdrawal symptoms (e.g., hangovers, delirium tremens), and (d) obsessive-compulsive drinking style (e.g., sneaks drinks, always has a bottle handy). For comparison purposes clients were administered the complete 147-item Alcohol Use Inventory (Horn et al., 1974), the Michigan Alcoholism Screening Test (Selzer, 1971), which yields a reliable index of problems related to drinking (Skinner, 1979), and the Lifetime Drinking History Structured Interview (Skinner, 1977), which provides indexes of the quantity, frequency, and type of alcoholic beverage consumed during major phases of a persons's drinking career.

Other variables. Demographic characteristics, education, and employment record were recorded by a structured interview. Data relating to the client's present accommodation, work history, family contact, and legal status were used to build a social stability index (Skinner, 1981a). In addition, verbal ability was assessed by the Wechsler Adult Intelligence Scale (WAIS) Vocabulary subscale (Wechsler, 1955). Two performance measures included the WAIS Digit Symbol subscale (Wechsler, 1955), which taps visual-motor performance, response speed, and sustained attention, and the Visual Retention Test (Benton, 1974), which measures visual perception and memory. Psychopathology was assessed by the Basic Personality Inventory (Jackson, 1976), a self-report instrument developed according to a construct validation paradigm (Jackson, 1971). This 240-item inventory taps three broad classes of disorder, including affective disorders (e.g., depression), character disorders (e.g., social deviation), and psychotic tendencies (e.g., thinking disorder). The tendency to be defensive and minimize problems was measured by the Denial scale of the Basic Personality Inventory (Jackson, 1976), and the Social Desirability scale from the Personality Research Form (Jackson, 1974) was used to identify clients who consistently responded to items in a socially desirable direction. Finally, the Cornell Medical Index (Brodman, Erdmann, & Wolff, 1949) is a self-report instrument that was designed to obtain a comprehensive medical history in a quick and reliable manner. The 195 items cover physical symptoms, past illnesses, and family medical history.

Table 1
Item-Analysis Summary for the 29-Item Alcohol Dependence Scale

Alcohol Use Inventory[a] item no.	Correlation[b]
Loss of Behavior Control	
9	.31
10	.66
11	.44
12	.53
33	.46
34	.43
54	.31
75	.62
96	.16
117	.53
Obsessive Drinking Style	
46	.43
47	.47
67	.41
68	.41
89	.49
110	.47
131	.32
Psychoperceptual Withdrawal	
36	.67
57	.73
78	.69
98	.68
99	.63
119	.73
Psychophysical Withdrawal	
37	.34
58	.56
79	.51
100	.49
120	.55
121	.45

Note. Scale M = 23.1. SD = 11.3. Internal consistency reliability (alpha) = .92.
[a] Horn, Wanberg, and Foster, 1974.
[b] Correlation of an item with the total-scale score where the variance of the particular item has been removed from the total score.

Results

Internal Properties

Table 1 summarizes the item-analysis statistics. The mean score on the Alcohol Dependence Scale was 23.1, with a standard deviation of 11.3. A fairly broad distribution of scores was evident, with only a slight positive skewness (.36). The item/total-scale correlation reflects the content saturation and discrimination power of each item (Nunnally, 1978). Except for the item "Do

[1] Details about obtaining the Alcohol Dependence Scale are available from the first author.

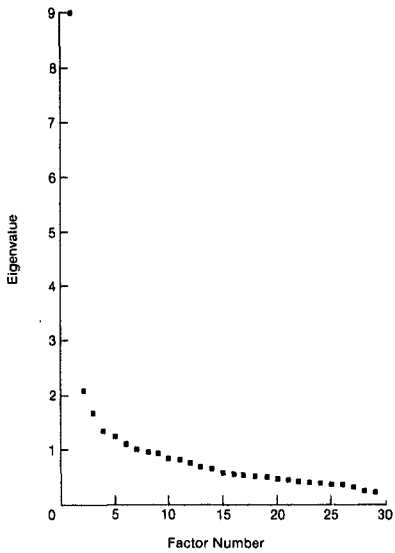

Figure 2. Eigenvalues plotted from a principal-components factor analysis of the 29 items of the Alcohol Dependence Scale.

you tend to be physically harmful to other people when drinking?" (Alcohol Use Inventory; Horn et al., 1974), the majority of items had a moderate to substantial correlation with the total scale. Moreover, the internal consistency reliability estimate (alpha) at .92 was high. Coefficient alpha measures the clients' consistency of responding to the 29 items and provides a lower bound estimate of the reliability of the total scale in the population (Nunnally, 1978).

To investigate the dimensionality of the scale, a principal-components analysis (Gorsuch, 1974) was performed on correlations among the 29 items. The distribution of eigenvalues in Figure 2 suggests that in this clinical population the alcohol dependence items form a predominantly unidimensional scale. Although there is a small break between the third and fourth factors, the first factor accounted for almost one third of the total variance (31.0%) in contrast to the second (7.1%) and third (5.7%) factors. Item weightings on the first principal-component factor are proportional to the item–total scale correlations given in Table 1 (Henrysson, 1962). When three factors were rotated either orthogonally (varimax) or obliquely (indirect oblimin), the first factor was basically defined by alcohol withdrawal symptoms, the second factor by obsessive–compulsive drinking items, and the third factor by loss-of-behavioral-control items.

The Alcohol Dependence Scale had a correlation of $-.22$ ($p < .001$) with denial and $-.51$ ($p < .001$) with social desirability. Although the tendency to be defensive had a small effect (5% common variance), the influence of social desirability was more evident (26% common variance). Clients scoring higher on social desirability tended to report fewer symptoms of alcohol dependence. The content of the Alcohol Dependence Scale reflects symptoms and behaviors that are considered deviant in our society. Nevertheless, this finding suggests caution when interpreting the Alcohol Dependence Scale for clients who scored high on desirability because these individuals may be underreporting the severity of their drinking problems.

Table 2
Correlation of the Alcohol Dependence Scale With Alcohol-Related Measures

Alcohol-related measure	Correlation
AUI primary scales	
1. Social Benefit Drinking	.37*
2. Mental Benefit Drinking	.34*
3. Gregarious Drinking Style	.06
4. Obsessive–Compulsive Drinking Style	.72[a]
5. Sustained Drinking Style	.22*
6. Post Drinking Guilt	.54*
7. Drinking to Change Mood	.54*
8. Prior Help for Alcohol Abuse	.53*
9. Loss of Behavioral Control	.86[a]
10. Social Maladaptation	.64*
11. Psychoperceptual Withdrawal	.90[a]
12. Psychophysical Withdrawal	.83[a]
13. Drug Use	.18*
14. Daily Quantity of Alcohol	.60*
15. Drinking Following Marital Problems	.14
16. Drinking Provokes Marital Conflict	.11
Michigan Alcoholism Screening Test[b]	.69*
Lifetime total alcohol consumed	.43*
Lifetime daily average	.47*
Present daily average	.35*

Note. AUI = Alcohol Use Inventory (Horn, Wanberg, & Foster, 1974).
[a] Included in the 29-item Alcohol Dependence Scale.
[b] Selzer, 1971.
* $p < .001$.

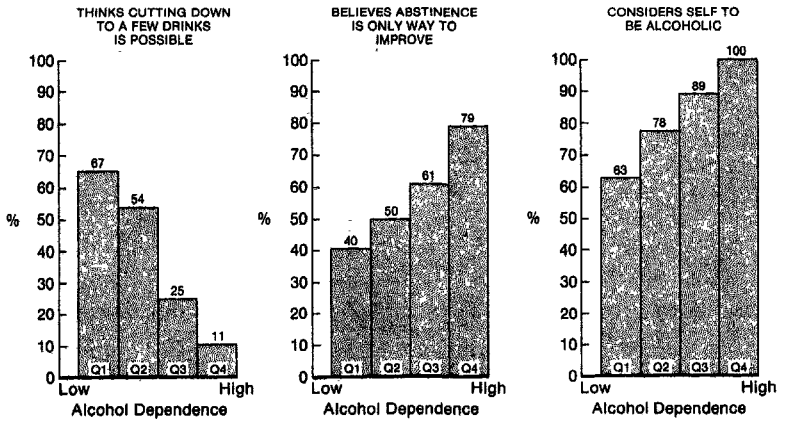

Figure 3. Response to drinking items by clients at different quartiles (Q) on the Alcohol Dependence Scale.

Concurrent Validity

With respect to the Alcohol Use Inventory (AUI) primary scales (Table 2), a higher level of alcohol dependence was correlated with greater daily consumption of alcohol, social consequences from drinking, prior treatment for alcohol abuse, use of alcohol to change mood, and feelings of guilt over drinking. The relationships reflect problems that are either a direct or an indirect consequence of prolonged, excessive drinking. This interpretation is further corroborated by the .69 correlation with the Michigan Alcoholism Screening Test, which taps various alcohol-related disabilities (Figure 1). However, the level of alcohol dependence was not systematically related to marital conflict in this clinical sample. Finally, a higher level of alcohol dependence was correlated with a greater quantity of alcohol consumed both at present and over the client's lifetime drinking career.

As the level of alcohol dependence increases, evidence suggests the need to consider abstinence over controlled-drinking strategies for treatment (Hodgson, Stockwell, Rankin, & Edwards, 1978). This perception was shared by clients in this clinical population. In Figure 3 the Alcohol Dependence Scale was divided into four quartiles (Quartile 1 = score of 1 to 13; Quartile 2 = 14 to 21; Quartile 3 = 22 to 30; and Quartile 4 = 31 to 51). When clients were asked if they thought that cutting down to a few drinks a day was possible, the majority at low levels of dependence responded "yes" whereas almost all clients in the upper quartile said "no" ($\chi^2 = 45.0$, $p < .0001$). Also, clients at higher levels of alcohol dependence recognized the need for abstinence as a major focus of treatment ($\chi^2 = 17.9$, $p < .001$). This perception coincided with self-identification as an alcoholic ($\chi^2 = 28.8$, $p < .0001$); indeed, all clients in the upper quartile of the Alcohol Dependence Scale considered themselves to be alcoholic.

Prediction of Show Rate for Treatment

Client dropout from treatment is a persistent problem in the alcoholism field. One might expect individuals at higher levels of alcohol dependence to be less able to sustain treatment, especially on an outpatient basis. Following the initial assessment, clients in this study were assigned to one of three treatment categories (the waiting period was typically 1 or 2 weeks): (a) *inpatient care*—multimodal programs offering various services, such as group therapy, vocational rehabilitation, and relaxation training; (b) *outpatient care*—traditional modes of psychotherapy, such as individual, group, and marital counseling; (c) *primary care*—supportive counseling and help with practical matters. In contrast to inpatient and outpatient treatment, primary care involved briefer sessions and is seen as a lower cost basic level of care that may be offered to all clients.

Table 3 gives the percentage of clients that

Table 3
Clients' Show Rate (%) for Treatment as a Function of Alcohol Dependence

Treatment	Level of alcohol dependence				Point-biserial correlation	*p*
	Q1	Q2	Q3	Q4		
All programs (N = 213)	87	72	72	67	−.15	<.02
Outpatient only (n = 84)	86	63	62	64	−.19	<.05
Inpatient only (n = 79)	83	85	77	66	−.17	.07
Primary care (n = 50)	92	77	77	75	−.14	.17

Note. Q1 = first quartile (1–13); Q2 = second quartile (14–21); Q3 = third quartile (22–30); Q4 = fourth quartile (31–51).

showed up for treatment as a function of alcohol dependence. In general, the treatment show rate declined with increasing levels of alcohol dependence. This trend was statistically significant ($p < .05$) for outpatient care, where there was a high show rate of 86% for clients in the first quartile of alcohol dependence followed by a drop in show rate to around 63% for the higher levels of dependence. The most pronounced drop in show rate for all treatments appeared between the first and second quartile of alcohol dependence. Future research could evaluate strategies for increasing treatment compliance with these clients (e.g., Sellers, Cappell, & Marshman, 1979).

Table 4
Correlation of the Alcohol Dependence Scale With Client Characteristics and Psychopathology

Characteristic	Correlation	
	Zero order	Social desirability partialed out
Demographic		
Age	−.07	.06
Sex[a]	−.01	.00
Education level	−.23**	−.06
Social stability	−.48**	−.38**
Social class	−.45**	−.33**
Intellectual functioning		
Verbal ability	−.17*	−.08
Visual-motor performance	−.16*	−.13*
Visual retention	−.09	−.05
Basic Personality Inventory[b]		
Hypochondriasis	.45**	.26**
Depression	.44**	.17*
Interpersonal Problems	.28**	.05
Social Deviation	.32**	.08
Persecutory Ideas	.45**	.24**
Anxiety	.44**	.20*
Thinking Disorder	.50**	.32**
Impulse Expression	.44**	.18*
Social Introversion	.25**	.01
Self Depreciation	.47**	.23**

[a] 1 = male; 2 = female.
[b] Jackson, 1976.
* $p < .05$. ** $p < .001$.

External Correlates

The Alcohol Dependence Scale was not correlated with either age or sex (Table 4). One might have expected older individuals with a longer duration of drinking to score at higher levels of alcohol dependence; however, this relationship was not obtained in this clinical sample. On the other hand, alcohol dependence was marginally associated with a lower level of education and more strongly correlated with problems in social stability as well as a lower social-class index (Skinner, 1981a). Greater levels of alcohol dependence were only marginally related to lower scores on verbal ability and visual-motor performance. The low correlation with the neuropsychological tests is somewhat surprising given the extensive research on alcohol abuse and brain damage (Lishman, 1981). With respect to psychopathology the Alcohol Dependence Scale was correlated with maladjustment in every area. However, the magnitude of these correlations was clearly reduced when the influence of social desirability was partialed out (Table 4). This finding suggests that the response style of social desirability was a com-

mon influence on the Alcohol Dependence Scale and Basic Personality Inventory (Jackson, 1976). That is, individuals who scored higher on the Social Desirability scale tended to report less deviant behaviors across both the alcohol use and psychopathology domains. Nevertheless, after social desirability was partialed out, significant relationships remained between alcohol dependence and thinking disorder, hypochondriasis, persecutory ideas, self-depreciation, anxiety, depression, and impulsiveness.

Similarly, alcohol dependence was associated with various physical and psychiatric symptoms assessed by the Cornell Medical Index (Brodman et al., 1949), although the magnitude of these relationships was reduced when social desirability was statistically removed (Table 5). Higher levels of alcohol dependence were reflected in a broad spectrum of symptoms and health problems. The most noticeable were poor health habits; physical problems related to the nervous, cardiovascular, and digestive systems; and psychiatric symptoms associated with problems in controlling tension and anger as well as feelings of inadequacy. The virtually identical correlation of higher levels of alcohol dependence with both the overall Physical Index and Psychiatric Index suggests that individuals at higher levels of alcohol dependence are likely to incur both physical and psychosocial disorders. As part of the assessment program, clients were given a physical examination by a qualified physician, and diagnoses were recorded according to the International Classification of Diseases-8 (WHO, 1969). The most common finding was diseases of the digestive system (primarily liver), where 30 cases (13%) were diagnosed. The prevalance of digestive diseases (Figure 4) tended to increase with higher levels of alcohol dependence (point-biserial correlation = .16, $p < .01$).

Table 5
Correlation of the Alcohol Dependence Scale With the Cornell Medical Index (CMI)

CMI scales	Correlation: Zero order	Correlation: Social desirability partialed out
1. Eyes or Ears	.34**	.25*
2. Respiratory	.45**	.31**
3. Cardiovascular	.53**	.37**
4. Digestive Tract	.53**	.36**
5. Musculoskeletal	.44**	.32**
6. Skin	.50**	.34**
7. Nervous System	.60**	.45**
8. Genitourinary	.30**	.20*
9. Fatigability	.46**	.27*
10. Frequency of Illness	.34**	.20*
11. Miscellaneous Diseases	.31**	.31**
12. Habits (sleep, exercise, smoking, caffeine, and alcohol consumption)	.60**	.46**
13. Inadequacy	.56**	.36**
14. Depression	.49**	.29*
15. Anxiety	.40**	.27*
16. Sensitivity	.45**	.27*
17. Anger	.56**	.38**
18. Tension	.61**	.46**
Physical index	.64**	.49**
Psychiatric index	.62**	.45**

* $p < .05$. ** $p < .001$.

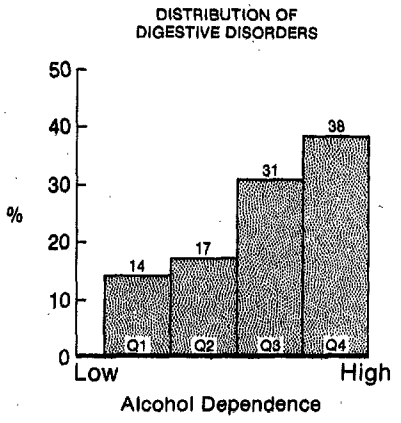

Figure 4. Diagnosis of digestive disorders broken down by quartiles (Q) on the Alcohol Dependence Scale.

Discussion

Most alcoholism scales, such as the widely used MAST (Selzer, 1971), lack a theoretical grounding. Thus, an advantage of the Alcohol Dependence Scale is that it is more closely linked to an underlying theoretical concept. Although further refinement of the alcohol dependence syndrome is needed, this

concept attempts to advance our level of understanding from the description of alcohol abuse to the development of a theory-based classification and diagnostic system (Skinner, 1981d). Moreover the distinction between a core dependence syndrome and alcohol-related disabilities (Figure 1) has important implications for assessment and treatment planning. Edwards et al. (Note 1) emphasize the need "to identify and treat the underlying dependence syndrome, rather than dealing only with the presenting physical, mental and social disabilities that may cluster around the syndrome" (p. 6). A second advantage of the Alcohol Dependence Scale is that it may be used to order individuals along a continuum of alcohol dependence rather than make a discrete diagnosis of alcoholic or nonalcoholic. The finding in this clinical sample that the Alcohol Dependence Scale scores conformed quite closely to a normal distribution provides empirical support for a quantitative interpretation of the syndrome as existing in degrees of severity.

On the other hand, a potential limitation of the Alcohol Dependence Scale is that the AUI items listed in Table 1 do not tap all elements of the syndrome described by Edwards and Gross (1976). Specifically, there are no items relating to an increased tolerance to alcohol or reinstatement of the syndrome following a period of abstinence. Also, several items from the AUI Loss of Control scale go beyond the concept of an impaired control over alcohol intake and deal with broader issues of behavioral-control problems when drinking (e.g., getting belligerent). In a previous factor analytic study (Skinner, 1981c), the four AUI scales proved to be strong markers of the Alcohol Dependence factor. Hence, items covering other aspects of the syndrome can be expected to correlate highly with the factor and the subsequent Alcohol Dependence Scale. Nevertheless, in order to strengthen the content validity of the scale, a revised Alcohol Dependence Scale has been prepared where four of the poorer items in Table 1 have been deleted (Items 9, 54, 96, and 131) and replaced by new items that cover an increased tolerance to alcohol and reinstatement of the dependence syndrome. The revised Alcohol Dependence Scale may be obtained by writing to the first author.

Although the influence of a denial response style was modest, there was a stronger relationship between the Alcohol Dependence Scale and social desirability. However, correlations between the Alcohol Dependence Scale and physical, psychological, and social distress were robust even after the influence of social desirability was partialed out. Because the symptoms and behaviors of alcohol dependence are considered undesirable in our society, it may not be possible to generate items that are neutral in social desirability and yet retain enough clinical relevance to tap the syndrome. From a measurement perspective, the correlation with social desirability demands caution when interpreting the Alcohol Dependence Scale. One suggestion is to administer a social-desirability measure (e.g., Jackson, 1974) routinely with the Alcohol Dependence Scale, whereupon extra care may be taken when interpreting results for individuals scoring high on the response style. Another suggestion, when resources are available, is to assess the syndrome by alternative modes, such as behavioral techniques (Rankin, Hodgson, & Stockwell, 1980), laboratory tests of liver functioning, and clinical signs from a physical examination. To the extent that all measurement methods converge, the validity of assessment is empirically established. To save costs a sequential assessment strategy (Skinner, 1981a) could be used in which a brief assessment with the Alcohol Dependence Scale and a social desirability measure could be followed by a more specialized, multimodal assessment of selected individuals.

Recent evidence suggests that the level of alcohol dependence can make a substantial difference in the risks of continued drinking. Polich, Armor, and Braiker (1980) found that older (over 40) individuals who were highly dependent on alcohol during the intake assessment had a lower relapse rate at the 4-year follow-up if they had achieved a stable period of abstinence (6 months or more) during the first 18 months of follow-up. In contrast, younger individuals who

were less dependent on alcohol had a lower relapse rate at the 4-year follow-up if they had obtained a controlled-drinking status during the first 18 months. Similarly, Orford, Oppenheimer, & Edwards (1976) found at a 2-year follow-up that abstainers were more likely to have been diagnosed at intake as physically dependent on alcohol (gamma alcoholics), whereas controlled drinkers were primarily diagnosed at intake as psychologically dependent on alcohol (alpha alcoholics). These results suggested that goals of controlled drinking are appropriate with less dependent individuals at earlier ages, and abstinence treatment goals are more suitable for older individuals at more severe levels of alcohol dependence. Miller and Caddy (1977) discuss other important factors to consider when deciding between goals of abstinence or controlled drinking.

The present study found that individuals at lower levels of alcohol dependence felt that they could cut down to a few drinks a day, whereas individuals at higher levels increasingly endorsed abstinence as the only way to improve (Figure 3). This finding suggests that individuals who are less dependent on alcohol would be more likely to comply with a controlled-drinking program and reject a treatment focus on abstinence. In a study of socially stable problem drinkers, Sanchez-Craig (1980) found that individuals randomly assigned to an abstinence goal drank significantly more during treatment than individuals assigned to a controlled-drinking goal. The high rate of rejection of abstinence suggests that controlled drinking was a more acceptable treatment goal in a population of socially stable problem drinkers.

The alcohol dependence syndrome requires further development in a number of areas (Skinner, 1981d). From a theoretical perspective work is needed on specifying the etiological factors and natural history of the syndrome as well as describing more precisely relationships between the syndrome and various biomedical and psychosocial disabilities (Figure 1). Edwards and Gross (1976) postulated that loss of control was a cardinal feature of the syndrome. However, a better understanding is needed of the physiological and psychosocial factors that underlie this controversial behavior (Hodgson, 1980a; Shaw, 1979). At the measurement level a comparative evaluation should be conducted between the Alcohol Dependence Scale and other techniques for assessing the syndrome, including self-report (Stockwell, Hodgson, Edwards, Taylor, & Rankin, 1979), clinical interview (Chick, 1980a), and behavioral measurement (Rankin et al., 1980). With respect to external validity, research is needed on the predictive validity of the syndrome with respect to differential treatment outcome. In particular, prognostic value of the Alcohol Dependence Scale should be evaluated regarding goals of abstinence versus controlled drinking.

Several cautions must be observed when interpreting this study. The sample consisted of outpatient clients who voluntarily sought help at a specialized treatment center for alcohol/drug addiction. More guarded descriptions of drinking behavior might be expected from individuals in other settings, such as an employment context. Also, when a scale is used in a different population, the reliability and validity properties may be attenuated due to restriction of range in observed scores (Nunnally, 1978). A higher prevalence of severely dependent individuals may be expected on an inpatient medical ward for chronic alcoholics. With individuals at earlier stages of problem drinking, items on the Alcohol Dependence Scale may be less correlated, and several factors among the items may be in evidence. For instance, one may observe a preoccupation with drinking but not symptoms of alcohol withdrawal. When this study was conducted, routine breath samples for alcohol analysis were not taken. Hence, one cannot assume that all clients were alcohol free at the time of testing, even though individuals were not assessed if they appeared to have been drinking. The possibility that some individuals were at least mildly intoxicated might have introduced measurement error and obscured relationships between the Alcohol Dependence Scale and other measures.

Over the six years since Edwards and Gross (1976) gave a provisional description of the alcohol dependence syndrome, this

construct has been an important catalyst and focal point for research. The present study found that the dependence syndrome can be assessed quite reliably by a brief self-report scale and that the syndrome was correlated in predictable ways with clinic attendance, physical symptoms, and psychosocial problems. In conclusion, a continued refinement of the alcohol dependence syndrome could be instrumental in advancing scientific understanding of alcohol use and misuse.

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1. Edwards, G., Gross, M. M., Keller, J., Moser, J., & Room, R. *Alcohol related disabilities* (Offset Publication No. 32). Geneva, Switzerland: World Health Organization, 1977.

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