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DEPRESSION IN ALCOHOL AND OTHER DRUG ABUSERS:
PREVALENCE, NATURE, ASSESSMENT, AND
RELATIONSHIP TO SHORT-TERM RELAPSE

by

Patricia Moulton Guilford

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
June 1989

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**Depression in alcohol and other drug abusers: Prevalence,
nature, assessment, and relationship to short-term relapse**

Guilford, Patricia Moulton, Ph.D.

Western Michigan University, 1989

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Patricia Moulton Guilford

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CHAPTER 1

INTRODUCTION

The Impact of Alcoholism in the United States

Alcohol is the nation's most abused drug. The scope of the problem is so great that the Secretary of Health and Human Services makes a biannual special report to the U.S. Congress concerning the effects of alcohol on the well-being of our nation. The latest report, the Sixth Special Report to Congress on Alcohol and Health (National Institute of Alcohol Abuse and Alcoholism [NIAAA], 1987), estimates that 18 million adult Americans currently experience serious problems as a result of alcohol use. These problems may include alcohol dependence symptoms such as loss of control over drinking behavior and poor health or negative personal consequences such as job loss, deteriorating personal relationships and legal difficulties. Alcoholism has direct harmful effects on the individual, the family, and the nation.

Several studies have established that alcoholics have lower life expectancies than nonalcoholic populations (Pell & D'Alonzo, 1973; Thaler, 1977). Regular heavy ingestion of alcohol increases the chances of physical illness and early death from many causes including liver diseases, particularly cirrhosis; heart and vascular disease; diseases of the nervous, gastrointestinal, and respiratory systems; various cancers; metabolic and immune system disorders;

endocrine disorders; nutritional deficiencies; poisoning; and suicide (Popham, Schmidt, & Israelstam, 1984). It is estimated that alcohol is associated with more than 200,000 deaths annually in the United States (Klerman, 1982).

The families of alcoholics suffer too. Infants born to women who drink excessively while pregnant often have lower birth weights, are irritable, fail to thrive, and can be afflicted with severe birth defects, including mental retardation. Spouses and children who live with alcoholics--some 40 million people--incur an increased risk of abuse as well as increased anxiety (DeLuca, 1981). It is well documented through police, hospital, and social service reports that alcohol abuse results in domestic violence, crime, property damage, homicide, and suicide.

Alcohol abuse and alcoholism exact a high price to our nation in terms of both lives and money. Alcohol is often implicated in accidental deaths. Nearly half of all traffic deaths (Aitken & Zobeck, 1985) and 25% of deaths by falls, fire, and environmental factors are alcohol related (Ravenholt, 1984). Drowning is the third leading cause of accidental death in the United States, with alcohol involved in an estimated 69% of drowning deaths (National Transportation Safety Board [NTSB], 1983).

The economic costs include lost production, vehicle accidents, violent crime, social responses, fire losses, and health and medical expense. A federally funded report estimated the annual cost to be over \$89 billion in 1980 (Harwood, Napolitano, Kristiansen, & Collins, 1984). By the time of the Sixth Special Report to Congress

in 1987 (NIAAA, 1987) this figure had climbed to approximately \$117 billion.

The Relationship of Alcoholism to Health Care Costs

The effect of alcohol treatment on overall health care utilization and costs has become an important issue in the last 10 years. Twenty percent of all hospital costs in the country are a direct result of alcoholism (Klerman, 1982). Alcoholics and the members of the alcoholic's family covered under a health insurance plan consume health care resources at a much higher rate than nonalcoholic persons of similar age and sex (Hallan, 1981; NIAAA, 1983a; MIAAA, 1985). Effective alcoholism treatment has been identified as an important means to reduce overall health care costs (NIAAA, 1985; Sherman, Reiff, & Forsythe, 1979). The results of several small studies suggest that total health care costs decline following treatment for alcoholism (NIAAA, 1985; Sherman et al., 1979). This hypothesis is further supported by a long term, large scale study in which the Aetna Insurance Company analyzed over 20 million individual claim records for federal employees from 1980 through 1983. It was found that alcoholism treatment is associated with statistically significant reductions in total health care costs for all patients, especially those under 45 years of age (NIAAA, 1985).

The Search for More Effective Treatments for Alcoholism

Increased services for alcoholism are reflected in the statistics published by the U.S. Department of Health and Human Services

through the National Institute for Alcohol Abuse and Alcoholism (NIAAA, 1983b, 1986). This trend is evident in comparing their data on treatment utilization published in 1983 and 1986. During that period more than 3,500 new alcoholism treatment units were started. Despite this thrust for increased services, the overall relapse rate is not improving. The impetus to reduce overall health care costs is demanding more effective treatment for alcoholism at the same time that research into treatment effects is being greatly complicated by the rapidly changing patterns of chemical dependency.

Today alcohol and other drug abuse go hand-in-hand, but historically these two problems have been considered separately. The assumption had been that alcoholics and other drug abusers comprise two quite different populations. Prior to the 1970's, the demographics of those entering alcohol versus other drug treatment did vary considerably. Typical alcoholics were middle-class, middle-aged, married, employed, and lived in a suburban area. They abused alcohol. Treatment involved abstinence. Typical drug addicts were poor, young, single, unemployed, and lived in the inner city. They abused narcotics. Treatment involved the substitution of another drug. As a result of these striking differences, the total population of substance abusers was always divided along these lines. Treatment units for alcoholics did not admit other drug abusers; drug abuse units would not admit alcoholics. Funding for treatment programs, clinical research in treatment effectiveness, and membership in self-help groups clearly supported this separation. Government acknowledged such a division by the creation of two independent agencies

to deal with these problems, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the National Institute of Drug Abuse (NIDA).

However, in the late 1960's and early 1970's the nonmedical drug use among our youth increased nationally in a great unprecedented surge. Marijuana, hashish, hallucinogens, amphetamines, barbiturates, inhalants, tranquilizers, and cocaine became readily available. Typical abuse today involves alcohol and other drugs, especially cocaine. Current data from both the NIDA and the NIAAA suggest that many of the subjects studied by the NIDA could just as easily qualify as subjects for the NIAAA and vice-versa.

The literature on drug abuse reflects the wide use of alcohol by drug addicts. The Treatment Outcome Prospective Study (TOPS) is a large-scale longitudinal study supported by the National Institute on Drug Abuse. The study includes more than 11,000 clients who entered public outpatient methadone detoxification and methadone maintenance, drug-free outpatient (OPDF), and drug-free residential treatment programs during calendar years 1979, 1980, and 1981. Seven pattern classes of drug use were identified of which four included alcohol. When the percentages of users in each category are totaled, those abusing alcohol in combination with other drugs comprise half of their sample of drug addicts (Allison, Hubbard, & Ginzburg, 1985).

Similarly, the literature on alcoholism reflects the wide use of drugs by alcoholics. Estimates of drug abuse by alcoholics range from 20% (Freed, 1973), to 60 to 80% (Carroll, Malloy, & Kenrick, 1977). Statistics from Hazelden, a large well-known treatment center in Minnesota, support the higher estimates. Only 16% of the youth

(under age 26) entering treatment there were classified as abusing only alcohol whereas 75% abused alcohol and other drugs (Lauder-gan, 1980). Many alcoholics do not consider drugs such as marijuana or cocaine to be a problem for them and do not intend to give up their use after treatment. Nearly 30% of those clients treated for alcoholism use drugs after treatment (Behar, Winokur, & Berg, 1984; Sokolow, Welte, Hynes, & Lyons, 1981). Most of those who use drugs after treatment were multiple substance abusers before treatment, but some were "pure" alcoholics who, in effect, just substituted a new addiction for an old one.

The shift to multiple substance abuse has complicated treatment issues as the whole network of services, funding, and research has been established along a division that, for the most part, no longer exists. It is now very difficult to separate substance abusers into the two traditional categories formerly utilized by treatment units and self-help groups: alcoholics and drug addicts. As the percentage of pure alcoholics in the population entering treatment continues to decline, this separation will become increasingly more difficult to maintain.

Treatment centers founded and organized to treat alcoholism are finding themselves in a position of having to accept multiple substance abusers in order to fill their beds. This trend is evident in reviewing the data on treatment utilization (NIAAA, 1983b, 1986). Between the time of these two surveys there was a 23% decrease in the number of "alcoholism only" units with a 175% increase in the number of "combined alcoholism and drug abuse" units.

The worsening relapse rate for treatment units is likely just a reflection of more chemical abusers combining alcohol with other drugs. Alcohol use has become recognized as a major factor in relapse to drugs just as drug use has become recognized as a major factor in relapse to alcohol (Washton, 1987).

The demographics of these entering treatment for chemical dependency are now very mixed with both sexes, all ages, all races, and all socio-economic levels being represented. The alcohol and other drug histories of these patients are not homogeneous. The physical sequelae of withdrawal varies greatly between patients depending upon their patterns of use. Treatment philosophies tailored to the division of alcoholism and drug addiction are compromised by the sheer heterogeneity of the population within the treatment unit being served.

An outgrowth of this pattern of combined alcohol and other drug abuse is the development of generic concepts of chemical dependency and addictive diseases, regardless of the particular substances involved. Proponents of this perspective emphasize the point that alcohol is a drug and that alcoholism is an addiction. Successful treatment must have as its goal the total abstinence from all mood-altering chemicals. The search for a more effective treatment for alcoholism must be, by necessity, a search for a more effective treatment for the addictive process in general. Theories of alcoholism and alcoholism treatment must give rise to new perspectives which can generalize to other drugs as well.

The Bio-Psycho-Social Perspective in Alcoholism

The disease concept popularized by Jellinek (1960) viewed alcoholics as being biologically predetermined to become alcoholics and to remain alcoholics their entire lives even if abstinent. This is essentially the perspective of alcoholism expanded upon by Alcoholics Anonymous. Sociologists countered this concept with the thesis that anyone could become alcoholic if social pressures were sufficient. Neither physical nor psychological susceptibilities are necessary or sufficient conditions.

The new approach to the disease concept of alcoholism incorporates both viewpoints asserting that alcoholism can arise as a result of a variety of influences--physiological, psychological, and social (Kissin & Hanson, 1987). From this perspective the use of mood-altering chemicals develops as an adaptive response to pressures from one or more of these influences. In the alcoholism-prone individual, the mood-altering effects appear to be more reinforcing than in non-alcoholics. This is either experienced as euphoria or as relief from the psychic discomfort of anxiety or depression. The drinking behavior is constantly reinforced by this gratification and a feedback loop becomes established in which the more one drinks the more one needs to drink. Heavy use of alcohol suppresses information and reduces one's ability to recognize problems which allows the individual to feel relief. Kissin (1977) summarizes the theme of this model of alcoholism:

It is truism that alcoholics cannot cope. They cannot deal with the normal frustrations and irritations of the

external world nor can they deal with the anxiety, depression and sense of inadequacy which swells from within. Accordingly they drink, and by drinking they are able to ignore (although they do not reduce) their external problems. Thus alcohol becomes their method of coping with the problems of life. (pp. 31-32)

This primary psychological dependence eventually results in the second major feedback loop, increased tolerance and physical dependence. At this point the physiological factors take an increasingly greater role in determining behavior. More and more alcohol is needed to obtain less and less gratification. The long-term effects of heavy drinking eventually elicit changes in other areas each with their own feedback loop. This model recognizes four major feedback loops: tolerance and dependence, affective problems, coping skills, and social stability. Each of these is related to the level of alcohol use and to all of the other bio-psycho-social functions as well. Individual differences determine the extent to which each of these loops contribute to specific cases of alcoholism.

This method of describing alcoholism can be generalized to all addictions and has general therapeutic use as well. Assessing each of these feedback loops can point to the area which has the greatest influence on the perpetuation of a specific individual's addiction. The implication is that successful treatment of alcoholism or any addiction must incorporate both a basic therapy and one or more specific therapies depending upon the individual. That is, the basic therapy will address the common element in all addictions, the use of mind-altering chemicals as a method of dealing with problems. The specific therapies will deal differentially with the various

subpopulations identified.

The focus of this investigation is on one of these feedback loops, affective problems. It is well documented that the co-existence of an affective disorder is associated with poor prognosis in the treatment of alcoholism (Freed, Riley, & Ornstein, 1977; Murphy, Armstrong, & Hermele, 1979; O'Leary, Rohsenow, & Chaney, 1979; Penick, Othmer, Powell, Rice, & Bingham, 1983). The prognosis for depressed alcoholic inpatients improves when the affective disorder is recognized and treated (Bedi & Halikas, 1985). Level of depression is also the best predictor of treatment outcome in group therapy programs for alcoholism (Zastowny, Janosik, Trimborn, & Milanese, 1982). In addition, there is a significant relationship between being depressed at follow-up and continuing to drink (Pottenger et al., 1978; Westermeyer & Neider, 1984). Those patients who were still abstinent two years following treatment for alcoholism scored significantly lower on all measures of depression than those whose drinking behavior increased (Westermeyer & Peake, 1983). Hatsukami and Pickens (1982) reported similar results in a follow-up of a combined alcohol and drug abuse population. Among subjects who relapsed, the rate and severity of depressive symptoms were higher than those found in the general population. Depressed mood is the most frequently cited reason for the return to substance abuse (Pickens, Hatsukami, & Spicer, 1982).

The depressed alcoholic is at much greater risk for suicide than other alcoholics (Benensohn & Resnik, 1974; Berglund, 1984; Martin, Cloninger, & Guze, 1985; Murphy et al., 1979; Rushing, 1969;

Winokur, 1983). The national statistics on suicide support a strong association between heavy alcohol consumption and suicidal behavior (Public Health Service, 1986). Nearly two-thirds of all drug deaths reported by medical examiners in the United States can be accounted for by alcohol-in-combination (31%) and heroin/morphine (30%). Among the deaths attributed to heroin/morphine 1 out of 25 are suicides with the rest being accidental. In contrast, 1 out of 4 of the alcohol-in-combination deaths are suicides.

It is hypothesized that a special therapy which treats the depression of the subpopulation of alcohol and other drug abusers who have depressive disorders will increase the effectiveness of the core therapy for addiction and thus reduce relapse rates. The overall research design for such an endeavor would advance in three stages. The first stage would address assessment. Techniques need to be established that can reliably and accurately identify depressive disorders among alcoholics and other drug abusers. In this stage, short-term relapse rates need to be compared between the two groups to see if there are any differences. If differences are found to be a function of depressive disorders, stage two would address intervention. Therapies need to be investigated that can treat the depression of the subpopulation of alcoholics and other drug abusers who have a depressive disorder. In this stage, short-term relapse rates would again be the criteria for making any comparisons. If differential treatment is successful in the short term, the last stage of research would address follow-up. Follow-up procedures that serve to reinforce the effects of both the core therapy for the addiction and the

addiction and the special therapy for the depression must be studied. In this stage, the long-term effects of treatment would be the criteria for comparison.

This study concerns the first stage, that of assessment. Thus, the prevalence of depressive disorders in alcoholics, the nature of this depression, the methods used to assess it, and the relationship of depressive disorders to short-term relapse rates will be addressed in this investigation.

CHAPTER II

THE ASSESSMENT OF DEPRESSION IN ALCOHOLISM

The Difficulties Inherent in Assessing Depression in Alcoholics

Accurate assessment of depression in alcoholics is complicated by the transdiagnostic nature of the symptoms of these two disorders. That is, many of the clinical features of these two conditions overlap. A review of the diagnostic criteria for Major Depression and Dysthymic Disorder according to the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R) (American Psychiatric Association [APA], 1987) will help to illustrate this. Partial criteria for both of these depressive disorders are reproduced in Tables 1 and 2 with those symptoms written in italics which are also commonly seen in alcoholics. It is obvious from the number of symptoms in italics that alcoholism and depressive disorders share many symptoms.

Instruments used to assess alcohol abuse such as the Impairment Index (Eagleston & Mothershead, 1974), the questionnaire utilized by the NIAAA in its Treatment Monitoring System, have questions about sleep disturbance, loss of appetite, and work difficulties which are items also found on depression scales.

Symptoms of depression are very common in alcoholism and may even be severe without there actually being a true underlying depressive disorder (Schuckit, 1986). Complex factors contribute to the

Table 1

DSM-III-R Diagnostic Criteria for Major Depressive Episode

-
- A. At least five of the following symptoms have been present during the same two-week period and represent a change from previous functioning; at least one of the symptoms is either (a) depressed mood, or (2) *loss of interest or pleasure*.
- (1) depressed mood most of the day, nearly every day
 - (2) *markedly diminished interest or pleasure* in all, or almost all, activities most of the day, nearly every day
 - (3) significant weight loss or weight gain when not dieting or *decrease* or increase *in appetite* nearly every day
 - (4) *insomnia* or hypersomnia nearly every day
 - (5) psychomotor agitation or retardation nearly every day
 - (6) *fatigue* or *loss of energy* nearly every day
 - (7) *feelings of worthlessness* or excessive or inappropriate *guilt*
 - (8) *diminished ability to think or concentrate*, or *indecisiveness*, nearly every day
 - (9) recurrent thoughts of death, *recurrent suicidal ideation* without a specific plan, or a suicide attempt or a specific plan for committing suicide
-

Source: American Psychiatric Association, 1987, p. 222.

depressive symptomatology seen in alcoholics not the least of which is simply the direct chemical effects of alcohol on the central nervous system. Alcohol is like any other general anesthetic; it depresses the central nervous system. At the lowest effective blood level, the reticular system begins to malfunction. Complex, abstract, and poorly learned behaviors are disrupted at the lower alcohol level,

Table 2
DSM-III-R Diagnostic Criteria for Dysthymic Disorder

-
- A. Depressed mood for most of the day, more days than not for at least two years
 - B. Presence, while depressed, of at least two of the following:
 - (1) *poor appetite* or overeating
 - (2) *insomnia* or hypersomnia
 - (3) *low energy* or *fatigue*
 - (4) *low self-esteem*
 - (5) *poor concentration* or *difficulty making decisions*
 - (6) *feelings of hopelessness*
-

Source: American Psychiatric Association, 1987, p. 232.

and, as the dose increases, better-learned and simpler behaviors also deteriorate. The fact that alcohol impairs functioning of the reticular system, which disrupts cortical functions, resulting in behavioral changes, makes it impossible to predict specific behavioral effects after alcohol intake. Which behaviors are released from inhibition and which are suppressed vary with the individual. During rising blood alcohol levels (BAL), people experience reduced anxieties and feel quite happy. When the BAL is falling, the mood shifts to sadness and irritability which may carry over to the next day. The extent to which a person experiences this sadness varies with the individual, but the severity of the depression tends to be greater

and longer lasting following higher BALs and longer periods of drinking.

Physiological measures cannot reduce the diagnostic confusion. Neither of the widely recognized biological tests for major depression, the dexamethasone suppression test (DST) (Carroll et al., 1981) or the thyrotropin-releasing hormone (TRH) (Loosen, Prange, & Wilson, 1979), can be used in alcoholics. Developers of the DST found that cortisol, a product of the adrenal cortex, is significantly elevated in depressed patients. Dexamethasone is a substance which normally suppresses cortisol secretion. In depressives, the production of cortisol is so great that dexamethasone does not suppress it. This can be measured by the urinary-free cortisol (UFC) which has been shown to be indicative of actual cortisol levels (National Institute of Mental Health [NIHM], 1981). However, alcohol interferes with cortisol regulation and confounds any results. A high rate of false positives are likely until after several weeks of abstinence. Newsom and Murray (1983) reported that all of the alcoholic nonsuppressors in their study returned to normal suppression after 4 weeks of abstinence. The TRH test is also unsuitable as a diagnostic aid for depression in alcoholics. Dackis et al. (1984) found that 53.3% of the nondepressed alcoholics tested had abnormal TRH responses during withdrawal with 25% still showing blunted responses after 3 weeks of sobriety. This suggests that the TRH test is strongly influenced by alcoholism and is not specific for depression.

The Confusing Aspects of the Existing Literature

Speculations as to why research in this area has been so perplexing have been offered by several reviewers (Freed, 1978; Schuckit, 1986; Solomon, 1982). Difficulties seem to rise for four main reasons: (a) there are no clearly defined criteria for alcoholism; (b) there is a lack of uniform terminology for depression; (c) there is a wide range of prevalence of these two conditions; and (d) there is no agreement across studies as to the point in the alcoholic process when measurements of depression take place.

To begin with, the criteria for alcoholism is not the same across studies. Schuckit (1980) makes a plea for careful diagnosis maintaining that to be identified as an alcoholic an individual must demonstrate severe alcohol related life difficulties in any one of the following areas: marital separation or divorce related to alcohol; multiple arrests related to alcohol; physical evidence that alcohol has harmed health (cardiomyopathy, peripheral neuropathy, cirrhosis, etc.) or job loss related to drinking. In the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (APA, 1980), Alcohol Dependence must meet two criteria: (a) either a pattern of pathological alcohol use or impairment in social or occupational functioning due to alcohol use; and (b) either tolerance or withdrawal. Both Schuckit and the DSM-III identify life difficulties as markers of alcoholism, but only the DSM-III requires physical indicators of excessive use.

Nyberg (1981) suggests that there may be gross differences between treatment units in the criteria used to make diagnosis of

alcoholism in those treatment units that were polled were Social/Legal Problems. Evidence of physical dependence was not required. This more closely resembles Schuckit's definition than that of the DSM-III.

Other researchers have simply used being in treatment to define subjects as alcoholics. In other words, if the subjects were participants in either outpatient or inpatient services for alcoholism, they were assumed to be alcoholic. In such studies, the researchers made no independent diagnoses of their own but used those made by the staff at the treatment unit. Sometimes the criteria used by the staff for diagnosis was mentioned; more often it was not. Therefore, it is likely in the studies that do not make independent diagnoses or mention the criteria used, that there is great variability across subjects regarding their alcohol dependency. Tables 3 and 4 review the important characteristics of those studies which have been done in the last 20 years that were specifically designed to measure depression in alcoholics. Of these 27 different studies (three studies appear on both tables), less than half used the DSM-III criteria for alcoholism or a suitable equivalent--the Feighner criteria (Feighner et al., 1972), the Research Diagnostic Criteria (Spitzer, Endicott, & Robins, 1978), or the National Council on Alcoholism Criteria (National Council on Alcoholism [NCA], 1971).

The inconsistencies in terminology regarding depression are even more confusing. The term "depression" has been variously used in the literature to refer to such diverse concepts as a transient mood state, a cluster of specific symptoms, or a mental disorder.

Table 3
Frequency of Depression in Alcoholism: Studies Using Diagnostic
Interview Criteria for Depression

	Criteria for Alcoholism	Criteria for Depression	Instrument Used	Day of Testing	n	Percentage Depressed
Keeler et al., 1979	inpatient*	DSM-II	interview	5-7	35	9%
Fowler et al., 1980	Feighner	Feighner	interview ^{oo}	4-7	169	12%
Willenbring, 1986	DSM-III	DSM-III	interview	7-14	51	12%
Clark et al., 1984	DSM-III	RDC	SADS	7-21	75	19%
Dackis et al., 1986	RDC	RDC	SADS	14+	49	20%
Hesselbrock et al., 1983	DSM-III	DSM-III	NIMN-DIS	2-7	250	27%
Winokur, 1972	inpatient*	irregular ^o	interview ^{oo}	not stated	135	28%
Kolodner, 1977	outpatient**	not stated	interview	not stated	206	30%
Bedi & Halikas, 1985	NCA	RDC	interview ^{oo}	not stated	421	33%
O'Sullivan et al., 1983	Feighner	Feighner	interview ^{oo}	10+	300	35%
Robins et al., 1977	Feighner	Feighner	not stated	not stated	58	38%
Cadore & Winokur, 1974	Jellinek	Feighner	interview ^{oo}	1	259	39%

Table 3, Continued

	Criteria for Alcoholism	Criteria for Depression	Instrument Used	Day of Testing	n	Percentage Depressed
Weissman & Myers, 1980	RDC	RDC	SADS	not stated	34	44%
Woodruff et al., 1973	Feighner	Feighner	interview	not stated	68	57%
Weissman et al., 1977a	outpatient**	Raskin 7	interview	1	61	59%
Pottenger et al., 1978	MAST 5	Raskin 7	interview	1	61	59%

* Admission as inpatient in alcoholism treatment program, no criteria stated.

** Acceptance as outpatient in alcoholism treatment program, no criteria stated.

° Depressive affect and 4 other symptoms.

°° Structured interview, instrument not stated.

Table 4
Frequency of Depression in Alcoholism: Studies Using
Rating Scales Criteria for Depression

	Criteria for Alcoholism	Criteria for Depression	Instrument Used	Day of Testing	n	Percentage Depressed
Hamm et al., 1979	MAST ≥ 6	HAM-D ≥ 25	HAM-D	1-3	48	0%
Behar et al., 1984	AA Member	Feighner	self report	1 year+	72	15%
Willenbring, 1986	DSM-III	HAM-D ≥ 15	HAM-D	2	51	16%
		BDI ≥ 13	BDI			35%
		MMPI ≥ 70	MMPI			45%
Keeler et al., 1979	inpatient*	HAM-D ≥ 20	HAM-D	5-7	35	28%
		MMPI ≥ 70	MMPI			43%
		SDS ≥ 44	SDS			66%
Steer et al., 1983	outpatient**	HAM-D ≥ 14	HAM-D			
		& BDI ≥ 16	& BDI	1	105	33%
Hatsukami et al., 1981	inpatient*	SDS ≥ 50	SDS	1 year	1605	36%
Zielinski, 1979	not stated	2 out of 3: MMPI ≥ 70 BDI ≥ 18 SDS ≥ 50	MMPI & BDI & SDS	not stated	103	38%

Table 4, Continued

	Criteria for Alcoholism	Criteria for Depression	Instrument Used	Day of Testing	n	Percentage Depressed
Clark et al., 1985	DSM-III	BDI ≥ 14	BDI	7-21	106	40%
Equi & Jabara, 1976	inpatient*	MMPI ≥ 70	MMPI	1	58	53%
Hesselbrock et al., 1983	DSM-III	BDI ≥ 13	BDI	2	250	54%
		MMPI ≥ 70	MMPI	1		62%
Fine & Steer, 1977	outpatient**	BDI ≥ 10	BDI	1	103	65%
Weingold et al., 1968	inpatient*	SDS ≥ 44	SDS	1	73	70%
Nakamura et al., 1983	inpatient*	HAM-D ≥ 20	HAM-D	1	88	70%
Shaw et al., 1975	NCA	BDI ≥ 7 or MMPI ≥ 70 or SDS ≥ 34	BDI MMPI or SDS	1	58	98%

* Admission as inpatient in alcoholism treatment program, no criteria stated.

** Acceptance as outpatient in alcoholism treatment program, no criteria stated.

There is a considerable difference between a temporary state of mind or feeling that is of minor consequence, a group of symptoms that occur together, and a prolonged emotion that colors the whole life of an individual. Each of these aspects of "depression" are legitimate areas of research. However, problems arise when investigations clearly designed to measure one aspect are used to draw conclusions about another aspect. For example, statements about the occurrence of mood disorders in alcoholics cannot be made based upon such self-report scales as the Zung Self-Report Scale (SDS) (Zung, 1965) or the Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) which were designed to measure the current behavioral manifestations of depression.

Another difficulty in understanding the relationship between alcoholism and mood disorders may arise from the wide range of prevalence of these two combined conditions reported in the literature. Hamm, Major, and Brown (1979) reported that none of their alcoholic subjects had a clear-cut indication of depression while Shaw, Donley, Morgan, and Robinson (1975) found significant levels of depression present in 98% of the alcoholic patients in their study. And, there are many reports of percentages everywhere between these two extremes as evidenced by the studies summarized in Tables 3 and 4.

Inspection of the data contained in these reports suggests several explanations for such a wide range of prevalence. First of all, rates of depression vary directly with the strictness of the criteria used to define alcoholism. The subjects in the Hamm et al. (1979) study, in which a zero percent rate for depression was reported, were

were "referred solely for problems of excessive drinking without the complications of associated medical and/or significant psychiatric problems" (p. 580). In other words, they were really "problem drinkers" not alcoholics.

The prevalence of depression in alcoholics also varies by the method used to assess the depression. The lower rates are characterized by designs which use clinical interview methods (Dackis, Gold, Pottash, & Sweeney, 1986; Keeler, Taylor, & Miller, 1979; Willenbring, 1986; Winokur, Rimmer, & Reich, 1971). Higher rates, in general, are found using self-report instruments to newly admitted patients or to those still drinking (Hesselbrock, Hesselbrock, Tennen, Meyer, & Workman, 1983; Keeler et al., 1979; Pottenger et al., 1978; Shaw et al., 1975). These differences occur not only between studies, but within studies that have used several measurement tools. Even in the study by Hamm and his associates (1979) which found a 0% rate of affective disorder in alcoholics using clinical interviews rated on the Hamilton Depression Scale (HAM-D) (Hamilton, 1960), a 35% rate was reported using the Zung Self-Rating Depression Scale (SDS) (Zung, 1965), a self-report instrument. Furthermore, the same cut-off scores on well-known depression instruments are not used across studies. Table 4 shows scores used to define depression on the Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) ranging from a low of 7 to a high of 18. Similarly, the HAM-D shows a range from 14 to 25 while the SDS varies from 34 to 50. Such inconsistencies have not been taken into account in any reviews; therefore, much of what has been synthesized on this subject bears

more careful scrutiny before any conclusions about prevalence can be made.

And, lastly, the relationship between alcoholism and depression remains unclear because there is no agreement across studies, or in some case even within studies, as to the point in the alcoholic process when measurements of depression take place. Inspection of Tables 3 and 4 reveals a range of times for data collection from the first day in treatment (note: those in outpatient treatment may still be actively drinking) to several years of abstinence. The mercurial shifts in mood that are known to be associated with detoxification and Alcohol Withdrawal Syndrome (AWS) may confound any measurements taken within the first two weeks of abstinence. Some uniformity needs to be agreed upon so that measurements of depression can be made at consistent points in time.

The Disadvantages of Employing the Commonly Used Depression Instruments in an Alcoholic Population

Difficulties in accurately assessing depression in alcoholics would still remain even with the adoption of uniform diagnostic criteria, consistent cut-off scores, and standard times of measurement. Many of the standard instruments commonly utilized to measure depression have drawbacks when used with the alcoholic population.

While structured clinical interview is considered the most accurate, it is also the most time-consuming. The Schedule for Affective Disorders and Schizophrenia (SADS) (Endicott & Spitzer, 1978), which rates a total of 45 symptoms, is the most comprehensive

and most structured of the interview formats. It involves a lengthy administration and requires one to two hours of professional time to complete. The rate for identifying positive cases of affective disorders using the SADS declines with the number of days of sobriety (Willenbring, 1986).

The Hamilton Depression Rating Scale (HAM-D) (Hamilton, 1960) is a shorter, less structured clinician-administered interview which rates 21 symptoms. Nakamura, Overall, Hollister, and Radcliffe (1983) reported a similar declining rate using a repeated measurement design with the HAM-D. On admission, 25% of the alcoholics were assessed as clinically depressed using the HAM-D, whereas only 5% remained depressed after four weeks. Diagnosis of a mood disorder requires identifying specific symptoms of the condition while ruling out other explanations. The results of chronic alcoholism, excessive drinking, or withdrawal can affect many categories on the HAM-D without a mood disorder actually being present. The HAM-D also failed to meet standards of internal consistency in studies with psychiatric inpatients, medical inpatients, and sober alcoholics (Clark, Cavanaugh, & Gibbons, 1983) and has not yielded a single dimension of depressive severity by latent trait analysis (Bech & Allerup, 1981).

The self-report measures have the obvious benefits of ease of administration and the saving of professional time; therefore, the development and refinement of this class of tools for assessing depression in alcoholics is important. A review of the commonly used self-report measures suggests there are significant problems

associated with their use in an alcoholic population. The Minnesota Multiphasic Personality Inventory (MMPI) (Hathaway and McKinley, 1951) is frequently used to assess depression, but 566 questions are simply too many for individuals already experiencing poor concentration, low motivation, and fatigue. Its length and complexity also makes it time-consuming to score and interpret. In addition, Keeler and his associates (1979) analyzed MMPIs given to alcoholics and reported elevations on the F scale (confusion and/or random answering) as high or higher than the depression scale. Many of the MMPIs were invalid due to this confusion.

The Zung Self-Rating Depression Scale (SDS) (Zung, 1965) is also frequently used to assess depression in alcoholics. It has the advantage of having only 20 questions and asks patients to consider the questions' application to them at the time of testing rather than having to keep in mind a certain time frame. However, they must choose between four categories of frequencies, so there are 80 possible responses. The SDS requires less concentration, but has been criticized for not being able to adequately distinguish between different levels of depressive symptomatology (Carroll, Fielding, & Blashki, 1973; Yesavage et al., 1983).

The Beck Depression Inventory (BDI) (Beck et al., 1961) is probably the most popular of the self-report instruments. This inventory looks at 21 symptoms at the time of testing. The possible responses involve endorsing one or more of four to six statements following each symptom, so there are 94 possible choices. Statistical analyses of the BDI suggest that it meets high standards for internal

consistency (Clark, Gibbons, Fawcett, Aagesen, & Setters, 1985; Yesavage et al., 1983). It has also been shown to be useful to screen for depression in alcoholics by the fourth day of sobriety (Dorus as cited by Willenbring, 1986) and to be superior to other instruments as a screening device for depression among drug abusers (Rounsaville, Weissman, Rosenberger, Wilber, & Kleber, 1979). Clark and associates (1985) have shown that the BDI measures a single dimension of depressive severity in alcoholics and identifies an independent depressive syndrome that may coexist with alcoholism in some patients. This independent syndrome consists of seven symptoms--work inhibition, guilt, self-disgust, irritability, indecision, dissatisfaction, and loss of social interest. Vegetative symptoms, hopelessness, and suicidal ideation were poor discriminators of depression in alcoholics. Of the seven optimal items for discriminating depressive severity in alcoholics, three of these symptoms--loss of social interest, dissatisfaction, and indecision--also discriminated well the severity of depression among medical inpatients. These three symptoms may be the most important characteristics of an affective disorder that are not obscured by the presence of physical illness or alcoholism.

The last self-report depression instrument of interest is the Mood Assessment Scale (MAS), also known as the Geriatric Depression Scale (GDS) (Yesavage et al., 1983). The MAS consists of 30 short questions covering the past week presented in a yes/no format. An obvious advantage of this scale is that simple yes/no choices are the easiest to make and thus the most appropriate for individuals who are

suffering from poor concentration and fatigue. This scale was developed to overcome the heavy loading of somatic symptoms in existing scales which accounted for their low specificity rates with elderly patients. In other words, more false-positives occur when standard depression measures are used with the aged because many somatic symptoms are present even in the absence of an affective disorder. Since this situation is also true for the alcoholic population, the MAS may be a better measure of depression than the commonly used instruments. Only two studies have utilized the MAS with alcoholics (Nakamura et al., 1983; Tamkin, Carson, Nixon, & Hyer, 1985). Nakamura and associates used three self-report measures to assess depression in an alcoholic population. The MAS was chosen as one measure because organicity and somatic symptoms do not affect the scores of this scale. The findings of Tamkin and associates indicate that the MAS is comparable in efficacy with the BDI and the Dysthymic scale of the Millon Clinical Multiaxial Inventory (MCMI-D) in the prediction of depression in alcoholic patients when the MMPI-D is used as the criterion. The only drawback to this instrument is that it has not been validated against clinical diagnosis in an alcoholic population.

The Theoretical Implication of Using Existing Depression Instruments in an Alcoholic Population

The last concern about the suitability of established depression instruments in the alcoholic population is theoretical. Since depression inventories are based on items which discriminate "normals" from individuals suffering from depressive disorders only, will they

retain their power with the addition of alcoholism? If the depression of the alcoholic is organized much differently than the depression of the patients with depressive disorders, then inferences about depression based upon clinical scales will not be applicable to alcoholics. However, if the depression of alcoholics is substantially no different than the depression experienced by persons suffering from a depressive disorder, then inferences can be drawn in the same way.

One way to test this notion is to compare the pattern of responses made to depression instruments by alcoholics with the pattern of responses made to the same instruments by patients diagnosed with depressive disorders. The patterns of covariance among the individual items in the depression inventories made by both populations should resemble each other if these two "depressions" are fundamentally the same. Therefore, factor structure is one way to investigate whether any differences exist.

There have been two major reviews of the factor analytic studies of the responses of patients with depressive disorders to depression inventories. Lorr (cited in Gibson & Becker, 1973) reviewed eight such studies and identified three factors which he called Anxious Self-Blame, Depressed Mood, and Somatic Disturbances. He noted that Anxious Self-Blame occurred in all eight studies. This factor is characterized by: self-criticism, worthlessness, sense of failure, guilt, responsibility for misfortune, and anxiousness. Beck and Lester (1973) reviewed the factor analyses of the Beck Depression Inventory among patients with depressive disorders and identified

three factors: Negative Attitudes-Suicide, Physiological, and Performance Difficulties.

The literature on the factor structure of the responses of alcoholics to depression inventories is much more limited. Only two studies have been done on this topic. Gibson and Becker (1973) analyzed the responses of alcoholics to the BDI and the SDS. They identified three factors in the BDI: Self-Debasement, Vital Depression, and Pessimism-Suicide. The component of these three factors were then compared with the components of the factors in the literature for persons diagnosed with depressive disorders. They concluded there were major similarities between the depression described by alcoholics and the depression described by patients with depressive disorders. These similarities appeared across both the BDI and the SDS. Steer, Shaw, Beck, and Fine (1977) studied the responses of alcoholics to the Beck Depression Inventory and reported similar results.

When applied to both alcoholics and patients with depressive disorders, self-report depression instruments appear to produce patterns of covariance among the individual items which are similar to each other. One interpretation is that both groups have similar cognitive organization because the shared factors are substantive, internal, and relevant to the nature of depression. In such a case, it is appropriate that depression instruments developed on clinical populations be used in alcoholic populations. At the same time, it is important to note that only two factor analytic studies of depression in alcoholics have been reported (Gibson & Becker, 1973; Steer et al., 1977) and neither are very recent. Future work in the assessment of

depression in alcoholics should ideally include factor analyses so that a body of work can be accumulated from which solid comparisons can be made.

CHAPTER III

STATEMENT OF THE PROBLEM

Areas Where Research Can Be Refined

There are several areas where research into the assessment of depression in alcoholics can be refined. To begin with, subjects need to be identified by their pattern of alcohol abuse, that is, whether they use alcohol alone or in combination with other drugs. The National Institute on Drug Abuse identifies seven pattern classes of drug use of which four include alcohol. While it is appropriate for large-scale studies to use very fine discriminations between subject groups, it is not practical for most clinical studies which generally take place in one or two individual treatment units. Therefore, it is recommended that at least three use groups be identified as standard in any research in substance abuse: alcohol only, alcohol and other drugs, and other drugs only. Larger scale studies can further sub-divide within these categories as sample size dictates.

Secondly, it is important that future research be careful to distinguish between depression as a transient feeling or as a mood disorder. Self-report instruments are adequate for measuring depression as negative affectivity, but diagnosing a mood disorder necessitates additional clinical interview methods.

When self-report instruments are used as a measure of depression indicative of mood disorder, it is important that the scores mean the

same thing across studies. Recall that previous studies looking at depression among alcoholics have used several different cut-off scores on the various depression instruments. From Table 4 it can be seen that 7, 10, 13, 14, 16 and 18 have all been used as cut-off scores on the BDI. Kendall and his associates (1987) recently published the following recommendations regarding the use of the Beck Depression Inventory: (a) only the long form of the BDI should be used with the original cut-off score of 16 and above to indicate possible depression; (b) the category of depression should be reserved only for those subjects which additionally meet the diagnostic criteria for affective disorders, preferable established by structured clinical interviews; and (c) all others with high scores should be referred to as "dysphoric". Similar guidelines need to be followed for all depression instruments. The cut-off scores to indicate depression which may qualify as a mood disorder should be those established to represent "severe" cases not cut-off scores used to denote "mild" cases. Ideally, if the research design is concerned with diagnostic categories, then clinical interviews should be conducted for those subjects who scored above the cut-off score. In cases where interviews are not possible, then scores from at least two sources should be used.

Thirdly, guidelines need to be established for uniform times of measurement of depression in alcoholics. Measurements used to define initial levels of depression must be taken at admission into treatment which should be defined as the first day after detoxification, if detoxification is necessary. Measures for diagnostic purposes should

not be taken before a two-week wash-out period. Short-term follow-up measurements need to be taken 1 to 3 months after discharge.

A fourth point of importance to future research is that prevalence studies must adhere to strict diagnostic criteria and methods. The rate of mood disorders which accompany alcoholism is best measured by structured clinical interview methods.

Research in the area of depression in substance abusers must continue to look for easier and more accurate screening devices. However, the criterion against which their new instruments should be measured must be diagnostic categories determined by clinical interview methods, not other self-report measures.

Lastly, the literature on the factor structure of the responses of alcoholics to depression inventories needs to be greatly expanded. The two existing studies (Gibson & Becker, 1973; Steer et al., 1977) have not included women. These studies are not very representative as one-third of all patients entering treatment for alcoholism are women. Future samples need to address this weakness.

² THE Purposes of This Study

There are four main purposes to this study. Each of these is intended to address current weaknesses in the literature by following the guidelines prescribed above. The purposes of this study are:

1. To establish the prevalence of depressive disorders among persons in residential treatment for alcohol or other drug abuse using structured clinical interview after two weeks of abstinence. Only those subjects who fulfill the criteria for any of the Depressive

Disorders in the DSM-III-R will be identified as depressed. Prevalence rates will be calculated for sub-populations determined by type of use group (alcohol only, alcohol and other drugs, and other drugs only) and other demographic characteristics.

2. To validate a self-report depression instrument, the Mood Assessment Scale (MAS), as a measure of depression in an alcohol and other drug abuse population.

3. To compare the utility of the MAS and the BDI as screening instruments for depressive disorders in a population of alcohol and other drug abusers in residential treatment. The sensitivity and specificity of the MAS will be established against DSM-III-R criteria for depressive disorders.

4. To investigate the relationship of depressive disorders, demographic characteristics, and certain post-treatment behaviors to early relapse after treatment.

5. To compare the nature of depression in alcohol and other drug abusers to that of patients diagnosed with depressive disorders through the use of factor analysis on two depression instruments: the BDI and the MAS.

CHAPTER IV

METHOD

Subjects

The sample of 168 inpatient substance abusers consisted of volunteers recruited from routine patient admissions to two different residential treatment programs for substance abuse in Kalamazoo County from July 19, 1987 through March 22, 1988. The practice of drawing from several sites is common in the literature on alcoholism because most treatment units are too small to generate sufficiently large samples in a reasonable length of time (Clark, Pisani, Aagesen, Sellers, & Fawcett, 1984; Clark et al., 1985; Hesselbrock et al., 1983; Schuckit & Winokur, 1972; Weissman, Slobetz, Prusoff, Mezritz, & Howard, 1976).

All subjects completed detoxification, if necessary. Both sites used the Clinical Modification of the World Health Organization's International Classification of Diseases, 9th Revision (ICD-9-CM) (Commission of Professional and Hospital Activities, 1978) for indexing medical records. Criteria for alcohol dependence and other drug dependence are spelled out in the DSM-III (APA, 1980) and DSM-III-R (APA, 1987) according to a numbering system that corresponds to the ICD-9-CM. These numbers were used to separate subjects into three substance use groups: "alcohol only", "alcohol and other drugs", and "other drugs only".

The differences in sociodemographic and clinical characteristics between the two patient groups were within chance expectation on race, employment status, educational level, number of previous treatments for substance abuse, distribution between the three substance use groups, and family history for alcoholism. Differences occurred between the two sites on sex and age distribution. One site had more women and more patients in the third age group, age 40-49. However, there were no significant interactions by site on any of the measures of depression. Therefore, unless specified, results will refer to the combined sample.

The subjects ranged in age from 19 to 67 years, with a mean age of 33.5 years ($SD=9.7$ years); 73.2% of the subjects were male; 85.1% of the subjects were Caucasian; and 14.9% were black. The majority of the subjects had a family history of alcoholism (54.8%), were employed full-time (66.7%), had finished high school (mean education 12.3 years; $SD=1.7$ years), and were entering treatment for the first time (82%). Approximately equal numbers were single (41%) or married (36%) with smaller numbers being divorced (19%) or widowed (3.6%). The distribution of subjects by substance use groups were: "alcohol only" (57.1%), "alcohol and other drugs" (28%), and "other drugs only" (14.9%).

Instruments

Beck Depression Inventory

The Beck Depression Inventory (BDI) (Beck et al., 1961) is one of the most widely used of the self-report rating scales for depression.

It consists of 21 symptoms of depression which are rated by the patient with a value ranging from 0 (absent) to 3 (severe). The score for this inventory is obtained by adding together the 21 responses. The highest score which can be obtained is 63. The standard cut-off score on this instrument for severe depression is 16. (See Appendix A.)

Mood Assessment Scale

The Mood Assessment Scale (MAS), also known as the Geriatric Depression Scale (GDS) (Yesavage et al., 1983) consists of 30 short questions presented in a yes/no format. It has been shown to correlate very highly with classifications of depression based upon the Research Diagnostic Criteria (RDC) (Spitzer, Endicott, & Robins, 1978) in the elderly. It is unique because it does not use the somatic symptoms of depression which often confound measurements of mood disorder in the elderly. Because somatic symptoms may also confound the assessment of depression in alcoholics, the MAS may prove to be a better self-report measure of depression with this population than commonly used BDI. A cut-off score of 11 has been suggested for this instrument (Brink et al., 1982). However, a cut-off score of 14 has been proposed by these authors when a more stringent criterion is required. (See Appendix B.)

Schedule for Affective Disorders and Schizophrenia

The Schedule for Affective Disorders and Schizophrenia (SADS) (Endicott & Spitzer, 1978) is a highly structured interview format

used to diagnose affective disorders and schizophrenia using the RDC. It has very high standards of reliability and validity. It covers 45 symptoms of depression in detail and controls for any confounding due to the existence of thought disorder. The version known as the SADS-C will be used in this study. Subjects were considered as having an affective disorder if they met the DSM-III-R criteria for Major Depression or Dysthymia. (See Appendix C.)

SCL-90-R

The revised version of the Symptom Check List (SCL-90-R) (Derogatis, Rickels, & Rock, 1976) is a 90-item self-report symptom inventory designed to reflect the psychological symptom patterns of psychiatric and medical patients. Each item is rated on a five-point scale of distress ranging from "not-at-all" to "extremely". The SCL-90-R is scored and interpreted in terms of nine primary symptom dimensions and three global indices of distress. The symptom dimension of interest to this study is Dimension IV: Depression. (See Appendix D.)

Follow-up Questionnaire

A six-item follow-up questionnaire was designed for this study which asked subjects about their behaviors regarding alcohol or drug use since completing residential treatment, their participation in self-help groups, their participation in outpatient therapy, and their opinions about the treatment program they had just completed. (See Appendix E.)

Procedure

Upon admission each new patient filled out the BDI and MAS as part of the regular admissions forms. On approximately the 14th day of sobriety (no earlier than the 13th day and no later than the 18th day), a request was made of each subject to participate in a research project investigating short-term treatment outcome. It was explained that being a subject in this study would involve participating in a personal interview, filling out three short questionnaires, giving permission to use information from the intake forms, and authorizing follow-up contact. It was further explained that all information would be kept confidential.

After obtaining the signed consent statement (see Appendix F), each subject participated in a structured clinical interview conducted by the author using the SADS-C. Based upon responses to this interview, subjects were diagnosed as having a mood disorder if they met the DSM-III-R criteria for Major Depression or Dysthymia.

At the end of the interview, a packet containing the BDI, the MAS, and the SCL-90-R was given out with instructions to return the completed forms by the end of the next day.

One month after discharge all subjects were mailed the follow-up questionnaire, a BDI, a stamped return envelope, and a cover letter (see Appendix G) asking them to complete and return the enclosed forms.

CHAPTER V

RESULTS

The Prevalence of Depressive Disorders in Alcohol and Other Drug Abusers

The first purpose of this study was to determine the prevalence of depressive disorders among alcoholics and other drug abusers utilizing improved methods over those used in previous prevalence studies in this area. A total of 59 (35.1%) patients were diagnosed by structured clinical interview as currently meeting DSM-III-R criteria for either major depression (n=39), dysthymia (n=19) or a depressive disorder not otherwise specified (n=1) after a two-week wash-out period. Roughly one-third of these patients in residential treatment for alcoholism and other drug addictions were depressed, and this prevalence rate did not appear to vary as a function of most patient characteristics. Table 5 presents the rates of depressive disorders found in this study according to several demographic variables.

Chi-square analyses were performed on all the demographic categories. There were no statistically significant differences in the prevalence of depressive disorders due to sex, race, use group, marital status, or employment status. Prevalence rates did differ, however, by age group. Subjects in the 40-49 age range showed a significantly higher rate of depressive disorders than did subjects in any of the other age groups.

Table 5

The Rates of Depressive Disorders Among Several Subpopulations
of Alcohol and Other Drug Abusers in Residential Treatment
(N = 168)

	% Depressed	% Non-Depressed
Females (N=45)	40.0	60.0
Males (N=123)	33.3	66.7
Caucasians (N=143)	34.3	65.7
Blacks (N=25)	40.0	60.0
Use Group: Alcohol only (N=96)	35.4	64.6
Alcohol & Other Drugs (N=47)	34.0	66.0
Other Drugs only (N=25)	36.0	64.0
Age Group: I (18-29) (N=68)	31.0	69.0
II (30-39) (N=62)	30.6	69.4
III (40-49) (N=22)	63.6*	36.4*
IV (≥50) (N=13)	30.8	69.2
Marital Status:		
Single (N=69)	34.8	65.2
Married (N=61)	31.2	68.8
Divorced (N=32)	40.6	59.4
Widowed (N=6)	50.0	50.0
Employment Status:		
Employed (N=112)	33.0	67.0
*Unemployed (N=56)	39.3	60.7

*p ≤ .05

The Analysis of the MAS as a Measure of Depression in Alcohol and Other Drug Abusers

The primary test of the validity of the MAS as a measure of depression in alcoholics and other drug abusers was provided by the classification of subjects as depressed versus non-depressed on the basis of DSM-III-R criteria for depressive disorders. If the MAS is valid index of depression, it would be expected that the non-depressed

subjects would receive significantly lower scores on the MAS compared with subjects classified as depressed. As a test of this hypothesis, an analysis of variance was conducted in which the classification variable served as a between-subjects factor while the total scores on the second MAS (the one taken after a two-week wash-out period) served as the dependent measure. Similar analyses were also performed on the BDI and the SCL-90-R which had been administered concurrently with the MAS. The results of these analyses provided evidence for each of the scales' validity. In each analysis the main effect for the classification variable was highly significant [MAS: $F(1,152) = 152.301$, $p < .0001$; BDI: $F(1,155) = 125.101$, $p < .0001$; SCL-90-R: $F(1,137) = 122.145$, $p < .0001$]. Table 6 shows that in each case the means were ordered as predicted.

Table 6

Means and Standard Deviations for the 2-Week Scores on
the MAS, BDI, and SCL-90-R as a Function
of Subject Classification

Scale	Non-Depressed	Depressed	Total Sample
MAS	6.39 (4.10)	16.22 (5.69)	9.84 (6.65)
BDI	4.57 (3.74)	14.22 (7.09)	7.95 (6.91)
SCL-90-R	.63 (.34)	1.65 (.74)	1.00 (.72)

Standard deviations appear in parentheses.

The convergent validity of the MAS was investigated by calculating correlations between it and existing measures of depression. Previous findings indicate that the BDI is a valid measure of depression in alcoholics (Clark et al., 1985) and drug abusers (Rounsaville et al., 1979). The SCL-90-R has proven very sensitive in a broad variety of clinical and medical contexts (Derogatis, 1983). In particular, research on depression has revealed the "90" to be very sensitive to the presence and alteration of depressive disorders. Weissman and her colleagues (Weissman et al., 1976) reported on clinical depression among methadone addicts and found the SCL-90-R to be highly sensitive to depressive manifestations. The obtained correlation between the MAS and the BDI was found to be .073 while a correlation of .072 was found between the MAS and the SCL-90-R. The correlation between the BDI and SCL-90-R was .061. All of these correlations were statistically reliable beyond the .0001 level.

Finally, a comparison was also made across the three scales to determine the relative strength with which each one was related to the number of Research Diagnostic Criteria (RDC) for depressive disorders. The correlation of each of the depression scales with the RDC was computed, and then, the magnitude of each correlation was compared to the other two. The Ferguson (1971) procedures for testing the null hypothesis when r 's are not independent were followed. The obtained correlations between the RDC variable and the MAS, BDI, and SCL-90-R were 0.71, 0.67, and 0.69 respectively. All of these correlations were statistically significant beyond the .0001 level. None of the differences between any of the three possible pairs of

correlation coefficients was found to be statistically significant. However, when a step-wise regression analysis was performed predicting RDC from the three predictor variables (MAS, BDI, and SCL-90-R), only the MAS was entered into the formula. In other words, neither the BDI scores nor the SCL-90-R scores were able to add any information to the prediction of depressed from non-depressed beyond what was already contained in the MAS scores.

The Utility of the MAS and BDI as Screening Instruments for Depressive Disorders in Alcohol and Other Drug Abusers

Another purpose for testing the MAS with this population was to investigate its utility against the commonly used BDI as a screening instrument for depression in patients receiving treatment for alcohol or other drug abuse. For this comparison, it is desirable to compute the percentage of individuals correctly and incorrectly classified using specific cut-off scores. Sensitivity, the true-positive rate, refers to the number of depressed persons correctly classified as depressed based on a particular criterion. Specificity, the true-negative rate, refers to the number of non-depressed persons correctly classified as such. Table 7 shows the sensitivity and specificity of the three self-report instruments used in this study, the GDS, the BDI, and the SCL-90-R. Obviously, the MAS performed with the highest sensitivity, and the BDI with the highest specificity. When both sensitivity and specificity are taken into consideration, the MAS, using a cut-off score of 11, appears to be the best screening instrument for depressive disorders after a two-week wash-out period.

Table 7

Sensitivity and Specificity of Three Measures of Depression
Using DSM-III-R Diagnosis as a Comparison*

	Sensitivity		Specificity	
	% True Positive	% False Positive	% True Negative	% False Negative
MAS (cut-off 11)	87.0	20.0	80.0	13.0
MAS (cut-off 14)	66.7	4.0	96.0	33.3
BDI (cut-off 16)	41.8	1.0	99.0	58.2
SCL-90-R (≥ 70)	68.0	6.7	93.3	32.0

*all measurements were taken after a two-week wash-out period of sobriety.

Another task of this study was to determine if a simple self-report instrument for depression could be used at intake which would discriminate between those subjects with transient dysphoria and those who would be diagnosed as having an affective disorder after two weeks of abstinence. From the results summarized in Table 8, it appears that neither the MAS nor the commonly used BDI does a very good job of screening for depression at intake into treatment. The sensitivity of the MAS and the BDI is adequate, but the specificity is unacceptable for both instruments.

A two-step screening procedure does not improve results over that obtained with just the MAS taken after two weeks. The MAS was chosen for both steps because it demonstrated the highest sensitivity

at intake and the highest sensitivity after two weeks of sobriety (Table 9).

Table 8

Sensitivity and Specificity of Two Measures of Depression Taken at Intake Using DSM-III-R Diagnosis as a Comparison*

	Sensitivity		Specificity	
	% True Positive	% False Positive	% True Negative	% False Negative
MAS (cut-off 11)	91.8	68.1	31.9	8.2
MAS (cut-off 14)	77.6	55.3	44.7	22.5
BDI (cut-off 16)	83.7	48.9	51.1	16.3

*MAS & BDI taken at intake; DSM-III-R diagnosis made after a two-week wash-out period.

Table 9

Sensitivity and Specificity of a Two-Stage Approach to Detecting Depression with the MAS Using DSM-III-R Diagnosis as a Comparison

	Sensitivity		Specificity	
	% True Positive	% False Positive	% True Negative	% False Negative
MAS-1* ≥ 11 & MAS-2** ≥ 11	77.9	18.4	81.6	22.2

*MAS-1 taken at intake **MAS-2 taken after two-week wash-out period of sobriety

Variables Related to Early Relapse After Treatment

Follow-up questionnaires were sent out one month after treatment. While this is a very short time, it is the most productive time period in terms of data collection. Regular follow-up research at Hazelden, a well-known treatment center in the Midwest, suggests that nearly half of all patients who relapse after residential treatment do so within 1-3 months of discharge. Also, subjects can usually be found within the first month at the address they give at discharge.

The return rate for the mailed questionnaires was approximately 50%. This compares very favorably with 38% return rate for mailed questionnaires reported by Hazelden. In the follow-up sample, 59 subjects were male and 21 were female. A total of 7 Blacks and 73 Caucasians returned their follow-up forms. The mean age of this group was 35.3 years (range 20-67 years). Approximately 41% were presently married or living as married, with 34% single, 22.5% divorced, and 2.5% widowed. Most were employed (67.5%). Their mean educational level was 12.6 years of schooling. 67.5% had been treated for alcoholism, 25% for abusing both alcohol and other drugs, and 7.5% for other drug abuse only. Chi-square analyses were computed on all the demographic factors which were category data, and ANOVAs were computed on all the demographic factors that were numerical data. Table 10 summarizes the demographic characteristics of those who returned their follow-up questionnaires and those who did not. The two groups did not differ by site, sex, marital status, employment status, or alcohol use groups (alcohol only and alcohol & other

Table 10

The Percentage of Subjects in Each Demographic Category Who Returned or Did Not Return Their Follow-Up Questionnaire and Their Average Age and Educational Level

	% of Subjects Who Did Return Follow-Up N = 80	% of Subjects Who Did Not Return Follow-Up N = 88
Site: #1	55%	45%
#2	44%	56%
Sex: Males	48%	52%
Females	47%	53%
Race: Blacks	28%	72%*
Caucasian	51%	49%
Marital Status:		
Single	39%	61%
Married	54%	46%
Divorced	56%	44%
Widowed	33%	67%
Employment Status:		
Employed	48%	52%
Unemployed	46%	54%
Use Group:		
Alcohol only	56%	44%
Alcohol & Other Drugs	43%	57%
Other Drugs only	24%	76%*
DSM-III-R Depressive Disorder	47%	53%
Age	35.3 years	31.8 years*
Educational Level	12.6 years	12.0 years*

* $p < .05$

drugs). They did show statistically significant differences in age, educational level, racial composition, and other drug use. Those who returned their follow-up questionnaires were slightly older, slightly more educated, more likely to be Caucasian, and more likely to have been treated for alcohol or alcohol and other drug abuse in

combination rather than drug abuse alone.

The Relationship of Short-Term Relapse to Measures of Depression

Post-treatment drinking or drug use behavior during the month following discharge was analyzed according to three categories:

abstinent: no use of alcohol or drugs since discharge

mild relapse: use of alcohol or drugs only once since discharge

total relapse: use of alcohol or drugs more than once since discharge

The patterns of short-term relapse were different between the two groups based upon the presence of a depressive disorder during treatment. For purposes of simplicity in this presentation of these data, an acronym will be used to distinguish the two patient groups. Those patients who were diagnosed during substance abuse treatment as suffering from a depressive disorder using DSM-III-R criteria will be referred to as the DDD group (Diagnosed with a Depressed Disorder). Those patients who did not meet such criteria will be referred to as the non-DDD group. The BDI scores obtained at follow-up were used to classify subjects into four groups according to their level of depression:

none: 0 - 4 moderate: 8 - 15

mild: 5 - 7 severe: 16

Depression continued unabated after release from treatment for the DDD group with 86% of these subjects showing some level of depression at follow-up. The majority of these patients fell into the moderate or severe categories of depression. In contrast, only 35%

of the non-DDD group showed any level of depression at follow-up with the majority of those falling into the mild category of depression. The DDD group were 6 times more likely to be severely depressed at 1-month follow-up than the non-DDD group. For those who had been diagnosed as having a depressive disorder during treatment, 100% of those patients who suffered a total relapse within the first month after release from treatment were severely depressed. Only 50% of the non-DDD group who relapsed were severely depressed. Tables 11 and 12 summarize these data.

Table 11

The Distribution of DDD Subjects by Relapse Behavior
and Level of Depression at Follow-Up

<u>Percents of Column Totals</u>				
	abstin	mild relap	total relap	<u>Totals</u>
none	17.39%	0%	0%	14.29%
mild	26.09%	0%	0%	21.43%
moderate	43.48%	100%	0%	39.29%
severe	13.04%	0%	100%	25%
Totals	100%	100%	100%	100%

Table 12

The Distribution of Non-DDD Subjects by Relapse Behavior
and Level of Depression at Follow-Up

<u>Percents of Column Totals</u>				
	abstin	mild relap	total relap	<u>Totals</u>
none	67.44%	66.67%	0%	64.71%
mild	20.93%	33.33%	0%	21.57%
moderate	9.3%	0%	50%	9.8%
severe	2.33%	0%	50%	3.92%
Totals	100%	100%	100%	100%

Levels of depression as measured by self-report instruments at intake (BDI and MAS) and after a two-week wash-out (BDI, MAS, and SCL-90-R) did not predict post-discharge relapse behavior at a statistically significant level. However, measurements of depression taken at follow-up did correlate positively with relapse behavior. Scores on the BDI administered at follow-up were much higher for the relapsed subjects as compared to the abstinent subjects ($p < .0001$). Table 13 summarizes these results.

The Relationship of Short-Term Relapse to Demographic Characteristics

Chi-square analyses were computed on all category demographic data and ANOVAs were performed on all numerical demographic data.

Table 13

The Distribution of Subjects by Relapse Behavior and Level of Depression as Measured by the BDI at Follow-Up

<u>Percents of Column Totals</u>				
	abstin	mild relap	total relap	<u>Totals</u>
none	50%	57.14%	0%	46.84%
mild	22.73%	28.57%	0%	21.52%
moderate	21.21%	14.29%	16.67%	20.25%
severe	6.06%	0%	83.33%	11.39%
Totals	100%	100%	100%	100%

There were no statistically significant relationships between most client characteristics and early relapse. In other words, among the subjects responding to follow-up, those who remained abstinent did not differ significantly on most characteristics from those who suffered mild or severe relapses. No differences were found by sex, race, age, type of use group, marital status, or employment status. One difference which did reach statistical significance was educational level. Those subjects who remained abstinent during the first month after discharge from residential treatment were better educated than those subjects who suffered a total relapse. The abstinent subjects averaged one year of education beyond high school while those subjects who suffered a total relapse generally did not complete high school [$F(2,77) = 3.068, p < .05$].

The Relationship of Short-Term Relapse to Post-Treatment Behaviors

Post-treatment behaviors were also analyzed as they related to drinking or drug use practices after treatment. They included frequency of AA or NA attendance, whether or not a sponsor was selected for either of these self-help groups, and whether or not the patient was participating in individual outpatient therapy. Coded chi-square analyses were computed on all category data. Selecting a sponsor did not relate significantly with the prevention of relapse among the follow-up subjects, but regular AA or NA attendance ($p < .05$) and participation in individual therapy ($p < .01$) were very significant. Fifty percent of those subjects responding to the follow-up who did not attend any self-help meetings since discharge suffered a relapse compared with the 2.7% relapse rate of subjects who attended several AA or NA sessions a week. The statistics on individual therapy are even stronger. No subject who participated in individual therapy after treatment experienced a total relapse after treatment. All subjects who did experience a total relapse were not involved in individual therapy of any kind.

The Factor Structure of Depression in Alcohol and Other Drug Abusers

Product-moment correlations were calculated among the 21 items of the Beck Depression Inventory. According to Guttman (1954) a composite of variables that is going to be factor analyzed should have partial correlations between the variables that approach zero while

the multiple correlations for the variables should be reasonably high. Kaiser (1970) developed an index, variable sampling adequacy, of the extent to which a matrix of partial and multiple correlations conforms to zero partial and large multiple correlations. Specifically, to the extent that a composite of variables is logically homogeneous, that is, measuring the same universe of content, they are especially appropriate for factor analysis. This index of the sampling efficiency for the total composite of variables, total matrix sampling adequacy (MSA), should be greater than .500 in order to assume that Guttman's assumptions have been minimally met. As the index approaches one, the data are conforming almost perfectly to the assumption of zero partial correlations. For this correlation matrix of the BDI the index is .857, which suggests that these data represent a homogeneous collection of variables and are suitable for factor analysis.

It is also important that each of the individual variables have relatively high indexes of variable MSA. Variables with a low index of variable MSA may not logically belong to the same psychometric universe of content as the other variables in the composite of variables. They will have an unpredictable influence on any factor analysis done on the composite. In this study, the lowest index of variable MSA is .711 which is substantially larger than the minimum value of .500, thereby providing additional proof that these variables are appropriate for a factor analysis.

It is also important to have a measure of the statistical significance of the correlations. Bartlett's Test of Sphericity (1951) is the multivariate analog of the statistical test that is frequently

applied to a single correlation coefficient to see if it is significantly different from zero. The test of sphericity is used to determine if the collection of correlations in the correlation matrix are different from zero. The chi-square value for these data is 1092.653 which is significant at the .0001 level.

A principal component analysis (Hotelling, 1933) was chosen for factor extraction because it is the most established factor method. The computer program used to perform the factor analysis was StatView 512+ (Feldman & Gagnon, 1986). The squared multiple correlation (SMC) was used as the communality estimate. A varimax transformation for an orthogonal solution was initially computed. Since depression was viewed as a syndrome composed of interrelated symptoms, an oblique solution was computed from the orthogonal solution known as the ortho-tran solution. Unfortunately for purposes of comparison, of the two previous factor analyses done on the BDI in a population of alcoholics, one used an oblique solution and the other used an orthogonal solution.

Table 14 presents the salient loadings for each of the six factors extracted in this analysis. A salient loading was considered to be one greater than or equal to .40. Only three of these factors can be considered meaningful since they have three or more salient variables. Ideally, a factor should have at least four variables to increase the likelihood of its being able to be replicated. Factor I represented 35.1% of the total variance; Factor II explained 14.5%; and Factor III contained 13.5% of the total variance.

The correlations between the oblique factors were low and ranged from -.400 to .339. Since all of the factor intercorrelations were

Table 14
Principal Components Factor Pattern of the
Beck Depression Inventory

Subscale	Factors					
	I	II	III	IV	V	VI
Sense of Failure	.764					
Guilt	.729					
Self-Dislike	.689					
Pessimism	.662					
Self-Accusations	.613					
Indecisiveness	.613					
Sadness	.445					
Suicidal Ideas	.438					
Body Image Change	.420					
Dissatisfaction	.415					
Insomnia		.755				
Fatigability		.547				
Work Retardation		.543				
Social Withdrawal			.671			
Loss of Libido			.619			
Crying			.571			
Expectation of Punishment				.788		
Weight Loss				.700		
Anorexia					.724	
Irritability					.545	
Somatic Preoccupation						.818

Factors		Correlations Between Factors					
I	1						
II	.259	1					
III	.339	.275	1				
IV	.285	.282	.18	1			
V	.138	.242	.163	-.004	1		
VI	.252	.299	.237	.102	.158	1	

Note: Loadings $\geq .40$ were considered as salient.

less than .50, this suggests that the factor solution was not underfactored.

A factor analysis was also performed on the Mood Assessment Scale with this population of alcohol and other drug abusers. Product-moment correlations were calculated among the 30 items of the MAS. The index of the sampling efficiency for the total composite of variables, total matrix sampling adequacy (MSA), is .87, a figure which is considered meritorious. In other words, the items of the MAS are measuring the same universe of content and are suitable for factor analysis. There were no variables with a low index of variable MSA which might unpredictably influence any factor analysis. The lowest value of .75 very adequately exceeds the minimum needed of .50.

Bartlett's Test of Sphericity (1951) resulted in a chi-square value of 1883.4 which is significant at the .0001 level. Therefore, both of the evaluations which must be performed prior to any attempts to interpret the results of a factor analysis, sampling adequacy, and statistical significance of the correlations, were very satisfactory for the responses to the MAS obtained from a population of alcohol and other drug abusers.

A principal components analysis following procedures described for the BDI were also computed for the MAS. Table 15 presents the salient loadings for each of the eight factors extracted in the analysis. Only five of the eight factors will be interpreted since they have three or more salient variables. Factor 2 represented 16.9% of the total variance; Factor 3 explained 10.1%; Factor 5 contained 14.1%; Factor 6 represented 16.2%; and Factor 7 explained 15.8% of

Table 15
Principal Components Factor Pattern of the
Mood Assessment Scale

Subscale	Factors							
	1	2	3	4	5	6	7	8
Hopeless-present	.844							
Dislike being alive	.660							
Hard to get up		.713						
Sad		.695						
Dissatisfied		.607						
Life is dull		.549						
Unhappy		.475						
Easily upset		.454						
Poor memory			.642					
Downhearted			.503					
Crying			.492					
Poor concentration			.455					
Restless				.863				
Worry-past					.875			
Obsessive					.748			
Fearful					.507			
Confused						.849		
Worthless						.718		
Worry-future						.672		
Helpless						.530		
Stay at home							.742	
Dropped activities							.668	
Social withdrawal							.595	
No energy							.570	
Bored							.482	
Work retardation							.433	
Hopeless-future								.717

Factors	Correlations Between Factors							
1	1							
2	.376	1						
3	.005	.096	1					
4	.157	.200	.108	1				
5	.207	.424	.210	.268	1			
6	.198	.508	.183	.279	.470	1		
7	.230	.473	.181	.364	.414	.555	1	
8	.182	.273	-.043	-.008	.113	.131	.108	1

Note: Loadings $\geq .40$ were considered as salient.

the total variance. Factors 1, 4, and 8 are either singletons or a doubleton and therefore not interpretable.

The correlations between the oblique factors were moderate ranging from .005 to .555. Since two of the factor intercorrelations were over .5, this suggests that Factor 6 is measuring a dimension highly associated with what Factor 2 and Factor 7 is measuring.

CHAPTER VI

DISCUSSION

How Many Alcohol and Other Drug Abusers Have a Depressive Disorder?

The association between alcoholism and depression has been a topic of considerable interest in the literature. Most clinicians involved in the treatment of alcoholics would readily agree that many of their patients appear quite depressed. As to whether this symptomatology represents a true co-existing depressive disorder or whether it is merely a transient state induced by the toxic effects of heavy alcohol use is still debated. While the toxic effects of alcohol may last for weeks or months after a person stops drinking (Goodwin, 1982), a two-week period of abstinence is typically used as a wash-out period to eliminate the effects of alcohol-induced depression in those studies which attempt to control for this factor. Of the 27 studies in Tables 3 and 4 which have investigated the prevalence of depression in alcoholics, only the study done by O'Sullivan and her colleagues (1983) matches this study in the use of a definite wash-out period, structured interviews, established criteria for subject membership, established criteria for depression, and a large sample (over 100). The 35% rate of depression found in this study of 168 hospitalized alcohol and other drug abusers is identical to the 35% prevalence rate reported by O'Sullivan and her colleagues in their sample of 300 hospitalized alcoholics. One other study by

Dackis and his associates (1986) followed these guidelines but used a rather small sample of 49 subjects. Their reported rate of depression in alcoholics was 20%. Using a chi-square analysis, this is not statistically different from the rate of 35% found in this study when sample sizes are considered ($\chi^2=3.9375$, $p .05$, $.95\chi^2=3.84$). It is difficult to compare the results of this study with any of the others because of their failure to control for one or more important factors in their designs: use of established criteria for alcoholism and depression, a wash-out period of sobriety, and a structured interview.

Criticism of studies which have reported high rates of affective disorder among alcoholics has centered on the use of self-report instruments (Keeler et al., 1979; Willenbring, 1986). The contention has been that self-report instruments identify too many alcoholics as depressed that would not be classified as such using interview methods. However, of the studies identified in Table 3 which have used interview methods and reported rates under 20%, all have serious flaws. The study which reported a 9% rate (Keeler et al., 1979) did not use a structured interview and used DSM-II criteria for establishing the presence of a Major Affective Disorder which does not include any depression directly related to a precipitating life experience. The DSM-III category of Affective Disorders groups all the Affective Disorders together, regardless of the association with precipitating life experiences. This lower rate may have been, in part, a reflection of different criteria used for establishing the presence of an affective disorder. The 9% rate is even more curious when it is compared with the 28% rate reported in the same study using the HAM-D

(see Keeler et al., 1979 in Table 4). The HAM-D is simply a checklist used by a physician to record symptoms of depression noted in an interview. In other words, 28% of these subjects were diagnosed as depressed based upon interviews in which the symptoms were recorded by means of a checklist, whereas only 9% were classified as depressed based upon non-structured interviews taken during the same time period. Fowler and his colleagues (1980) explained their low rate of 12% to be a result of the overinclusive admittance policy where the sample was collected. Lastly, Willenbring (1986) also reported a low rate of 12%, but no structured interview was used so it is difficult to say that these diagnostic decisions were made on similar samples of data from each subject. Those studies which used structured interviews report much higher rates ranging from 19% to 44% (Clark et al., 1984; Dackis et al., 1986; Hesselbrock et al., 1983; Winokur, 1972; Bedi & Halikas, 1985; O'Sullivan et al., 1983; Cadoret & Winokur; Weissman & Myers, 1980). The three studies in Table 3 which reported rates higher than 44% did not use a structured interview (Woodruff et al., 1973; Weissman et al., 1977a; Pottenger et al., 1978). Therefore, the one out of three rate found in this study appears to be supported by previous research which has used structured interview methods.

High rates of depression in alcoholics have also been criticized as resulting from selection biases in subject samples (Hamm et al., 1979). It is argued that the alcoholics or other drug abusers who become the subjects in studies are those who are seeking treatment. Substance abusers who seek treatment are more likely to be suffering from related physical and/or mental problems since persons with two

disorders are more apt to want help. Since alcoholics and other drug abusers may be more likely to seek treatment when they are depressed, the association between depression and substance abuse could be exaggerated in studies based on clinic populations. However, a non-patient survey conducted by Weissman and Myers (1980) does not support this hypothesis. On the contrary, a very high rate of coexisting alcoholism and affective disorder was reported in this non-patient sample. The study was well designed drawing a random sample of 938 adults from a catchment area of 72,000 persons which included all ethnic, racial, and socioeconomic groups. Diagnostic judgements were made based upon information from a structured interview (SADS). Of those subjects who were diagnosed as ever having been alcoholic, 53% had received another diagnosis of affective disorder at some time in their lives. Interestingly, of those subjects who reported both conditions as having occurred in their lives, more than half (60%) experienced the affective disorder before the alcohol abuse. This is compelling evidence that not all of the depression seen in hospitalized alcoholics is simply a result of the pharmacological effects of alcohol on mood.

To summarize these findings, it would appear that the one-out-of-three rate reported in this study is very consistent with rates found in similar studies which used clinical interviews method. Furthermore, the rate of co-existence of alcoholism and depressive disorder reported in this study does not appear to be elevated as a result of being based upon samples of patients seeking treatment. The prevalence rates reported by Weissman and Myers (1980) in a sample of individuals selected randomly from the general population were even higher.

There are several interesting results in this study regarding the prevalence rates as they varied by demographic characteristics. No statistically significant difference was found between the number of men and the number of women diagnosed with depressive disorders in this study. This is not consistent with the theme that runs through the literature that the rate of depression in alcoholic women is much higher than the rate in alcoholic men. When a careful analysis is made of the introductions to many of the studies investigating depression in alcoholics, two articles are repeatedly cited as establishing this gender difference. One study was published by Winokur, Rimmer, and Reich in 1971 and the other study was published by Cadoret and Winokur in 1971. However, both articles were based upon measurements taken at the same time upon the same sample of 259 alcoholics. The actual datum upon which this popular conclusion has rested was the fact that 26 females versus 5 males were diagnosed as being "primary depressives" in their sample. The problem with this 5 to 1 ratio being repeatedly quoted as the established female to male ratio among patients with both alcoholism and affective disorder is that there were another 30 females and 41 males in this sample with "secondary depression". In other words, their study was concerned with the temporal sequence in which the depression and the alcoholism occurred rather than with overall prevalence of the two conditions together. If their data are reanalyzed not considering temporal sequence, that sample of 259 alcoholics showed a depression prevalence rate of 49.5% among females, 31.5% among males, and an overall rate of 39%. This is essentially no different than the 40% among females, the 33.3%

among males, and the overall rate of 35.1% found in this study.

There were also no differences in rates of depression due to race in this study. While this author could find no other studies that directly addressed this question among inpatient alcoholics, Steer, McElroy, and Beck (1983) report that white alcoholics are more likely to be depressed than black alcoholics receiving outpatient treatment. However, their subjects were poorly educated (averaged 10 years of school) and mostly unemployed (77%). The majority of subjects in this study averaged high school or better and were gainfully employed. It may be that socio-economic factors interact with racial differences in determining the rates of depression found.

Patients aged 40 to 49 were much more likely to be diagnosed as having a depressive disorder than patients in the other age categories. It was hypothesized that this might be due to the higher number of women in this age category, but a 2-factor ANOVA did not bear this out. The only statistically significant effect on the mood categories was the influence of the age groups [$F(3,160)=4.771$, $p \leq .01$]. Sex did not contribute to the difference [$F(1,160)=.159$, $p=.69$] nor was there a statistically significant interaction between sex and age group [$F(3,160)=.1013$, $p=.10$]. Previous research has reported the highest rates of depression in the youngest group (18-29 years) (Hatsukami et al., 1981) or in younger females (20-30 years) (Bedi & Halikas, 1985). No obvious reason for these differences can be noted.

No statistically significant differences were found in this study in the prevalence of depressive disorders between the marital status categories. Bedi and Halikas (1985) reported that marital

status is a significant variable in predicting affective disorder among alcoholic inpatients. Those patients not presently married were more likely to be depressed than married patients. However, when this author computed chi-square analyses on the Bedi and Halikas data as they published it, no significant differences could be found.

Can Existing Self-Report Depression Instruments be Used with Alcohol and Other Drug Abusers?

The data from the factor analysis of the BDI support the contention that the depression of alcoholics is substantially no different than the depression experienced by persons suffering from a depressive disorder. In this study there were many similarities displayed between the affect described by substance abusers and that of primarily depressed patients.

Factor I shown in Table 14, the strongest factor in this study, has all of the elements of the strongest factors identified in both of the review papers of the primarily depressed (Lorr cited in Gibson & Becker, 1973; Beck & Lester, 1973). It also closely resembles the first factor identified in both of the previous studies of alcoholics (Gibson & Becker, 1973; Steer et al., 1977).

Difficulty arises in trying to compare the second and third factors across studies because these have less variables in their composition. Factor II of this study (Insomnia, Fatigability, & Work Retardation) repeats elements found in previously identified depression factors identified as Performance Difficulties (Beck & Lester, 1973), Vital Depression (Gibson & Becker, 1973), and Factor Two

(Steer et al., 1977). Similarly, Factor III of this study (Social Withdrawal, Loss of Libido, & Crying) has common variables with factors known as Pessimism-Suicide (Gibson & Becker, 1973) and Factor Three (Steer et al., 1977): It appears that Fatigability accompanies Work Retardation in the studies of the primarily depressed. In this study, Fatigability accompanied both Insomnia and Work Retardation, suggesting that the patterns of responses to depression inventories among patients with an affective disorder and patients being treated for alcohol and drug abuse are very similar.

The differences which are seen on the weaker factors may also be arising due to variations in the computer programs used to make the analyses and to variations in the statistics used. For example, Gibson and Becker (1973) used an orthogonal solution whereas Steer et al. (1977) and this study reported the oblique solution. Gibson and Becker may have used an equamax transformation since a more equal number of variables were reported in each of their factors. Steer et al. used a quartimin transformation where the majority of variance is allocated to the first factor. The Varimax transformation used in this study selects a solution between the equamax and the quartimax.

The results of the factor analysis on the MAS is interesting in its own right as it is the first look at this relatively new instrument. The disadvantage, of course, is that this analysis cannot contribute to the question of whether or not the depression experienced by substance abusers is essentially no different than the depression experienced by persons suffering from a depressive disorder since no

previous factor analysis of the MAS has been done with the primarily depressed.

The MAS is quite different from other depression instruments because it does not have variables which deal with somatic symptoms. This instrument was developed to distinguish between depressed elderly and nondepressed elderly since the somatic symptoms associated with affective disorder were common in the elderly as a matter of course. It has been shown that MAS is a better measure of depression in alcoholics possibly for the same reason.

Analysis of the MAS items resulted in eight significant factors, five of which were interpretable and accounted for 73% of the total variance. Referring to Table 15, Factor 2 will be known as Poor Morale, Factor 3 as Cognitive Deficits, Factor 5 as Anxiety, Factor 6 as Poor Self-Image, and Factor 7 as Reduced Behavior. The variables which make up Poor Morale and Poor Self-Image in the MAS are very similar to the variables which combine to form Factor 1 in the BDI as shown in Table 14. Reduced Behavior in the MAS appears to combine the factors expressed separately in the BDI as Factors II and III. A good description for Factor II could be Reduced Behavior-Performance and Factor III could be described as Reduced Behavior-Social.

The two factors which stand separately in an analysis of the MAS are Anxiety and Cognitive Deficits. Since anxiety as a construct has typically been difficult to distinguish from depression in self-report instruments (Meites, Lovallo, & Pishkin, 1980; Lipman, 1982), one would expect Factor 5-Anxiety, to have relatively strong correlations with the factors commonly found on other depression instruments,

Factor 2-Poor Morale, Factor 6-Poor Self-Image, and Factor 7-Reduced Behavior. From an inspection of Table 15, it can be seen that Factor 5 did have moderate intercorrelations with Factors 2, 6, and 7.

The factor of Cognitive Deficits is so named for the variables of poor memory and poor concentration. These variables are not found on any other depression instrument so this factor could not correspond to any previous factor analytic work in depression. It does not have any strong intercorrelations with any other factors within the MAS which have been shown to be similar to factors found in other depression studies. This is consistent with what would be expected for a relatively independent domain of information.

To summarize, the information from these factor analyses further supports the notion that it is theoretically appropriate to use depression inventories developed in clinical populations of primarily depressed patients in the population of alcoholics and other drug abusers. Both groups appear to respond in ways which produce similar factors. Inferences may be drawn from these instruments in the same way they are for the primarily depressed.

How Useful is the MAS as a Measure of Depression in Alcohol and Other Drug Abusers?

The results of this study provide evidence that the MAS is a valid measure of depression in a population of alcoholics and other drug abusers involved in residential treatment. Evidence for the validity of the scale came from a comparison of the mean scores associated with subjects classified as non-depressed versus depressed

based on DSM-III-R criteria for depressive disorders. The means of the two groups were reliably different and ordered as expected. Further support for the validity of the MAS was evidenced by its high correlations with established self-report instruments, the BDI and the SCL-90-R. Furthermore, the BDI was unable to add any information to the prediction of depressed from non-depressed beyond what was already contained in the MAS scores.

The primary purpose for investigating the utility of using the MAS with a population of alcohol or drug abusers entering treatment was to compare its power to that of the BDI. Whereas the BDI has been shown to be the best screening instrument to date with alcoholics or drug abusers entering treatment, it does not have the simple yes/no format of the MAS. Patients entering treatment for alcohol or drug abuse suffer from poor concentration, confusion, and fatigue. When both sensitivity and specificity are taken into consideration, the data in this study suggest that the MAS is the best screening instrument to detect depressive disorders. Since the MAS is the shortest depression instrument, has the least confusing format, and has greater predictive power, it appears to be superior to the BDI as a self-report measure of depression in a population of alcoholics and other drug abusers.

This study did not establish either of the self-report depression scales as a satisfactory instrument to screen for depressive disorders at admission into treatment. Neither the BDI nor the MAS was specific enough at intake to be useful. Using the MAS at intake and again after a 2-week period of abstinence produced a sensitivity of 77.9%

and a specificity of 81.6%. These rates are favorable compared to a 51% sensitivity and a 98% specificity of a two-stage approach reported by Lewinsohn and Teri (1982). However, these rates are no better than that found by using a single administration of the MAS after a two-week wash-out period.

Variables Related to Early Relapse After Treatment

The data suggest a relationship between depression and a return to drinking. The levels of depression measured at intake into treatment by self-report instruments seem to bear very little relationship to future relapse, but at follow-up subjects who have relapsed have significantly higher scores on a self-report measure of depression than subjects who have remained abstinent.

The coexistence of a depressive disorder was associated with very different patterns of depression and short-term relapse after treatment. The difference in the extent of depression between the two groups was very great. Most of the subjects without depressive disorders (the non-DDD group) experienced little or no depression at follow-up whether they relapsed or not. The subjects with a depressive disorder (the DDD group) experienced mild to moderate levels of depression even if abstinent. All of the relapsers in the DDD group were severely depressed whereas only half of the relapsers in the non-DDD group were severely depressed. These data support previous findings that show a relationship between depression and relapse, but imply that the effects of depression on relapse rates are stronger in those subjects who were diagnosed as having a depressive disorder

than in those without such a diagnosis. Such evidence is supportive of the feedback loop of affective problems hypothesized by the bio-psycho-social perspective in alcoholism. Previous research has never investigated the differential effects of depression in these two groups. The data from this study suggest that an avenue of future research would be to make this clinical distinction at discharge.

It is the DDD group that warrants the additional time for a diagnostic interview so that treatment and aftercare planning can be aimed at the co-existing depressive disorder. Abstinence alone will relieve alcohol-induced depression, but it will not relieve a depressive disorder. Specific interventions shown to be effective for depression such as cognitive therapy or the use of antidepressant medications need to be considered on a case-by-case basis.

Previous reviews of the literature on the use of medication with alcoholics have not been favorable (Ditman, 1966; Halikas, 1983; O'Sullivan, 1984; Viamontes, 1972). However, the majority of the studies cited which looked at the effects of antidepressants in alcoholics were using abstinence as their measure of success in treating alcoholism not stabilization of mood in treating depression. Subjects in several of these studies were not selected on the basis of whether or not an affective disorder was present along with alcoholism, but only if they were alcoholic. Even in those studies which looked at depression as an outcome measure, cases were chosen by rating scales rather than diagnostic criteria. Also, wash-out periods for withdrawal symptoms were not strictly adhered to. The present study found only one-third of the alcoholic inpatients having a co-existing

affective disorder. Thus, it would appear that at least two-thirds of the subjects in the drug studies mentioned were given antidepressants even though no mood disorder was established in hope that such drugs might have an effect on reducing drinking behavior. Controlled studies which used antidepressants with just depressed alcoholics have reported success (Butterworth, 1971; Kissin & Gross, 1970; Wilson, Alltop, & Riley, 1970).

Several patient characteristics bear discussion. At first glance, most patient characteristics do not seem to have much of an influence on relapse rates as there were no differences found by sex, race, age, type of use group, marital status, or employment status. However, the return rate for follow-up was not the same for racial groups. Caucasians were twice as likely as Blacks to respond to the follow-up request. Relapse rates are generally considered to be higher for those who do not respond to follow-up by mail than those who do (Hatsukami & Pickens, 1982). Data collected by Hazelden showed a relapse rate in non-responders twice that of those who returned their mailed questionnaires. Therefore, it is possible that Blacks in this study relapsed at a higher rate than Caucasians, but this was not evident because of the low return rate. Those subjects who did respond to follow-up were statistically older and more educated. But, age and education could not explain the racial differences. The mean age for Black subjects in treatment was 34.7 years which does not differ significantly from the mean age of 33.3 years for Caucasians in treatment. Similarly, Blacks ($M=12.2$ years of education) were just as likely to be high school graduates as Caucasians ($M=12.3$ years of education).

Similarly, clients in either of the alcohol use groups were twice as likely to respond to follow-up as those who were exclusively abusing drugs. Even though educational level was related to whether or not a subject responded to the mailed follow-up, it did not differ between the use groups. Age was a factor in return rate, in that younger subjects were less likely to respond. However, age did vary significantly by use group. The two drug groups were significantly younger than the alcohol only group. Racial composition was also statistically different. In this sample of adults in treatment, Blacks were far more likely to be involved with drug use than Caucasians. Blacks were half as likely as Caucasians to be using just alcohol, twice as likely to be using alcohol in combination with other drugs, and three times more likely to be using just other drugs alone.

The drug use groups were comprised, by and large, of individuals under the age of thirty-five. The drug use groups may have actual relapse rates higher than what was evidenced in this study because of their low return rate. Furthermore, Blacks made up the drug use groups at a far higher percentage rate than Caucasians. Since age, marital status, employment status, and educational level did not differ between races in this sample, only the greater likelihood of drug use distinguishes the Black subjects from the Caucasians. What these data suggest is that there is greater damage by the use of drugs in the youth of the Black community than in the society at large.

One patient characteristic whose relationship with relapse was statistically significant across all categories was educational level. Despite age, marital status, employment status, racial group, type of

use group or presence of a depressive disorder, those individuals with a higher educational level were more likely to be able to remain abstinent during the first month after discharge from treatment. It is possible that the didactic components of treatment exert a greater influence on the better educated patients.

Post-treatment behaviors also affected relapse rate. Regular attendance in self-help groups was associated with maintaining abstinence even though selecting a sponsor was not. More striking, however, was the effect of individual therapy upon relapse. No one involved in therapy relapsed even if they were severely depressed.

Conclusion

The data from this study support the contention that a significant proportion of those clients seeking treatment for alcohol or drug abuse suffer from a coexisting affective disorder. Approximately one-third of all the subjects in this sample met the DSM-III-R criteria for major depression or dysthymia when interviewed after two weeks of sobriety. No difference in rates of depression by sex were found in this study, but it is felt this was due to the fact that no attempt was made to distinguish between primary and secondary depression.

A new instrument, the MAS, which was originally developed as a self-report measure of depression in the elderly, proved to be an excellent instrument for use with this population and outperformed the commonly used BDI. Because of its simple yes/no format, short questions, and brevity (30 questions), it is extremely easy to administer

even to those clients recently released from detoxification. And, since it performed with remarkable accuracy against clinical diagnosis, it is suggested that the MAS is the best self-report instrument to use to measure depression in alcohol and other drug abusers.

It is further recommended that the measurement of depression become an integral part of assessment and treatment planning for substance abusers. The co-existence of depressive disorders appears to affect relapse rates very differently.

Lastly, it is hoped that future research will look at the effects of special therapies for depression on the impact of the core therapy for addictions. This research should begin by making certain that only those alcoholics or other drug abusers who meet strict diagnostic criteria for depressive disorders are the subjects for such study.

APPENDICES

APPENDIX A

Beck Depression Inventory

PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

81-81a,	Beck Depression Inventory
83,	Mood Assessment Scale
85-85a,	Schedule for Affective Disorders and Schizophrenia
87-87a,	Symptom Check List-90-Revised

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APPENDIX B
Mood Assessment Scale

APPENDIX C

Schedule for Affective Disorders and Schizophrenia

APPENDIX D
Symptom Check List-90-Revised

APPENDIX E
Follow-Up Questionnaire

Gateway Villa 1 Month Follow-up

Date_____ Study I.D._____

1. Have you been attending AA or NA meetings?

_____Yes; if yes, about how many have you attended since
you were discharged from Gateway Villa?

_____ 1-5 AA meetings	_____ 1-5 NA meetings
_____ 6-10 AA meetings	_____ 6-10 NA meetings
_____ 10-20 AA meetings	_____ 10-20 NA meetings
_____ over 20 AA meetings	_____ over 20 NA meetings

_____No

2. Have you selected a sponsor? _____Yes _____No

3. Have you been participating in outpatient therapy?

_____Yes _____No

4. Have you been able to maintain your sobriety?

_____Yes

_____No; if no, what was the cause of your relapse?

5. What did you learn from the program that has been of most help to
you during this past month?

6. What changes do you think would improve the program ?

APPENDIX F
Informed Consent

GATEWAY VILLA

1910 Shaffer Road
Kalamazoo, Mi 49001
(616) 349-8785

Research in Treatment Effectiveness

Informed Consent

I volunteer to be a participant in this study which is looking at the relationship between how I feel and how well the program worked for me. To do this I will participate in a brief interview, fill out 3 questionnaires, give permission to use the information from the intake forms, and authorize follow-up contact. The principal investigator for this project is Patricia M. Guilford who may be contacted through Gateway Villa regarding this research.

I understand that all information is strictly confidential and that my name will never be used in this study.

I understand that I will receive a copy of my consent form.

I have read all of the above, asked questions, received answers concerning areas I did not understand, and willingly give my consent to participate in the study.

(Signature of participant)

(Date)

(Signature of witness)

(Date)

APPENDIX G
Cover Letter

Gateway Villa
1910 Shaffer Road
Kalamazoo, Michigan 49001

May 31, 1988

Dear Don,

It has been about one month now since you completed the program at Gateway Villa. I hope things have been going well for you.

Enclosed are the questionnaires we talked about for the follow-up. Try to fill them out as soon as you can. Please return them in the enclosed envelope.

Best wishes to you.

Sincerely,

Pat Guilford

APPENDIX H
Human Subjects Approval



*Human Subjects
Institutional Review Board*

TO: Patricia Guilford
Chris Koronakos

FROM: Ellen Page-Robin, Chair

RE: Research Protocol

DATE: July 8, 1987

This letter will serve as confirmation that your research protocol, "Validation of two depression scales as screening instruments for alcoholic inpatients" has been approved by the HSIRB with the following provisions:

1. There is a discrepancy in the interview schedule. At one point subjects will be interviewed three times, but on the consent form it specifies two interviews.
2. The consent form needs to specify that responses will be kept in subjects' medical records with the responses encoded so as to be interpreted only by authorized personnel.
3. It needs to be clearly specified who these authorized personnel are.

If you have any further questions, please contact me at 383-4917.

P.S. Please send copies of the above changes to the HSIRB.

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