Addiction and Psychopathology:
A Multidimensional Approach to Clinical Practice

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This study was supported by grant # 2534 from the Nationaal Fonds voor de Geestelijke Volksgezondheid.

CIP-GEGEVENS KONINKLIJKE BIBLIOTHEEK, DEN HAAG

Hendriks, Vincent M.

Addiction and psychopathology: a multidimensional approach to clinical practice / Vincent M. Hendriks - [S.l. : s.n.]
Proefschrift Rotterdam. - Met lit. opg. - Met samenvatting in het Nederlands.
ISBN 90-70116-57-X
SISO 614.7 UDC 613.8:616.89 (043.3)
Trefw.: verslaving; psychopathologie

Addiction and Psychopathology:

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PROEFSCHRIFT

ter verkrijging van de graad van doctor
aan de Erasmus Universiteit Rotterdam
op gezag van de Rector Magnificus
Prof. Dr. C.J. Rijnvos
en volgens besluit van het College van Dekanen.
De openbare verdediging zal plaatsvinden op
woensdag 12 september 1990 om 13.45 uur

door

VINCENT MARINUS HENDRIKS

geboren te 's Gravenhage

universiteits
DRUKKERIJ
1990

Promotie-commissie

Promotor:	Prof. Dr. C.D. Kaplan
Overige leden:	Prof. Dr. A. Hofman
	Prof. Dr. W.J. Schudel
	Prof. Dr. M.W. de Vries

ACKNOWLEDGEMENT

The contributions of many people have made this dissertation possible. I first wish to thank the coordinators, staff, and residents of the clinical detoxification center De Weg, the therapeutic community Emiliehoeve, and the Informatie Centrum Drugspreventie, for their participation, cooperation and assistance in data collection. Without their work, this study could not have been conducted. In particular, thanks are due to Drs. Chris van der Meer for his active involvement and his valuable comments during all phases of the study.

From the Instituut voor Verslavingsonderzoek, I wish to thank Prof. Dr. Charles Kaplan, promotor of this study, for his supervision and his valuable suggestions. Appreciation is due to Gerben van der Heide, for his assistance in data processing, and to Drs. Peter Blanken, for his help in interpreting the data. Fruitful discussions on the meaning of the data have been held with Nico Adriaans. Much appreciation is due to Mr. Ineke van Leeuwen for her help with financial matters, and to Margaret van Randwijck for her secretarial support.

Thanks are due to the Nationaal Fonds voor de Geestelijke Volksgezondheid for financing the study.

For their valuable contributions to chapter 3 of this dissertation, I wish to thank Drs. Chris van der Meer, Prof. Dr. Charles Kaplan, Dr. Jacques van Limbeek, and Drs. Peter Geerlings. The insightful comments of Dr. Thomas McLellan on an early version of this chapter are also gratefully acknowledged. The active involvement of Prof. Dr. Jerome Platt and Dr. Robert Steer from the University of Medicine and Dentistry of New Jersey (UMDNJ) has been of great value in writing chapter 5.

For the support and opportunities offered to me during my visit to the United States, I would like to express my appreciation to Prof. Dr. Jerome Platt and Dr. Robert Steer from the UMDNJ, Dr. Charles Winnick from the City University of New York, Dr. George De Leon from Phoenix House Foundation, Inc., New York, and Dr. Thomas McLellan from the Philadelphia Veterans Administration Medical Center.

Last but not least, I want to thank my wife, Kathleen Prattis-Hendriks, for her continuous support as well as her contributions to the English language of the manuscript, and my children, Jada and Dylan, who have been so patient with their father.

PREFACE

The study presented in this dissertation is part of a follow-up study on the significance of psychosocial characteristics of addicts for prognosis in treatment in a clinical detoxification center and a drug-free therapeutic community. This dissertation reports on the first part of the study, which focuses on the client-characteristics at intake, and on the prognostic significance of these characteristics for retention in treatment. The data for this part of the study were collected between january 1987 and january 1989.

The chapters of this dissertation have been written in the form of separate articles. Therefore, there is some overlap between the Methods-sections of the chapters. Parts of the dissertation have been published or have been accepted for publication by journals. Chapter 2 is based on an article published in the Journal of Consulting and Clinical Psychology. Chapter 3 is based on an article published in the Journal of Substance Abuse Treatment, and on an article published in the Tijdschrift voor Psychiatrie. Co-authors of these latter two articles are Prof. Dr. Charles Kaplan, Drs. Chris van der Meer, Dr. Jacques van Limbeek and Dr. Peter Geerlings. Chapter 5 is based on an article accepted for publication by the International Journal of the Addictions. Co-authors of this article are Dr. Robert Steer and Prof. Dr. Jerome Platt. The references of these articles are as follows:

Hendriks, V.M., Kaplan, C.D., van Limbeek, J., & Geerlings, P. (1989). The Addiction Severity Index: Reliability and validity in a Dutch addict population. Journal of Substance Abuse Treatment, 6, 133-141.

Hendriks, V.M., van der Meer, C.W., Kaplan, C.D., van Limbeek, J., & Geerlings, P. (1990). De Addiction Severity Index: Een multidimensionele ernstlijst voor de verslavingszorg. Tijdschrift voor Psychiatrie, 32, 420-436.

Hendriks, V.M. (1990). Psychiatric disorders in a Dutch addict population: Rates and correlates of DSM-III diagnosis. Journal of Consulting and Clinical Psychology, 58, 158-165.

Hendriks, V.M., Steer, R.A., & Platt, J.J. (in press). Psychopathology in Dutch and American Heroin Addicts. Accepted for publication by the International Journal of the Addictions.

CONTENTS

to Kathleen

Chapter 1

THE MULTIDIMENSIONALITY OF ADDICTION: FOCUS ON PSYCHOPATHOLOGY

The etiology of addiction has a long history of clinical and scientific interest, which is characterized by differences in conceptual approach, conflicting data and public controversy. There have been numerous attempts to describe the antecedents and consequences of addiction in theoretical models and by classifying addicts on the basis of personal, pathological and environmental characteristics (Lettieri, Sayers, & Pearson, 1980). Despite these considerable efforts, the insights that emerged from theory and empirical research have not led to a clear understanding of the etiology and the course of addiction. Perhaps evenly important, the limited clinical applicability of theory and research has led practitioners in the addiction field to rely on their private theories about the nature of addiction and the significance of co-existent problems in the treatment of addiction. Complicating the issue, addiction is subject to considerable moral debate, which includes opposing views on the types of drugs that are considered acceptable, the acceptability of drug use in general, law enforcement strategies, and treatment methods.

Perhaps the most important trend that emerges from the past decades of model-development and research in the addiction field, is that scientist of various disciplines now agree that addiction is a heterogeneous concept in terms of its antecedents, concomitants, and consequences. Simply acknowledging the multifaceted complexity of addiction however, does itself not necessarily lead to a better understanding of the phenomenon, nor does it provide a guidance for clinical decisions. To expand our views on addiction, it has become extremely important to examine the interactions between the various components of the full addiction complex in detail. Of particular importance is the question whether addiction constitutes a complex of highly interdependent problem areas that together form one underlying "addiction-dimension", or whether separate dimensions exist that are relatively independent from each other. Perhaps the most intriguing issue in this question is the relationship between substance abuse and psychopathology, as psychiatric disorders are often assumed to antedate and precipitate the onset and continuation of substance abuse. Clearly, the issue of dimensionality and the specific role of psychopathology in addiction is not only

important from a theoretical point of view, but also bears relevance to the treatment of addiction. While the unidimensional concept of the full addiction complex would argue for a treatment approach that primarily focuses on reduction of the actual substance use, under the assumption that this will more or less automatically lead to reduction of addiction-related problems in other areas, the multidimensional concept of addiction would argue for focused attention on each of the specific problem areas, including psychiatric symptomatology, independently.

This introductory chapter describes the context and perspective of the dissertation. First, the major models and research findings in the general field of addiction are briefly summarized as background of the study. Second, issues associated with dimensionality conceptualizations of addiction are discussed. Third, the relationship between psychopathology and addiction is examined. Fourth, the significance of psychopathology in the treatment of addiction is discussed. At the end of the chapter, the methodology and research questions on which this dissertation is based are described.

Models of Addiction

Dole and Nywswander (1967) already postulated that heroin addiction is a disease of the metabolism. Their practical intent was to replace the idea of addiction as a type of misbehavior with that of a disease model. Over the years the original metabolic disease concept has been revised in light of emerging discoveries in medical science. In the most recent statement, Dole (1988) emphasizes the central importance of narcotic receptor occupation. Dole postulates that the frequently observed relapse of heroin addicts is dependent upon a persistent derangement of the endogenous ligand-narcotic receptor system. Adequate daily doses of methadone correct this defect allowing for an essential stability and, in patients, "most remarkably, their interests shifted from the usual obsessive preoccupation with timing and dose of narcotic to more ordinary topics" (Dole, 1988, p. 3026; Dole, Nyswander, & Kreek, 1966). The discovery of endogeneous opiod peptides in the 1970's has led to an upsurge of interest in constitutional factors in the process of addiction. Research efforts in this field have specifically been focused on the chemistry of the brain (van Ree, 1979, 1987; De Wied, 1977; see for recent overviews of studies on this subject: Szara,

1986; Harris, 1987) as well as the role of genetic factors that constitute risk markers for addiction (Cloninger, Bohman, & Sigvardsson, 1981; Cadoret, Troughton, O'Gorman, & Heywood, 1986; Peele, 1986; Tarter, 1988).

From a psychodynamic perspective, addiction is primarily viewed as an attempt of the individual to cope with problems in controlling impulses and affects. Rado (1933) considered a high level of tension and little tolerance for pain to be essential for addicts. Drug use results from out of a need to reduce this tension. Regression to a narcistic state, characterized by immediate gratification and primitive needs, is the result of the absence of early childhood experiences in which basic needs were satisfied (Savitt, 1963; Khantzian, Mack, & Schatzberg, 1974; Kaplan & Wogan, 1978). Others emphasize the role of the overprotective mother in combination with the passive, emotionally absent father (Fort, 1954). Because of the dependent, symbiotic relationship with the mother, the individual cannot cope with feelings of insecurity and anxiety during adulthood. With the use of drugs the individual attempts to compensate for feeling vulnerable.

Elaborating these individually oriented psychodynamic views, Stanton and his colleagues formulated a family theory of addiction (Stanton et al., 1978; Stanton, 1979) which focuses on specific patterns of communication among family members. According to Stanton, drug abuse can best be understood by examining its functional meaning in the family system (Stanton, 1980). Addicts' families of origin have often experienced earlier traumatic loss; while the parents tend to depend on their children for emotional support, the adolescent child starts to individuate. Intense fear of separation occurs from both sides, as the child attempts to maintain close ties with the family as well as prepares to leave his parental home. Unable to choose, drug abuse provides a paradoxical resolution to this dilemma, both for the child and for the parents (Stanton, 1980). There have been numerous studies on the structure of addicts' families of origin. Among the more recently published studies, addiction has been found to be associated with early childhood separation and over-protection by the parents (Tennant & Bernardi, 1988), broken homes (Crawford, Washington, & Senay, 1980; Cadoret et al., 1986), and emotional rejection during childhood (Kaplan, Martin, & Robbins, 1984).

Opposing the view on addiction as symptomatic of underlying psychological impairment, Lindesmith (1938, 1947) proposed a model in which the distinction between initial drug use and the continuation of such use is a central element.

While initial experimentation with drugs can be attributed to such factors as drug availability and peer group behavior, continued drug use primarily serves the purpose of alleviating the withdrawal syndrome, provided that the individual correctly attributes the withdrawal symptoms to the drug. Lindesmith (1968) has refined his theory to emphasize that the association of the absense of the drug and the withdrawal symptoms is learned in interaction with other addicts. McAuliffe and Gordon (1974, 1975, 1980) have criticized the basic postulate of Lindesmith's theory of the social conditioned withdrawal syndrome as being the basis of addiction. In contrast, they developed a theory of opiate addiction that gives the central role to the establishment of euphoric effects. Addiction is caused in their theory by potent combinations of reinforcing effects including euphoria, impact ("the rush"), reduction of withdrawal and various psychotherapeutic and analgesic characteristics. Addiction is identified with the strength of the drug-taking response and is construed as a continuous variable rather than a qualitatively different state. Biernacki (1986) has reconstructed much of this theory and placed it within the framework of social identity and other cognitive processes that fix the addict to the social environment and provide both the potentials and obstacles for recovery.

Elaborating the reinforcement aspect of Lindesmith's theory, Wikler (1965, 1973) proposed a model of addiction that emphasizes the contribution of sets of conditioning mechanisms, that include pharmacological reinforcement (e.g. euphoria) and the pairing of either euphoric mood or withdrawal symptoms to behavioral and contextual cues. According to Wikler (1980; see also Schuster & Woods, 1968) both classical and operant conditioning factors play a central role in the processes of addiction and relapse, regardless of antecedent etiological variables such as premorbid personality. Addiction in this theory is a dynamic state that results in the addict moving through successive phases each of which has its own combination of reinforcement effects. Consequently, treatment should primarily focus on the extinction of classically conditioned abstinence and operantly conditioned drug self-administration (Wikler, 1980). This often involves a treatment regime involving both behavioral modification and narcotic antagonists (Martin, Gorodetzsky, & McClane, 1966).

Complementing research that has been specifically grounded on the above mentioned models, numerous studies have provided cumulative evidence for the heterogeneity of environmental and personal factors associated with the initiation and maintenance of drug use. For example, alcohol- and drug abuse

has been found to be more prevalent among adolescents and young adults than among older people and more prevalent among men than among women (Kandel, 1984; Robins, 1980; Robins et al., 1984). Several investigators have identified a specific sequence of stages of involvement in drug use (Kandel, 1980, 1984; Kandel & Logan, 1984; Yamaguchi & Kandel, 1984a, 1984b). Other studies have found substance abuse to be related to indices of educational functioning, including poor academic results (Newcomb, Maddahian, & Bentler, 1986), early dropout from school (Crawford et al., 1980), and truancy (Bachman, Johnston, & O'Malley, 1981), to traumatic events during childhood (Rounsaville, Weissman, Wilber, & Kleber, 1982; Dembo et al., 1987; Rohsenow, Corbett, & Devine, 1988), and to degree of urbanization (Bachman et al., 1981; Robins et al., 1984) Finally, several studies have documented the role of religion as a protective factor for substance abuse (Bachman et al., 1981; Newcomb et al., 1986; Hays, Stacy, Widaman, DiMatteo, & Downey, 1986; Kandel, 1984).

The Issue of Dimensionality

While the above outlined models have clearly each provided valuable contributions to the field of addiction, it has become evenly clear that none of these models does itself sufficiently explain or even describe the full addiction complex. Shaffer and Milkman (1985) have characterized the inadequacy of using categorical and narrow models as an outmoded trend of "reductionism and the addictions" (p. xii-xiii). Recognizing that present theoretical state-of-the art in addictions lacks a consistent operational paradigm, research must therefore adopt an attitude of "multidimensional considerations of biological, psychological, sociological, and behavioral heuristics." Translating this growing awareness of the multifaceted complexity of addiction into practice however, has proven to be a difficult task, as measurement instruments have been designed to collect information on either the actual substance use or on its co-existing problems and consequences, but not on the relationship between them.

A major contribution to the refinement of the diagnosis of addiction has been the formulation of a complex, interactive model of "drug-dependence" by the World Health Organization working group on "Nomenclature and classification of drug- and alcohol-related problems" (Edwards, Arif, & Hodgson, 1981). In this model, dependence is considered as a "psycho-physiological-social

syndrome determined and kept going by a complex system of reinforcements" (p. 225). The dependence syndrome construct was first developed in London for the purpose of demonstrating a distinct clinical syndrome of alcohol dependency that was independent of its sociopsychological consequences (Edwards & Gross, 1976), and has subsequently been broadened to include both alcohol and other psychoactive substances. The following elements have been proposed as central to the dependence syndrome (Edwards, Arif, & Hodgson, 1981): (1) a subjective awareness to use the substance, (2) a desire to stop substance use in the face of continued use, (3) a narrowing in the substance use repertoire, (4) tolerance and withdrawal symptoms, (5) avoidance of withdrawal symptoms by means of substance use, (6) salience of drug-seeking behavior relative to other important activities, and (7) readdiction liability.

Initial research on the validity of the dependence syndrome has focused exclusively on alcoholism (Stockwell, Hodgson, Edwards, Taylor, & Rankin, 1979; Chick, 1980; Hesselbrock, Babor, Hesselbrock, Meyer, & Workman, 1983). While these studies have demonstrated the utility of the construct in alcohol-abusing populations, no instruments were available to assess its validity with other psychoactive substances. With the introduction of the third version of the Diagnostic and Statistical Manual (DSM-III, American Psychiatric Association, 1980) it became possible to diagnose substance use disorders apart from other clinical syndromes. The distinction between "abuse" and "dependence" in the DSM-III however, has led to major criticism in the field (Rounsaville, Spitzer, & Williams, 1986a). Furthermore, the DSM-III criteria did not sufficiently reflect the proposed dependence syndrome. To make the DSM criteria more compatable with the dependence syndrome construct, major changes of the DSM-III have been proposed (Rounsaville et al., 1986a), that have been included in the DSM-III^R (APA, 1987). Comparison of the DSM-III criteria and the DSM-III^R criteria for substance use disorders has shown a high level of agreement between the diagnostic systems (Rounsaville, Kosten, Williams, & Spitzer, 1987a). In line with this trend toward greater compatability, the DSM-IV and the ICD-10 (both scheduled to be published in 1993) are currently developed in close cooperation (Frances, Widiger, & Pincus, 1989).

With the introduction of the DSM-III^R it became possible to investigate the validity of the dependence syndrome among abusers of non-alcoholic substances. Recently, research has suggested that the elements of the syndrome form an internally consistent, unidimensional scale across different psychoactive

substances (Kosten, Rounsaville, Babor, Spitzer, & Williams, 1986, 1987). Opiates, cocaine, stimulants, hallucinogens and sedatives all had reproducibility coefficients of > .90, indicating good approximation of a unidimensional and cumulative scale, while alcohol and cannabis had coefficients close to the .90 level (Kosten et al., 1987). Thus, within each substance of abuse category higher scores were congruent with more severe syndrome representation, suggesting that substance dependence can be conceptualized as a continuous variable. This in turn, calls into question the typological approach of categorical classification systems: "(...) the syndrome is manifested by the clustering of certain elements to form a single dimension, and since the syndrome is not all-or-none but dimensional, with increasing severity a substance abuser manifests more of its elements" (Kosten et al., 1987, p. 834). Furthermore, the dependence syndrome scales of each drug category generally showed low correlations with problems in other life areas, suggesting that "(...) the dependence syndrome constitutes one axis of drug problems, and other problems related to substance abuse, such as legal, occupational, and family consequences of drug use, form a separate, relatively independent axis" (Kosten et al., 1987, p. 834).

Complementing these developments in categorical psychiatric diagnosis, several investigators have examined the multi-axial conceptualization of the full addiction complex by using dimensional measures of functioning. Among the most prominent has been the work of McLellan and his colleagues, who used the Addiction Severity Index (ASI, McLellan, Luborsky, Woody, & O'Brien, 1980) to assess the severity of problems commonly associated with addiction along seven dimensions: medical, employment, alcohol use, drug use, legal, family/social, and psychiatric status. Using a global measure of problem severity in each of these areas, they found that the seven dimensions of addicts' functioning were generally independent from each other, both in pre-treatment status (McLellan et al., 1980, 1985) and in improvement from pre-treatment status to post-treatment status (McLellan, Luborsky, Woody, O'Brien, & Kron, 1981). Using the same instrument, Kosten, Rounsaville, and Kleber (1983) reached similar conclusions.

Theoretically, the absence of a relationship between severity of substance abuse and severity of concomitant problems calls into question the generality of models that view addiction as a sequential process that begins with initial substance use and gradually progresses into a general state of deterioration in other domains of functioning (Jellinek, 1960; Mulford, 1977). If substance abuse is such a "progressive disease", then one would expect that the severity of

concomitant problems is greatest in individuals with the most severe substance abuse (McLellan et al., 1981). Instead, the absence of a relationship suggests that "(...) it may be more reasonable to think of alcohol and drug abuse as a general syndrome having the common symptom of excessive chemical use, but varying permutations of other problems" (McLellan et al., 1981, p. 238), and that the progressive disease view is reflective of only a subgroup of addicts (McLellan et al., 1980, 1981; Kosten et al., 1983).

There is contradictory evidence stemming from a number of sources that suggests that the progressive disease concept may be challenged by other disease concepts. Three challenging concepts can be distinguished: a chronically relapsing model, a "maturing out" model and a situational model. There is much research evidence that many addicts after prolonged periods of abstinence will relapse and become readdicted (Hunt & Odoroff, 1962; Gossop, 1989; Hunt, Barnett, & Branch, 1971; Chaney, Roszell, & Cummings, 1982; McAuliffe, 1982; Stephens & Cottrell, 1972). This research leads to a disease concept that the addiction might indeed be a lifelong chronic disease that is characterized not so much by a process of progressive deterioration, but by prolonged periods of abstinence followed by sudden relapse. The dictum of alcohol anonymous of "once an addict, always an addict" illustrates the nature of this disease concept. The clinical consequences of this concept is that treatment is not enough and must be coupled with a program of after-care and "relapse prevention" that may even extend over a lifetime (Marlatt, 1985). In opposition to both the progressive disease and chronically relapsing disease models, is a disease concept of "maturing out" which contends that addiction is the result of being fixed into a particular stage of psychological development. The cessation of addiction occurs through a process of maturation in which the drug ceases to have the adaptive function it had at an earlier stage of development. This theory was first proposed by Winick (1962) in a study of the records of over 40,000 heroin addicts. A number of recent studies have critically elaborated this theory providing specfic explanations, mostly of a social-psychological nature, for the cessation of addiction through naturally occurring processes (Biernacki, 1986; Anglin, Bonett, Brecht, & Woodward, 1986; Waldorf, 1983; Swierstra, 1987; Maddox & Desmond, 1980). The clinical consequences of this naturally self-limiting disease concept has been to focus more attention on the manipulation of the social conditions of addicts than on offering expanded clinical interventions. The importance of drug counseling that recognizes the mechanism of

"spontaneous remission" and the process of "natural recovery" have been emphasized (Biernacki, 1986). A related disease concept has been proposed by Zinberg (1984) which may be termed "situational". Zinberg proposes that addiction and controlled use of drugs are related. Both normal use of drugs and addiction are the result of the interplay of a specific interaction of drug, set and setting factors. This theory gives critical importance to the functioning of rituals and social sanctions which modulate the interaction and lead to disease or other outcomes. The theory provides a social-psychological model involving the interplay of relative ego autonomy and social environment (Zinberg & Shaffer, 1985). A dramatic historical example that is often referred to in support of this situational disease concept is the experience of heroin addiction among the American soldiers during the Vietnam War. In Vietnam it was estimated that as much as one half of the soldiers were addicted to heroin, but on their removal from the social setting of the war zone only twelve percent became readdicted (Siegel, 1989; see also Robins, Davis & Goodwin, 1974; Ingraham, 1974). The practical consequences of this disease model is an emphasis on prevention and controlling and changing situational and environmental factors.

Addiction and Psychopathology

Whereas the generality of the disease concept seems to be limited, data from several studies have called into question the lack of a relationship between psychiatric problems and substance use problems. Although McLellan et al. (1981) provided support for a general independence between substance abuse and concomitant problems, they also found a moderate general relationship in both improvement scores and in outcome status measures, between the severity of psychiatric problems and the severity of problems in other areas, including substance abuse. In a study of Rounsaville, Kosten, Weissman, and Kleber (1985), currently depressed opiate addicts reported heavier recent use of both alcohol and opiates, and were rated as having a more severe drug problem on the ASI than non-depressed addicts. In addition, a lifetime history of depression was associated with heavier use of alcohol and sedatives. Similarly, Ross, Glaser, and Germanson (1988) found that patients with a lifetime or current psychiatric disorder had higher mean scores on various substance rating scales than those without these disorders. More recently, the work of Stoffelmayr, Benishek,

Humphreys, Lee, and Mavis (1989) has suggested that a general association exists between the severity of psychiatric problems and the severity of problems in other life areas, including medical, alcohol, drugs, legal, and social problems.

Given these conflicting findings, a more detailed examination of the relationship between addiction and psychopathology is necessary. In the literature, there are three basic hypothesis on this relationship. First, psychopathology represents a preexisting condition that precipitates and causes substance abuse. Second, psychopathology is a result of the pharmacologic effects and/or the social consequences of substance abuse. The third hypothesis, which has been addressed in the previous section, suggests that psychopathology is independent from substance abuse. In this section the two first hypotheses will be addressed.

While the early psychodynamic literature has relied heavily on case reports, the majority of empirical studies of the 1960's and early 1970's has relied mainly on data yielded by the Minnesota Multiphasic Personality Inventory (MMPI) in an attempt to identify a unique personality type which might be attributed to addicts. Most of these efforts have been focussed on the concept of sociopathy or psychopathy. On the basis of elevations on the Psychopathic Deviate scale of the MMPI, many investigators have argued that psychopatic traits, including impulsive acting out, low frustration tolerance and inability to sustain meaningful relationships, are characteristic of the addict's psychological "make up". In addition, addicts have been described as neurotic and psychotic (Hill, Haertzen, & Glaser, 1960), having internal locus of control (Berzins & Ross, 1973), having greater needs for aggression and sexuality (Reith, Crockett, & Craig, 1975), and exhibiting much sensation seeking behavior (Platt, 1975). However, given their cross-sectional and correlational designs, none of these studies have been able to provide evidence for the significance of these traits in the etiology of addiction. Reviewing the empirical literature on personality characteristic of heroin addicts, Craig (1979) concludes that "(...) it is impossible to determine whether these traits comprise the "addictive personality" and predated drug use, or whether they are the result of drug addiction" (Craig, 1979, p. 607). Nathan (1988) more recently argued that the literature has consistenly documented a link between antisocial behavior in childhood and adolescence and later alcoholism, but that it is primarily antisocial **behavior** and not **personality** that differentiates alcoholics from nonalcoholics. According to

Nathan (1988), the concept of personality is most often defined in the literature as internal, causal, and unique, whereas the factors reported in the literature on the link between personality and addiction have been overt, reactive and shared. The search for the 'addictive personality' has not been very successful. In his overview of studies on this subject, Platt (1986) states that "The most reasonable conclusion to draw based on available data (...) would seem to be that although addicts generally exhibit pathologic traits, there is low probability that a common pattern of personality traits is present in all addicts" (p. 164).

During the 1970's another line of empirical studies emerged on the relationship between psychopathology and addiction. Based on the psychoanalytic view on addiction as an attempt to cope with severe inner conflicts, several investigators have attempted to expand the early views by suggesting a causal relationship between underlying psychopathology and the choice of a specific drug. Empirical studies that attempted to determine the direction in this relationship however, have proven to be extremely problematic, as most measurement instruments have been designed to collect information on either psychopathology or addiction, but not on the interaction between them.

Milkman and Frosch (1973) were among the first investigators that empirically tested the hypothesis that the choice of a particular drug is tied to specific psychiatric symptomatology. On the basis of interview material of heroin and amphetamine users, they conclude that "The specific drug effects of "satiation" (heroin) and "activation" (amphetamine) temporarily aid in the reduction of anxiety by bolstering characteristic modes of defensive functioning" (p. 242). While the amphetamine users were characterized by an inflated sense of self-worth, the heroin users were primarily characterized by depression and low self-esteem. The issue of causality however, remains unclear: "It is (....) difficult to know if our findings represent a factor in the etiology of the pattern of drug use or the result of such drug use and its imposed life pattern" (p. 245).

The self-medication hypothesis of addictive disorders was elaborated in a series of studies by Khantzian and his colleagues (Khantzian et al., 1974; Khantzian, 1980, 1985). Khantzian views the selection mechanism of drug preference as "an interaction between the psycho-pharmacologic action of the drug and the dominant painful feelings with which they struggle" (Khantzian, 1985, p. 1259). While the major motive for opiate use is protection against intense feelings of aggression, cocaine use serves as a defense against acute and chronic feelings of depression, hypomania and hyperactivity (Khantzian, 1985).

McLellan and Druley (1977) analysed the distribution of psychiatric diagnoses in psychiatric patients who reported problem usage of a particular drug and in a non-drug problem group. The results showed that amphetamine or hallucinogen use was associated with a high incidence of paranoid schizophrenia and a low incidence of depression. Conversely, barbiturate use was asociated with a high rate of depression and a low rate of schizophrenia. The distribution of diagnoses in the alcohol and heroin group, although showing an elevated proportion of depression, was not significantly different from the distribution in the non-drug problem group. These results were largely confirmed in another study of McLellan, Woody, and O'Brien (1979), in which they compared the development of psychiatric disorders in a group of stimulant users, depressant users and opiate users over a 6-year period. They found that the primary drug was associated with the development of specific psychiatric symptomatology: psychotic disorders among stimulant users and depressive disorders among depressant users. The group of opiate users showed no change in psychopathology.

In a carefully designed study, Spotts and Shontz (1983) compared the MMPI scores of a group of combined stimulant users, combined depressant users and a group of nonusers. They generally found increasing MMPI scores from nonusers to stimulant users to depressant users, with profile shapes of the stimulant and depressant users being very similar. With regard to the particular drug of abuse, they found a stairstep elevation of MMPI scores from nonusers to amphetamine, cocaine, opiate and barbiturate/ sedative-hypnotic users. Blatt, Rounsaville, Eyre, and Wilber (1984) differentiated between a group of opiate addicts and a group of polydrug users, including users of barbiturates, cocaine, hallucinogens, marijuana and nonaddictive users of opiates. The group of opiate addicts was signigicantly more depressed than the polydrug group. Inspection of the symptom profile showed that this depression was primarily focussed around self-criticism (guilt, shame), rather than dependency (loneliness, rejection). Furthermore, within the polydrug group the intensity of self-criticism was positively related to the degree of involvement in opiate use. Schneier and Siris (1987) reviewed studies on the use of substances among schizophrenic and control populations and concluded that "(...) schizophrenic patients may use more amphetamines and cocaine, cannabis, hallucinogens, inhalants, caffeine, and tobacco, and less alcohol, opiates, and sedative-hypnotics than do other psychiatric patients or normal control subjects" (p. 650).

In contrast with studies that emphasize the role of psychopathology as an etiological factor in drug abuse, data from several studies have suggested that prolongued opiate use results in an increase of dysphoria. Haertzen and Hooks (1969) monitored changes in mood among male opiate addicts during a period of 60 days, in which subjects intraveneously administered heroin up to 95 mg daily. They found that the initial increase in euphoria after acute heroin administration tended to dissapear and was replaced by feelings of dysphoria, hyperirritability and decreased motivation for activity. These findings were confirmed in a study of Mirin, Meyer, and McNamee (1976), in which subjects were allowed self-regulated acces to increasing doses of heroin. While subjects initially (after 30 minutes) responded to the heroin with a more positive mood, prolonged use of heroin during the addiction cycle resulted in increasing psychopathology and dysphoria. Because of the absent negative side effects in the research setting (subjects did not need to hustle for the heroin), the authors conclude that "the observed increase in psychopathology and dysphoria in these subjects was more likely related to the pharmacologic effects of heroin itself" (p. 1507). Mirin continued his investigations of the adverse effects of the "heroin stimulus" in other areas and found, for instance, a suppressing effect on hormonal functioning (Mirin, Meyer, Mendelson, & Ellingboe, 1980; see also Meyer & Mirin, 1979). However, in a controlled comparison study, Mendelson and Mello (1982) confirmed that while chronic heroin use did have an effect on the hormonal levels of male addicts, it did not have an effect with respect to sexual behavior or pubertal development. More recently, Aronson and Craig (1986) described the role of cocaine as a possible precipitant of panic disorder. They found that panic attacks that began during recreational use of cocaine persisted autonomously even after three years of cocaine abstinence. According to Aronson and Craig, the long period of abstinence "makes a prolonged cocaine (...) abstinence syndrome extremely unlikely" (p. 644).

Despite its obvious importance, there have been few systematic investigations of the relationship between psychopathology and withdrawal symptomatology. In fact, most studies on psychiatric diagnoses in addicts have been performed in clinical populations, in which it is often difficult to differentiate between immediate post-use symptoms and enduring psychiatric symptomatology. Complicating the issue, several investigators have described the existence of an "abstinence phobia", in which the anticipation of being abstinent may produce anxiety through conditioning mechanisms and preoccupation with the

stressful demands of a drug-free life (Milby, Garrett, & Meredith, 1980; Hall, 1984). However, Khantzian, Gawin, Kleber, and Riordan (1984) have distinguished four subtypes at risk for cocaine abuse, one of which clearly was characterized as a postcocaine depression due to a withdrawal abstinence syndrome (see also Gawin & Kleber, 1986; Siegel, 1982).

In the past decade there has been a renewed interest in the relationship between addiction and psychopathology. Much greater emphasis has been placed on the significance of psychopathology in the treatment of addiction. This renewed interest echoes a general need throughout the addiction field for more direct clinical applicability of theory and research findings. For example, Shaffer and Neuhaus (1985) argued that "The absence of a practice theory in the field of addictions contributes still more to the confusion that surrounds the assessment of addictive behavior. Practitioners fail to distinguish between theories of addiction and theories of abstinence or controlled use" (Shaffer and Neuhaus, 1985, p. 88). Conversely, "Theorists continue to search for explanations that will satisfy and include a wide variety of perspectives (psychoanalytic, psychosocial, metabolic, biochemical, behavioral, etc.). These competing orientations serve to identify different theoretical camps rather than facilitate the conduct of eclectic, prescriptive clinical practice or the development of a practice theory " (Shaffer & Neuhaus, 1985, p. 100).

Two factors may have contributed to the recent upsurge of interest in the role of psychopathology in addiction treatment. First, data from several studies suggest an increase in psychological disturbance among treatment seeking addicts since the 1960's (McLellan, MacGahan, & Druley, 1979; De Leon, Jainchill, Kornreich, & Ortiz, 1986). Attempting to explain this trend, Rounsaville, Kosten, Weissman, and Kleber (1986b) speculated that "(...) to the extent that psychopathology is associated with treatment failure, a "silting up" process may be taking place, whereby treatment programs are treating a progressively larger proportion of those who have failed in previous treatment attempts to curtail opiate use"(p. 739). Concommitantly, there is increasing evidence that a considerable proportion of the psychiatric population has a high prevalence of alcohol and drug addiction (Fernandez-Pol, Bluestone, & Mizruchi, 1988; Hulsbos & Schaap, 1989; O'Farrel, Connors, & Upper, 1983). Second, new diagnostic systems have been developed, both in the field of general psychiatry and in the field of drug use, that offer potential benefits for use in addiction research and

treatment. As stated earlier, both the DSM-III and the DSM-III^R have made major contributions to the refinement of the diagnosis of addiction. Based on these diagnostic systems and on the Research Diagnostic Criteria (RDC; Spitzer, Endicott, & Robins, 1978), highly structured psychiatric interviews, like the Diagnostic Interview Schedule (DIS; Robins, Helzer, Croughan, & Ratcliff, 1981), the Schedule for Affective Disorders and Schizophrenia (SADS; Endicot & Spitzer, 1978), and more recently, the Structured Clinical Interview for DSM-III (SCID; Spitzer & Williams, 1985) have been developed, which have been shown to improve the (interrater) reliability of psychiatric diagnoses considerably. In addition, internationally there has been a trend toward greater compatability between diagnostic systems. In the addiction field, the primary example of this trend is the collaborative international project of the World Health Organization (WHO) and the US Alcohol, Drug Abuse, and Mental Health Administration (US-ADAMHA) on "Classification and Diagnosis" (Babor et al., 1988), which recently resulted in the development of the Composite International Diagnostic Interview (CIDI; Robins et al., 1988).

Since the beginning of the 1980's, many studies have been performed with the newly developed instruments. These studies have consistently shown considerable rates of psychiatric disorders among addicts. Although the rates of disorders still show some variation across studies, probably due to differences in sample characteristics and diagnostic criteria (Rounsaville, Rosenberger, Wilber, Weissman, & Kleber, 1980), the most commonly found disorders besides substance abuse and substance dependence have been antisocial personality, with rates varying from 19% to 55%, major depression (10% - 54%) and anxiety-related disorders (11% - 36%). Rates of schizophrenic and manic disorders have generally been found low (0% - 5%) (Rounsaville et al., 1980; Rounsaville, Cacciola, Weissman, & Kleber, 1981; Rounsaville, Weissman, Kleber, & Wilber, 1982; Kosten, Rounsaville, & Kleber, 1982, Khantzian & Treece, 1985; Jainchill, De Leon, & Pinkham, 1986; Gawin & Kleber, 1986; Ross et al., 1988).

Despite these high rates of diagnosable psychopathology, relatively few studies have used these newly developed diagnostic instruments to assess the prognostic significance of psychiatric disorders in addiction treatment. In a six-months follow-up study, Rounsaville, Weissman, Wilber, Crits-Christoph, and Kleber (1982) found that being in a depressive episode (according to RDC) was predictive of poorer outcome in the areas of illicit drug use and psychological symptoms, but unrelated to the areas of occupational functioning and legal

problems. In 2.5-year follow-up study, Rounsaville et al. (1986b) found most lifetime psychiatric disorders with a prevalence of greater than 10%, including major depression, chronic minor mood disorders, anxiety-related disorders and antisocial personality disorder, to be associated with poorer outcomes in the areas of current functioning and psychosocial adjustment, but not related to the areas of substance use, legal problems and medical problems. In a study among alcoholics, Rounsaville, Dolinsky, Babor, and Meyer (1987b) reported significant interactions in the relationship between diagnoses and treatment outcome for men and women. For both men and women, antisocial personality and drug abuse were predictive of poorer outcome. However, major depression was associated with poorer outcome for men, and with better outcome in drinking-related measures for women. In a study of Woody, McLellan, Luborsky, and O'Brien (1985), opiate addicts with specific combinations of disorders (according to the DSM-III criteria) were found to respond differently to treatment. Significant improvements on several outcome measures were seen among those with opiate dependence alone, opiate dependence plus depression, and opiate dependence plus depression plus antisocial personality. However, the group with only antisocial personality in addition to opiate dependence showed little evidence of improvement.

In addition to the advances in categorical psychiatric assessment, a number of studies has suggested the usefullness and prognostic value of a global measure of psychological disturbance. McLellan and his colleagues found that a global rating of severity of psychiatric symptomatology, derived from the Addiction Severity Index (ASI; McLellan et al., 1980) was the single best predictor of treatment outcome (McLellan et al., 1983a, 1986). Based on this finding, the ASI psychiatric severity rating has been found useful in matching clients to their most effective treatment program (McLellan et al., 1983a, 1983b). While the level of improvement from pre-treatment to post-treatment was highest for clients with low psychiatric severity and lowest for the high-severity clients in all types of treatment, mid-severity clients responded differently to different types of treatment. Elaborating this issue, Stoffelmayr et al. (1989) have argued that psychiatric problem severity is a better predictor of treatment outcome than specific psychiatric diagnosis. Given the fact that only two studies have directly compared the prognostic significance of both types of measures, this seems a premature conclusion. In the first study, Rounsaville et al. (1986b) found among opiate addicts that a global measure of psychiatric severity was a generally more

robust predictor of outcome than a specific psychiatric diagnosis and that the prognostic power of all disorders other than major depression was accounted for by a global severity dimension. In the second study, among alcoholics, Rounsaville et al. (1987b) found that covarying with a global psychiatric severity measure did not affect the predictive power of specific psychiatric disorders; both types of measures yielded unique prognostic information.

The Present Study: Research Questions and Methodology

Research Questions

Given the previously reported high prevalence of psychiatric disorders in addicts, it is extremely important to investigate the extent and the nature of the relationship between addiction and psychopathology, and the significance of co-existing psychopathology for the treatment of addiction. Research in this direction follows important international developments, and has been strongly recommended by the World Health Organization (Edwards et al., 1981). In studying this relationship, psychopathology should not be isolated from other co-existing problems. Instead, psychopathology should be investigated within a multidimensional framework, in which psychopathology takes a relative position to other domains of functioning. Medical, social, and legal factors also need consideration, as they often complicate the addiction process and the course of treatment.

From a clinical viewpoint, it is important to find more effective ways to treat the "dual diagnosis" patient, as undiagnosed, misunderstood or inappropriately treated co-existing psychopathology may be a major factor contributing to relapse in substance abuse treatment. To improve treatment, clinicians need tools that can correctly identify the severity of substance use and the presence of co-existing problems. Therefore, it is important to assess the usefulness, reliability, and validity of general psychiatric diagnostic instruments in addict populations, and of instruments specifically designed for use in an addict population. These include such widely used instruments as the DSM-III (APA, 1980), the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), and the Symptom Checklist-90 (Derogatis, 1983), and - as a representative of a scale specifically for substance abusers - the Addiction

Severity Index (McLellan et al., 1980). The latter instrument will be introduced in The Netherlands by means of the present study.

To increase the effectiveness of treatment, clinicians also need information on the significance of specific problem factors for the outcome of treatment. Research is urgently needed to identify subgroups of addicts who have a poor prognosis or who are at risk for premature termination of treatment. On the basis of such information, individual treatment programs may refine or modify their treatment methods, and appropriate patient-treatment "matches" may be identified, that will increase the overall effectiveness of the addiction treatment system.

To investigate these issues, the present study addresses the following questions:

1. What are the rates and correlates of psychiatric disorders in a clinical addict population? The distribution of DSM-III diagnoses in a sample of 152 addicts is described, as well as the extent and the nature of the associations among disorders, and between disorders and indices of substance use.

2. What is the usefulness, reliability and validity of the Addiction Severity Index (ASI) when applied in a clinical addict population in The Netherlands? The concept of the ASI is discussed and data are presented on the psychometric characteristics of the instrument in a sample of 264 addicts admitted to treatment. Of specific focus is the relationship among the ASI problem areas, because this relationship may provide insight into the dimensionality of substance use and its concomitant problems.

3. What is the usefulness of various dimensional instruments to screen for psychopathology in a clinical addict population? Data are presented on the sensitivity and specificity of the BDI, the SCL-90, and the psychiatry scale of the ASI for detecting DSM-III current depressive disorders, and DSM-III current anxiety-related disorders in a sample of 147 addicts in treatment.

4. What are the differences and similarities in self-reported psychopathology between Dutch and American heroin addicts in treatment? Fourty-seven

Dutch and 121 American white male heroin addicts are compared on their level of self-reported psychopathology measured by the BDI and the SCL-90.

5. What are the clinical features associated with retention in substance abuse treatment? First, differences in the conceptual approach of retention are discussed, and a literature review is presented of empirical studies since the 1970's on retention in substance abuse treatments. Second, data are presented on the background characteristics, patterns of substance use, psychosocial characteristics, and psychiatric status, associated with retention in a clinical detoxification center and a drug-free residential therapeutic community.

Methodology

To investigate these research questions, subjects were evaluated between 1987 and 1989 at the inpatient detoxification center De Weg in The Hague. This unit is part of the psychiatric hospital Bloemendaal, and serves both as a detoxification clinic and mode of entry for the drug-free residential therapeutic community Emiliehoeve in The Hague. Following clinical detoxification in De Weg, using methadone, and - if necessary - benzodiazepines (duration between 5 and 10 days), residential introduction is offered to clients who want to continue treatment after detoxification, to prepare them on entering long-term treatment. The Emiliehoeve is a hierarchichal therapeutic community with a capacity of approximately 35 beds, and with a planned duration of 12 months. Following treatment in the Emiliehoeve, clients enter an aftercare program, during which clients are for the greater part in a living-out situation. Clinical treatment in the Emiliehoeve is contraindicated for clients with manifest psychosis or suicidal behavior, and often for clients with no history of outpatient substance abuse treatment.

Subjects were consecutively admitted to the detoxification center, and were evaluated during the first week following admission. In the first session, usually on the first or second day after admission, the ASI (McLellan et al., 1980), the BDI (Beck et al., 1960), and the SCL-90 (Derogatis, 1983) were administered by trained staff members. In the second session, usually one week after the first

session, clients who were still in treatment were evaluated with the DIS (Robins et al., 1981) to obtain a DSM-III (APA, 1980) diagnosis. Of this latter group, a nonsystematic "sample of convenience" was also evaluated with the Nederlandse Verkorte MMPI (NVM, Dutch abbreviated MMPI; Luteijn & Kok, 1985). In all cases and at all times, participation in the study was on a voluntary basis.

Staff members of the detoxification center were trained in administering the ASI by the author of this dissertation. The author received training at the Substance Abuse Treatment Unit of the Philadelphia Veterans Administration Medical Center, were the ASI was originally developed. Training of the staff members included observation of a series of interviews and several practice interviews with a supervisor present. Also, a manual was available in which the concept, the interviewer ratings and the individual items are discussed.

The DIS was administered by interviewers with a master's degree who had experience in psychiatry and interviewing. Training in administering the DIS included observation of video-tapes and a series of supervised practice interviews.

Table 1. Instruments and Samples in the Study

Instruments	Sample size	Sample type
Addiction Severity Index	321	Full sample/consecutive
Beck Depression Inventory (13-item)	280	Full sample/consecutive
Beck Depression Inventory (21-item)	185	Subsample/consecutive
Symptom Checklist-90	275	Full sample/consecutive
Nederlandse Verkorte MMPI	104	Subsample/nonsystematic
Diagnostic Interview Schedule	159	Subsample/consecutive

Note. The differences in sample size between the ASI, the 13-item BDI, and the SCL-90 are due to (nonsystematic) missing cases.

Between 1987 and 1989, a total of 321 subjects were evaluated with the ASI (see Table 1). In the first months of the study, the BDI was administered only in its 13-item version (Beck & Beck, 1972; Bouman, Luteijn, Albersnagel, & van der Ploeg, 1985). During the study period, this version was replaced by the

full 21-item BDI (Beck & Steer, 1987; Bouman et al., 1985). Of the full sample of 321 subjects, the short version and the long version of the BDI were administered in respectively 280 and 185 subjects. For the SCL-90, assessments were made in 275 subjects. The NVM was administered in 104 subjects. Data on DIS/DSM-III diagnoses were obtained in 159 subjects.

Analyses in this study were performed while the process of data collection continued. Therefore, the number of data included in the various analyses differ between the chapters of this dissertation. In addition, these numbers differ because of overlap in missing observations between the samples displayed in Table 1.

The data in this study were analyzed using the Statistical Package for the Social Sciences (SPSS^x, 1983, 1988).

Chapter 2

PSYCHIATRIC DISORDERS IN A DUTCH ADDICT POPULATION: RATES AND CORRELATES OF DSM-III DIAGNOSIS

INTRODUCTION

In the past decade several measures have been developed to improve the validity and reliability of psychiatric diagnoses. In addition to the Research Diagnostic Criteria (RDC; Spitzer, Endicott, & Robins, 1978) and the third version of the Diagnostic and Statistical Manual (DSM-III; American Psychiatric Association, 1980), several structured psychiatric interviews have been introduced for use in community surveys. These instruments, like the Schedule for Affective Disorders and Schizophrenia (SADS; Endicott & Spitzer, 1978) and the National Institute of Mental Health Diagnostic Interview Schedule (NIMH-DIS; Robins, Helzer, Croughan, & Ratcliff, 1981) have been shown to improve the reliability of psychiatric diagnoses considerably (Robins, Helzer, Ratcliff, & Seyfried, 1982; Helzer et al., 1985). With the development of these highly structured psychiatric interviews there has been a growing interest in the prevalence of psychiatric disorders in addict populations. In the past decade several diagnostic studies have been performed which have consistently shown a considerable degree of psychopathology in this group. Besides the substance abuse and substance dependence disorders, the most prevalent disorders found have been antisocial personality (ASP), with rates varying from 19% to 55%, major depression (10%-54%) and anxiety-related disorders (11% - 36%) (Rounsaville, Rosenberger, Wilber, Weissman, & Kleber, 1980; Rounsaville, Cacciola, Weissman, & Kleber, 1981; Rounsaville, Weissman, Kleber, & Wilber, 1982; Kosten, Rounsaville, & Kleber, 1982; Khantzian & Treece, 1985; Jainchill, De Leon & Pinkham, 1986; Gawin & Kleber, 1986). Rates of schizophrenic and manic disorders have generally been found low (0% - 5%).

The relationship between addiction and psychopathology is extremely complex. This complexity is reflected by differences in conceptual approach and diverse interpretations in the literature on this subject. For example, some authors argue that psychiatric disorders represent preexisting conditions and propose a self-medication model of addiction in which drugs are used to control

a variety of painful affects (Milkman & Frosch, 1973; Khantzian, Mack, & Schatzberg, 1974; Khantzian, 1985; Schneier & Siris, 1987). Others emphasize that psychiatric disorders may develop as a consequence of the addiction, tied to the pharmacological effects of the drug itself (Haertzen & Hooks, 1969; Mirin, Meyer, & McNamee, 1976) and to the sociocultural context in which the drug-taking behavior takes place (Sederer, 1985, p. 187).

Attempts to describe this relationship empirically have proven to be extremely difficult, as most measurement instruments are designed to collect information on either psychopathology or addiction, but not on the interaction between them. Diagnostic studies in addict populations are often complicated by the presence of psychiatric symptoms that are a direct result of intoxication or withdrawal. For example, somatic symptoms associated with depression (loss of appetite, sleep impairment etc.) might be caused by the psychopharmacological action of a drug rather than by depression. As these drug-induced symptoms tend to disappear on their own within a certain period of abstinence, it is important to distinguish them from "true" depressive symptoms. Another complicating factor is the presence of **multiple** diagnoses in addition to substance abuse. The presence of other psychiatric disorders in addition to the disorder in question might contribute to the lack of homogeneity in etiology and prognosis commonly found in discrete diagnostic groups. For example, subgroups of addicts with specific combinations of disorders have been shown to respond differentially to treatment (Woody, McLellan, Luborsky, & O'Brien, 1985). As alcohol or drug abuse can be accompanied by almost any psychiatric disorder (Schuckit, 1985), the question of multiple diagnoses may be of particular relevance to this population.

Whereas much of the research efforts in the past have been devoted to the search for unique "addictive personality" traits (Craig, 1979), there is now a growing awareness that "(...) there is little basis for assuming commonality of such traits among addicts" (Platt, 1986, p. 351). Given the complex interactions between addiction and psychopathology, classification research today has to focus attention to the **relationship** between diagnostic variables.

The study presented in this chapter used the NIMH-DIS for making DSM-III diagnoses without using the diagnostic hierarchy of the DSM-III. This allowed for the assignment of multiple diagnoses and relating the presence of multiple diagnoses to drug use factors. The purpose of this study was (1) to describe the distribution of DIS/DSM-III disorders in a Dutch addict population, (2) to

investigate the relationship between the diagnosed disorders and (3) to compare diagnostically related groups on specific drug use and drug-related variables.

METHODS

Subjects

The study sample consisted of 152 subjects who were consecutively admitted to the inpatient detoxification center De Weg in The Hague. This unit is part of a psychiatric hospital and serves both as a detoxification clinic and as a mode of entry for a residential drug-free therapeutic community. Upon admission to the detoxification clinic, clients are involved in a variety of structured activities which include group (encounter) therapy sessions, educational seminars, unit meetings and a variety of physical activities. Upon admission, clients who had been using opiates were given a dose of methadone to prevent withdrawal and this dose was subsequently decreased over time.

The subjects in the sample were predominantly male (80.1%) and unmarried (94.0%). Ethnicity was as follows: 81.3% Whites, 8.0% Surinamese, 5.3% Asian, 2.7% Moroccan and 2.7% other. Age ranged from 16 to 42 years. The mean age was 27.25 years (SD = 5.01 years). While 90.1% reported regular (more than three days a week) polydrug use, most of the subjects (70.0%) considered heroin as their primary drug. Cocaine was the primary drug for 13.3% of the subjects. The number of years of heroin use ranged from 1 to 20 years. The mean number of years of heroin use was 5.42 (SD = 3.97 years).

Assessments

Subjects were evaluated during the first week following admission to the detoxification center. Each subject was seen for two sessions. In the first session, on the first or second day after admission, the following instruments were administered by trained staff members:

Addiction Severity Index (ASI). The ASI (McLellan, Luborsky, Woody, & O'Brien, 1980) is a semi-structured interview that collects data in the areas of medical health, employment, alcohol use, drug use, criminality, social problems

and psychiatric problems. In each of these problem areas the interviewer provides an estimate of problem severity on a scale ranging from 0 to 9. In American studies the ASI has shown high interrater reliability, high test-retest reliability and evidence of concurrent and discriminant validity across a range of client types (McLellan et al., 1980, 1985; Kosten, Rounsaville, & Kleber, 1983). In the present study a Dutch translated and adapted version of the ASI was used (Hendriks, 1987). This Dutch version has shown psychometric charateristics that are very similar to those of the American original. For example, the average internal consistency reliability of the subscales of the Dutch ASI amounted to .75 (Hendriks, Kaplan, van Limbeek, & Geerlings, 1989).

Beck Depression Inventory (BDI). The BDI (Beck, Mendelson, Mock, & Erbaugh, 1961; Bouman, Luteijn, Albersnagel, & van der Ploeg, 1985) is a self report inventory that measures affective, cognitive, motivational and somatic symptoms of depression. The BDI is scored by summing the items which are rated on a 4-point scale ranging from 0 to 3. In the present study a 13-item version was used; in an earlier study this version has been demonstrated to have the highest sensitivity (94%) and specificity (59%) of several screening instruments for assessing depression in an addict population (Rounsaville, Weissman, Rosenberger, Wilber, & Kleber, 1979). The internal consistency of the 13-item Dutch BDI in the present study was .84.

Symptom Check List-90 (SCL-90). The SCL-90 (Derogatis, 1983; Arrindell & Ettema, 1981, 1986) is a multidimensional self report inventory designed to assess the psychological symptom patterns of psychiatric and medical patients. It is a widely accepted psychological screening instrument for detecting psychopathology in addicts. For example, the instrument has shown usefulness in identifying psychological distress in methadone patients (Jacobs, Doft, & Koger, 1981) and in documenting psychotherapeutic benefit in opiate addicts (Woody et al., 1983). The internal consistency of the SCL-90 dimensions in the present study ranged from .81 for the Agoraphobia scale to .89 for the Depression scale. Following the recommendations of Derogatis (1983, p. 11), in the present study the mean total score of the SCL-90 was used as a general index of symptom severity.

Diagnostic Interview Schedule (DIS). In the second session, generally one week after the first, psychiatric diagnoses were obtained by a trained psychologist, using the third version of the DIS (Robins et al., 1981; van Limbeek et al., 1986). The DIS is a highly structured psychiatric interview that can be used to make a diagnosis according to the DSM-III criteria. The interviewer evaluates the

presence and severity of each symptom that serves as a criterion for a diagnosis and determines whether the symptom occurred at least once whithout a definitive physical cause (i.e. medication, alcohol or drug use, physical illness or in injury). A symptom is coded positive only when all these criteria are met. The DIS examines psychiatric disorders in terms of both lifetime and recent diagnoses. In the present study a diagnosis was considered "recent" when the most recent occurrence fell within six months prior to the assessment, with two exceptions. First, antisocial personality was considered only as a lifetime disorder. Second, because the NIMH-DIS does not ask for recency of symptoms of a dysthymic disorder, a "recent" diagnosis of dysthymic disorder could not be made. In addition, a diagnosis of generalized anxiety disorder could not be made because this diagnosis was not included in the third version of the DIS. In order to systematically assess overlap between diagnoses, the diagnostic hierarchy of the DSM-III was not used. Thus, multiple diagnoses were assigned if they were present. Earlier studies with the DIS have shown high concordance between lay interviewers' DIS diagnoses and psychiatrists' diagnoses in a general population (mean Kappa value across diagnoses .69; Robins et al., 1981) and high concordance between interviewers' DIS diagnoses in an addict population (mean Kappa value .99; Ross, Glaser & Germanson, 1988). In the present study no reliability data were gathered.

Data Analysis

Overlap in diagnosis was assessed for the three most prevalent diagnostic categories in the study sample: antisocial personality disorder (ASP), depressive disorder (major depressive episode (single or recurrent), atypical bipolar disorder and dysthymia) and "anxiety-related" disorder (obsessive compulsive disorder, agoraphobia, social phobia, simple phobia, somatization disorder and panic disorder)(see Table 1). In order to examine the magnitude of the relationships among these (nominal) variables, odds ratios (Knoke & Burke, 1980) were calculated on the basis of 2 x 2 contingency tables. The odds ratio is the number of respondents with both characteristics times the number of respondents without these characteristics, divided by the product of the number of respondents with only characteristic A and those with only characteristic B. Odds ratios were used because they provide a single summary statistic of the extent to which the two

categories of diagnosis A (yes/no) differ in the chance of being in one category of diagnosis B relative to being in the other category of diagnosis B. An odds ratio of 1.00 indicates complete independence of the diagnoses. Odds ratios larger or smaller than 1.0 indicate respectively direct covariation or an inverse relationship. Chi-square was used to test whether the odds ratio differed significantly from 1.

In order to account for the relationship between the diagnostic subgroups, a three-way analysis of variance was employed to compare the demographic variables age and years of education and the drug use variables of those with and without a diagnosis of antisocial personality, depressive disorder and anxiety-related disorder. Mean differences between those with and without a diagnosis were only considered to be significant if the overall ANOVA F was significant at $p < .05$. Chi^2-analyses were used to test the significance of the relationship between the (categoric) demographic variables sex and race and the diagnostic subgroups.

Of the demographic variables, age and years of education were significantly related to the diagnostic groups and to several dependent variables. Since demographic variables were of only secondary interest, it was decided to employ age and years of education as covariates in the analysis of variance of the drug use variables.

RESULTS

Distribution of DSM-III Diagnoses

As shown in Table 1, the most prevalent lifetime disorder in the study sample, other than substance abuse and substance dependence, was antisocial personality (59.9%), followed by major depression (36.8%) and dysthymic disorder (35.5%). Anxiety-related disorders were also commonly diagnosed, with 25.0% reporting agoraphobia, 25.7% reporting social phobia and 17.8% reporting a panic disorder. Less common diagnoses were mania (5.3%), schizophrenia (3.9%) and somatization disorder (0.7%).

Table 1. Lifetime and Six-Month Prevalence of DSM-III Disorders (N = 152)

	Lifetime prevalence (%)	Six-month prevalence (%)
Mania	5.3	3.9
Major depressive episode	36.8	31.6
Dysthymia	35.5	-
Alcohol abuse	59.2	27.6
Alcohol dependence	52.0	23.7
Drug abuse	96.7	95.4
Drug dependence	96.7	95.4
Schizophrenia	3.9	3.9
Obsessive compulsive disorder	12.5	7.9
Agoraphobia	25.0	21.1
Social phobia	25.7	20.4
Simple phobia	11.2	10.5
Somatization disorder	0.7	0.7
Panic disorder	17.8	15.1
Agoraphobia with panic attacks	16.4	11.8
Antisocial personality disorder (ASP)	59.9	-
Pathologic gambling	14.5	4.6
Any depressive disorder[a]	50.7	35.5
Any anxiety-related disorder	41.4	36.2
Any non-substance psychiatric disorder (including ASP)	82.9	80.3
Any non-substance psychiatric disorder (excluding ASP)	60.5	50.7

Note. Dysthymia and antisocial personality disorder are considered only as lifetime disorders.
[a] Dysthymia is included in lifetime prevalence and excluded in six month prevalence.

Taken together, 50.7% reported at least one of the depressive disorders (major depressive episode (single or recurrent), atypical bipolar disorder and dysthymia) during their lifetime and 41.4% was diagnosed as having a lifetime anxiety-related disorder (obsessive compulsive, agoraphobia, social phobia, simple phobia, somatization disorder and panic disorder). Overall, 82.9% of the study sample met the criteria for having had at least one non-substance psychiatric disorder during their lifetime, including antisocial personality. Excluding antisocial personality, this rate was 60.5%.

A cross-tabulation of these lifetime rates with sex yielded two significant relationships. There was a greater tendency for women to be diagnosed with an obsessive compulsive disorder (33.3%; $Chi^2(1, N=151)=12.40$, $p<.001$) and a panic disorder (33.3%; $Chi^2(1, N=151)=4.85$, $p<.05$) than for men (7.4% and 14.0% respectively).

Depressive and anxiety-related disorders were also commonly diagnosed during the six months prior to the interview, with 31.6% of the sample meeting the criteria for major depression, 21.1% for agoraphobia, 20.4% for social phobia and 15.1% for a panic disorder. Including antisocial personality, 80.3% was found to have a non-substance psychiatric disorder within the six months prior to the assessment. When antisocial personality was excluded, this rate amounted to 50.7%.

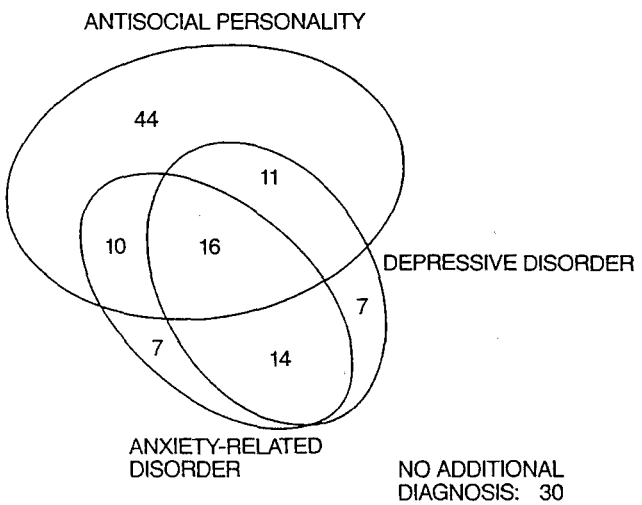
Significant differences in six month prevalence between men and women were found for a panic disorder ($Chi^2(1, N=151)=7.83$, $p<.01$) and the category "any non-substance abuse axis I" disorder ($Chi^2(1, N=151)=6.40$, $p<.05$). Both disorders were more prevalent among women (33.3% and 73.3% respectively) than among men (10.7% and 45.5% respectively).

Overlap Between DSM-III Diagnoses

The present results suggested a considerable degree of overlap between diagnoses. Figure 1 shows the co-occurrence of the three most prevalent recent diagnostic categories besides substance use in the study sample, e.g. antisocial personality disorder, depressive disorder and anxiety-related disorder (To minimize the influence of other disorders, subjects with a diagnosis of mania or schizophrenia were excluded from the analysis ($N=12$)). The data indicate that depressive and anxiety-related disorders were most often present in combination

with another disorder. The largest subgroup consisted of respondents who only met the criteria for an antisocial personality disorder in addition to a substance use disorder. The numbers of respondents with only depression or only anxiety are low. In contrast, a considerable number of respondents received all three diagnoses. Again limiting the results to antisocial personality disorder, depressive disorder and anxiety-related disorder, 21.6% of the subjects had no additional DSM-III diagnoses, 41.7% had one additional diagnosis, 25.2% had two diagnoses and 11.5% had all three diagnoses.

Figure 1. Co-occurrence of Recent DSM-III Diagnoses (N = 139)



Note. Subjects with other diagnoses (mania and schizophrenia) were excluded (N = 12) and one case had missing data.

The magnitude of the relationships between the three defined diagnostic subgroups was determined by calculating the odds ratios. Table 2 shows the odds ratios for each pair of diagnoses. Although antisocial personality was most often diagnosed in combination with another disorder, the relationships between this disorder and the other two disorders were not significant ($p > .05$). In contrast, there was a strong relationship between depression and anxiety ($Chi^2(1,$

N = 139) = 25.04, p < .0001). The odds of having a recent anxiety-related disorder were more than seven times as high for someone with a recent diagnosis of depression than for someone without this diagnosis.

The strength of these relationships was further explored for differences between men and women. The odds ratios for the co-occurrence of ASP and a depressive disorder and for the co-occurrence of ASP and an anxiety-related disorder were very similar for men (0.84 and 0.87 respectively) and women (1.50 and 1.14 respectively). However, the presence of a depressive disorder increased the odds of having an anxiety-related disorder 11.08 times for men (Chi^2(1, N = 114, p < .0001), but only 1.60 times for women (Chi^2(1, N = 25) = 0.03, p > .1).

Table 2. Odds Ratios for Coexistence of Recent DSM-III Diagnoses (N = 139)

Pair of diagnoses	Odds ratio	Chi^2	p <
Antisocial personality x depression	0.88	0.03	ns
Antisocial personality x anxiety	0.83	0.10	ns
Depression x anxiety	7.25	25.04	.0001

Drug Use Correlates of DSM-III Diagnoses

To decide whether demographic variables should be controlled for in the comparison of drug use variables, a three-way analysis of variance was employed to compare those with and without a diagnosis of antisocial personality disorder, depressive disorder and anxiety-related disorder on age and years of education. Mean differences between those with and without a diagnosis were only considered to be significant if the ANOVA F for main effects was significant at $p < .05$. The significance of the relationships between the categoric variables sex and race and the diagnostic subgroups was tested by using Chi^2-analyses.

As shown in Table 3, there were significant differences across the diagnostic subgroups for age (F(3, 138) = 3.42, p < .05) and years of education (F(3, 138) = 4.35, p < .01). Respondents with a diagnosis of antisocial personality had a significantly lower mean age (F(1, 138) = 8.51, p < .01) and lower mean level of education (F(1, 138) = 10.22, p < .01) than those without this diagnosis. Sex and race

were not significantly related ($p>.05$) to any of the diagnostic subgroups. There was a significant interaction between antisocial personality and anxiety-related disorder for the number of years of education ($F(3, 138)=3.33$, $p<.05$). Subjects without ASP had a significantly higher education level than those with ASP only if an anxiety-related disorder was absent (mean number of years of education: ASP-only 9.58; ASP and anxiety 9.85; anxiety-only 9.86; no ASP and no anxiety 11.84).

Because of these significant relationships, age and years of education were used as covariates in a three way analysis of covariance, comparing the drug use factors of subjects with and without a diagnosis of antisocial personality, depressive disorder and anxiety-related disorder.

Table 3. Demographic Correlates of DSM-III Diagnoses (N = 139)

	Diagnostic groups							
	Antisocial personality		Depressive disorder		Anxiety-related disorder			
	No	Yes	No	Yes	No	Yes	F	p<
n	58	81	91	48	92	47		
Age (years)	28.79	26.37[a]	27.01	28.08	27.33	27.49	3.42	.05
Years of education	11.12	9.67[a]	10.53	9.79	10.49	9.85	4.35	.01
% of males	74.1	87.7	84.6	77.1	85.9	74.5		
% of Whites	84.5	77.5	80.2	80.9	78.3	84.8		

Note. Comparisons were made by analysis of variance for continuous variables and by chi^2 analysis for categoric variables.

[a] F ratio for group comparison significant at $p < .01$.

As indicated in Table 4, the presence of an antisocial personality disorder was significantly related to longer heroin use ($F(1, 138)=7.60$, $p<.01$) and to longer polydrug use ($F(1, 138)=14.72$, $p<.001$). The presence of depression was related to higher mean severity ratings on the ASI in the medical problem area ($F(1, 138)=4.41$, $p<.05$), the alcohol problem area ($F(1, 138)=7.74$, $p<.01$) and the

psychiatric problem area ($F(1, 138)=6.07$, $p<.05$) and to a higher mean total score on the SCL-90 ($F(1, 132)=6.03$, $p<.05$). The presence of an anxiety-related disorder was significantly related to a higher mean social severity rating ($F(1, 138)=9.10$, $p<.01$) and psychiatric severity rating ($F(1, 138=6.91$, $p<.01$) on the ASI and to a higher mean score on the BDI ($F(1, 126)=7.17$, $p<.01$) and the SCL-90 total score ($F(1, 132)=11.43$, $p<.001$). None of the diagnostic groups was related to drug use in the previous month.

Interactions between the diagnostic groups were present in two comparisons. In the medical problem area of the ASI a highly significant three-way interaction occurred ($F(1, 138)=14.70$, $p<.001$). Subjects without any additional diagnoses had the lowest mean severity rating on the ASI medical scale of all subgroups (0.67). The presence of a depressive disorder resulted in a high mean severity rating (4.00), but did so only under the condition that ASP and anxiety were absent. The presence of antisocial personality or anxiety, either alone or in combination, resulted in less extreme scores, ranging from 1.50 for the ASP plus anxiety group to 2.88 for the group with all three diagnoses. A three-way interaction effect was also present for the SCL-90 total score. Subjects without any additional diagnoses had the lowest mean score on the SCL-90 (165.69). The presence of ASP resulted in moderately low scores, ranging from 184.50 for the ASP plus anxiety group to 187.33 for the ASP-only group, with the exception of the high mean score of the subjects with all three diagnoses (239.00). High scores were also found in the anxiety-only group (229.29), the anxiety plus depression group (240.92) and the depression-only group (207.57).

In general, the differences between subjects with and without ASP, depression or anxiety were mainly attributable to the scores of the group without any additional diagnoses. Compared with all possible combinations of the three most prevalent disorders (ASP-only, depression-only, anxiety-only, ASP plus depression, ASP plus anxiety, depression plus anxiety, ASP plus depression plus anxiety) this group had the longest education history (11.97 years), the shortest history of polydrug use (2.83 years), the lowest medical and psychiatric severity rating on the ASI (0.67 and 3.87 respectively) and the lowest BDI and SCL-90 total score (10.78 and 165.69 respectively).

Table 4. Drug use correlates of DSM-III diagnoses (N = 139)

	Diagnostic groups							
	Antisocial personality		Depressive disorder		Anxiety-related disorder			
	No	Yes	No	Yes	No	Yes	F	p<
n	58	81	91	48	92	47		
Years of use								
Heroin	4.71	6.00[a]	5.52	5.35	5.64	5.11	2.82	.05
Polydrug	3.22	5.27[b]	4.29	4.67	4.41	4.43	4.97	.01
Days of use in past month								
Heroin	18.90	18.01	20.35	14.65	19.95	15.32	2.37	ns
Cocaine	10.83	10.90	12.07	8.60	10.91	10.79	1.10	ns
Amphetam.	0.41	1.16	0.90	0.75	0.71	1.13	0.35	ns
Sleep. pills	5.69	6.57	5.51	7.52	5.45	7.68	0.56	ns
Tranquill.	3.66	5.51	4.13	5.88	4.10	5.98	0.69	ns
Marijuana	6.67	10.51	8.89	8.94	9.02	8.68	0.72	ns
Alcohol	5.91	6.02	4.38	9.00	5.12	7.66	1.90	ns
Polydrug	17.17	19.23	19.15	16.90	18.53	18.06	0.62	ns
ASI severity ratings (0-9)								
Medical	1.71	1.98	1.51	2.54[c]	1.60	2.38	2.89	.05
Employment	3.22	3.70	3.53	3.46	3.40	3.70	1.61	ns
Alcohol	2.26	1.88	1.47	3.10[a]	1.65	2.79	4.96	.01
Drugs	5.31	6.09	5.86	5.58	5.88	5.53	2.38	ns
Legal	2.79	3.68	3.44	3.06	3.32	3.30	1.85	ns
Social	4.79	4.65	4.69	4.75	4.45	5.23[a]	3.24	.05
Psychiatric	4.57	4.57	4.11	5.44[c]	4.11	5.47[a]	7.76	.001

Note. Comparisons were made by analysis of covariance, using age and years of education as covariates.
[a] F ratio for group comparison in ANCOVA significant at $p < .01$.
[b] F ratio significant at $p < .001$.
[c] F ratio significant at $p < .05$.

Table 4. Continued

	Diagnostic groups							
	Antisocial personality		Depressive disorder		Anxiety-related disorder			
	No	Yes	No	Yes	No	Yes	F	p<
n	58	81	91	48	92	47		
BDI (0-39)	13.56	12.78	12.30	14.66	11.77	15.66[c]	3.88	.05
SCL-90 total	196.34	196.79	183.22	222.78[c]	181.60	225.93[b]	9.91	.001

Note. Comparisons were made by analysis of covariance, using age and years of education as covariates.
[a] F ratio for group comparison in ANCOVA significant at $p < .01$.
[b] F ratio significant at $p < .001$.
[c] F ratio significant at $p < .05$.

DISCUSSION

The data indicate that the overall rate of diagnosable psychopathology in a Dutch addict population was comparable to that found in American samples (Rounsaville et al., 1980, 1981, 1982, 1985; Kosten et al., 1982; Khantzian & Treece, 1985). In the present study, rigorous diagnostic criteria were used and great care was taken to ensure that symptomatology was not due to the effects of substances or withdrawal. Therefore it is unlikely that the high rates of depression and anxiety-related disorders reflect bias due to temporary drug effects.

Depression was prevalent both in its episodic and chronic form. Although dysthymic disorder was introduced in DSM-III as a separate category representing a chronic, subsyndromal form of depression, many of the subjects with a diagnosis of dysthymic disorder (61.1%) also met the criteria for major depression. Reports in the field of general psychiatry have suggested that this high degree of overlap between dysthymia and major depression is mainly due to the lack of distinction between the severity criteria of both disorders (Kocsis &

Frances, 1987). Further differentiation of these severity criteria is needed, and may be of particular relevance for addict populations, because mild to moderate depressive symptoms are common in this group (Rounsaville et al., 1982).

The anxiety-related disorders found in this sample, consisted primarily of phobic and panic disorders. The clinical picture of this group was dominated by such symptoms as fear to go out of the house alone, to use public transportation, and to speak in public, often to the point that panic attacks occurred. This symptom pattern may reflect the role of progressive social isolation that often coincides with prolonged drug use. Other authors (Milby, Garret & Meredith, 1980; Hall, 1984) have hypothesized that the anticipation of being abstinent may produce symptoms of anxiety that are similar to those found in other phobias.

The high frequency of ASP may partly represent overinclusiveness of the DSM-III criteria (Rounsaville et al., 1982; Woody et al., 1985; Hesselbrock, Meyer, & Keener, 1985, Khantzian & Treece, 1985), in that the DSM-III does not require antisocial behavior to be independent of drug use. Application of the DSM-III^{R} criteria (A.P.A., 1987) would probably have resulted in a considerably lower rate of ASP disorders, because questions on repeated drunkenness and substance abuse before the age of 15, and questions on pimping, prostitution and selling of drugs since the age of 18 are excluded in this version. In the present study, a minority (11.3%) started using drugs before the age of 15. Additional analyses showed, that the prevalence of ASP was significantly higher in this group, than among subjects who started using drugs after the age of 15 (93% and 56 %, respectively).

There was a general tendency toward co-occurrence of ASP, depression and anxiety, because nearly half (46.8%) of the subjects who had one of these diagnoses met the criteria for two or all three disorders. First, nearly half (45.7%) of the subjects with ASP shared this diagnosis with anxiety and depression. Similar rates of comorbidity have been reported in other studies of substance abusers (Rounsaville et al., 1982; Khantzian & Treece, 1985) and alcoholics (Rounsaville et al., 1987). This finding supports the view of Reich (1985) who proposes a subdivision of ASP disorders into those related to affective disorders and those that are not. Moreover, Woody et al. (1985) showed that this subdivision is of significance for prognosis in treatment, as opiate addicts with a combined diagnosis of ASP and depression had better treatment results than those who only met the criteria of ASP. Second, there was considerable overlap between anxiety and depression. This overlap has also been

reported in other addiction studies (Rounsaville et al., 1982) and has been the subject of considerable debate in general psychiatry (Dealy, Ishiki, Avery et al., 1981; Leckman, Merikangas, Pauls et al., 1983; Reich & Troughton, 1988). On the conceptual level, the controversy focusses around the unitary versus the pluralistic model of anxiety and depression. According to the unitary model, both states lie on a single continuum of affective illness, whereas in the pluralistic model anxiety and depression are regarded as two separate entities. The DSM-III incorporates some of both models. While depression and anxiety are considered as distinct syndromes, application of the DSM-III hierarchy results in exclusion of some anxiety-related disorders (obsessive compulsive disorder, agoraphobia, social phobia, panic disorder) if they occur during an episode of major depression, because they are considered as manifestations of this disorder. While the strong association between anxiety and depression in this study lends support to such a hierarchical arrangement, the presence of a considerable group with depression but without an anxiety-related disorder suggests an area for future study.

Regarding the drug use patterns associated with the three most prevalent diagnoses, subjects with a diagnosis of ASP were most distinct. They were generally younger, had a lower education level and had a longer history of heroin use and polydrug use than subjects without this diagnosis. There are several factors that account for the longer addiction career. Although subjects with ASP started polydrug use significantly earlier (19.15 years) than subjects without ASP (22.06), the mean "period at risk" (current age minus age of onset) was very similar for both groups (7.22 years and 6.73 years respectively). Thus, in a similar period at risk, subjects with ASP used drugs on a more continuous basis. The data showed several trends that, in combination, may account for this finding. While subjects with ASP had more previous treatments, they reached abstinence less often and the periods of abstinence following treatment were generally shorter. These findings together suggest that the course of addiction is different for subjects with ASP compared to those without this diagnosis. Their addiction career seems to be characterized by long periods of actual drug use starting at an early age and many failures in previous attempts to reach abstinence. It is likely that these factors all contribute to the poor prognosis commonly found in this group.

With the exception of a higher alcohol severity rating on the ASI for the depressed group, none of the drug use measures was related to anxiety of depression. The similarity in patterns of recent drug use indicates that the type,

amount or severity of recent drug use is relatively independent from the presence of additional psychopathology. This independence has also been found in other studies (McLellan et al., 1981; Hendriks et al., 1989) and suggests that during the course of the addiction drug use and psychopathology become so much interrelated that neither one of them can be merely expressed as a function of the other. For example, the independence of depression and heavy recent drug use may represent "true" independence for a subgroup of addicts as well as the result of successful self-medication.

As expected, the psychological symptom scales generally showed higher scores for subjects with depressive or anxiety-related disorders. Surprisingly, there were no significant differences between depressed and non-depressed subjects on the BDI. As many subjects were on decreasing methadone doses, some of the reported somatic complaints on the BDI (e.g., fatigability, loss of appetite) may be more reflective of withdrawal symptoms than of depression per se. It has been argued elsewhere (Beck & Steer, 1988) that the use of a cognitive-affective subscale of the BDI (in which the somatic items are excluded) may lead to more meaningful results in addict populations.

Chapter 3

THE ADDICTION SEVERITY INDEX: RELIABILITY AND VALIDITY IN A DUTCH ADDICT POPULATION

INTRODUCTION

During the past few years, there has been a growing interest in The Netherlands in treatment evaluation (Schippers, Kwakman, & Broekman, 1988). With this the need has grown for useful and reliable instruments that can be utilized for registration, diagnosis and evaluation. Because the national registration systems (LADIS, CADIS and PIGG) are mainly directed toward uniformity of information, these systems often contain insufficient data for specific evaluation questions. Consequently, treatments often use internally developed instruments in evaluation studies, which makes comparison of treatment populations and effect of treatment difficult. While in the area of alcoholism (outside The Netherlands) several screening instruments have been developed (see van Limbeek & Walburg, 1987; Schippers et al., 1988), there are only a few instruments available in the area of drug use. To our knowledge, in The Netherlands there are no validated severity scales in the area of drug use.

Recent research in the area of alcohol-screening tests (van Limbeek & Walburg, 1987) and psychiatric diagnosis in addict populations (van Limbeek et al., 1986) has underlined the need for a diagnostic instrument that covers multiple dimensions of addiction. Often the abuse of substances goes together with social isolation, long-term unemployment and psychiatric problems, in which cause and effect are often hard to distinquish. For the diagnosis of addiction, this means that evaluation of only the actual use of psychoactive substances provides insufficient information on the course and complexity of the addiction problems and an insufficient basis for referral and treatment. The most widely used diagnostic systems, the DSM-III (American Psychiatric Association, 1980) and the DSM-III^R (APA, 1987) also have limited applicability in assessing the full range of problems commonly associated with the use of psychoactive substances in that they do not provide a clear profile of problem areas on which treatment and evaluation of treatment should focus.

Therefore, it is important to have a standardized instrument that can be used in research to compare clients, identify client subgroups, match clients to treatments and measure treatment outcome. The use of a standardized multidimensional instrument, validated and translated all over the world, facilitates cross-study comparisons from different countries. For clinical purposes it is important to have a diagnostic tool that can be used to assess specific treatment needs, identify clients for whom extensive clinical evaluation is necessary and measure client change during treatment.

The Addiction Severity Index

To meet the need for a multidimensional diagnostic instrument in the United States, the National Institute on Drug Abuse proposed the development of various prototypes for use in the addiction field. This led to the introduction of the Addiction Severity Index (ASI) in 1980 (McLellan, Luborsky, Woody, & O'Brien, 1980a). The ASI is a semi-structured interview that collects data in seven problem areas: medical condition, employment problems, alcohol use, drug use, criminality, family and social problems and psychiatric problems. In each area, information is collected on the amount, duration and intensity of the problems that occurred during the previous years and during the month prior to admission. At the end of each problem area two subjective questions are asked on which the client has to give an estimate of (a) the extent to which he has been bothered by problems and (b) the extent to which he thinks that treatment for these problems is important. These client ratings range from 1 (not at all) to 5 (very much).

According to a standardized procedure (McLellan et al., 1985a) both objective and subjective information are integrated by the interviewer to give an estimate of problem severity in each area on a 10-point scale:

0-1 No real problem, treatment not indicated
2-3 Slight problem, treatment probably not necessary
4-5 Moderate problem, some treatment indicated
6-7 Considerable problem, treatment necessary
8-9 Extreme problem, treatment absolutely necessary

These estimates of problem severity are defined in terms of importance of additional treatment. This implies that if problems have already been adequately treated, the severity rating should be accordingly low.

In addition to these (subjective) severity ratings, composite scores are calculated on the basis of a combination of items in each problem area. These composite scores can vary from 0 to 1 and offer a more objective measure of problem severity in the various areas than the severity ratings.

Since its introduction in the United States, a large body of research has been conducted with the ASI. To summarize, these studies have shown that (a) the instrument has high interrater reliability for the severity ratings (average concordance of 0.89), high test-retest reliability for both the items and the severity ratings (coefficients equal to 0.92 or above) and showed good evidence of concurrent and discriminant validity across a range of client types (McLellan et al., 1980a, 1985a, 1985b; McLellan, Luborsky, & O'Brien, 1986; Kosten, Rounsaville, & Kleber, 1983); (b) the instrument is sensitive enough to client change following treatment (McLellan, Luborsky, Woody, O'Brien, & Druley, 1982; Rounsaville, Kosten, Weissman, & Kleber, 1986); (c) the scales of the ASI can be used to predict treatment outcome and to assign (match) clients to appropriate treatments (McLellan, Luborsky, Woody, O'Brien, & Druley, 1983a; McLellan, Woody, Luborsky, O'Brien, & Druley, 1983b). In particular, the psychiatric symptomatology scale of the ASI has been shown to be important for prognosis in treatment. Based on a global rating of severity of psychiatric problems, subgroups with divergent psychiatric severity showed a different prognosis in various forms of therapy (McLellan et al., 1983a; McLellan, Childress, Griffith, & Woody, 1984). Based on this finding, the ASI has been used successfully in allocating clients to the most effective treatment program (McLellan, O'Brien, & Kron, 1980b; McLellan et al., 1983b).

Given the general concept and the satisfactory psychometric characteristics, the ASI was translated into Dutch (Hendriks, 1987). Inspection of the items and a series of test interviews, performed with a literal translation of the original interview, suggested several adaptations. Several problem areas seemed to be unnecessary detailed, while other areas provided insufficient specific data for our purposes. For example, the age of onset of drug use was included in the Dutch version, but not in the American original. In addition, some items seemed only relevant for the American situation. For example, the question on the availability of a car may provide useful information on mobility in the United States, but

seems less meaningful in the Dutch situation. Only the Psychiatry scale remained unchanged. These adaptations did not affect the central concept of the ASI: in each problem area a number of objective questions are asked (e.g., number of hospitalizations, number of criminal charges, duration of the addiction, etc.) and each area is ended with two subjective questions. Not only did research considerations play a part in these adaptations, but also length of the interview and the importance of the information for clinical purposes. Both the American and the Dutch version of the ASI can be assessed in approximately 30 to 40 minutes.

The fundamental concern of an instrument's ability to be transferred from one cultural context to another is the reliability and validity of the instrument in the new context. In this chapter, the results of a study on the psychometric characteristics of the Dutch translated version of the ASI are presented and comparisons are made between the Dutch and the American findings. Specifically, data are presented on (1) the construction and reliability of the ASI composite scores, (2) the relationships among the ASI severity ratings and among the ASI composite scores, (3) the relationship between items and severity ratings, (4) the formation of addict-subgroups on the basis of profile of problem severity, and (5) the concurrent validity of the ASI Psychiatry scale.

METHODS

Subjects

The full study sample consisted of 264 subjects who were consecutively admitted to the clinical detoxification center De Weg in The Hague. Part of the study was performed with a subsample which was drawn from the full sample and consisted of the first 142 admissions.

Subjects in the full sample were predominantly male (80.7%), white (80.2%) and unmarried (76.1%). The mean age was 27.1 years (SD = 5.2 years). On the average, subjects had attended 10.0 years of education (SD = 2.5 years). Although 91.7% of the sample reported regular (at least three times a week) polydrug use, most subjects considered heroin as their primary drug (68.4%). On the average, subjects had used heroin for 6.1 years (SD = 3.8 years). Cocaine and methadone were the primary drug for respectively 12.9% and 6.1% of the subjects.

Assessments

The ASI was administered by trained staff on the first or the second day after admission. Training included observation of a series of interviews and several practice interviews under supervision of a psychologist. Also, a manual was available in which the concept, the interviewer ratings and the individual items are discussed. Earlier findings have suggested that depressive disorders are of particular importance for prognosis in treatment (Rounsaville et al., 1985a, 1986). In addition, previous American studies have shown that the ASI psychiatric severity rating is highly correlated with various depression measures (Kosten et al., 1983; McLellan et al., 1985a; Rounsaville et al., 1986). To explore the association between the ASI Psychiatry scale and concurrent measures of psychological functioning, the following instruments were administered:

Beck Depression Inventory (BDI). The BDI (Beck, Mendelson, Mock, & Erbaugh, 1961; Bouman, Luteijn, Albersnagel, & van der Ploeg, 1985) is a self report inventory that measures affective, cognitive, motivational and somatic symptoms of depression. The BDI is scored by summing the items which are rated on a 4-point scale ranging from 0 to 3. In the present study a 13-item version was employed; in an earlier study this version has been demonstrated to have the highest sensitivity (94%) and specificity (59%) of several screening instruments for assessing depression in an addict population (Rounsaville, Weissman, Rosenberger, Wilber, & Kleber, 1979).

Symptom Check List-90 (SCL-90). The SCL-90 (Derogatis, 1983; Arrindell & Ettema, 1981, 1986) is a multidimensional self report inventory designed to assess the psychological symptom patterns of psychiatric and medical patients. It is a widely accepted psychological screening instrument for detecting psychopathology in addicts. For example, the instrument has shown usefulness in identifying psychological distress in methadone patients (Jacobs, Doft, & Koger, 1981) and in documenting psychotherapeutic benefit in opiate addicts (Woody et al., 1983). The Dutch version of the SCL-90 includes eight subscales: Agoraphobia, Anxiety, Depression, Somatization, Distrust and Interpersonal Sensitivity, Insufficiency of Thinking and Acting, Sleep Problems and Hostility. Following the recommendations of Derogatis (1983, p. 11), the mean total score of the SCL-90 was used as a general index of symptom severity.

Nederlandse Verkorte MMPI (NVM; Dutch abbreviated version of the MMPI). The NVM (Luteijn & Kok, 1985) is a self-report inventory designed to assess

various personality dimensions. The NVM consists of the following subscales: Negativism, Somatization, Introversion, Psychopathology, and Extraversion.

Diagnostic Interview Schedule (DIS). The DIS (Robins, Helzer, Croughan, & Ratcliff, 1981; van Limbeek et al., 1986) is a highly structured psychiatric interview that can be used to make a diagnosis according to the DSM-III criteria. The interviewer evaluates the presence and severity of each symptom that serves as a criterion for a diagnosis and determines whether the symptom occurred at least once whithout a definitive physical cause (i.e. medication, alcohol or drug use, physical illness or in injury). A symptom is coded positive only when all these criteria are met. The DIS examines psychiatric disorders in terms of both lifetime and recent diagnoses. In the present study a diagnosis was considered "recent" when the most recent occurrence fell within six months prior to the assessment. DIS-diagnoses were obtained in a subsample of 137 subjects; because assessment of the DIS is a comparatively lengthy procedure, only subjects who stayed longer than two days in the detoxification center were evaluated.

Data analysis

In the present study, the routine way of measuring interrater reliability, that is, repetition of assessment under the same circumstances by different interviewers and measuring the level of concordance between the interviewers, and measuring test-retest reliability, could not be choosen. In addition, with the exception of the ASI Psychiatry scale, comparison of the data with validated external criteria that measure the same concept (concurrent validity) was not possible because for most ASI scales no such criteria are available in The Netherlands. The approach that has been used in this study relied on gathering cumulative evidence of aspects of validity and reliability.

First, because the severity ratings are subjective measures of problem severity, it is important to assess the validity of these ratings. In order to show validity, these ratings have to meet the following criteria: (a) the intercorrelations among the ASI severity ratings should be low, (b) ASI items that clearly indicate problem severity should correlate higher with their corresponding severity rating than with severity ratings on other problem areas, (c) the severity ratings should correlate higher with items that indicate problem

severity from the same problem area than with items from other problem areas, (d) subgroups with divergent severity ratings should show significant differences on items that indicate problem severity, and (e) a large proportion of the variation in the severity ratings should be accounted for by items from corresponding problem areas. Second, the item scales from which the composite measures are calculated should show sufficient internal consistency reliability and, in order to show evidence of validity, (a) the composite scores should correlate higher with their corresponding severity rating than with severity ratings from other problem areas, and (b) the intercorrelations among the composite scores should be low. Third, a hierarchichal cluster analysis was performed to explore similarities and differences in profile of problem severity among subgroups of subjects. Fourth, Pearson product-moment correlations were calculated between the ASI psychiatric severity rating and the BDI total score, the SCL-90 subscales and mean total score, and the NVM subscales. To determine the relationship between the ASI psychiatric severity rating and DSM-III disorders, subgroups with divergent problem severity on this scale were compared on percentage DSM-III diagnoses, using chi-square analysis.

RESULTS

Internal Consistency of the ASI Composite Scores

Following the analytic procedures, performed by McLellan and his colleagues (McLellan et al., 1985a), in each problem area a number of items were selected, which were capable of showing change over time. In subsequent steps, items were removed that showed low item-rest correlations. Of the remaining item-pool the internal consistency (Cronbach's coefficient alpha; Cronbach & Furby, 1970) was determined. By dividing the scores on the remaining items by (a) the maximum values on these items, and (b) the number of items in the scale, in each problem area a standard score was obtained with a minimum value of 0 and a maximum of 1.

Table 1 presents the coefficients of internal consistency of the item-scales. The reliability of the item-scales is, regarding the low number of items in some of the scales, reasonable to good. The right column of Table 1 presents the consistency coefficients after correction by means of the Spearman-Brown

formula. These values indicate that the items in the area of drug use form the least homogeneous scale.

Table 1. Internal Consistency of the ASI Subscales (N = 264)

Problem Area	Alpha[a]	Hypothetical alpha[b]
Medical (4 items)	.80	.91
Employment (4 items)	.61	.80
Alcohol (5 items)	.89	.94
Drugs (12 items)	.72	.68
Legal (4 items)	.69	.85
Social (8 items)	.67	.72
Psychiatric (11 items)	.78	.76

[a] Cronbach's coefficient alpha.
b Hypothetical coefficient alpha for standardized scale-length of 10 items (Spearman-Brown correction).

Correlations among the ASI subscales

First the relationship was determined between on the one hand the severity ratings and composite scores, and on the other hand the demographic variables age, sex, ethnicity and educational level. Older subjects scored significantly ($p < .01$) higher on the alcohol severity rating ($r = .23$, $p < .001$), non-white subjects scored higher on the employment severity rating ($r = .20$, $p < .001$) and the employment composite score ($r = .28$, $p < .001$), and subjects with less education scored higher on the medical severity rating ($r = .25$, $p < .001$), the medical composite score ($r = .22$, $p < .001$), the employment severity rating ($r = .20$, $p < .001$) and the legal severity rating ($r = .25$, $p < .001$). Although these correlations, as a result of the relatively large study sample, are highly significant, none of the demographic variables show a strong relationship ($r < .30$).

Table 2. **Pearson Product-Moment Correlation Coefficients among ASI Severity Ratings and among ASI Composite Scores (N = 264)**

	Mean	Employ-ment	Alcohol	Drugs	Legal	Social	Psychi-atric
Severity rating							
Medical	2.0	.17[a]	.17[a]	.04	.10	.17[a]	.24[b]
Employment	3.6		.03	.05	.27[b]	.24[b]	.17[a]
Alcohol	2.1			-.16	-.03	.19[a]	.26[b]
Drugs	5.9				.22[b]	.03	.01
Legal	3.3					.12	.03
Social	4.5						.43[b]
Psychiatric	4.7						
Composite score							
Medical	0.40	.02	.21[b]	.05	.08	.19[a]	.26[b]
Employment	0.49		-.01	.02	.07	.19[a]	.18[a]
Alcohol	0.23			-.21[b]	-.01	.22[b]	.20[b]
Drugs	0.50				.05	.04	.10
Legal	0.46					.19[a]	.06
Social	0.62						.49[b]
Psychiatric	0.67						

[a] $p < .01$
[b] $p < .001$

As an internal criterion for the validity of the ASI severity ratings, the Pearson product-moment correlations have been determined between the severity ratings and between the composite scores. To show validity (a) the intercorrelations among the severity ratings should be weak, (b) the intercorrelations among the composite scores should be weak, (c) the severity ratings should correlate strongly with their corresponding composite score and correlate weakly with composite scores of other problem areas, and (d) the

composite scores should correlate strongly with their corresponding severity rating and correlate weakly with severity ratings of other problem areas.

Table 2 presents the mean values and correlation coefficients of the severity ratings and the composite scores. The correlation coefficients are generally low. The average correlations of the severity ratings with ratings from the other problem areas amount to .15 (Medical), .16 (Employment), .14 (Alcohol), .09 (Drugs), .13 (Legal), .20 (Social), and .19 (Psychiatric). Over all scales, the average correlation amounts to .14. In both matrices, the problem areas of social functioning and psychiatric problems show the strongest association, both with each other and with the other scales.

Table 3. Pearson Product-Moment Correlation Coefficients between ASI Severity Ratings and ASI Composite Scores (N = 264)

	Composite Score						
	Medical	Employment	Alcohol	Drugs	Legal	Social	Psychiatric
Severity rating							
Medical	.86[b]	.00	.18[a]	.06	.07	.16[a]	.25[b]
Employment	.14	.47[b]	.03	-.01	.20[b]	.15	.13
Alcohol	.16	-.06	.82[b]	-.23[b]	-.02	.17[a]	.15
Drugs	.00	-.10	-.17[a]	.57[b]	.04	-.01	.02
Legal	.08	-.03	.00	.17[a]	.70[b]	.12	.00
Social	.17[a]	.08	.25[b]	.06	.13	.64[b]	.40[b]
Psychiatric	.25[b]	.12	.25[b]	-.01	.07	.38[b]	.76[b]

[a] $p < .01$
[b] $p < .001$

Table 3 shows the correlations between the severity ratings and the composite scores. The data indicate that the above mentioned criteria for internal validity of both measures are met without exceptions: all severity ratings correlate highest with their corresponding composite score (horizontal direction in Table 3) and all composite scores correlate highest with their corresponding severity rating (vertical direction in Table 3). With the exception of the

correlations between the social and psychiatric problem area, all coefficients are lower than or equal to .25.

Relationship between ASI Items and ASI Severity Ratings

Given that the scales in the Dutch version of the ASI were relatively independent, several analyses were performed in a subgroup of 142 subjects to determine the relationships between the items and the severity ratings. In each problem area a number of items were selected as indicators of problem severity and the intercorrelations between these items and the severity ratings were determined. The Pearson product-moment correlations are presented in Table 4.

First, these selected items should correlate higher with their corresponding severity rating than with ratings on other problem areas. The data indicate that all but two correlation coefficients met this condition. Only the duration of the longest job showed no significant relationship with its corresponding severity rating. The number of overdoses a client incurred related stronger to the medical severity rating ($r = .43$) than to the drug severity rating.

Second, the severity ratings should correlate higher with the selected items from the same problem area than with items from other areas. Five correlation coefficients did not meet this condition. The medical severity rating was correlated higher with the number of days of alcohol use in the month prior to the interview ($r = .38$) and the number of overdoses ($r = .43$) than with the number of hospitalizations for medical problems. The employment severity rating was correlated higher with most of the items from other problem areas than with the duration of the longest employment period. The legal severity rating correlated higher with the number of years of regular heroin use ($r = .27$) than with the number of days of illegal activities in the month prior to the interview. The social severity rating showed higher correlations with most of the items from the alcohol section and the psychiatric section than with the variable "number of close friends".

Third, subgroups based on level of problem severity were compared on the selected items, using chi-square analysis for the categorical items and analysis of variance for the continuous variables. The severity ratings were divided into three groups: low severity, mid severity and high severity. The group assignment was based on a range for the mid severity group of one standard deviation from

the sample mean. In this way it was established that approximately 60% of the sample was included in the mid severity group. This analysis yielded comparable results as the correlational analysis. The three subgroups were significantly different ($p < .01$) on all but three of the selected variables: duration of the longest job, number of days experiencing employment problems in the previous month and number of close friends.

Table 4. Pearson Product-Moment Correlations between Items and Severity Ratings (N = 142)

Problem area/item		r
Medical	Number of hospitalizations, lifetime	.37[a]
	Chronic medical problems	.69[b]
	Days experiencing problems, previous month	.68[b]
Employment	Years of education	-.32[b]
	Longest employment period, lifetime	-.09
	Employment status, previous 6 months	.38[b]
	Days experiencing problems, previous month	.25[b]
Alcohol	Years of regular alcohol use in large amounts	.79[b]
	Days of alcohol use in large amounts, previous month	.75[b]
	Money spent on alcohol, previous month	.66[b]
	Times delirium, lifetime	.40[b]
	Days experiencing problems, previous month	.67[b]
Drugs	Years of regular heroin use	.66[b]
	Years of polydrug use	.52[b]
	Money spent on drugs, previous month	.36[b]
	Times overdosed, lifetime	.37[c]
	Times treated in a methadone program	.51[b]
	Days experiencing problems, previous month	.34[b]

[a] Item has its highest correlation with the corresponding severity rating.
[b] Item has its highest correlation with the corresponding severity rating and severity rating has its highest correlation with the corresponding item.
[c] Severity rating has its highest correlation with the corresponding item.

Table 4. Continued

Problem area/item		r
Legal	Times arrested for property offences	.43[b]
	Times arrested for violent offences	.42[b]
	Weeks of detention for property offences	.48[b]
	Weeks of detention for violent offences	.38[b]
	Presently awaiting a charge or sentence	.49[b]
	Days of illegal activities, previous month	.25[a]
Social	Number of close friends	-.15[a]
	Serious problems with family, lifetime	.38[b]
	Serious problems with friends, lifetime	.42[b]
	Serious problems with family, previous month	.39[b]
	Serious problems with friends, previous month	.47[b]
Psychiatric	Times treated	.45[b]
	Depressive mood, lifetime	.57[b]
	Depressive mood, previous month	.59[b]
	Suicide attempts, lifetime	.57[b]
	Days experienced problems	.51[b]

[a] Item has its highest correlation with the corresponding severity rating.
[b] Item has its highest correlation with the corresponding severity rating and severity rating has its highest correlation with the corresponding item.
[c] Severity rating has its highest correlation with the corresponding item.

Fourth, in order to determine the total amount of variation in the severity ratings accounted for by the items from the same problem area, a multiple regression analysis was performed using all the ASI items in each problem area as independent variables and the severity ratings as criterion (stepwise linear regression; probability of F-to-enter = 0.05; probability of F-to-remove = 0.10).

Table 5 presents for each problem area the cumulative percentage of variance accounted for by the first four items that entered the regression equation. As indicated, in the medical, alcohol and drug use problem areas, the first item that entered the regression equation accounted for a relatively large proportion of the variance. However, in these problem areas the percentage of

explained variance still increased considerably by adding items into the regression equation.

Table 5. Multiple Regression Analysis of the ASI Items to the Severity Ratings (N = 142)

Problem area/item		Cum. R^2
Medical	Chronic medical problems	.48
	Worried about medical problems, previous month	.71
	Number of hospitalizations, lifetime	.78
	Received medical treatment, previous 6 months	.83
Employment	Treatment need, previous month	.16
	Employment status, previous 6 months	.27
	Years of education	.35
	Worried about employment problems, previous month	.38
Alcohol	Years of regular alcohol use in large amounts	.62
	Days of alcohol use in large amounts, previous month	.85
	Age of onset of regular alcohol use	.88
	Worried about alcohol problems, previous month	.91
Drugs	Years of regular heroin use	.43
	Money spent on drugs, previous month	.54
	Years of regular cannabis use	.66
	Worried about drug problems, previous month	.73
Legal	Worried about legal problems, previous month	.36
	Weeks of detention for property offences	.54
	Times arrested for violent offences	.60
	Presently awaiting a charge or sentence	.66

Table 5. Continued

Problem area/item		Cum. R^2
Social	Treatment need family problems, previous month	.24
	Serious problems with friends, lifetime	.40
	Treatment need social problems, previous month	.45
	Parents inaccessable, unknown or dead	.49
Psychiatric	Treatment need, previous month	.49
	Hallucinations, previous month	.62
	Suicide attempts, lifetime	.70
	Depressive mood, lifetime	.77

As also indicated in Table 5, besides the 'objective' items, the client ratings contributed significantly to the variance in the severity ratings in each problem area. The total proportion of variance, accounted for by items from the corresponding problem area, amounted to 89% for medical condition (7 out of a total number of 8 items included in this section), 41% for employment problems (5 out of 11 items), 91% for alcohol use (4 out of 8 items), 73% for drug use (6 out of 42 items), 67% for legal problems (5 out of 14 items), 64% for family/social problems (8 out of 16 items) and 85% for psychiatric problems (8 out of 21 items). The average proportion of variance accounted for by the items was 73%.

Subgroups with Similar Pattern of Problem Severity

To determine whether in the sample subgroups with a similar pattern of ASI severity ratings could be distinguished, a cluster analysis was performed, using the seven severity ratings as independent variables. While in a cluster analysis any number of clusters can be selected, a relatively small number of clusters was choosen in the present study because clusters are often difficult to interpret.

Table 6 shows the results of the four cluster solution. The values represent the mean severity ratings on the problem areas within each cluster.

Table 6. Cluster Analysis of ASI Severity Ratings (N = 263)

Cluster	N	Medical	Employment	Alcohol	Drugs	Legal	Social	Psychiatric
1	71	0.8	3.8	0.4	6.0	4.7	4.5	4.2
2	69	2.2	3.9	5.5	5.7	3.5	4.9	5.2
3	55	0.9	2.4	1.0	5.9	1.5	3.8	4.1
4	68	4.1	4.0	1.4	5.9	3.3	4.7	5.2
F_{ratio}		101.1	17.6	203.8	0.5	41.7	5.3	6.6
$p <$		.0001	.0001	.0001	ns	.0001	.01	.001

With the exception of the drug problem area, all ASI problem areas show significant differences between the clusters. Cluster 3 consists of subjects with relatively low severity ratings on all problem areas except for drug use. Cluster 4 shows high severity ratings on most problem areas. The severity profile in cluster 2 is to a large extent comparable to that of cluster 4, but differs from this cluster by a high mean alcohol severity rating. Cluster 1 shows a less specific severity profile. This cluster differs mainly from the other clusters by a high mean legal severity rating and a low mean medical and alcohol severity rating. There were no significant differences in age or sex between the clusters.

Relationship between ASI Psychiatric Severity Rating and Concurrent Measures

To explore the relationship between the ASI psychiatric severity rating and concurrent self report measures of psychological functioning, Pearson product-moment correlations were calculated. The ASI psychiatric severity rating correlated .35 with the BDI and with the SCL-90 subscales respectively .37 (Agoraphobia), .39 (Anxiety), .36 (Depression), .31 (Somatization), .36 (Distrust and Interpersonal Sensitivity), .38 (Insufficiency of Thinking and Acting), .34

(Sleep Problems), and .12 (Hostility). Thus, with the exception of the SCL-90 subscale Hostility, all correlations are in the moderate range. This is also the case with the SCL-90 mean total score which of all investigated scales is most comparable in measurement aim to the ASI psychiatry scale (r =.41). Also moderate correlations were found with the personality dimensions of the NVM: .34 (Negativism), .48 (Somatization), .30 (Introversion), .36 (Psychopathology), and -.21 (Extraversion).

Table 7. Percentage DIS/DSM-III Diagnoses in ASI Severity Groups (N = 137)

Disorder	Low (0-3) (N = 43)	Mid (4-6) (N = 69)	High (7-9) (N = 25)	p
Major Depressive episode	14.0	39.1	44.0	b
Dysthymic disorder	20.9	37.7	52.0	a
Agoraphobia	9.3	18.8	52.0	c
Social phobia	9.3	21.7	36.0	a
Panic disorder	2.3	13.0	36.0	c
Schizophrenia	2.3	0.0	16.0	c
Antisocial Personality	60.5	62.3	56.0	ns
Any Depressive disorder	14.0	43.5	52.0	b
Any Anxiety-related disorder	16.3	36.2	72.0	c
Any DSM-III axis I disorder	27.9	55.1	80.0	c

[a] $p < .05$
[b] $p < .01$
[c] $p < .001$

To determine the relationship between the ASI psychiatric severity rating and a categorical psychiatric diagnosis, DIS/DSM-III diagnoses were obtained in a subsample of 137 subjects. The psychiatric severity rating was divided into low severity, mid severity and high severity, based on a range for the mid severity group of ± one standard deviation from the sample mean. The three groups were then compared on rates of DSM-III disorders, using chi-square analysis. As shown

in Table 7, with the exception of Antisocial Personality disorder all disorders show significant differences in the expected direction between the groups. This is also the case for the rubricated diagnoses "Depressive disorder" (Major Depressive episode (single or recurrent), Atypical Bipolar disorder and Dysthymic disorder), "Anxiety-related disorder" (Obsessive Compulsive disorder, Agoraphobia, Social Phobia, Simple Phobia, Somatization disorder and Panic disorder) and "any non-substance DSM-III Axis I" disorder.

DISCUSSION

Reliability of ASI Composite Scores

While the severity ratings are primarily used as clinical estimates of problem severity, the majority of research studies using the ASI have used the composite scores as measures of client change from pretreatment to posttreatment (McLellan, Luborsky, Woody, O'Brien, & Kron, 1981; McLellan et al., 1982, 1983a, 1983b, 1985a). Given the empirical nature of the scale construction and the differences in study population (the population in the United States consisted entirely of male subjects, of whom 80% between 28 and 46 years old (McLellan et al., 1986), it was considered necessary to repeat the process of item selection for the determining the composite scores. Because the composition of the item scales, with the exception of the psychiatric scale, differs between the American version and the Dutch version, comparison of the composite scores between both studies is not possible. In addition, because the actual values of the composite scores have no intrinsic meaning (McLellan et al, 1985a), the composite scores of different problem areas cannot be compared. Therefore, comparison of the composite scores is only possible within the same ASI problem area, for example to determine someone's position in relation to others or to determine client change from pretreatment to posttreatment.

The reliability of the item scales is reasonable to good. Each scale sastisfied Nunnaly's recommendation that in research preferably only scales with an item consistency of .60 or higher should be used (Nunnaly, 1967). Because the ASI measures very broad constructs ("Social functioning", "Psychiatric problems"), it is questionable whether the internal consistency of the ASI scales should be as high as possible. With such heterogeneous concepts very homogeneous item scales

cannot be expected. In addition, in each scale at least one of the subjective items (client rating) was included, even if exclusion would have increased the internal consistency. These items are very central in the concept of the ASI and accounted for a relatively large proportion of the variance in the severity ratings.

Relationship among ASI Problem Areas

The low to moderate correlations among the ASI severity ratings and among the composite scores indicate that the problem areas are relatively independent. In other words: the severity of problems in one area cannot simply be derived from the severity of problems in other areas. This seems to be particularly true for the relationship between the drug use problem area and the other areas, with an average correlation of .09. In addition, McLellan et al. (1981) showed in an earlier study that improvements in one of the problem areas are relatively independent from improvements in other areas. These findings contradict the view that drug use exerts a "halo-effect" to other problem areas, and may have important clinical implications. Based on these findings, treatments that solely attempt to reduce the use of psychoactive substances cannot be expected to produce an overall reduction of problems in other areas, commonly associated with addiction. Rather, treatments have to focus attention on the specific problems that coincide with substance use.

For both the severity ratings and the composite scores the highest correlation occurred between the problem areas of social functioning and psychiatric problems. This finding replicates earlier findings of McLellan et al. (1980a, 1981, 1985a), and may relate to the nature of the study population, in that the sample consisted only of treetment-seeking addicts. Rounsaville and Kleber (1985b) found more depressive symptomatology and more social problems among opiate users who applied for treatment than among those who did not seek treatment. According to Rounsaville and Kleber, during the social crisis that often precedes admission for treatment clients tend to over-report psychological problems. This suggestion is supported by other investigators, who found considerable reductions of psychological symptoms soon after admission to treatment (Sacks & Levy, 1979; De Leon & Jainchill, 1981; De Leon, 1984).

Although the severity ratings are subjective measures of problem severity, they generally showed a strong relationship with the composite scores (average correlation r = .69). This suggests that the procedure, given by McLellan et al. (1985a) to minimize the information variance due to differences between interviewers, is effective. For the interpretation of these relationships, it is important to note that the time set reference differs between both measures: while the severity ratings incorporate both lifetime and recent problems, the composite scores are exclusively based on problems that occurred during the month prior to the assessment. Consequently, very high correlations between these measures cannot be expected.

To further investigate the relationship among the ASI problem areas, a cluster analysis was performed. The sample was differentiated into four clusters, of which three clusters seem to have face validity. In combination with the low to moderate correlations among the problem areas, these clusters suggest the existence of addict subgroups, each presenting a specific problem profile and each requiring a specific treatment approach. Cluster 2 and cluster 4 seem to represent mostly the classical view on addiction, in which the use of substances, either combined alcohol and drug use (cluster 2) or only drug use (cluster 4), coincides with severe problems in most other areas. Regarding the relatively high scores on the ASI psychiatric severity rating, these clusters may include subjects whose substance use was preceded by psychiatric problems. Earlier, several authors have proposed a self-medication model of addiction, in which drugs are used to control a variety of painful affects (Milkman & Frosch, 1973; Khantzian, Mack, & Schatzberg, 1974; Khantzian, 1985; Schneier & Siris, 1987). Regarding earlier findings of McLellan et al. (1983a), clients in these clusters may benefit most from treatment that is primarily focussed on the additional psychiatric problems. The problems of individuals in cluster 3 on the other hand, seem to be limited to substance use. For these clients, treatment that primarily focusses attention on the actual use of substances, may suffice.

Concurrent Validity of ASI Psychiatry Scale

Overall, the severity ratings showed moderate to strong correlations with items from the same problem area, and weak correlations with items from other problem areas. With the exception of the employment area, the items accounted

for a considerable proportion of the variance in each of the severity ratings. Although these results are favourable, it should be noted that the data rely on comparison measures taken from the ASI itself. A more complete evaluation of validity requires comparison of the ASI ratings with independent measures of problem status.

In the psychiatric problem area, where external criteria were available, the severity rating correlated moderately with all comparison measures. As can be expected on the basis of earlier research on the relationship between the NVM and the SCL-90 (Arrindell & Ettema, 1986), the Extraversion dimension of the NVM correlated negatively with the ASI psychiatric severity rating. The correlations with the BDI and the SCL-90 were lower than those found in the United States (McLellan et al., 1985a, 1985b; Kosten et al., 1983). In line with the description of the ASI as a general measure of problem status, the moderate correlations indicate that although the ASI psychiatric scale shows some overlap with the concurrent tests, none of the constructs that these tests pretend to measure, are specifically covered by the ASI. Despite their similarity in measurement aim - both instruments are global indices of distress - this was also the case with the SCL-90 mean total score. The difference in time set reference between these measures cannot sufficiently account for this finding, because the ASI psychiatric composite score - which is only based on recent problems - also showed a moderate correlation with the SCL-90 mean total score ($r = .48$). An alternative explanation is that the ASI is specifically designed for use in addict populations. This implicates among other things, that symptoms that are a direct result of the psychopharmacological action of substances, should be excluded when scoring the ASI. This is not the case with the investigated self-report tests.

The ASI psychiatric severity rating was found to be significantly related to all DSM-III Axis I disorders. With the exception of schizophrenia, the rates of all Axis I disorders showed a stairstep increase from low to mid to high psychiatric severity on the ASI. The rates of antisocial personality disorder were evenly divided among the severity groups, suggesting that the ASI does not tap the criteria of this syndrome.

CONCLUSION

Several findings of the present study on the validity of the Dutch adapted version of the ASI are important. The internal consistency of the ASI subscales varies from moderate (employment) to good (alcohol). Regarding the broad constructs that these subscales represent, the reliability of all subscales is sufficient. Consistent with results from studies with the instrument in the United States, neither the severity ratings nor the composite scores showed evidence of a general relationship between the ASI problem areas. Corresponding severity ratings and composite scores were generally strongly associated. On the basis of the ASI severity ratings, subgroups with specific profiles of problem severity could be differentiated. Given the differences in profiles, such a cluster-classification may be important for prognosis in treatment. Regression analysis indicated that the ASI items generally contributed considerably to the variance in the severity ratings. The ASI psychiatric severity rating showed a moderate relationship with a variety of psychological constructs. None of the investigated constructs, including depression and anxiety, seemed to be specifically covered by the ASI. The association with the SCL-90 was however, given its comparable measurement aim, less strong than desirable. With the exception of Antisocial Personality disorder, all DSM-III disorders were significantly related to the ASI psychiatric severity rating.

Regarding the design of the ASI, it can be concluded that the instrument offers a number of interesting concepts. Its strengths are (a) the severity of the problems is estimated for each area individually, (b) each problem area consists of an objective section and a self-rating section, which both contribute to the final severity rating, (c) the severity rating provides a direct measure of the necessity of treatment, and (d) the ASI can be easily adapted for use as a follow-up instrument. Comparison of the scoring profile at admission and the profile at follow-up provides information required to assess client improvement. Earlier findings, indicating that the ASI psychiatric severity rating more robustly predicted treatment outcome than a categorical psychiatric diagnosis (Rounsaville et al., 1986), suggest that the application of a global rating of severity may offer advantages in evaluation research.

The ASI has a number of practical limitations. First, the ASI cannot be used with clients who have been in an inpatient treatment setting or have been

incarcerated during the 30 days prior to the interview. Second, while the severity rating should be based on both lifetime and recent problems, the definition of severity as 'need for additional treatment' suggests that recent problems should be weighted more than problems in the past. The extent to which this should be done however, is unclear. Consequently, it is difficult to produce a reliable severity rating if there have been long-standing problems that recently diminished. Third, the information provided by the items in the employment area and the family/social area is not always sufficient to arrive at a reliable rating of problem severity. The level of information in these areas may improve by adding more detailed questions, in particular about duration of unemployment and specific aspects of problems with significant others. Finally, while the problem areas represent distinct dimensions on a conceptual level, in practice it is often difficult to keep them apart. This is especially true for the psychiatric scale, since psychiatric symptoms may be induced by substances. In these cases the judgement of a clinician is needed.

Notwithstanding these limitations, the ASI seems an acquisition for the Dutch addiction treatment system, both as a general diagnostic tool and as an instrument for treatment evaluation.

Chapter 4

SCREENING FOR PSYCHOPATHOLOGY IN ADDICTS: A COMPARISON OF SYMPTOM SCALES

INTRODUCTION

The development of the Research Diagnostic Criteria (RDC; Spitzer, Endicott, & Robins, 1978) and the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association, 1980) has resulted in a substantial body of literature on the comorbidity of substance use and psychopathology. High rates of psychiatric disorders in addict populations have been reported both in The Netherlands (Hendriks, 1990; van Limbeek et al., 1986) and in the United States (Jainchill, De Leon, & Pinkham, 1986; Khantzian & Treece, 1985; Ross, Glaser, & Germanson, 1988; Rounsaville, Kosten, Weissman, & Kleber, 1985). In addition, results from several studies in the addiction field have suggested that co-existing psychopathology is of significance for prognosis in treatment (Rounsaville et al., 1982, 1986, 1987; Woody, McLellan, Luborsky, & O'Brien, 1985). Given these findings, it is very important to investigate the usefulness of less time-consuming methods for detecting psychopathology in addicts than a lengthy categorical psychiatric assessment. Whereas the usefulness of dimensional measures to differentiate between nonpsychiatric and psychiatric subjects has been well documented (Byerly & Carlson, 1982; Clark, Cavanaugh, & Gibbons, 1983; Gallagher, Nies, & Thompson, 1982; Luteijn & Bouman, 1988; Myers & Weissman, 1980; Oliver & Simmons, 1984), there are only few data available on the usefulness of dimensional measures to screen for psychopathology in addict populations (Kosten, Rounsaville, & Kleber, 1983; Rounsaville, Weissman, Rosenberger, Wilber, & Kleber, 1979), and no such data are available in The Netherlands.

Conceptually, categorical and dimensional psychiatric measures differ in a number of ways. The categorical psychiatric approach is aimed at ordering individuals into discrete categories, each representing a homogeneous syndrome. To meet the criteria of a syndrome, an individual should exhibit symptoms in sufficient number, duration and severity. Furthermore, the symptoms should not be explainable by physical illness or by another psychiatric disorder. The

dimensional approach is aimed at ordering individuals along dimensions that are conceptualized as continuous variables. The level of measurement is at least ordinal. Typically, the scores on individual items are added to form a scale-score with a minimum and a maximum value, regardless whether the symptoms were due to another disorder. Because the scale-score is not "all-or-nothing", the previously mentioned criteria of sufficient number, duration and severity of symptoms are not required.

Given these differences, it is likely that dimensional measures used to detect "cases" will produce higher prevalence estimates than categorical psychiatric assessments, and will consequently produce a relatively small number of "false negatives" (i.e., proportion of individuals with a positive diagnosis, not detected by the scale) and a large number of "false positives" (i.e., proportion of individuals with a negative diagnosis, but classified as positive by the scale). For example, individuals with a diagnosis of depression are likely to have a high score on a depression scale, whereas individuals who exhibit many depressive symptoms that are not of sufficient duration will have a high score on a depression scale, but will be classified as not depressed when diagnostic criteria are used.

The issue of false positive diagnoses may be of particular importance to addict populations, in that psychiatric symptoms may be caused by the psychopharmacological action of a drug. Dimensional measures, developed for use in general psychiatric and normal populations generally do not require symptoms to be independent of drug use, thus leading to a positive symptom-code. Dimensional measures that have specifically been designed for use in addict populations and that require independence between psychiatric symptoms and drug use, may produce less false positive diagnoses.

This chapter describes the relation between categorical psychiatric diagnoses and dimensional measures of psychopathology in an addict population. Specifically, data are presented on (1) the reliability of the dimensional scales, (2) the relation among the dimensional scales, and (3) the sensitivity and specificity of the dimensional scales for detecting DSM-III current depressive disorders and DSM-III current anxiety-related disorders.

METHODS

Subjects and Setting

The study sample consisted of 147 subjects who were consecutively admitted to the inpatient detoxification center De Weg in The Hague. This center serves both as a detoxification clinic and as a mode of entry for a residential drug-free therapeutic community. Upon admission, clients who had been using opiates were given a dose of methadone and this dose was subsequently decreased over time. Subjects were primarily male (81.0%), white (80.1%), with a minority of Surinamese (8.2%). The mean number of years of education was 10.26 years (SD = 2.65 years). The mean age was 27.29 years (SD = 5.01 years). Heroin was the primary drug for 70.5% of the subjects, followed by cocaine (13.7%), and alcohol (6.8%). Polydrug use was reported by 93.2% of the subjects.

Co-existing DSM-III disorders were commonly diagnosed in the sample. Six month prevalence rates of DSM-III diagnoses were 59.9% for antisocial personality disorder, 34.7% for major depressive episode (single or recurrent), 27.2% for alcohol abuse, 24.5% for alcohol dependence, 25.9% for agoraphobia, 24.5% for social phobia, 11.6% for simple phobia, and 14.3% for panic disorder. Taken together, 36.7% of the subjects were found to have a current depressive disorder (major depressive episode, single or recurrent, and atypical bipolar disorder), and 39.5% were diagnosed as having a current anxiety-related disorder (obsessive compulsive, agoraphobia, social phobia, simple phobia, somatization disorder, and panic disorder).

Assessments

Subjects were evaluated during the first week following admission to the detoxification center. All subjects were seen for two sessions. In the first session, on the first or second day after admission, the following instruments were administered by trained staff members:

Addiction Severity Index (ASI). The ASI (McLellan, Luborsky, Woody, & O'Brien, 1980) is a semi-structured interview that collects data in the areas of medical health, employment, alcohol use, drug use, criminality, social problems

and psychiatric problems. In each of these problem areas the interviewer provides an estimate of problem severity (severity rating) on a scale ranging from 0 to 9. In the present study a Dutch translated and adapted version of the ASI was used (Hendriks, 1987). This Dutch version has shown psychometric charateristics that are similar to those of the American original (Hendriks, Kaplan, van Limbeek, & Geerlings, 1989; Hendriks et al., 1990).

Beck Depression Inventory (BDI). The BDI (Beck, Mendelson, Mock, & Erbaugh, 1961; Bouman, Luteijn, Albersnagel, & van der Ploeg, 1985) is a self report inventory that measures affective, cognitive, motivational and somatic symptoms of depression. The BDI is scored by summing the items which are rated on a 4-point scale ranging from 0 to 3. In the present study, both the short (13-item) version (Beck & Beck, 1972; Bouman et al., 1985) and the long (21-item) version were used, as well as two subscales of the long version: a Cognitive-affective subscale, consisting of the first thirteen items, and a Somatic-performance scale, consisting of the last eight items (Beck, Steer, & Garbin, 1988). The BDI was assessed only in a consecutive subsample of 88 subjects.

Symptom Check List-90 (SCL-90). The SCL-90 (Derogatis, 1983; Arrindell & Ettema, 1981, 1986) is a multidimensional self report inventory designed to assess the psychological symptom patterns of psychiatric and medical patients. Based on its factor structure in Dutch populations (Arrindell & Ettema, 1981, 1986), the SCL-90 was scored for eight dimensions, representing Agoraphobia, Anxiety, Depression, Somatization, Distrust and Interpersonal Sensitivity, Insufficiency of Thinking and Acting, Sleep Disturbance, and Hostility. The mean total score of the SCL-90 was used as a general index of symptom severity.

Diagnostic Interview Schedule (DIS). In the second session, generally one week after the first, psychiatric diagnoses were obtained by a trained psychologist, using the third version of the Diagnostic Interview Schedule (Robins et al., 1981; van Limbeek et al., 1986). The DIS is a highly structured psychiatric interview that can be used to make a lifetime or recent diagnosis according to the DSM-III criteria. In the present study only recent DSM-III disorders were considered, based on the symptomatology during the six months prior to the assessment, with two exceptions. First, antisocial personality was considered only as a lifetime disorder. Second, because the DIS does not ask for recency of symptoms of a dysthymic disorder, a "recent" diagnosis of dysthymic

disorder could not be made. The diagnostic hierarchy of the DSM-III was not used. Thus, multiple diagnoses were assigned if they were present.

RESULTS

Internal Consistency of BDI Scales and SCL-90 Scales

The reliability of the BDI scales and the SCL-90 scales was determined, using Cronbach's internal consistency coefficient alpha. The coefficients are displayed in Table 1.

Table 1. Internal Consistency and Item-Rest Correlations of BDI Scales and SCL-90 Scales (N = 147)

Scale	Alpha[a]	Item-rest correlation	
		Range	Mean
BDI-Abbreviated (13 items):	.85	.33 - .62	.50
BDI-Cognitive (13 items):	.82	.01 - .62	.46
BDI-Somatic (8 items):	.71	.22 - .58	.40
BDI-Total (21 items):	.85	.05 - .68	.42
SCL-Ago (7 items):	.81	.36 - .67	.54
SCL-Anx (10 items):	.86	.40 - .72	.57
SCL-Dep (16 items):	.89	.26 - .77	.56
SCL-Som (12 items):	.85	.37 - .67	.52
SCL-In (9 items):	.84	.30 - .71	.55
SCL-Sen (18 items):	.90	.30 - .74	.55
SCL-Hos (6 items):	.81	.43 - .65	.57
SCL-Sla (3 items):	.84	.67 - .76	.71

Note. The BDI analyses were performed in a subsample of 88 subjects.
[a] Cronbach's coefficient alpha.

Both the short version of the BDI and the Cognitive-affective subscale had a level of internal consistency comparable to that of the long version. The Somatic-performance subscale was somewhat less homogeneous. For the SCL-90, the eight coefficients alpha ranged from .81 (Agoraphobia, and Hostility) to .90 (Interpersonal Sensitivity). As indicated by the range and means of the item-rest correlations, most items were moderately high correlated with the other items in the corresponding scales. Of the 136 item-rest correlations that were computed, only nine correlations were lower than .30.

Table 2. Intercorrelations between Symptom Scales (N = 147)

	BDI				SCL			
	Abbr	Cogn	Som	Total	Ago	Anx	Dep	Total
BDI								
Abbr								
Cogn	.92[a]							
Som	.73[a]	.49[a]						
Total	.95[a]	.92[a]	.79[a]					
SCL								
Ago	.47[a]	.59[a]	.25[b]	.52[a]				
Anx	.64[a]	.68[a]	.41[a]	.68[a]	.71[a]			
Dep	.71[a]	.72[a]	.44[a]	.68[a]	.57[a]	.80[a]		
Total	.72[a]	.76[a]	.46[a]	.73[a]	.74[a]	.89[a]	.90[a]	
ASI								
Psych	.37[a]	.30[b]	.16	.27[c]	.45[a]	.43[a]	.41[a]	.47[a]

Note. The BDI analyses were performed in a subsample of 88 subjects.
[a] $p < .001$
[b] $p < .01$
[c] $p < .05$

Intercorrelations Between the Symptom Scales

The relationship was determined between on the one hand the scores on the BDI scales, the SCL-90 scales and the ASI psychiatric severity rating, and on

the other hand the demographic variables age and sex. None of the correlations appeared to be significant ($p < .01$). The highest correlation occurred between the SCL-90 Sleep Disturbance scale and age ($r = .14$).

Sensitivity and Specificity of the Symptom Scales

To evaluate the ability of the symptom scales to detect DSM-III current depressive disorder and DSM-III current anxiety-related disorder, the sensitivity and specificity were determined, using various cut-off scores for each scale. As indicated in Table 3, sensitivity was generally much higher than specificity for both diagnostic categories. For depression, sensitivity ranged from 56% to 94%, and specificity ranged from 18% to 71%. For anxiety, these ranges were from 52% to 97% and from 20% to 70% respectively. Increasing the cut-off score resulted in higher specificity and lower sensitivity in all scales.

Table 3. Sensitivity and Specificity of Symptom Scales for Detecting DSM-III Current Depressive Disorder and DSM-III Current Anxiety-Related Disorder (N = 147)

Symptom scale/	Depressive disorder		Anxiety-related disorder	
Cut-off score	Sensitivity	Specificity	Sensitivity	Specificity
BDI-Abbreviated				
7	83%	19%	-	-
8	80%	23%	-	-
9	71%	34%	-	-
10	69%	42%	-	-
BDI-Cognitive				
7	80%	19%	-	-
8	80%	23%	-	-
9	77%	30%	-	-
10	74%	43%	-	-

Note. The BDI analyses were performed in a subsample of 88 subjects.

Table 3. Continued

Symptom scale/ Cut-off score	Depressive disorder Sensitivity	Depressive disorder Specificity	Anxiety-related disorder Sensitivity	Anxiety-related disorder Specificity
BDI-Somatic				
3	86%	23%	-	-
4	86%	30%	-	-
5	77%	38%	-	-
6	69%	47%	-	-
BDI-Total				
14	83%	26%	-	-
15	74%	30%	-	-
16	71%	34%	-	-
17	71%	38%	-	-
SCL-Depression				
31	85%	32%	-	-
32	83%	32%	-	-
33	81%	38%	-	-
34	72%	43%	-	-
SCL-Agoraphobia				
8	-	-	93%	26%
9	-	-	84%	39%
10	-	-	79%	49%
11	-	-	72%	61%
SCL-Anxiety				
16	-	-	91%	29%
18	-	-	86%	43%
20	-	-	83%	57%
22	-	-	72%	64%
SCL-Total				
163	89%	39%	90%	40%
166	87%	44%	84%	44%
173	83%	47%	83%	48%
178	77%	47%	79%	49%

Note. The BDI analyses were performed in a subsample of 88 subjects.

Table 3. Continued

Symptom scale/ Cut-off score	Depressive disorder Sensitivity	Depressive disorder Specificity	Anxiety-related disorder Sensitivity	Anxiety-related disorder Specificity
ASI-Psychiatric				
3	94%	18%	97%	20%
4	91%	39%	90%	39%
5	81%	55%	78%	54%
6	56%	71%	52%	70%

Note. The BDI analyses were performed in a subsample of 88 subjects.

Combining sensitivity and specificity, current depression was best detected by the ASI Psychiatry scale. Using a cut-off score of 5, sensitivity of this scale was 81% and specificity was 55%. Reducing the cut-off score to 4 increased sensitivity to 91% and reduced specificity to 39%. These rates compare favorably with those of the other instruments.

With the exception of the SCL-90 Total and the ASI Psychiatry scale, the scales were better in detecting anxiety-related disorders than in detecting depressive disorders. The SCL-90 Anxiety scale showed the best combination of sensitivity and specificity for detecting anxiety. Using a cut-off score of 20, sensitivity of this scale was 83% and specificity was 57%.

To further explore the relationship between diagnosis and symptom scales, an ANOVA was used to compare the mean scores on the symptom scales between (a) subjects who had never had a depressive disorder, (b) subjects with only a past diagnosis of depression, and (c) subjects with a current diagnosis of depression. The same analysis was performed for anxiety-related disorders. Comparisons between pairs of groups were only considered to be significant if the ANOVA F for main effects was significant at $p < .01$. Table 4 shows the mean scores on the scales for each subgroup.

Table 4. Mean Scores of Symptom Scales by Diagnostic Group (N = 147)

	DSM-III depressive disorder					
	(a) Never (N=68)	(b) Past only (N=25)	(c) Current (N=54)	F	p<	Groups
BDI						
Abbr	11.24	13.79	13.98	3.33	ns	-
Cogn	12.00	14.94	14.23	1.67	ns	-
Som	6.59	6.64	7.93	1.64	ns	-
Total	18.42	21.89	21.14	1.16	ns	-
SCL						
Dep	36.12	41.16	45.22	8.91	.001	a<c
Total	179.00	193.84	222.52	10.73	.0001	a,b<c
ASI						
Psych	4.01	4.54	5.61	13.76	.0001	a,b<c
	DSM-III anxiety-related disorder					
	(N=79)	(N=10)	(N=58)			
SCL						
Ago	10.50	10.80	15.05	15.62	.0001	a,b<c
Anx	19.58	19.50	26.38	16.72	.0001	a,b<c
Total	180.19	181.90	223.79	12.66	.0001	a,b<c
ASI						
Psych	3.98	5.20	5.61	16.77	.0001	a<b,c

Note. The BDI analyses were performed in a subsample of 88 subjects.

Not unexpectedly, given the poor results of the BDI in the sensitivity analysis, none of the BDI scales showed significant differences between the diagnostic subgroups. As indicated in Table 4, part of this lack of difference is attributable to the inability of the BDI to discriminate between a past diagnosis and a current diagnosis of depression. However, as indicated by the small

differences in mean BDI scores between on the one hand subgroup (a) and on the other hand subgroups (b) and (c), the BDI is also insufficiently able to discriminate between subjects with and without a **lifetime** depressive disorder. Contrastingly, the SCL-90 Depression scale and Total score and the ASI Psychiatry scale each showed stepwise increasing mean scores for the depressive disorders from group (a) to group (b) to group (c).

Concerning anxiety-related disorders, the SCL-90 scales Agoraphobia and Anxiety differentiated clearly between subjects with and without a current anxiety-related disorder (group (c) versus group (a) plus group (b)), but did not differentiate between subjects who had never had an anxiety-related disorder (group (a)) and subjects with only a past anxiety-related disorder (group (b)).

DISCUSSION

Given the high prevalence of psychopathology in addicts, there is a great need for brief screening instruments that can be used by clinicians to identify psychiatric disorders in this population. In this chapter, the BDI, the SCL-90 and the ASI Psychiatry scale were compared on their ability to detect DSM-III current depressive disorders and DSM-III current anxiety-related disorders. Before interpreting the results, it should be noted that none of these instruments was specifically designed to detect these disorders. For example, the BDI was developed to measure the intensity or depth of depression in patients with psychiatric diagnosis (Beck et al., 1961).

In general, the results indicated that the investigated scales combined acceptable sensitivity with low specificity. Although elevation of the cut-off scores resulted in less false positive diagnoses for each scale, this also reduced each scale's sensitivity. The choice of a certain cut-off score should take into consideration the nature of the sample and the purpose for which the instrument is being used (Beck, Steer, & Garbin, 1988). For screening purposes in clinical populations, for example to determine the necessity of additional clinical evaluation, sensitivity is of primary interest. This would argue for the use of relatively low cut-off scores, so that the number of false negatives will be minimized. Given the relatively high number of false positives found in the present study however, even the use of the most accurate screening instrument

will result in a substantial number of clients who will be unnecessarily referred for further clinical evaluation.

The ASI Psychiatry scale was found to be the best screening instrument for depression. At a sensitivity rate of 81%, this scale correctly identified 55% of the subjects without a depressive disorder. Earlier, Kosten, Rounsaville, and Kleber (1983) compared the ASI and the BDI on their ability to screen for current RDC depressive disorders in opiate addicts, and found the ASI to have better sensitivity (89%) and specificity (67%) than the BDI (83% and 55% respectively). The relatively low rate of false positives of the ASI is consistent with the fact that this instrument was specifically designed for use in addict populations and requires independence between psychiatric symptoms and drug use for a positive symptom code. On the other hand, on the basis of the description of the ASI psychiatry scale as a global measure of psychiatric severity covering a wide variety of symptoms, one would expect more false positives with this scale than with specific depression measures.

Anxiety-related disorders were best detected by the SCL-90 Anxiety scale, which correctly identified 57% of those without a current anxiety-related disorder, at a sensitivity rate of 83%. The investigated SCL-90 scales seem to specifically measure **current** anxiety-related disorders, in that the scales all showed significant differences between subjects with a current anxiety-related disorder and subjects who had recovered from previous anxiety-related disorders. This, in turn, is consistent with the description of the SCL-90 as a measure of current psychological symptom status (Derogatis, 1983).

The BDI was found to be a poor screening instrument for depression in this population. Although sensitivity was moderately high when using a low cut-off score, this was at the cost of unacceptable low specificity. There are three factors that, either alone or in combination, may account for the low specificity: (1) differences in content between the BDI and the DSM-III, (2) the requirement that symptoms are not due to another disorder in the DSM-III, and (3) the absence of the "duration" criterion in the BDI. Regarding the first possibility, it is unlikely that the low specificity is due to differences in content between the two instruments, because the items of the long (21-item) version of the BDI cover most of the DSM-III symptoms of major depression. Of the nine DSM-III criteria, only the symptoms of psychomotor agitation or retardation are not included in the BDI. Regarding the second factor, one would expect that the number of false positives would be reduced by removing items that cover somatic

and performance symptoms from the BDI, because in particular these symptoms may reflect drug effects rather than depression in this population. As indicated by the data however, the use of a cognitive-affective subscale of the BDI did not result in increased specificity rates. Regarding the third factor, the DSM-III criteria state that a symptom must be present nearly every day for at least two weeks to be coded positively. Given the absence of such a time set criterion in the BDI, it is likely that a proportion of the false positives consists of subjects who report a considerable number of depressive symptoms, but who do not meet the DSM-III criteria of depression, because the symptoms are not of sufficient duration.

The investigated scales all showed good internal consistency. The coefficients alpha of the eight SCL-90 scales are similar to those reported by Arrindell and Ettema (1986) in a heterogeneous Dutch population of "normals" and psychiatric patients. The three BDI subscales and the long version of the BDI were comparable in their level of internal consistency. Similar coefficients alpha for the short BDI version and the long BDI version have been reported by various investigators in both the United States (Beck et al., 1988) and The Netherlands (Bouman et al., 1985; Luteijn & Bouman, 1988).

As indicated by the moderate to high correlations between the investigated scales, substantial overlap was found between the areas of depression, anxiety, and neuroticism. Earlier, Luteijn and Bouman (1988) found the BDI to be highly correlated with measures of "stait"-anxiety ($r = .61$) and "trait"-anxiety ($r = .69$). In contrast with these findings, Steer, Beck, Riskind, and Brown (1986) found the BDI to be able to differentiate between patients with depressive disorders and patients with generalized anxiety disorders. Between the depression scale and the anxiety scale of the Dutch SCL-90, correlations have been reported of .76 (Arrindell & Ettema, 1986) and .68 (Koeter, Ormel, & van den Brink, 1988). Similarly high correlations between depression and anxiety have been found in numerous other studies, leading investigators to question whether the two constructs can be meaningfully differentiated. For example, Dobson (1985) concluded in his overview of studies on this subject that "the distinction may be more conceptually satisfying than empirically demonstrated" (p. 307). As argued by Dobson (1985), future research should focus on the cognitive, emotional and behavioral distinctions between depression and anxiety to get a better understanding of their relationship.

Chapter 5

SELF-REPORTED PSYCHOPATHOLOGY IN ADDICTS: A COMPARISON BETWEEN DUTCH AND AMERICAN HEROIN ADDICTS

INTRODUCTION

The prevalence of psychopathology in heroin addicts receiving methadone maintenance treatment has been well-documented over the last decade (Platt, 1986). Table 1 lists information about several selected American studies investigating the prevalence of psychopathology, especially depression, in substance abusers, and the prevalency rates are consistently high. For example, Rounsaville, Weissman, Kleber, and Wilber (1982) reported that the lifetime incidence for any psychiatric disorder in 533 opiate addicts was 86.9%; the lifetime incidence of major depressive disorders was 53.9%; and 23.8% were diagnosed with current major depressive disorders. In an earlier pilot study with 64 opiate addicts from the aforementioned study, Rounsaville, Weissman, Rosenberger, Wilber, and Kleber (1979) had indicated that the 13-item Beck Depression Inventory (BDI; Beck & Beck, 1972) and the Symptom Check List-90 (SCL-90; Derogatis, Lipman, & Covi, 1973) had yielded sensitivity rates of 94% and 89%, respectively, with respect to the detection of clinically diagnosed depression.

The feasibility of using brief self-report instruments developed in the United States, such as the BDI and the SCL-90, for estimating psychopathology in heroin addicts from other countries has recently been suggested. For example, during the 1987 Dutch-American Conference on the Evaluation of Drug Abuse Treatment (Platt, in press), it was proposed that the BDI and SCL-90 might also be applicable for detecting self-reported depression and symptom complaints in Dutch addicts. Although the BDI (Bouman, Luteijn, Albersnagel, & van der Ploeg, 1985) and the SCL-90 (Arrindell & Ettema, 1981, 1986) have been translated into Dutch and described as reliable and valid for Dutch populations, these instruments have not been used to compare self-reported psychopathology in Dutch versus American heroin addicts. Given the increasing interest in cross-cultural addiction research in these two countries (Platt, in press) as well as the continuing "export" of measurement instruments developed in the United States,

Table 1. Psychopathology in Heroin Addicts: Selected Studies and Parameters

Author(s)	Setting	Sample	Instruments	Raters	Results
Weissman et al. (1976)	Methadone maintenance program	106 male addicts	Raskin, HRSD, and HSCL	Masters- and bachelor level	32% clinically depressed
Dorus & Senay (1980)	Screening unit	289 male addicts 143 female addicts	HRSD, and BDI	Psychologists	46% with moderate to severe depression by BDI; 29% with moderate to severe depression by HRSD
Rounsaville et al. (1982)	Screening unit	403 male addicts 130 female addicts	SADS with RDC	Masters- and bachelor level	53.9% with lifetime major depression and 23.8 % with current major depression
Woody et al. (1983)	Methadone maintenance program	110 male addicts	SADS with RDC, HRSD, ASI, ABDI, and HSCL	Physician or psychologist	43% with lifetime major depression

Note. ABDI = Abbreviated Beck Depression Inventory; ASI = Addiction Severity Index; BDI = Beck Depression Inventory; HSCL = Hopkins Symptom Checklist; HRSD = Hamilton Rating Scale for Depression; SADS with RDC = Schedule for Affective Disorders and Schizophrenia with Research Diagnostic Criteria.

such a procedure may yield useful information with respect to the comparability of Dutch and American heroin addicts, both in terms of their psychopathology and their sociological background. Of more general relevance, this study may yield useful information through the examination of presumingly very different addict samples of the interactions between psychopathological variables, sociological variables, and the process of treatment selection.

METHODS

Subjects

Because males represent the majority of Holland's and the United States' heroin addicts and most of Holland's addicts are White, the present study was restricted to White male heroin addicts. Table 2 shows the background characteristics of the Dutch and American samples.

Table 2. Background Characteristics by Nationality (N = 168)

	Dutch (N=47)		American (N=121)		
Categorical variables	N	%	N	%	chi^2 (168, 1)
Marital status					
Never married	36	(76.6)	49	(40.5)	16.23[a]
Other	11	(23.4)	72	(59.5)	
Current living arrangements					
Alone	16	(34.0)	23	(19.0)	3.49
Other	31	(66.0)	98	(81.0)	
Employment status					
Employed	9	(19.1)	47	(38.8)	5.05[b]
Unemployed	38	(80.9)	74	(61.2)	

[a] $p < .001$
[b] $p < .05$
[c] $p < .01$

Table 2. Continued

Categorical variables	Dutch (N=47) N	%	American (N=121) N	%	chi^2 (168, 1)
Ever arrested					
Yes	42	(89.4)	113	(93.4)	0.31
No	5	(10.6)	8	(6.6)	
Current medical problem					
Yes	10	(21.3)	49	(40.5)	4.68[b]
No	37	(78.7)	72	(59.5)	
Treated for psychiatric problems					
Yes	13	(40.4)	33	(27.3)	0.12
No	28	(59.6)	88	(72.7)	
Drug use in past 30 days					
Heroin					
Yes	39	(83.0)	42	(34.7)	29.68[a]
No	8	(17.0)	79	(65.3)	
Cocaine					
Yes	29	(61.7)	46	(38.0)	6.76[c]
No	18	(38.3)	75	(62.0)	
Barbiturates					
Yes	16	(34.0)	65	(53.7)	4.49[b]
No	31	(66.0)	56	(46.3)	
Amphetamines					
Yes	9	(19.1)	3	(2.5)	11.78[a]
No	38	(80.9)	118	(97.5)	
Marijuana					
Yes	28	(59.6)	53	(43.8)	2.77
No	19	(40.4)	68	(56.2)	

[a] $p < .001$
[b] $p < .05$
[c] $p < .01$

Table 2. Continued

Categorical variables	Dutch (N=47) N	%	American (N=121) N	%	chi^2 (168, 1)
Alcohol					
Yes	21	(44.7)	60	(49.6)	0.16
No	26	(55.3)	61	(50.4)	

Continuous variables	Dutch (N=47) M	SD	American (N=121) M	SD	t (166)
Age (in years)	26.19	4.33	35.89	5.61	10.68[a]
Education (in years)	9.79	2.15	11.63	1.82	5.58[a]
Age of first heroin use	18.38	3.29	18.40	3.93	0.03
Years of heroin use	7.81	4.28	17.49	6.46	9.46[a]
Number of prior methadone programs	3.04	2.40	3.15	1.92	0.31
Number of prior inpatient detoxification programs	1.60	2.22	2.24	2.78	1.41

[a] $p < .001$
[b] $p < .05$
[c] $p < .01$

The Dutch sample had volunteered for the study within two days of being admitted to the clinical detoxification center of a psychiatric hospital in The Hague. Upon admission to the detoxification program, each patient was given a dose of methadone to prevent withdrawal, and this dose was subsequently decreased over time.

The American sample represented volunteers for a study being conducted by the third and fourth authors aiming to develop a typology of heroin addicts

based upon their treatment characteristics. The men were drawn from six methadone programs in the metropolitan Philadelphia area.

Instruments

The BDI (Beck & Steer, 1987) is a 21-item self-report inventory covering affective, cognitive, motivational, and vegetative symptoms associated with depression. It is usually scored by summing the ratings for its 21-items which range from 0 to 3. The 21-item Dutch BDI's psychometric characteristics are comparable to those of the American scale according to Bossler, Koning, and van Meurs (1986).

Recently, Steer (1987) employed the 21-item BDI with 99 outpatients diagnosed with DSM-III dysthymic disorder and 71 heroin addicts receiving methadone maintenance treatment, and found no mean difference between the samples' BDI total scores. The dysthymic patients described more severe cognitive and affective symptoms than did heroin addicts, whereas the heroin addicts reported more severe somatic and performance symptoms than did dysthymic patients. It was proposed that cognitive-affective symptoms were more effective for estimating depression in heroin addicts because the somatic-performance symptoms, such as loss of appetite, may be shared with heroin addiction, and might not represent depression per se.

Consequently, in the present study, two additional methods for scoring the BDI were employed. A cognitive-affective subscale was calculated by summing the ratings for the first 13 items, and a somatic-performance scale was calculated by summing the ratings for the last eight items (Beck & Steer, 1987).

The SCL-90 (Derogatis et al., 1973) was selected because it is widely accepted brief psychological screening instrument for detecting psychopathology in heroin addicts (Rounsaville et al., 1979). The instrument was scored for its nine syndromes representing (1) Somatization (SOM), (2) Obsessive-Compulsiveness (OBS), (3) Interpersonal Sensitivity (INT), (4) Depression (DEP), (5) Anxiety (ANX), (6) Hostility (HOS), (7) Phobic Anxiety (PHB), (8) Paranoid Ideation (PAR), and (9) Psychoticism (PSY), along with three global indices of distress called the Global Severity Index (GSI), Positive Symptom Distress Index (PSDI), and Positive Symptom Total (PST). Arrindell and Ettema (1981) have recommended an alternative scoring of the subscales based on the factor

structure for the Dutch SCL-90, but the present study used the American scoring system (Derogatis et al., 1973).

The BDI requires approximately five to 10 minutes to complete by a person who can read at the fifth grade level, whereas the SCL-90 takes about 15 to 20 minutes to complete by a person with a similar reading level.

Procedure

The BDI and SCL-90 were administered to the American heroin addicts during their routine visits to their methadone maintenance programs by research assistants. None of the patients manifested overt signs of withdrawal at the time of testing.

The Dutch addicts were administered the same tests two to three days after admission to their detoxification program.

Data Analysis

Although the two samples differed substantially in mean ages and years of heroin use (Table 2), age and years of heroin use were not significantly related to either the BDI ($r=-.09$ and $-.07$, respectively) or the GSI ($r=-.03$ and $-.03$, respectively). The GSI has been recommended by Derogatis (1983, p. 11) as the best SCL-90 estimator for overall depth of psychopathology. Therefore, age and years of heroin use were not employed as covariates in comparing the BDI and SCL-90 scores of the Dutch and American samples.

Independent t-tests were used to compare the three BDI scores and the three SCL-90 global indices. Since the nine SCL-90 subscales are highly intercorrelated with one another (Derogatis et al., 1973), a oneway multivariate analysis of variance (MANOVA) was employed to determine whether or not the mean profiles of the nine SCL-90 scores were significantly different for the Dutch and American heroin addicts samples.

RESULTS

Table 3 presents the means and standard deviations of the SCL-90 and BDI for the Dutch and American heroin addicts.

Table 3. Means and Standard Deviations of SCL-90 and BDI by Nationality (N = 168)

	Dutch (N=47)		American (N=121)		
Instrument/scale	M	SD	M	SD	t (166)
SCL-90					
Somatization	1.17	0.65	0.97	0.77	1.63
Obsessive compulsiveness	1.36	0.80	1.08	0.81	2.04
Interpersonal sensitivity	1.11	0.75	0.90	0.73	1.67
Depression	1.53	0.78	1.31	0.85	1.57
Anxiety	1.27	0.77	0.97	0.81	2.16
Hostility	0.95	0.88	0.84	0.83	0.76
Phobic anxiety	0.77	0.78	0.46	0.71	2.50
Paranoid ideation	1.32	0.79	1.02	0.84	2.09
Psychoticism	0.83	0.56	0.56	0.60	2.59
Global severity index	1.19	0.60	0.96	0.68	2.04[a]
Positive symptom distress	1.94	0.52	1.78	0.61	1.51
Positive symptom total	53.17	17.70	45.09	21.15	2.32[a]
BDI					
Cognitive-affective scale	12.61	6.33	9.83	6.85	2.41[a]
Somatic-performance scale	6.28	4.52	5.49	3.57	1.19
Total score	18.89	9.90	15.32	9.37	2.18[a]

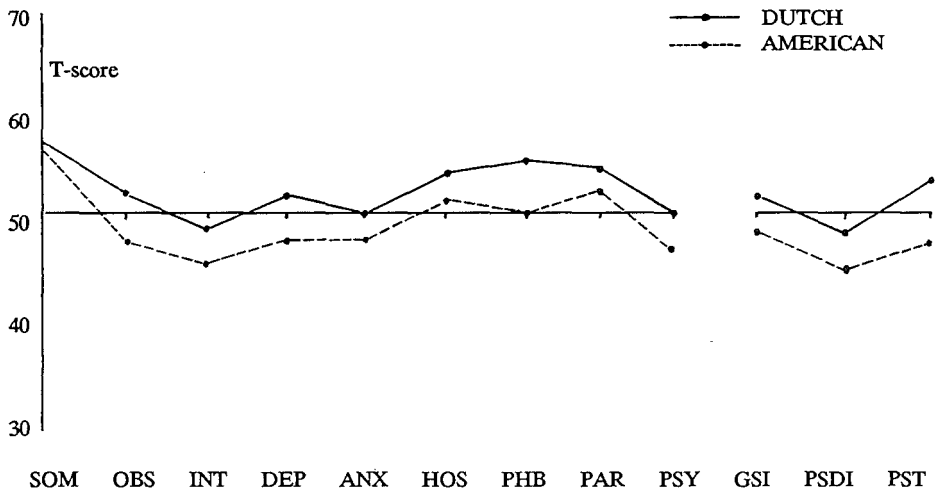
Note. The MANOVA F (9,158) for the nine SCL-90 subscales = 1.44, and none of the resultant mean differences was thus interpreted as significant.
[a] $p < .05$.

The MANOVA F(9, 158=1.44) was not significant for the nine SCL-90 symptom dimensions at the .05 level, two-tailed test. Therefore, none of the mean differences between the Dutch and American samples' nine SCL-90 scores shown in Table 3 was considered to be significant, even though the independent t-tests for some of these syndromes would have been significant if the upper level of alpha set by the MANOVA had been significant. The SCL-90 GSI and PST indices did differentiate the samples. The Dutch described approximately eight more positive symptoms (PST) and a higher mean level of overall symptom distress (GSI) than the Americans had. However, the PSDI did not discriminate the Dutch from the American addicts, indicating that the two samples had comparable levels of distress for the symptoms that each sample was separately complaining about.

The mean BDI score described by the Dutch was significantly higher than that of the Americans at the .05 level, two-tailed test (Table 3). The mean differences between the groups with respect to the two BDI subscales indicated that the Dutch and Americans indicated comparable levels of somatic and performance depression, but the level of cognitive and affective depression described by the Dutch was higher than that described by the Americans (Table 3).

Figure 1 displays the SCL-90 profiles for both the Dutch and American heroin addicts with respect to the normative data given by Derogatis (1983) for male psychiatric outpatients. Although the Dutch addicts were inpatients, outpatient norms were employed because all of the Americans were outpatients, and the inpatient norms given by Derogatis (1983) probably reflected a substantial number of patients with psychotic diagnosis. The levels of psychopathology reported for both samples were comparable to those reported for psychiatric outpatients; all of the Dutch and Americans' mean SCL-90 scores fell within one standard deviation of a T score of 50. The profiles shown in Figure 1 also indicate how similar the shapes of the Dutch and American mean SCL-90 profiles were to each other. Furthermore, neither the Dutch nor American SCL-90 profiles indicated significant elevation over a T score of 63, which Derogatis suggested as indicating "caseness".

Figure 1. SCL-90 Profiles



DISCUSSION

The present results indicate that the levels of self-reported psychopathology described by both the American and Dutch addicts were comparable to those levels typically found for American male psychiatric outpatients (Derogatis, 1983). The overall levels of self-reported psychopathology described by Dutch and American White male heroin addicts were significantly different. The Dutch heroin addicts described more complaints and higher overall levels of symptom distress than did the Americans. With respect to depression, the Dutch addicts described a higher mean level of self-reported depression than the American addicts, and this mean difference was attributable to more severe cognitive and affective symptomatology in the Dutch than in the Americans. However, the magnitudes of the mean differences are small and probably not clinically meaningful.

Thus, the present findings support the high levels of psychopathology previously reported for methadone patients in America (Platt, 1986) and now also establish that such levels exist in Dutch addicts. Because of these similarities, the implication is that both Dutch and American heroin addicts should be routinely screened for clinical levels of psychopathology and referred for appropriate psychiatric interventions when necessary.

The similarities in psychopathology were surprising given the differences in sociological background between the two countries' samples. First, the Dutch were more likely to be unmarried, unemployed, to have no current medical problems, and to have recently used heroin, cocaine and amphetamines. They were less likely to have recently used barbiturates. In addition, the Dutch were generally 10 years younger, had received 2 years less education, and had used heroin 10 years shorter than the Americans.

The 10-year age differential between the Dutch and American addict samples, although not significantly related to overall levels of psychopathology and depression, certainly indicated that the Dutch sample was at an earlier stage of heroin addiction than was the American sample. Nevertheless, the Dutch reported significantly higher levels of depression and symptom distress than the Americans, and this is the opposite of what would have been predicted since there is some evidence that self-reported depression increases with age (Beck & Steer, 1987).

Second, the Dutch and Americans were attending different types of treatment programs. The American addicts were stabilized in their treatment environment at the time of testing, whereas the Dutch were in the process of adjusting to their new detoxification regimen. The anticipation of decreasing methadone doses might have increased the anxiety levels of the Dutch. Therefore, the more severe cognitive and affective distress described by the Dutch as opposed to the Americans may reflect the situational crisis that either precipitated admission to the detoxification program or their anxieties about detoxifying rather than enduring psychopathological traits.

Nevertheless, Steer (1979) had previously found that number of years of heroin use and educational attainment differentiated American heroin addicts seeking inpatient detoxification and methadone maintenance. Patients seeking inpatient detoxification were more educated and had been using heroin for fewer years than were patients seeking methadone maintenance. There was no

difference between the inpatients and outpatients with respect to their affective states.

Together, these findings suggest that despite obvious differences in demographic, treatment, and sociocultural variables between the Dutch and American addicts, stable patterns of psychopathology may exist in these two countries' addict populations. Further research should be undertaken with larger samples representing both sexes and minorities to determine whether or not there are unique types of psychopathology being displayed by these two countries' heroin addicts.

Chapter 6

RETENTION IN SUBSTANCE ABUSE TREATMENTS: A LITERATURE REVIEW

INTRODUCTION

Many studies in the addiction field have shown that longer treatment duration is strongly associated with better treatment outcome across various types of treatments and client populations (Simpson, 1979, 1981; Bale et al., 1980; De Leon, 1984, Holland, 1986; Rounsaville, Kosten, Weissman, & Kleber, 1985). Thus, treatment effectiveness could be improved upon considerably by enhancing the time that clients spent in treatment. However, while early termination from treatment is not uncommon in the field of general psychiatry (Baekeland & Lundwall, 1975; Kool & Sijben, 1989), addiction treatments are often disproportionally confronted with high rates of dropouts (Sansone, 1980; Foureman, Parks, & Gardin, 1981; De Leon & Schwartz, 1984; Kok, 1984). Generally, the dropout rate is highest during the first weeks following admission and gradually declines with longer time in treatment (De Leon & Schwartz, 1984; Hendriks, 1989).

Although the presence of high dropout rates and its significance for treatment outcome are now widely recognized, the dropout phenomenon itself- and conversely, the phenomenon of treatment continuation - is still largely unclear, both conceptually and empirically. In this chapter, differences in conceptual approach of the dropout phenomenon are discussed and a review is presented of empirical studies on dropout in substance abuse treatments.

MEASUREMENT OF DROPOUT: SOURCES OF VARIATION

On a conceptual level, the literature is characterized by differences in - or vague definitions of the term dropout. Whereas it seems obvious that dropouts form in many ways a heterogeneous group, this heterogeneity is not always taken into account sufficiently in studies. Typically, studies focus on differences in

client characteristics between those who complete treatment and those who leave prematurely, but tend to ignore other sources of variation. These include: (a) length of stay, (b) type of program, (c) reason for termination, (d) criterion for program completion/dropout, (e) multiple admissions for treatment, and (f) client's intention at admission. Each of these will be discussed in the following section.

Length of Stay

Many investigators define dropouts as those who fail to complete treatment. This definition tends to mask differences in length of stay among dropouts. Such differences are particularly apparent in long-term programs such as therapeutic communities, in which the length of stay of dropouts may vary from one day to more than two years. It is likely that client characteristics associated with dropout during the first month are different from those associated with dropout after, for instance, 10 months. From a program viewpoint, there is often a major difference in therapeutical approach between the earlier and later stages in treatment. For example, in therapeutic communities the focus of attention usually shifts from basic behavioral problems and the development of trust during the early stage of treatment to underlying emotional problems and confrontation during later stages.

Besides these differences in length of stay itself and in client characteristics and program orientation associated with length of stay, the above mentioned definition of dropout may mask differences in treatment outcome. Some authors argue on theoretical grounds that program completion is the critical factor that determines outcome status: "The cumulative number of days a person spends in a program only seems to be an important factor in what a person retains and internalizes from his experience. Of more severe importance is the status of the individual who leaves the therapeutic community. Each person leaves as either a splittee or a graduate, and it is this status that determines to a large degree his social relationships and immediate future." (Aron & Daily, 1976, p. 8). However, while many studies have reported significant better treatment results among program completers than among dropouts, research has also consistently shown a positive relationship between length of stay and favorable outcome among dropouts (Holland, 1983; De Leon, 1984, 1985).

Furthermore, research has shown very similar improvement rates among program graduates (93% improvement) and longest staying dropouts (89% improvement) (De Leon, 1984), indicating a gradual difference instead of an absolute difference between program completers and dropouts.

Given these differences it seems clear that length of stay and premature termination (or program completion) are two different aspects of retention. In a study on retention in a methadone maintenance program, Steer (1980) reported that both aspects accounted for only 55% of each other's variance. Wexler and De Leon (1977) and De Leon and Schwartz (1984) investigated the relationship between them in a therapeutic community and found that the likelihood of continued retention increased with longer stay in treatment itself. It seems advisable, especially in studying retention in long term treatments, to combine both sources of information by categorizing dropouts in temporal groups, a suggestion made earlier by Baekeland, Lundwall and Shanahan (1973), Baekeland and Lundwall (1975) and Ward and Hemsley (1981). The latter authors state: "(...) a major problem in the studies published to date (is that) most have not considered length of stay as a sequence of stages at which different factors may influence drop out (Ward & Hemsley, 1981, p. 1287). By utilizing such categorization, specific temporal patterns of dropout during subsequent phases in treatment, may be identified.

Another, more fundamental problem in retention research concerns the conceptual meaning of the variable "length of stay" itself. While length of stay has been found to be the most consistent predictor of successful treatment outcome among studies, length of stay and treatment outcome should not be confused. An indication of the risk of using length of stay as a sole measure of success is given by McLellan, Childress, Griffith, and Woody (1984). They found a positive relationship between treatment duration and percent improvement in both a methadone maintenance program and a therapeutic community for clients with low or moderate levels of psychiatric problem severity, but a negative relationship in the therapeutic community for clients with severe psychiatric problems.

It should be recognized that length of stay itself is an indirect measure, that refers to other, more basic variables. For example, in residential drug-free treatment, length of stay partly reflects the mere time that an individual is isolated from drugs and the influence of his environment outside the clinic. Length of stay also refers to the amount or doseage of treatment a client has

received. Clearly, the implicit assumption that longer treatment duration means "more" treatment, is not always true. During a same treatment period clients may have received different amounts of treatment. Clients obviously also differ in the time they need for change.

Given these considerations, more direct measures of treatment influence than length of stay are needed. This requires a more clear definition of the treatment process and description of the relationship between specific treatment components, retention and outcome. Although some efforts have been undertaken in this direction (De Leon, 1974; Sacks & Levy, 1979; Biase, Sullivan, & Wheeler, 1986; De Leon & Jainchill, 1986b; Holland, 1986), treatment process research is still in its initial stage.

Type of Program

Regarding the treatment component in retention studies, there are two major sources of variation. These include (a) the type of treatment modality (detoxification, therapeutic community, methadone maintenance), and (b) the specific treatment facility being studied. First, given their differences in view of drug abuse, treatment method and treatment goal, it is not unlikely that different factors are associated with dropout in each of these types of modalities. This in turn, may partly reflect differences in client population that are attracted by these modalities. Yet, some investigators only report on combined retention data from different modalities (Siguel & Spillane, 1978; Dorus & Senay, 1980; Keil & Esters, 1982). Second, within each type of program there are often major differences in philosophy, staff experience, admission criteria, client population, planned duration of treatment etc. An indication of the effect of such program-specific variables on retention is provided by Craig, Rogalski, and Veltri (1982), who found that clients were more likely to leave prematurely if treatment staff were more available and if less clients were admitted to the program during the client's hospitalization. In a discriminant analysis, the application of only the latter variable - number of admissions- resulted in an accuracy of stay-leave classification of 81 %. While the use of combined data from several programs within the same modality (such as in the Drug and Alcohol Rehabilitation Programs studies) may conceal specific correlates of retention that are associated with these program-specific differences, results

from individual program based studies may only be generalizable to the specific program in question and not to the type of modality being studied.

Reason for Termination

Given the obvious importance of the actual circumstances that led to the moment of leaving treatment, surprisingly few studies have focused on the reason for premature termination of therapy. Premature termination can be either staff-induced (disciplinary discharge) or decided on by the client.
In their review on dropping out of treatment, Baekeland and Lundwall (1975) suggested that clients who are expelled from a treatment program are likely to differ from "regular dropouts" in client characteristics and in outcome status. Comparing both groups in a therapeutic community, Harris, Linn and Pratt (1980) reported some differences in admission and outcome status, but there was no indication of an overall pattern of more disturbance among the disciplinary discharges. Clearly, if a treatment program shows high rates of disciplinary discharges, it seems a wise policy to differentiate between this group and regular dropouts in retention research.

Client's reasons for terminating treatment have been investigated in a therapeutic community by De Leon (1985). Preliminary findings from this study suggest that early dropouts report more personal reasons, while long term dropouts report more program-based reasons. Pekarik (1983) investigated the relationship between client's reasons for leaving treatment and outcome status among psychotherapy outpatients in a community mental health center. Clients who left treatment because they considered themselves to be without further need of treatment improved significantly, while clients who reported dislike of services showed no significant symptom reduction. Given the general lack of research in this area, however, these findings are only indicative of the relevance of clients' reasons for leaving treatment in retention and outcome studies. Much research is still needed in this area.

Criterion for Program Completion/Dropout

Among studies there is much diversity on the definition of program completion and the use of cutoff points in time for determining dropouts. Program completion has been defined in terms of mutual consent of both staff and client (Steer, 1983), achievement of treatment goals as decided by progam staff (Keil & Esters, 1982) or planned (expected) duration of treatment (Roffe, 1981; Craig, 1984a, 1984b; Craig & Olson, 1988; De Leon, 1984). Often a distinction is made between those who remain in treatment less than or more than a certain number of days after admission to treatment. Some investigators apply a cross-sectional design, in which the cutoff date is not based on the day of admission but on the day of cross-sectional testing (Biase, 1971; Cuskey, Chambers, & Wieland, 1971; De Leon, 1974; Wexler & De Leon, 1977; Condelli, 1986). Only a few studies report explicitly on the considerations leading to the choice of a certain cutoff point. These include: clinical impression (Baekeland, Lundwall, & Shanahan, 1973), prior research findings (De Leon & Jainchill, 1986a) or a combination of both (De Leon & Schwartz, 1984). Some investigators determine the cutoff point a posteriori, on the basis of differences in client characteristics or outcome status associated with the actual distribution of dropout in the sample being studied (Foureman et al., 1981; Sirotnik & Roffe, 1977).

Multiple Admissions

Many clients who enter drug abuse treatment have attended one or more other treatment programs before. This is particularly true for The Netherlands, where treatment is relatively widely available and easily accessible. For example, clients admitted to a Dutch clinical detoxification center had previously attended an average of six treatments; 93% of the clients had been in substance abuse treatment before (Hendriks, 1989). It is also not uncommon that clients who leave a program prematurely, are subsequently re-admitted to the same program. Although these clients may have received different "amounts" of treatment than new admissions, only a few studies focus attention to this factor.

Regarding the impact of prior treatment experiences on current retention, Siguel and Spillane (1978) present two conflicting viewpoints. First, the

probability of completing current treatment increases with the number of previous treatment attempts. According to this hypothesis, earlier treatment experiences may contribute to the motivation of clients to complete treatment; it can be argued that some clients require more (treatment) attempts to give up drugs before they actually do so. Additionally, some clinicians argue that the time spent ouside of a program after dropping out is an important learning period in that it reaffirms negative experiences associated with drug use. Alternatively, the above mentioned positive relationship may simply reflect a greater familiarity of multiple admissions with the treatment system in general or with the particular treatment facility being re-entered (Sansone, 1980). The second viewpoint proposes a negative relationship between number of previous treatments and the probability of current treatment completion. According to this hypothesis a greater number of previous treatments may reflect a more severe addiction problem, resulting in poor treatment results (Siguel & Spillane, 1978). It can also be argued that each earlier attempt to give up drugs that failed, is perceived by the client as another dissappointment, negatively influencing the client's expectations of future attempts.

From studies that incorporate the number of previous treatment attempts, conflicting data emerge. Sansone (1980) found support for a positive relationship, in that readmitted clients in a therapeutic community showed higher retention rates during the early stages of treatment than single or first admissions. After the seventh month, however, this difference could no longer be observed. Contrastingly, in a multi-program study Siguel and Spillane (1978) found higher completion rates among clients with no prior treatment experiences compared to clients with at least one experience. Clients with one, two, three or more prior treatment experiences did not differ in completion rate. Steer (1980, 1983) and Craig, Rogalski and Veltri (1982) found no relationship between retention and previous treatments in respectively a methadone maintenance program, drug-free counseling and an opiate detoxification program. Sirotnik and Roffe (1977) found no differences in prior treatments between clients who stayed less than or more than 90 days in a long term therapeutic community. In the same study, however, they found a negative relationship between the number of prior voluntary detoxifications and staying longer than 75 days in a short term residential half-way house.

Given these conflicting viewpoints and research findings, more detailed studies are needed that include various aspects of treatment history besides the

mere number of previous treatment attempts. Such aspects include the types of modalities being attended, the duration of previously attended treatments and the result of those treatments. In addition, the question of what constitutes a readmission should be clarified. A clear operational definition of this status, though unavoidably sometimes arbitrary, may solve some of the controversy presented in this section.

Clients' Intention at Admission

It is often an implicit assumption that clients who enter a drug abuse treatment program, have the intention to complete it. The generality of this assumption is, however, questionable and seems to depend at least partly on the appropriate match between clients' intentions and the goals of the treatment program. Some clients may only want to regulate their drug use because of recent (social, psychological, justicial or physical) crises, while others may be determined to reach abstinence on a long term basis. Another group may consist of clients who are still uncertain about their intentions at the time of admission and who choose to let their decision to either continue or leave treatment depend on their subsequent experiences during treatment. In the case of an inappropriate match between client and treatment - for example a client who only wants to regulate his drug use, but who attends a long term drug-free program - leaving treatment may thus reflect a planned decision, made before the start of treatment. Yet, this act will be classified as dropout.

In the context of clients' intentions, the term "motivation" may clarify some of the controversy. In an attempt to define clients' motivation for therapy, Zitman (1978) states: "Motivation for therapy is the multicausally determined probability that a patient chooses for a therapy and continues to participate in that therapy until he has sufficiently improved." (p. 345). According to Zitman, motivation can be viewed by the treatment program as either a static factor (programs that demand a certain level of motivation to be admitted) or a dynamic factor (programs that attempt to improve the client's motivation). In line with this definition, a client is defined as a dropout if he does not continue treatment to the point of sufficient improvement, while he intended to do so at the time of admission. As argued above, from the viewpoint of the client this intention does not necessarily implicate completing treatment. Since the client's

initial intention is rarely assessed and the client's perception of his improvements is often no longer accessable, in retention studies the treatment staff's judgement of the client's status at the time of treatment termination is often decisive. In practice, this often means that anybody who leaves a treatment program prior to the length of stay that is considered necessary by the treatment staff, is classified as a dropout.

Despite its importance, only a few studies have - indirectly - adressed the issue of the client's initial intention. In a study on retention in a general psychiatric hospital, Steinglass, Grantham, and Hertzman (1980) showed that the client's estimate of their anticipated length of stay was positively related to remaining in treatment, suggesting that clients who left prematurely, intended to do so from the start. In a drug-free therapeutic community, De Leon and Jainchill (1986a) showed that remaining in treatment was positively related to measures of the client's perception of the severity of his problems and the need for treatment at the time of admission.

Statistical Analysis

In "predicting" dropout, many investigators apply univariate analyses (chi-square test for categorical variables and t-test for continuous measures) to compare dropouts and remainers on a large set of variables. It should be reminded however, that this procedure yields a number of statistically significant associations that may in fact be due to chance. For example, with a significance level of $p=.05$, one can expect five significant relationships in every hundred comparisons to occur merely by chance. In addition, univariate analyses do not provide information on the interactions between the independent variables and the combined effect of the variable set on the criterion.

While the application of univariate procedures may suffice for basic exploratory purposes, a more thorough investigation of the complex nature of the drop out phenomenon requires multivariate techniques. In retention research the most widely used multivariate techniques are Multiple Regression Analysis (MRA) and Discriminant Analysis (DA). Both techniques produce a function which represents a linear combination of weighted variables to predict the criterion (which is continuous in MRA and categorical in DA). Both types of analyses however, are in statistical terms very powerful and tend to maximize chance

findings to achieve good predictive accuracy. To minimize the risk of obtaining results that are due to chance, the findings should therefore be replicated in another sample.

A commonly used replication procedure involves the use of two random samples from the same population and the application of the (regression or discriminant) function, found in one of the samples to the other sample. Although this procedure is preferable to methods without cross-validation, the randomized selection of the two samples tends to overestimate the predictive accuracy of the function in the cross-validation sample. A more stringent test of the prediction function's validity is cross-validation of the results on an independent sample across time. Such prospective research designs, however, have rarely been applied. In a retention study, Craig (1984a) cross-validated a discriminant function against an independent sample of clients who were admitted to the same program three years later, and found a reduction in the function's predictive accuracy of 50% or more.

In addition to the lack of sufficient replication and the need for prospective research, studies sometimes fail to report separately on the classification results for dropouts and remainers. Especially if the size of the groups is very different, the overall predictive accuracy may be high at the cost of low classification accuracy for one of the groups. Comparison of the function's predictive accuracy with the results obtained from base rate prediction, should therefore be included. If the (known) base rates are incorporated in the analysis as prior probabilities of group membership, the number of cases belonging to the largest group will be overestimated. If the information on base rates is not incorporated (assuming equal probability of group membership), the size of the largest group will be underestimated (Sirotnik & Roffe, 1977).

Table 1. Overview of Retention Studies in Substance Abuse Treatments

Author(s)	Setting	Sample	Instruments/variables	Retention criteria	Factors, significantly related to either dropout or shorter length of stay
Perkins & Bloch (1970)	Methadone maintenance program	521 heroin addicts	Demographic, social, medical and treatment variables	Disciplinary discharges versus remainers	Disciplinary discharges were more likely to be unmarried, unemployed, not residing with their family, admit to have drug use problems, had more previous arrests and incarcerations, more medical problems, had been in the treatment program for a shorter period and received a lower methadone dosage than remainers
Biase (1971)	Therapeutic community	37 heroin addicts	Multiple Affect Adjective Check List	Left within 6 months after initial testing	Higher mean score on Depression scale (MAACL)
Cuskey et al. (1971)	Outpatient detox	86 narcotic addicts	Demographic, drug use and legal variables	Left against medical advice within 5-8 months after cross-sectional testing	Less education, married, no concurrent use of drugs other than heroin
Levine et al. (1972)	Methadone maintenance program	33 Black, male heroin ddicts	Diagnostic and Statistical Manual-II, ratings of anxiety, depression, paranoia, object relatedness, compliance; demographic, background, drug use, legal, sexual and familial variables	Left treatment themselves or were terminated by staff	Lower mean anxiety rating, low compliance score (defiant and rebellious attitude)
Rosenberg et al. (1972)	Methadone maintenance program	60 narcotic addicts	Demographic, background, familial, religious and drug use variables	2 retention groups (early dropouts (1-7 days), late dropouts (>63 days))	Black, protestant, unemployed, living apart from family, lower initial methadone dose

Table 1. Continued

Author(s)	Setting	Sample	Instruments/variables	Retention criteria	Factors, significantly related to either dropout or shorter length of stay
Baekeland et al. (1973)	Outpatient alcohol clinic	143 alcoholics	Zung Depression Inventory, Cattell Anxiety Scale, Cornell Index, ratings of anxiety, depression, sleep problems and alcohol intake; demographic, background, motivation, impulse control, and childhood variables	4 retention groups (0, 1-4, 5-26, >26 wks)	(Drop out groups versus attenders) Immediate dropouts: failed more to attend first visit, had more often alcoholic relatives, higher anxiety and depression scores (physician ratings, tended to live alone, not dry on admission, more likely to receive antidepressants Rapid dropouts: shorter periods of abstinence, higher anxiety score (CAS), higher CI scores, more often self-referred Slow dropouts: shorter maximum periods of prior abstinence, less education, had more often alcoholic relatives, had had less contact with AA
De Leon (1974)	Therapeutic community	208 drug addicts	Internalization-Externalization Scale, Locus of of Control Scale, Short Schizophrenia Scale, Beck Depression Inventory, Shortened Manifest Anxiety Scale, Multiple Affect Adjective Check List	Left within 6 months after cross-sectional testing	Higher mean scores on all scales
Henchy et al. (1974)	Methadone maintenance program	133 drug addicts	Demographic, drug use, medical and legal variables	Left treatment	Younger clients, White, no medical complications, less terms served for nondrug offenses, no court action pending
Jarvis et al. (1975)	U.S. Air Force drug treatment	170 male drug abusers	Minnesota Multiphasic Personality Inventory, IQ and demographic variables	Program completers versus last phase residents who manifest disciplinary problems	The group with disciplinary problems had higher scores on F, Hs and Pd scales (MMPI)

Table 1. Continued

Author(s)	Setting	Sample	Instruments/variables	Retention criteria	Factors, significantly related to either dropout or shorter length of stay
Lin (1975)	Residential substance abuse program	199 alcoholics and drug addicts	Minnesota Multiphasic Personality Inventory, Wide Range Achievement Test, demographic variables	4 retention groups (Left Without Permission, Against Medical Advice, Administrative discharge, Regular discharge)	Drug addicts more likely to receive Adm. discharge; higher proportion of males among AMA discharges (versus Reg. discharges); higher scores on F and Pd scale (MMPI) among LWP and Adm. discharges (versus Regular discharges)
Williams & Lee (1975)	Methadone maintenance program	119 opiate addicts	Demographic, legal and drug use variables	Left treatment within 90 days	Lower last recorded methadone doseage level, larger number of dirty urines while on the program (indicating more other opiate usage than methadone)
Zuckerman et al. (1975)	Three therapeutic communities	145 drug abusers (59 male soft, 58 male hard, 28 female soft and hard drug users)	Minnesota Multiphasic Personality Inventory, IQ and demographic variables	Left before end of treatment	Male soft drugs: higher scores on F,Pa, Pt, Sc, D and Ma scales (MMPI) Male hard drugs: higher scores on Pa, Pt and Sc scales (MMPI) Female soft/hard drugs: higher scores on F, Pa, SI and Hs scales, lower score on K scale (MMPI)
Aron & Daily (1976)	Therapeutic Community	286 drug abusers	Demographic, socio-economic, religious, familial, drug abuse, attitude, intelligence, sexual identity, identity diffusion variables	Left before planned length of stay	Males: longer drug abuse history, voluntary admission, family history of alcohol or drug abuse, being gay or bisexual Females: low self-image, longer drug abuse history, voluntary admission
Sheffet et al. (1976)	Inpatient detox	802 drug addicts	Demographic, drug use and legal variables	Left before end of treatment	Older than 20 years, not student, White

Table 1. Continued

Author(s)	Setting	Sample	Instruments/variables	Retention criteria	Factors, significantly related to either dropout or shorter length of stay
McFarlain et al. (1977)	Multimodal treatment	52 narcotic addicts	Multiple Affect Adjective Check List, Suitable for Treatment Scale, IQ, demographic variables	4 retention groups (0-7, 8-30, 31-180, >180 days)	Low suitability for treatment, no legal pressure
Sirotnik & Roffe (1977)	Therapeutic community	237 heroin addicts	Demographic, background and familial variables	Left treatment within 90 days	Not black, not living with another drug user, no court appearance pending, internally motivated, both mother and father as primary guardians, higher family economic status, less days per week of heroin use at intake
Wexler & De Leon (1977)	Therapeutic community	809 drug addicts	Shortened Schizophrenia Scale, Beck Depression Inventory, California Personality Inventory, Shortened Manifest Anxiety Scale, IQ, Minnesota Multiphasic Personality Inventory, demographic, background, drug use and readmission variables, length of stay prior to cross-sectional testing	Left treatment within 6 months after cross-sectional testing	Shorter length of stay prior to initial testing, not Black, Hispanic, lower socioeconomic and less deviant family background, less prior attempts to give up drugs, lower education level, higher score on R factor (MMPI), lower scores on Distribution 4 and Defense Positive Scales (TSCS), higher score on Shortened Schizophrenia Scale
Gossop (1978)	Inpatient treatment	40 polydrug abusers	Cognitive, motivational, social pressure and social-historical variables	Left against medical advice; Length of stay	Less pressure exerted by the patient for admission, less frequent contact with family before admission, less pressure from family to seek treatment, less worried about future in terms of legal problems, less severe criminal history, drug friends are perceived as less important

Table 1. Continued

Author(s)	Setting	Sample	Instruments/variables	Retention criteria	Factors, significantly related to either dropout or shorter length of stay
Siguel & Spillane (1978)	Federally funded drug treatments	66.000 drug users	Number of previous treatment experiences	Did not complete treatment	Having had one or more prior treatment experiences (versus no prior treatment experiences)
Keegan & Lachar (1979)	Inpatient detox	176 polydrug abusers	Minnesota Multiphasic Personality Inventory, IQ, background variables	Left before end of program	Less likely to obtain normal or neurotic MMPI profiles, higher mean scores on F, Pd, Pa, Sc, Ma and A scale (MMPI)
Dorus & Senay (1980)	Multimodal treatment	432 substance abusers	Drug abuse history, Beck Depression Inventory, Hamilton Depression Scale	Left treatment within 4 months	Short (< 2 yrs) history of opiate dependence (versus long history)
Harris et al. (1980)	Therapeutic community	104 male drug addicts	Hopkins Symptom Checklist, Social Dysfunction Rating Scale, Lorre's Mood Scale, Ward Atmosphere Scale, background variables	Dropouts versus disciplinary discharges	Disciplinary discharges were born earlier in the family, used more amphetamines, believed more that drugs helped them to work better, believed less that they could stop using drugs and had a less negative attitude toward the Hard Drug User than dropouts
Sansone (1980)	Therapeutic community	1.130 drug addicts	Demographic, background and previous treatment variables	Survival rates	Female, Hispanic, adolescent, no court cases pending (only during first 6 months: single or first admissions)
Steer (1980)	Methadone maintenance program	207 heroin addicts	Eysenck Personality Inventory, Profile of Mood States, Beck Depression Inventory, Beck Hopelessness Scale, Raskin Depression Scale, Hamilton Depression Scale, Brief Psychiatric Rating Scale, Suicide Ideation Scale, background variables	Left before end of treatment; Length of stay	Black, not living with other addicts, past suicide attempts, high score on Vigor-activity scale (POMS)

Table 1. Continued

Author(s)	Setting	Sample	Instruments/variables	Retention criteria	Factors, significantly related to either dropout or shorter length of stay
Weingarten et al. (1980)	Inpatient alcohol rehabilitation center	61 male alcoholics	Frontalis Electromyographic level, IQ, education level	3 retention groups (<10, 11-19, 20 sessions)	Dropouts versus remainers: lower mean IQ score, lower education level. Early dropouts versus late dropouts: higher EMG baseline level, higher reduction from EMG baseline level
Foureman et al. (1981)	Therapeutic community	200 male heroin addicts	Minnesota Multiphasic Personality Inventory	Left treatment within 20 days	Higher scores on F, Hs, D, Hy, Pa, Pt and Sc scale (MMPI)
Roffe (1981)	8-week inpatient alcohol program	76 male alcoholics	Minnesota Multiphasic Personality Inventory, Tennessee Self Concept Scale, demographic, background, familial and perceived problem severity variables	Left before end of treatment	Living alone, shorter employment period during previous year, earlier age of onset heavy drinking, no previous treatments, perceived drinking problem as less severe
Steer et al. (1981)	Ambulatory detox	60 male drug addicts	Eysenck Personality Inventory, background variables	3 retention groups (completed detox, transferred, left before end of treatment)	Dropouts and completers were less neurotic and more likely to be Black than those who were transferred
Ward & Hemsley (1981)	Inpatient unit	38 polydrug abusers	Eysenck Personality Questionnaire, Perceptual Experience Inventory, socio-historical variables	3 retention groups (0-4, 5-8, >8 wks)	High psychoticism, high extraversion, social pressure on admission, no childhood separation
Craig et al. (1982)	Inpatient detox and rehabilitation unit	150 opiate addicts	Demographic and treatment variables	Left before planned length of stay	Less clients admitted during hospitalization, less therapists absences, less program staff absences, not treated with methadone. In discriminant function analysis 88% classification accuracy

Table 1. Continued

Author(s)	Setting	Sample	Instruments/variables	Retention criteria	Factors, significantly related to either dropout or shorter length of stay
Kell & Esters (1982)	Alcohol treatments in Pennsylvania	21.350 alcohol users	Quantity-Pattern Index of Drinking Behavior, demographic, background, alcohol use, legal, treatment history and ecological variables (from counties were clients were living)	Left treatment within 2 weeks	Client variables: less employed, younger, less DWI arrests, lower level of drinking (QPI), lower income, earlier age of onset alcohol use, longer periods of continued use, younger at first arrest, not first admission, no institutional referral, blue-collar occupation, previous dropout, no legal pressure, on public assistance, male, not White, single, not married, separated Ecological variables: high unemployment, large population decline, high population density, high rate employed in secundary and tertiary industries, more income inequality, more liquor sales, more alcohol cirrhosis deaths, less mariages, more divorces, more reported DWI, more reported liquor law violations, more Irish, more Latins, less Canadians, more South Europeans, more females, more people on public assistance, lower rate of owner-occupied housing
Steer (1983)	Outpatient drug-free program	110 polydrug users	Symptom Check List -90, background variables	Left before end of treatment; Length of stay	White, no secondary use of stimulants, higher occupational level, no fellony arrests, voluntarily reffered, high score on the Global Severity Index (SCL-90)
Craig (1984a)	Inpatient detox and rehabilitation unit	100 opiate addicts	Millon Clinical Multiaxial Inventory	Left before planned length of stay	In univariate ANOVA no differences between dropouts and completers. In discriminant function analysis 76% classification accuracy

Table 1. Continued

Author(s)	Setting	Sample	Instruments/variables	Retention criteria	Factors, significantly related to either dropout or shorter length of stay
Craig (1984b)	Inpatient detox and rehabilitation unit	200 opiate addicts	Minnesota Multiphasic Personality Inventory	Left before planned length of stay	In multivariate ANOVA no differences between dropouts and completers. In discriminant function analysis 69% classification accuracy
De Leon & Schwartz (1984)	Therapeutic community	982 drug addicts	Length of stay before initial dropout among multiple admissions	Left treatment before study's cut-off date	Shorter length of stay before initial dropout among multiple admissions
Condelli (1986)	Multimodal treatment	139 drug addicts	Demographic, external pressure, treatment need and sacrifice, behavior expected by program, importance to stay in program and program evaluation variables	Length of stay prior to 100 days after cross-sectional testing	Older clients, no legal pressure, no pressure from significant others, therapeutic community treatment, report shorter treatment need at admission, lower rating on Salience factor (program evaluation), report less that it was important to staff that they stayed
De Leon & Jainchill (1986a)	Therapeutic community	400 drug addicts	Circumstance, Motivation, Readiness and Suitability Scales	Left treatment within 30 days	Lower Motivation, less Readiness, less Suitability
De Leon & Jainchill (1986b)	Therapeutic community	1055 drug addicts	Reducing early dropout by utilizing experienced, senior staff, individual counseling and involvement of family	Left treatment within 30 days	The three interventions reduced the dropout rate significantly among non-volunteers and multiple admissions; effect of interventions less clear for total study sample
Craig & Olson (1988)	Short-term, hospital based program	116 drug addicts	Adjective Check List, demographic variables	Left before planned length of stay	Higher scores on Autonomy and Aggression scale, lower scores on Deference scale (ACL)

Table 1. Continued

Author(s)	Setting	Sample	Instruments/variables	Retention criteria	Factors, significantly related to either dropout or shorter length of stay
Dehmel (1989)	Outpatient drug abuse treatment	78 drug addicts	Demographic, socio-economic and drug use variables	Left before end of treatment	No completion of higher education, no reduction in rate of opiate use during 4 weeks prior to admission
Kunz (1989)	Therapeutic community	115 substance abusers (108 heroin, 7 alc./marijuana)	Socialization, drug related problems, cognitive attachment in drug culture, participation in group discussions and commitment to the treatment variables	3 retention groups (0-4, 5-12, >12 months)	More drug related problems, stronger cognitive association with drug culture, less committed to the treatment facility

STUDIES ON RETENTION

In this section a review is given of retention studies from the early 70's to the present. The findings of 41 studies on retention, as well as some aspects of the applied methodology, are presented in chronological order in Table 1. Since many studies report not only on statistically significant relationships but also on trends, factors that were not significantly (according to the author's criteria) related to retention, are not included in the table.

Demographic Variables

The relationship between demographic variables and retention has been investigated in most of the reviewed studies. Only five of these studies found a significant relationship between age and retention. Dropouts were generally younger in the studies of Henchy, Eckerson, and Paez (1974), Sansone (1980) and Keil and Esters (1982) and older in the studies of Sheffet, Quinones, Lavenhar, Doyle, and Prager (1976) and Condelli (1986). Both being non-White (Rosenberg, Davidson, & Patch, 1972; Steer, 1980; Steer, Herlick, & Diamond, 1981; Keil & Esters, 1982; Sansone, 1980) and being White (Henchy et al., 1974; Sheffet et al., 1976; Sirotnik & Roffe, 1977; Wexler & De Leon, 1977; Steer, 1983) has been found to relate to dropout. Dropouts were more likely to be female in the study of Sansone (1980) and to be male in the study of Keil and Esters (1982).

Several studies found a relationship between dropout and lower educational level (Cuskey et al., 1971; Baekeland et al., 1973; Wexler & De Leon, 1977; Weingarten, Hartman, & Holcomb, 1980; Dehmel, 1989) and unemployment (Perkins & Bloch, 1970; Rosenberg et al., 1972; Roffe, 1981; Keil & Esters, 1982). However, dropouts generally had a higher occupational level in a study of Steer (1983) and came from families with a higher socioeconomic background in the studies of Wexler and De Leon (1977) and Sirotnik and Roffe (1977).

A completely different approach of the relationship between retention and demography is presented by Keil and Esters (1982) who included macroscopic environmental variables in their analysis. They found that dropouts from alcohol treatments were more likely to come from counties with high population density, high levels of unemployment and high rates of people on welfare. In a

discriminant analysis, the addition of these ecological variables to client-specific characteristics increased the accuracy with which retention could be predicted significantly.

Thus, with the exception of the relationships between premature termination and lower educational level and unemployment, client-specific demographic variables are generally only weakly related to dropout and the types of related variables vary across studies. Ecological factors have rarely been investigated, but seem to have an effect on the prediction of premature termination. Given the lack of replication studies in this area, this conclusion should be viewed as tentative.

Legal Pressure

There has been considerable debate on the use of legal pressure to induce addicts to enter and remain in treatment. While this debate clearly has political and ethical dimensions (for example, see Platt, Buhringer, Kaplan, Brown, & Taube, 1988), the key question from a practical viewpoint is whether legal pressure improves the effectiveness of treatment.

Limiting this question to treatment retention, studies have consistently shown a positive relationship between remaining in treatment and the presence of legal pressure (Henchy et al., 1974; Aron & Daily, 1976; McFarlain, Cohen, & Yoder, 1977; Sirotnik & Roffe, 1977; Gossop, 1978; Sansone, 1980; Keil & Esters, 1982; Steer, 1983; Condelli, 1986; De Leon & Jainchill, 1986a). However, the type of legal pressure being studied - if defined - varies across studies; most studies refer to criminal justice procedures (eg. legal referral, on probation or parole, court case pending), but others assess the amount of legal pressure as perceived by the client (Gossop, 1978; Condelli, 1986). With the exception of the studies of Perkins and Bloch (1970) and Gossop (1978), variables that assess clients' legal history, such as number of previous arrests or incarcerations (Henchy et al., 1974; Steer, 1983) or age at first arrest (Keil & Esters, 1982) generally have little or no predictive value. Furthermore, the magnitude of the relationship between legal pressure and retention is generally small and may itself be related to other variables. For example, De Leon (1987) reported a negative relationship between age and 9 month retention in a consortium of therapeutic communities among legal referrals, while retention increased with age among voluntary

admissions. In addition, in a study of De Leon and Jainchill (1986b) non-volunteers and volunteers responded differently to specific treatment interventions in a therapeutic community: attempts to increase short-term retention by utilizing specific interventions seemed to be more effective among legal referrals than among volunteers.

To summarize, although the general relationship between legal pressure and enhanced retention has been well documented in the literature, much less is known about the differential effects of specific pressure procedures and the interaction between legal pressure and client characteristics.

Psychological Status

In general, research on psychological factors in substance use populations is often complicated by potential pharmacological effects of the substances used. For example, somatic symptoms associated with depression, such as loss of appetite or sleep impairment, may be caused by the psychopharmacological action of a drug rather than by depression. This is particularly true in clinical settings were clients often experience a variety of withdrawal symptoms.

The relationship between psychological status at admission and subsequent program retention has received much attention in the literature. Many studies have focussed on measures of psychopathology, using instruments as the Minnesota Multiphasic Personality Inventory (MMPI) and the Beck Depression Inventory (BDI). While in the past decade highly structured instruments, such as the Diagnostic Interview Schedule (DIS; Robins, Helzer, Croughan, & Ratcliff, 1981), have been developed to improve the validity and reliability of psychiatric diagnoses, none of the reviewed studies have used these instruments. Out of seventeen studies that adressed the issue of psychological dysfunctioning, thirteen studies showed a positive relationship between high symptom levels at the time of admission and premature termination of treatment (Biase, 1971; Baekeland et al., 1973; De Leon, 1974; Lin, 1975; Zuckerman & Sola, 1975; Jarvis, Simnegar, & Traweek, 1975; Aron & Daily, 1976; Wexler & De Leon, 1977; Keegan & Lachar, 1979; Steer, 1980, 1983; Foureman et al., 1981; Ward & Hemsley, 1981). No relationship was found in the studies of Craig (1984a, 1984b) and Steer (1981) and a negative relationship was found in the study of Levine, Levin, Sloan, & Chappel (1972). Of the MMPI based studies, elevations on the

validity scale Infrequency (F) and the clinical scales Psychopathic Deviate (Pd), Paranoia (Pa), Schizophrenia (Sc) and Depression (D) most consistently predict dropout. Of the studies that utilized other psychopathology instruments, high anxiety and depression scores seem to be the most consistent predictors of premature termination.

Only a few investigators have studied the relationship between normal psychological or personality dimensions and retention. In these studies dropout was found to be associated with high extraversion scores (Harris et al., 1981), and high needs for autonomy and aggression and low needs for deference (Craig & Olson, 1988). Out of seven studies that incorporated a measure of intelligence, only Weingarten et al. (1980) found a significant relationship between dropout and IQ: dropouts had a lower mean IQ score than remainers. These results however, lack replication; in general these dimensions are too infrequently investigated to substantiate the findings.

Besides psychopathological and basic psychological dimensions, several investigators have directly focussed on the relationship between clients' perceptions toward treatment and retention. Dropouts were found to be less suitable for treatment (McFarlain et al., 1977; De Leon & Jainchill, 1986a), less motivated and less ready for treatment (Gossop, 1978; De Leon & Jainchill, 1986a), less committed to the treatment facility (Kunz, 1989) and reported less treatment need (Condelli, 1986) than remainers.

Substance Use Factors

Nearly all studies have included some measure of amount, frequency or duration of substance use as predictor of retention, but the results show little consistency. Premature termination has been found to be related to a more "severe" substance use problem in terms of earlier age of onset of alcohol use among alcoholics (Keil & Esters, 1982; Roffe, 1981), longer history of drug abuse (Aron & Daily, 1976) or longer periods of continued alcohol use (Baekeland et al., 1973; Keil & Esters, 1982), more drug related problems (Kunz, 1989), no reduction in rate of opiate use prior to admission (Dehmel, 1989) and more opiate usage other than methadone during treatment (Williams & Lee, 1975). Contrastingly, several investigators found dropout to be related to a less severe substance use problem in terms of lower methadone dose at the time of

admission (Perkins & Bloch, 1970; Rosenberg et al., 1972) or at the time of termination of treatment (Williams & Lee, 1975), shorter history of opiate dependence (Dorus & Senay, 1980), less recent heroin use (Sirotnik & Roffe, 1977), no concurrent use of drugs other than heroin (Cuskey et al., 1971) and lower level of drinking (Keil & Esters, 1982).

Four of the reviewed studies included a perceptual or cognitive variable of substance use. Dropouts perceived their drinking as less severe in the study of Roffe (1981), but were more likely to admit that they had a drug use problem in the study of Perkins and Bloch (1971). Gossop (1978) found that dropouts perceived their drug friends as less important than remainers. In contrast, Kunz (1989) found that dropouts showed a stronger cognitive association with the drug culture.

On a somewhat different level related to substance use, both Sirotnik and Roffe (1977) and Steer (1980) found that clients who had not been living with other addicts were more likely to dropout. The predictive value of prior treatment experiences for retention has been addressed previously; for a discussion of this issue, the reader is referred to a previous section of this chapter.

Family Factors

Studies have investigated both clients' family background as a static factor and family pressure for admission or family involvement in therapy as situational factors in relationship to length of stay in treatment. Concerning the family background of the client, dropouts were more likely to live apart from their families in the studies of Perkins and Bloch (1970) and Rosenberg et al. (1972), and generally had less frequent contact with their families (Gossop, 1978). Three investigators found a more "healthy" family among dropouts. Dropouts were more likely to come from a less deviant family (Wexler & De Leon, 1977), had not been separated from either parent during childhood (Ward & Hemsley, 1981) and reported more often both mother and father as primary guardians (Sirotnik & Roffe, 1981). Contrastingly, Aron and Daily (1976) and Baekeland et al. (1973) reported respectively more alcohol and drug abuse in the family and more alcoholic relatives among dropouts.

Concerning the impact of family involvement on retention, both Gossop (1978) and Condelli (1986) found more dropout among clients who had experienced less pressure for admission from significant others. Similarly, family attendance of seminars during the early stage of treatment reduced the dropout rate significantly in a study of De Leon and Jainchill (1986b). Only Ward and Hemsley (1981) found a negative relationship between family pressure and length of stay.

CONCLUSION

Overall, research has failed to establish strong and consistent preadmission client-related predictors of treatment outcome. Instead, evaluation studies have consistently documented a strong positive relationship between treatment retention and treatment outcome. Given the prognostic significance of treatment tenure, many investigators have attempted to identify predictors of retention.
From the reviewed literature bearing upon this issue, a number of conclusions are suggested. First, the research is characterized by differences in conceptual approach, differences in study design and methodological problems. These include differences in definition or vague definition of the drop out phenomenon, differences in measures of retention, instruments, client population, treatment setting, lack of prospective and replication studies and limitations of the applied statistical analyses.

Second, given these differences in conceptual approach and methodology, it is not surprising that research findings tend to vary from one study to the other. Therefore, a typical client profile that predicts dropout, cannot be given on the basis of these studies. Some findings however, have been similarly documented in several studies and are therefore interesting to summarize. The following factors have been found to be related to dropout in at least three of the reviewed studies: low educational level (five studies), short employment history or unemployment (four studies), absence of legal pressure (nine studies), high levels of psychological dysfunctioning (thirteen studies), little contact with family or not living with parents (three studies), absence of pressure from family for admission or family not involved in treatment (three studies), and less motivation for treatment (five studies). Regarding substance use factors,

conflicting results emerge: both a more severe history (eight studies) and a less severe history of substance use (seven studies) has been documented with some consistency as a correlate of dropout.

Third, the pretreatment variables being studied were generally only weakly related to retention. The proportion of variance in length of stay that was accounted for by the predictor variables, was rarely higher than 20%. Remarkably, the highest percentage of explained variance (42%) was found in a study that utilized relatively many subjective measures of clients' status (Gossop, 1978).

Fourth, the reviewed literature provides no evidence for effective client-treatment matching. No profile emerges of clients who tend to remain in one type of treatment, but tend to dropout in the other. Partly this is due to the generally found low correlations between the predictor variables and retention, partly also to differences between individual treatments within each type of modality.

From the reviewed literature several suggestions for future research can be made. First, a theoretical framework is needed that describes the domains of influences and the interactions between these domains, which determine retention behavior. Such a framework should serve as a guideline to formulate and test specific hypotheses and to interpret research findings on retention. Second, there is a great need of prospective studies on retention. Findings from retrospective studies could serve as a basis for prospective research. Third, the comparability of study findings should be increased by applying similar instruments, assessment procedures, statistical procedures and measures of retention. In particular, replication studies are needed, either in the same treatment facility or in a comparable treatment-program. The first possibility minimizes potential differences between original sample and target sample and seems to have the strongest potency to impact on treatment procedures. The cross-validation sample should then be drawn from clients admitted in the near future, otherwise either the program or the client population may have changed too much. If results are cross-validated in another treatment-program, it is especially important to give a detailed description of the program and the client population, to minimize confounding influences. Fourth, investigators should make more direct use of the client's own view on his situation before treatment, on those factors directly leading to treatment admission and on his situation during treatment. Objective,

quantitative data should be combined with subjective, ethnographic data to explore more fully both the static and dynamic forces leading to admission and leading to premature termination of treatment. Finally, as most researchers and clinicians agree that dropout reflects a dynamic interaction between client factors and treatment elements, process studies are needed that link clients' change in general and dropout in particular more directly to specific treatment components.

Chapter 7

RETENTION IN SUBSTANCE ABUSE TREATMENT: PREDICTORS OF DROPOUT AT DIFFERENT PROGRAM STAGES

INTRODUCTION

Whereas the previous chapter has shown that the generality of results of retention studies is limited, the identification of predictors of dropout in a particular treatment facility can have important clinical and managemental consequences. If in a particular facility predictors of dropout that are sufficiently consistent over time can be identified, then the holding power of the program may be increased by taking direct measures toward high risk clients. In the present study an attempt has been made to provide a basis for such measures.

The literature review in the previous chapter has suggested several implications for future research, a number of which have been incorporated in the present study. First, because dropout at different stages of the treatment process may be associated with different client characteristics, a distinction has been made between those who drop out during the initial detoxification phase and those who do so during the subsequent first three months of therapeutic community (TC) treatment. Both cut-off points have been choosen relatively early in the course of treatment, because this has been shown to be the period of highest dropout. Consequently, measures aimed at reducing dropout are likely to have the highest impact at this stage. At the treatment program being studied, the detoxification program and TC program are maintained in separate facilities, thus providing a natural basis for this distinction.

Second, in order to maximize comparability among studies, in the present study standard measurement instruments have been used, each of which has shown sufficient reliability and validity when applied in addict populations. Besides various dimensional measures of clients' status, a categorical psychiatric assessment based on the DSM-III criteria (American Psychiatric Association, 1980) has been included. Although none of the reviewed retention studies have incorporated such a categorical assessment, there are indications in the literature that addicts with and without co-existing psychiatric disorders respond

differently to treatment (Rounsaville, Weissman, Wilber, Crits-Christoph, & Kleber, 1982; Rounsaville, Kosten, Weissman, & Kleber, 1985; Rounsaville, Dolinsky, Babor, & Meyer, 1987; Woody, McLellan, Luborsky & O'Brien, 1985).

Third, given their potential predictive power that emerges from the reviewed literature in the previous chapter, a number of variables have been included that inform directly about the client's perception of his situation, his intention for admitting to treatment and his need for treatment.

Fourth, in order to minimize the possibility of chance findings, the results of the multivariate analysis incorporated in this study have been cross-validated on an independent sample of clients who were admitted to the same program later during the study period.

The purposes of the present study were (1) to compare the background characteristics, patterns of substance use, treatment career, psychosocial characteristics, and psychiatric status of subjects who only attended the detoxification clinic (detox-only group) and subjects who continued treatment in the therapeutic community after detoxification (TC group), (2) to compare within the TC group subjects who left the program within 3 months (TC dropouts) and subjects who remained at least 3 months in treatment (TC remainers) on the same set of variables, and (3) to cross-validate the results with an independent sample in the same program.

METHODS

Subjects

The full sample consisted of 319 subjects who were consecutively admitted in 1987 and 1988 to the clinical detoxification center De Weg in The Hague. Of this group, 239 subjects were included in the comparison between the detox-only group (152 subjects) and the TC group (87 subjects), and the remaining 80 subjects formed the cross-validation sample (40 subjects in the detox-only group and 40 subjects in the TC group). These 80 subjects were consecutively admitted to the detoxification program later during the study period.

The 87 subjects of the original TC group and the 40 subjects of the TC group in the cross-validation sample were combined to form a complete sample of TC admissions. Of these 127 subjects, 66 clients left the TC program within 3

months, 60 clients remained in the TC until at least 3 months, and 1 subject had missing data.

Subjects in the full sample were primarily male (80.5%), unmarried (76.7%), and White (79.1%), with a minority of Surinamese (10.4%). The mean age was 27.10 years (SD = 5.14 years), with a range from 16 to 44 years. On the average, subjects had attended 9.98 years of education (SD = 2.49 years), had used heroin for 5.57 years (SD = 3.98 years), and had attended 6.08 previous treatment programs (SD = 4.89 treatments). Although polydrug was common in the sample (91.6 %), the majority of the clients considered heroin as their primary drug (69.1 %). Cocaine was the primary drug for 12.3 % of the subjects.

DSM-III diagnoses were obtained in a subsample of 159 subjects, drawn from the full sample. Co-existing DSM-III disorders were commonly diagnosed in the subsample. Six month prevalence rates of DSM-III diagnoses were 59.7 % for Antisocial Personality disorder, 35.8 % for Major Depressive Episode (single or recurrent), 25.8 % for Agoraphobia, 25.2 % for Social Phobia, 11.9 % for Simple Phobia, and 15.1 % for Panic disorder. Alcohol Abuse and Alcohol Dependence were also prevalent, with rates of 27.4 % and 25.2 % respectively. Mania (5.7 %), Schizophrenia (3.8 %), Obsessive Compulsive disorder (8.2 %), and Somatization disorder (0.7 %) were less frequently diagnosed. Overall, 83.0 % of the sample met the criteria for having had at least one non-substance abuse psychiatric disorder within the six months, prior to admission.

Setting

The study was performed in the 10-bed detoxification center De Weg and the residential drug-free therapeutic community Emiliehoeve, which are both part of a psychiatric hospital in The Hague. Following clinical detoxification in De Weg, using methadone, and - if necessary - benzodiazepines (duration approximately 5 to 10 days), residential introduction is offered to clients who want to continue treatment after detoxification, to prepare them on entering long-term treatment. The Emiliehoeve is a hierarchichal therapeutic community program, consisting of approximately 35 beds, with a planned duration of 12 months. Following treatment in the Emiliehoeve, clients enter an aftercare program, during which clients are for the greater part in a living-out situation. Clinical treatment in the Emiliehoeve is contraindicated for clients with manifest

psychosis or suicidal behavior, and often for clients with no history of outpatient substance abuse treatment.

Assessments

Subjects were evaluated during the first week following admission to the detoxification center. The following instruments were administered by trained staff members:

Addiction Severity Index (ASI). The ASI (McLellan, Luborsky, Woody & O'Brien, 1980) is a semi-structured interview that collects data in the areas of medical health, employment, alcohol use, drug use, criminality, social problems and psychiatric problems. In each of these problem areas the interviewer provides an estimate of problem severity (severity rating) on a scale ranging from 0 to 9. In American studies the ASI has shown high interrater reliability, high test-retest reliability and evidence of concurrent and discriminant validity across a range of client types (McLellan et al., 1980, 1985; Kosten, Rounsaville & Kleber, 1983). In the present study a Dutch translated and adapted version of the ASI was used (Hendriks, 1987). This Dutch version has shown psychometric characteristics that are similar to those of the American original (Hendriks, Kaplan, van Limbeek, & Geerlings, 1989; Hendriks et al., 1990).

Beck Depression Inventory (BDI). The BDI (Beck, Mendelson, Mock, & Erbaugh, 1961; Bouman, Luteijn, Albersnagel, & van der Ploeg, 1985) is a self-report inventory that measures affective, cognitive, motivational and somatic symptoms of depression. The BDI is scored by summing the items which are rated on a 4-point scale ranging from 0 to 3. In the present study the full 21-item version was used, as well as two subscales: a Cognitive-Affective subscale, consisting of the first thirteen items, and a Somatic-Performance scale, consisting of the last eight items (Beck and Steer, 1988).

Symptom Check List-90 (SCL-90). The SCL-90 (Derogatis, 1983; Arrindell & Ettema, 1981, 1986) is a multidimensional self report inventory designed to assess the psychological symptom patterns of psychiatric and medical patients. Based on its factor structure in Dutch populations (Arrindell & Ettema, 1981, 1986), the SCL-90 was scored for eight dimensions, representing Agoraphobia, Anxiety, Depression, Somatization, Distrust and Interpersonal Sensitivity, Insufficiency of

Thinking and Acting, Sleep Disturbance, and Hostility. The mean total score of the SCL-90 was used as a general index of symptom severity.

Diagnostic Interview Schedule (DIS). A subgroup of 159 subjects was seen in a second session, generally one week after the first, in which psychiatric diagnoses were obtained by a trained psychologist, using the third version of the Diagnostic Interview Schedule (Robins et al., 1981; van Limbeek, Schalken, Geerlings et al., 1986). In the present study only recent DSM-III disorders were considered, based on the symptomatology during the six months prior to the assessment, with two exceptions. First, antisocial personality was considered only as a lifetime disorder. Second, because the DIS does not ask for recency of symptoms of a dysthymic disorder, a "recent" diagnosis of dysthymic disorder could not be made. The diagnostic hierarchy of the DSM-III was not used. Thus, multiple diagnoses were assigned if they were present.

Data Analysis

The two comparisons (detox-only group versus TC group, and TC dropouts versus TC remainers) were carried out separately, each comparison consisting of a univariate and a multivariate analysis. First, the groups were compared by using independent t-tests for continuous variables and chi-square tests for categorical variables. The independent variables included the individual items and severity ratings of the ASI, the subscales and total score of the BDI, the subscales and total score of the SCL-90, and the DIS/DSM-III diagnoses.

Second, from this entire item pool, variables that showed significant differences between the groups ($p < .02$ for the comparison between the detox-only group and the TC group, and $p < .05$ for the comparison between TC dropouts and TC remainers), were selected for the multivariate analysis. In cases of high intercorrelations among the independent variables ($r > .60$), the variable with the lowest correlation with the criterion was excluded. The multivariate analysis consisted of discriminant analysis (DA) with stepwise variable selection. The results from the DA were cross-validated only for the detox-only versus TC comparison; the sample involved in the comparison between TC dropouts and TC remainers was too small for cross-validation purposes.

RESULTS

Detox-Only versus TC

The detox-only group and the TC group were compared on all relevant variables in the study. Table 1 presents the variables that were significantly different between the two groups.

Table 1. Significant Relationships between Independent Variables and Program Status: Detox-Only versus TC (N = 239)

Instrument/ Variable	Detox-only	TC	chi^2/ t-test	p=
n	152	87		
ASI				
Intention for treatment:				
TC	52.5%	47.5%		
Detox-only/do not know	79.6%	20.4%	17.20	.0000
Satisfied with living arrangements:				
No	56.5%	43.5%		
Yes	81.2%	18.8%	11.88	.0006
Years of education	9.63	10.46	-2.50	.013
Days of use in previous month				
Methadone	14.26	7.82	3.72	.000
Sleeping pills	8.66	3.85	3.41	.001
Tranquillizers	6.32	3.14	2.48	.014
Family-social severity rating (0-9)	4.31	4.99	-3.34	.001
BDI				
Somatic-Performance scale (0-24)	8.10	6.17	3.36	.001
SCL-90				
Sleep Disturbance scale (0-15)	8.92	7.48	2.71	.007

Of the subjects who intended to attend only the detoxification program (10.5% of the sample) or were unsure if they wanted to continue treatment after

detoxification (30.5%), only a minority (20.4%) continued treatment in the TC. Subjects who were satisfied with their living arrangements (e.g. living alone, with a partner, with parents) were also less likely to enter the TC program (18.8%). Furthermore, subjects in the detox-only group generally had a lower educational level, had more frequently used methadone, sleeping pills, and tranquillizers during the month before admission, had a lower severity rating on the Family-Social problem area of the ASI, and had higher scores on the Somatic-Performance scale of the BDI and the Sleep Disturbance scale of the SCL-90. None of the DSM-III diagnoses were significantly related to program status.

Since there were no high intercorrelations ($r > .60$) among the variables that were related to program status, all nine variables were selected as potential candidates for the discriminant function. Table 2 presents in order of selection the variables that were included in the resultant discriminant function and their standardized discriminant function coefficients.

Table 2. Standardized Discriminant Function Coefficients of Selected Predictor Variables: Detox-only versus TC (N = 239)

Variable		Standardized discriminant function coefficient
(1)[a]	Days of methadone use during previous month	0.37[b]
(2)	ASI Family-Social severity rating	-0.38
(3)	BDI Somatic-Performance scale	0.21
(4)	Years of education	-0.39
(5)	Satisfaction with living arrangements	0.36
(6)	Intention for treatment	-0.31
(7)	SCL-90 Sleep disturbance scale	0.27
(8)	Days of tranquillizer use during previous month	0.24

[a] The numbers represent the order of the variables in the selection procedure.
[b] If the sign of the coefficient is negative, higher scores on the variable are related to remaining in treatment. A positive sign means that higher scores are related to dropout.

Only the number of days of sleeping pill use was excluded from the function by the stepwise selection procedure. As shown in Table 2, all selected variables made approximately equal contributions to the function, with standardized discriminant function coefficients varying from 0.21 to -0.39. The canonical correlation of this eight-variable function amounted to 0.51. The function correctly classified 71.8% of the total sample. Compared to the base rate prediction accuracy of 63.6%, this is an improvement of 8.2%. For subjects in the detox-only group and subjects in the TC group the function yielded a classification accuracy of 70.1% and 74.7% respectively.

The eight-variable function was cross-validated in an independent sample of 80 subjects. In this sample the function produced an overall classification accuracy of 68.8%. In the detox-only group and the TC group the classification accuracy amounted to 67.5% and 70.0% respectively.

Table 3. Significant Relationships between Independent Variables and Program Status: TC Dropouts versus TC Remainers (N = 126)

Instrument/ Variable	Dropouts <90 days	Remainers >90 days	chi^2/ t-test	p=
n	66	60		
ASI				
Recent problems with partner:				
No	58.9%	41.1%		
Yes	36.1%	63.9%	4.47	.03
Months of longest employment	22.21	33.23	-2.13	.04
Age at first cannabis use	14.88	16.47	-2.31	.02
Reported treatment need for alcohol problems (1-5)	2.02	1.30	2.81	.006
Reported treatment need for drug problems (1-5)	4.47	4.90	-2.59	.01
Drug severity rating (0-9)	5.62	6.23	-2.12	.04

Note. DSM-III diagnoses were obtained in 97 of the 126 subjects. Of these, 43 subjects left the TC program within 90 days, and 54 remained in treatment.

Table 3. Continued

Instrument/ Variable	Dropouts <90 days	Remainers >90 days	chi^2/ t-test	p=
n	66	60		
ASI				
Reported treatment need for family problems (1-5)	2.74	3.48	-2.47	.02
Reported treatment need for social problems (1-5)	2.82	3.50	-2.28	.02
Family-Social severity rating (0-9)	4.71	5.28	-2.20	.03
DSM-III				
Antisocial personality				
No	28.2%	71.8%		
Yes	55.2%	44.8%	5.82	.02
Panic disorder				
No	38.0%	62.0%		
Yes	72.2%	27.8%	5.66	.02

Note. DSM-III diagnoses were obtained in 97 of the 126 subjects. Of these, 43 subjects left the TC program within 90 days, and 54 remained in treatment.

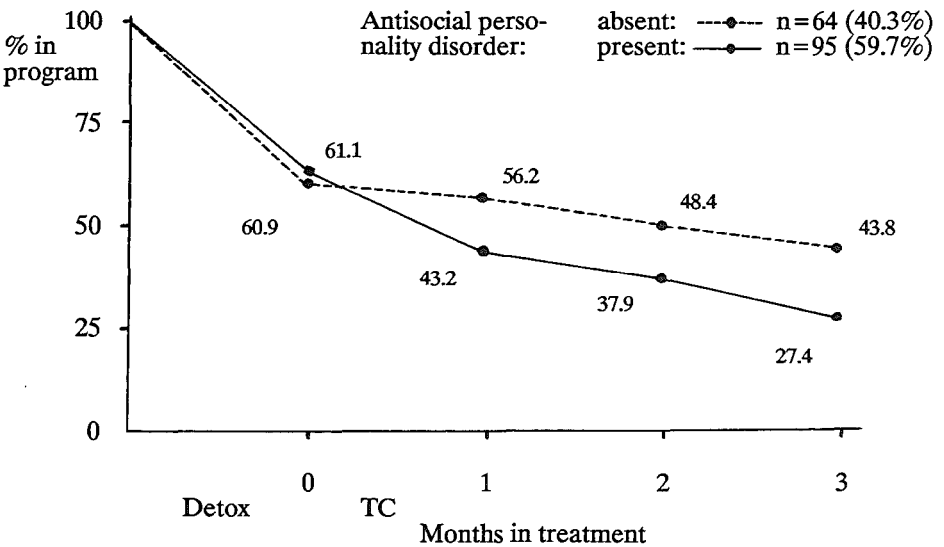
TC Dropouts versus TC Remainers

Subjects who stayed less than 90 days in the TC and those who stayed longer than 90 days were compared on the same set of variables as in the detox-only versus TC analysis. The significant differences between the two groups are presented in Table 3. Compared to subjects who stayed longer than 90 days in the TC program, early dropouts were less likely to have recently experienced serious problems with their partner. They generally had a shorter employment history, started using cannabis at an earlier age, reported more treatment need for alcohol problems and less treatment need for drug-, family- and social problems, and had a lower severity rating on the Drug- and Family-Social

problem area of the ASI. Concerning the DSM-III diagnoses, dropouts were more likely to have an antisocial personality disorder and a panic disorder.

An additional analysis was performed to investigate the relationship between these two DSM-III disorders and retention from the time at admission to the detoxification clinic until the cut-off point of three months TC treatment. The results of this analysis are displayed in Figure 1 and Figure 2.

Figure 1. Retention Rates of Subjects With and Without a DSM-III Diagnosis of Antisocial Personality Disorder (N = 159)

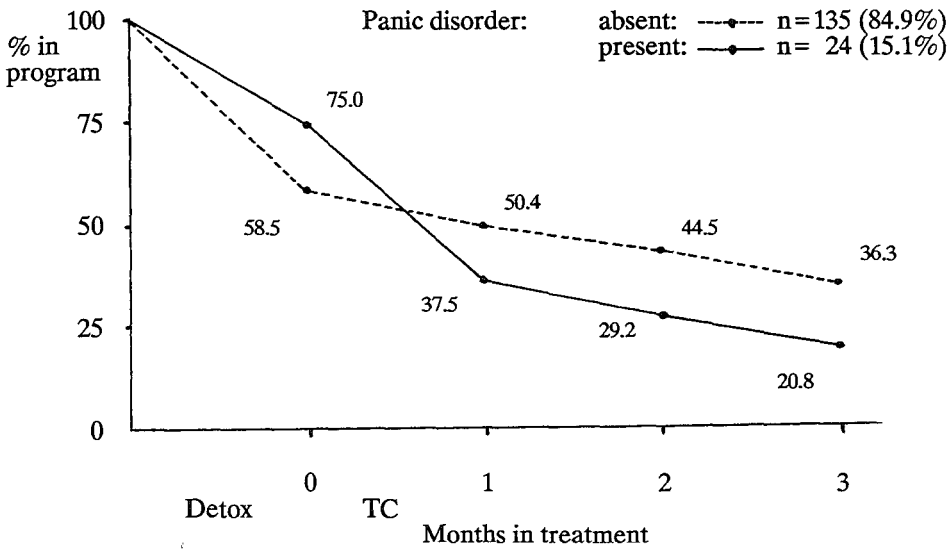


Note. DSM-III diagnoses were obtained in 159 subjects, drawn from the full sample. Of this group, 62 subjects attended only the detoxification program, and 97 subjects continued treatment in the TC.

During the detoxification phase, differences in retention rates between subjects with and without an antisocial personality disorder and between subjects with and without a panic disorder were not significant. During the first three months of TC treatment however, the dropout rates of subjects with an antisocial personality disorder or a panic disorder were significantly higher than those of subjects without these disorders. As indicated in Figure 1 and Figure 2, the differences in dropout rates occurred mainly during the first month of TC

treatment. During this period, approximately four times as much dropout occurred among subjects with an antisocial personality disorder or a panic disorder than among subjects without these disorders.

Figure 2. Retention Rates of Subjects With and Without a DSM-III Diagnosis of Panic Disorder (N = 159)



Note. DSM-III diagnoses were obtained in 159 subjects, drawn from the full sample. Of this group, 62 subjects attended only the detoxification program, and 97 subjects continued treatment in the TC.

As in the previous analysis, none of the independent variables showed high intercorrelations. In the DA three variables were excluded from the function by the stepwise selection procedure. The remaining variables are listed in order of selection in Table 4. As indicated by their standardized discriminant function coefficients, both DSM-III diagnoses contributed relatively much to the function. The discriminant function produced a canonical correlation of 0.57. The classification accuracy of the function amounted to 74.2% for the total sample (21.8 % above the base rate prediction accuracy of 52.4%), and to 72.1% and 75.9% for the dropouts and the remainers respectively.

Table 4. Standardized Discriminant Function Coefficients of Selected Predictor Variables: TC Dropouts versus TC Remainers (N = 126)

Variable		Standardized discriminant function coefficient
(1)[a]	Antisocial Personality disorder	0.65[b]
(2)	Recent problems with partner	0.51
(3)	Panic disorder	0.50
(4)	Reported treatment need for alcohol problems	0.41
(5)	Reported treatment need for social problems	-0.35
(6)	Reported treatment need for drug problems	-0.36
(7)	Months of longest employment period	0.34
(8)	Family-Social severity rating	-0.32

[a] The numbers represent the order of the variables in the selection procedure.
[b] If the sign of the coefficient is negative, higher scores on the variable are related to remaining in treatment. A positive sign means that higher scores are related to dropout.

DISCUSSION

The results of the present study have both methodological and substantive relevance. From a methodological viewpoint, the similarity of the discriminant function's predictive accuracy in the original sample and the cross-validation sample (only 3.0% reduction) is an important finding regarding earlier studies in which considerable reductions of correct classifications were found in independent cross-validation samples (Craig, 1984). The results of the present replication procedure suggest that discriminant functions can retain their predictive power in future samples if they are replicated within a limited period and in the same treatment facility. If this suggestion holds true in future research, DA can provide a meaningful basis for clinical and managemental measures aimed at reducing dropout in individual programs.

In the present study, the factors that predicted dropout during the detoxification phase were different from those that predicted dropout during the

first three months of TC treatment. This finding underscores the importance of categorizing dropouts in susequent temporal groups. If a single summary statistic of retention had been used, the differences in pattern of dropout would have remained undetected.

From a substantive viewpoint, several issues are important. First, although dropouts and remainers showed differences on several factors, they were found to be similar in most investigated areas. For example, at the detoxification phase, none of the DSM-III diagnoses, nor the indices of employment history, criminality, and lifetime substance use discriminated between the groups. In addition, the ASI psychiatric severity rating did not yield any prognostic information with regard to retention, neither during the detoxification phase, nor during the first three months of TC treatment. Earlier research similarly found the ASI psychiatric severity rating to be unrelated to retention, even though this rating was found to be the most powerful predictor of treatment outcome (McLellan, Childress, Griffith, & Woody, 1984). These findings together suggest that the severity of psychiatric problems has a direct effect on treatment outcome, rather than an indirect effect on treatment outcome via retention.

The finding of the present study that dropouts and remainers were similar in many of the investigated areas, may be of relevance to the ongoing debate in The Netherlands on the accessability of low-threshold versus high-threshold drug treatments (see for example Jongsma & van der Velde, 1985; Kok, 1984). In this debate, it is often assumed that high-threshold programs, such as TC's, differ from low-threshold programs by only attracting less problematic drug users, characterized by a shorter addiction career, less employment problems, less legal problems, and less psychological disturbance. Contrastingly, others argue that high-threshold programs primarily attract more problematic drug users, because this group is particularly motivated to enter a long-term, abstinence oriented treatment program. Given the absence of a generally more problematic profile of subjects who only attended the detoxification program, the present data do not lend support to either of these assumptions.

Second, the data indicate that variables that inform directly on the client's intention for admitting to treatment and his need for treatment are important predictors of retention. A considerable portion of the admitted clients (41.0%) intended to attend only the detoxification program or did not know yet whether

they wanted to continue treatment after detoxification. Of these subjects, only a minority (20.4%) became motivated to continue treatment after detoxification and actually entered the TC. Conversely, of the subjects who entered the TC, the vast majority (70.0%) already intended to do so at the time of admission to the detox center. Taken together, these findings indicate that (1) for a considerable group of clients, leaving treatment at this stage reflects a planned decision rather than an impulsive act, and (2) whereas one of the objectives of the detoxification program is to motivate clients to enter long-term treatment, this goal is rarely achieved for clients who did not have the intention to do so at admission.

Dropout during the first months of TC treatment was associated with less treatment need in the areas of drug use and family-social functioning. Similar relations have been reported elsewhere (Gossop, 1978; De Leon & Jainchill, 1986a, Condelli, 1986), indicating the importance of incorporating measures of the client's perception and motivation in retention studies. The finding of more treatment need for alcohol problems among dropouts may reflect the primary focus of the investigated TC program on problems associated with drug use; relatively little attention is paid to specific problems associated with alcohol use.

Third, both frequency of recent use of "downers" and presence of sleep dysfunctions were important predictors of dropout during the initial detoxification phase, but were unrelated to dropout during the first months of TC treatment. Additional analyses showed that the strongest association between recent use of downers and other predictor variables occurred with indices of somatic functioning. For example, the variable "days of sleeping pill use during the previous month" had its highest correlation with the Somatic-Performance scale of the BDI ($r=.24$, $p<.001$). Given these relationships, it is likely that the high frequency of recent use of methadone, sleeping pills and tranquillizers contributed to a more problematic withdrawal process, which in turn increased the likelihood of premature termination of treatment.

Fourth, both panic disorder and antisocial personality disorder were found to be strong correlates of dropout during the first months of TC treatment, but were unrelated to dropout during the detoxification phase. Several factors may account for this finding. In some subjects, the anticipation of being abstinent for a long period may produce symptoms of anxiety similar to those of panic attacks. It is not unlikely that the prospect of an abstinent future really dawns on the

client only after the detoxification process, in which he is often occupied with the physical symptoms of withdrawal. Differences in therapeutical approach between the two programs may also play a role. Whereas the interventions during the detoxification phase are mainly directed toward practical problems and adjustment to the treatment routines, the TC employes a more confrontative approach, directed toward underlying emotional problems. In clients with a history of panic disorder, these confrontative interventions may evoke anxiety levels to the extent of panic attacks, resulting in premature termination of treatment.

Although studies are lacking on the relationship between DSM-III disorders and retention, the present finding of high prevalence of antisocial personality disorder among dropouts is consistent with earlier reports of elevated scores on the Psychopathic Deviate scale of the MMPI among dropouts (Jarvis et al., 1975; Lin, 1975; Keegan and Lachar, 1979) and with studies that found antisocial personality disorder to be associated with poor treatment outcome in alcoholics (Rounsaville et al., 1987) and opiate addicts (Woody et al., 1985). Given their basic lack of trust and inability to sustain meaningful relationships, it is not surprising that clients with an antisocial personality disorder tend to drop out in the TC, but not in the detoxification program; it is the TC model that emphasizes trust and feelings of togetherness as central elements for therapeutic change.

Fifth, clients with more severe social problems were more likely to enter TC treatment and to remain longer than three months in the TC. In addition, those who continued treatment perceived a greater need for treatment in this area at the time of admission. In line with these findings, earlier studies showed that the initiation of treatment is often in response to demands by family or friends (Brown, Cauvey, Meyers and Stark, 1971), and that treatment seeking addicts experience more pressure from their families to seek treatment (Gossop, 1978) and have more adequate social supports than those who do not seek treatment (Rounsaville et al., 1985). Together, these findings form a strong indication that social problems are an important pressure factor for seeking treatment and remaining in treatment.

Clinical Implications

The present study has shown, at the least, that in the investigated facilities certain groups exist that are at risk for premature termination of treatment. Whether modifications of the treatment procedures according to these findings, will effect the holding power of the programs however, remains to be shown. Clearly, successful implementation of the findings depends on many factors. Perhaps most importantly, periodical reevaluation of the predictive validity of the model is necessary, because changes in client population and treatment procedures may occur that require adaptations of the model. For such continual monitoring, structural assessment of the relevant variables is a sine qua non.

Upon admission to the detoxification program, clients' drug history and drug-related problems should be routinely evaluated, using relatively short screening instruments, a number of which have been used in the present study. Because of its lengthy procedure, the assessment of a categorical psychiatric diagnosis should either be limited to the most commonly found disorders (depressive disorders, anxiety-related disorders and antisocial personality), or to clients that show signs of co-existing psychopathology on the short screening instruments.

Based on the pattern of dropout in the present study, a number of specific measures can be suggested to reduce dropout rates. First, extra medical attention should be given to clients who have used relatively much methadone, sleeping pills or tranquillizers in the month prior to admission and to clients who report severe somatic (sleep) problems. Such attention could include slower reduction rates or sequential reduction of methadone and diazepines, accupuncture, relaxation training, meditations and yoga. For example, accupuncture has been shown to be effective in reducing somatic complaints associated with withdrawal from heroin in a recent study of Geijer (1987). These measures should start upon admission to the detoxification clinic and should, if necessary, be continued during the first phase of TC treatment.

Second, recent studies in the area of biological psychiatry have demonstrated the efficacy of certain anti-depressants in the treatment of anxiety disorders, particularly panic disorder (den Boer, & Westenberg, 1988; den Boer, Westenberg, Kamerbeek, Verhoeven, & Kahn, 1987; Rickels & Schweizer, 1987; Zitrin, Klein, Woerner, & Ross, 1983). Given the high dropout rate of clients

with a panic disorder in the present study, clients with this diagnosis should be considered for a combination of psychotherapy and anti-depressant medication (Ballenger, 1986; Telch, Agras, Taylor, Roth, & Gallen, 1985), which - if necessary - should be continued during TC treatment. In doing so, special attention should be given to clients' feelings and attitudes toward medications, because the use of medications may enhance the danger of relapse to drug use (Zweben & Smith, 1989).

Third, given the prognostic significance of the ASI psychiatric severity rating which has been reported in earlier studies (McLellan, Luborsky, Woody et al., 1983; McLellan, O'Brien, Kron et al., 1980), clients with a high rating on this scale should be referred for more extensive psychiatric evaluation, including for example a DIS interview and a psychiatric consultation.

Fourth, clients who at the time of admission to the detoxification clinic intend to continue treatment in the TC should be referred earlier to the TC, unless contra-indications such as those mentioned above exist. For these "motivated" clients, residential introduction in the TC should be considered. Since attempts to motivate clients to enter long-term TC treatment have been shown to have little effect on clients who did not intend to do so at the time of admission to the detoxification clinic, these clients should no longer be confronted on their motivation. Instead, recources may be more efficiently used by offering medical-, employment-, and legal counseling services to this group.

Fifth, clients with a low educational- or employment level may benefit more from treatment if a more practical approach is employed, including the above mentioned counseling services, setting short-term goals, and offering an educational plan at an early stage of treatment.

Sixth, earlier research has indicated that family attendance of seminars during the early stage of treatment may reduce dropout rates (De Leon & Jainchill, 1986b). Given the indications in the present study that a relatively stable social environment forms a potential "pull-factor", family therapy at an early stage of treatment should also focus attention to less problematic family situations, both for diagnostic purposes and to encourage clients to stay in treatment.

Seventh, more explicit attention should be given to former alcohol use of residents. Although the rates of alcohol abuse and alcohol dependence and the severity of alcohol problems did not differ between dropouts and remainers in the TC, dropouts reported a significantly greater treatment need for alcohol

problems. Given the primary focus of the investigated TC program on problems associated with drug use, dropout in this group may reflect disappointment in alcohol-related services offered by the program.

Eighth, given their lack of trust, lack of impulse-control and lack of planning ahead, antisocial clients may benefit mostly from a highly structured program in which firm behavioral controls are set. Such an approach may include the establishment of short-term goals, working in small steps with an emphasis on the "here and now", and not insisting too fast on trust and change. However, because the results of treatment of antisocial personality disorder have generally been found poor, it is far from clear what measures could enhance the length of stay of clients with this disorder.

SUMMARY, CONCLUSIONS, LIMITATIONS, AND FUTURE RESEARCH

Summary and Conclusions

In chapter 1, the context and perspective of the dissertation have been described. Various models of addiction have been outlined, that each have provided valuable contributions to theory and practice in the field. From these models and from research findings, it has become increasingly clear that addiction constitutes a heterogeneous concept in terms of its antecedents, concomitants, and consequences. A major contribution to the development of a multidimensional model of addiction has been the formulation of a "drug-dependence syndrome" by the World Health Organization. During the last decade, research on the dependence syndrome has suggested that separate dimensions of addiction exist that are relatively independent from each other. Of specific interest in this multidimensional framework is the relationship between substance abuse and psychopathology, as psychiatric disorders are often assumed to antedate and precipitate the onset and continuation of substance. abuse. Research on this relationship has specifically focused attention on the "addictive personality" and the "self-medication hypothesis" of addictive disorders. Although these conceptualizations may be reflective of subgroups of addicts, it is unlikely that preexisting psychopathology or personality traits are antecedent to substance abuse in all addicts. In addition, from studies on these concepts it is often impossible to distinguish between cause and effect in the relationship between substance abuse and psychopathology.

In the last decade, there has been an upsurge of interest in the role of psychopathology in the treatment of addiction. New diagnostic instruments have been developed, both in the field of general psychiatry and in the field of drug use, that offer potential benefits for use in addiction research and treatment. Studies that have used these instruments have demonstrated high rates of psychopathology in addicts, and have suggested that coexisting psychopathology is an important predictor of treatment outcome. As a result, it has become increasingly clear, that treatments must refine or modify their methods to effectively treat the "dual-diagnosis" patient. To improve treatment, clinicians need tools that can correctly identify the severity of substance use and the presence of coexisting problems, and they need information on the significance

of these factors for the outcome of treatment. These are the major issues that this dissertation has attempted to address.

At the end of chapter 1, the specific research questions have been described, and the general methodology of the study has been presented. To summarize, the study has been conducted in the inpatient detoxification center De Weg in The Hague. Between 1987 and 1989, a total of 321 addicts have been evaluated within a week after admission to the detoxification center. The assessment instruments included the Addiction Severity Index (ASI), the Beck Depression Inventory (BDI), the Symptom Checklist-90 (SCL-90), the Nederlandse Verkorte MMPI (NVM; Dutch abbreviated MMPI), and the Diagnostic Interview Schedule (DIS).

In chapter 2, data have been presented on the rates and correlates of psychiatric disorders in the sample. Lifetime and six month prevalence rates of DIS/DSM-III diagnoses were determined in 152 addicts. Eighty percent of the sample met the criteria of at least one recent psychiatric disorder in addition to substance abuse. The nature and extent of diagnosable psychopathology in Dutch addicts applying for treatment was similar to that of clinical addict populations in the United States. The three most prevalent disorders in the sample, antisocial personality disorder (ASP), depressive disorder and anxiety-related disorder, were all commonly diagnosed in combination with each other. This general tendency toward co-occurrence of these disorders suggests that within each diagnostic group, there is much heterogeneity with respect to etiology, symptom patterns, and prognosis in treatment. Nearly half of the subjects with ASP shared this diagnosis with a depressive disorder or an anxiety-related disorder, but only depressive disorder and anxiety-related disorder were significantly related to each other. However, the relationship between depression and anxiety occurred only for men; these disorders were unrelated for women. According to the DSM-III hierarchy, some anxiety-related disorders should not be diagnosed if they occur during an episode of major depression, because they are considered as manifestations if this disorder. Given the present findings, such a hierarchichal arrangement may be correct for men, but not for women.

Subjects with ASP were generally younger, had had less education, and had a longer history of drug use compared to subjects without this diagnosis. They started using drugs earlier in life, and had used drugs on a more continuous basis. Thus, the course of addiction of subjects with ASP may be different from those without this diagnosis. None of the indices of recent drug use was found

to be associated with psychopathology. This suggests that the type, amount or severity of recent drug use is relatively independent from the presence and nature of additional psychopathology. These findings call into question the generality of the progressive disease model of addiction and, instead, can be interpreted as supporting the multi-axial conceptualization of addiction, as in the dependence syndrome construct.

In chapter 3, the concept, usefulness and psychometric characteristics of the Dutch version of the ASI have been discussed. Data have been presented on the internal consistency of the ASI subscales, the relationship between items and ASI severity ratings, the concurrent validity of the ASI psychiatry scale, the relationship among the ASI problem areas, and the formation of addict-subgroups on the basis of profile of problem severity.

Subscales of selected items in each problem area of the ASI were demonstrated to have good internal consistency reliability. Regression analysis indicated that the ASI items accounted for a considerable proportion of the variance in the severity ratings, indicating a strong relationship between "subjective" ratings and "objective" data. The ASI psychiatric severity rating showed a moderate relationship with a variety of psychological constructs. None of the investigated constructs, including depression and anxiety, seemed to be specifically covered by the ASI. On the basis of the concept and the satisfactory psychometric characteristics, implementation of the ASI in Dutch addiction treatment is advocated.

In addition to the independence between recent drug use and DSM-III psychiatric diagnoses found in chapter 2, a general independence was found between the severity of drug use and the severity of medical, employment, legal, social, and psychiatric problems. Furthermore, clusters with specific profiles of problem severity could be differentiated on the basis of the ASI severity ratings. Two of the differentiated clusters seemed to represent the classical view on addiction, in which the use of substances coincides with severe problems in most other areas. In another cluster however, the problems seemed to be limited to the actual substance abuse. These findings together suggest the existence of addict subgroups, each presenting a specific problem profile and each requiring a specific treatment approach.

In chapter 4, the usefulness of various dimensional instruments to screen for psychopathology in a clinical addict population has been discussed. Data have been presented on the internal consistency reliability of three subscales of the

BDI, the long (21 item) version of the BDI, and the SCL-90, on the relationship among the BDI, the SCL-90 and the ASI, and on the sensitivity and specificity of these instruments for detecting DSM-III current depressive disorder and current DSM-III anxiety-related disorder.

The investigated scales all showed good internal consistency, with coefficients varying from .71 to .90. Moderately high correlations between the investigated scales indicated substantial overlap between the areas of depression, anxiety, and neuroticism. In general, the results indicated that the investigated scales combined acceptable sensitivity with low specificity. The ASI psychiatry scale was found to be the best screening instrument for depression. At a sensitivity rate of 81%, this scale correctly identified 55% of the subjects without a depressive disorder. Anxiety-related disorders were best detected by the SCL-90 anxiety scale, which had a sensitivity of 83% and a specificity of 57%. For screening purposes in clinical populations, for example to determine the necessity of additional clinical evaluation, sensitivity is of primary interest. Given the relatively high number of false positives however, even the use of the most accurate screening instruments will result in a substantial number of clients who will be unnecesarily referred for further clinical evaluation.

The BDI was found to be a poor screening instrument for depression in this population. Although sensitivity was moderately high when using a low cut-off score, this was at the cost of unacceptable low specificity. This in turn, seemed to be partly due to the presence of depressive symptoms that were of insufficient duration to meet the DSM-III criteria of depression.

In chapter 5, data have been presented on the differences and similarities in self-reported psychopathology between Dutch and American heroin addicts in treatment. The BDI and SCL-90 were administered to 47 Dutch and 121 American White male heroin addicts receiving methadone. A oneway MANOVA indicated that the Dutch and American samples displayed comparable SCL-90 profiles, but that the Dutch had more symptom complaints than the Americans. The mean BDI total score of the Dutch was higher than that of the Americans, and this mean difference reflected more severe cognitive and affective symptoms in the Dutch than in the Americans. However, the magnitude of the differences was small and probably not clinically meaningful. There was no difference between the samples with respect to somatic and performance symptoms. Furthermore, the mean levels of symptom distress for the nine SCL-90 subscales reported by both the Dutch

and the American heroin addicts were comparable to those of American psychiatric outpatients.

In general, although the generalizability of the findings is limited by the difference in type of program that the Dutch and Americans were attending, the present data do not lend support to the hypothesis that the level of psychopathology of Dutch addicts is lower than that of Americican addicts, because of the more tolerant drug policy in The Netherlands.

In chapter 6, a literature review has been presented of empirical studies since the 1970's on retention in substance abuse treatments. It is concluded that research on retention has been characterized by differences in conceptual approach, differences in study design, and by methodological problems. Some factors associated with retention have been similarly reported in several studies. Among the most consistently reported correlates of dropout are: low educational level, short employment history or unemployment, absence of legal pressure, high levels of psychological dysfunctioning, and less motivation for treatment. In general however, research findings tended to vary from one study to the other. Therefore, a typical client profile related to dropout does not emerge from the literature.

In chapter 7, data have been presented on the background characteristics, patterns of substance use, psychosocial characteristics, and psychiatric status, associated with retention in a clinical detoxificaton center and a drug-free residential therapeutic community (TC). Although the generalizability of results from retention studies is limited, the identification of predictors of dropout in a particular treatment facility can have important clinical and managemental consequences.

Compared to subjects who continued treatment in the TC after detoxification, subjects who only attended the detoxification clinic were characterized by more recent use of methadone, sleeping pills, and tranquillizers, more recent somatic problems, less social problems, and less education. In addition, most of them originally intended to attend only the detoxification clinic. Given the rather strong relationship between clients' original intention for treatment and their actual choice, leaving treatment at the detoxification stage may reflect a planned decision rather than an impulsive act.

Dropout during the first three months of TC treatment was associated with a shorter employment history, less social problems, less drug problems, and more treatment need for alcohol problems. Important differences in dropout rates were

found between subjects with and without ASP, and between subjects with and without a panic disorder. More than half of the subjects with ASP left TC treatment within three months, compared to 28% of the subjects without this disorder. Of subjects with and without a panic disorder, respectively 72% and 38% left treatment.

Discriminant analyses were performed to predict retention in the detoxification clinic and retention in the TC. For the comparison between subjects who only attended the detoxification clinic and subjects who continued treatment in the TC, a discriminant function based on the aforementioned variables together correctly identified 71.8% of the sample. Cross-validation of this function in an independent sample yielded a reduction in predictive accuracy of only 3.0%. This small reduction suggests that discriminant functions can retain their predictive power in future samples if they are replicated within a limited period and in the same treatment facility. If this suggestion holds true in future research, discriminant analysis can provide a meaningful basis for clinical and managemental measures aimed at reducing dropout in individual programs.

For the comparison between subjects who left TC treatment within three months and subjects who remained at least three months in the TC, a discriminant function produced an overall classification accuracy of 74.2%. Compared to the base rate prediction accuracy of 52.4%, this was an improvement of 21.8%.

Based on these findings, a number of specific measures can be suggested to reduce the dropout rates in the investigated facilities. These include extra medical attention to clients with relatively much recent use of methadone, sleeping pills and tranquillizers, and to clients with severe somatic (sleep) problems, anti-depressant medication combined with psychotherapy for clients with a panic disorder, earlier referral to the TC of clients who at the time of admission to the detoxification clinic intend to continue treatment in the TC, and involvement of the client's family at an early stage of treatment. Clients with ASP may benefit mostly from a highly structured program in which firm behavioral controls are set. Such an approach may include the establishment of short-term goals, working in small steps with an emphasis on the "here and now", and not insisting too fast on trust and change.

Whether such modifications of the treatment procedures will effect the holding power of the programs, remains to be shown. Clearly, successful implementation of the findings depends on many factors. Perhaps most

importantly, periodical reevaluation of the predictive validity of the model is necessary, because changes in client population and treatment procedures may occur that require adaptations of the model.

Limitations of the Study and Future Research

In the addiction field, there is still a large gap between theory, research and clinical practice. Bridging this gap should be one of the primary aims of future addiction research. Both from a methodological and a substantive viewpoint, it is important to extend studies to non-clinical samples of drug abusers, because clinical studies are essentially limited to the unsuccessful drug user. Specifically, direct comparisons are needed of the patterns of substance use and concomitant problems between clinical and non-clinical samples. Such comparisons may provide important insights into factors associated with the process of treatment seeking, and may thereby provide clues for a more efficient organization of the treatment system. For example, Rounsaville and Kleber (1985) found treatment seeking addicts compared to addicts in the community to be similar in duration and severity of opiate use, whereas the treatment seeking addicts reported less adequate social functioning, more drug-related legal problems, and lower rates of depression.

Within the treatment system, more research is needed on the effectiveness of addiction treatments in general, and on the effectiveness of different treatment modalities for different subgroups of addicts in particular. On the basis of such studies, addict-subgroups may be identified that benefit mostly from a particular type of treatment. For example, McLellan, Woody, Luborsky, O'Brien, and Druley (1983) demonstrated that by matching clients on the basis of psychosocial variables to their most appropriate treatment program, the effectiveness of treatment could be improved considerably.

The present study has investigated the prognostic significance of a variety of person characteristics for retention in treatment. However, these characteristics are not necessarily similar to those associated with client status after treatment. Not only are the differences between untreated and treated addicts important, but also the differences between addicts at the moment of admission, during treatment, and after treatment. As part of the present study, follow-up evaluations are currently in progress to investigate the associations

between client status at intake and client status at 1-year follow-up. In this follow-up study, a direct comparison is included between the prognostic power of a global measure of psychiatric severity and a categorical psychiatric diagnosis.

To get a better understanding of the factors associated with treatment outcome, more research is also needed on the dynamic interaction between client factors and the treatment process. Process-variables may include specific treatment elements, clients' perceptions of program elements, client change during treatment, and clients' experiences with the program staff. This would argue for using not only quantitative data, but also qualitative case studies using ethnographic methodology.

In the past, addiction research has been severely limited by a lack of consensus on the definitions of substance use, substance abuse, substance dependence, and addiction. During the last decade, there has been a clear trend toward more uniformity in definition. Operationally defined diagnostic systems are now widely available and should be standardly used in research. Their development and application however, is not a static and rigid state, but rather a dynamic process. For example, Frances, Widiger, and Pincus (1989) in their discussion of the development of DSM-IV, note a constant process of revision leading to the introduction of DSM-II, DSM-III, and DSM-III^R. The overall result of the strive toward more unformity has been a good consistency in coding and terminology.

By providing a descriptive nosology that is atheoretical in regard to etiology, such as in DSM-III, some critics have argued that the increasing reliability of these systems occurred at the cost of losing clinical significance (see for example: Frances & Cooper, 1981). However, although in itself not sufficient, reliability is a necessary condition for validity. Furthermore, current classification systems can only be as valid as the current research evidence in psychiatry. Given the present state of knowledge, many psychiatric constructs still lack good external validity, regardless of which classification system is used.

Compared to DSM-III, DSM-III^R may have particular advantages for use in addict populations. First, the criteria for substance dependence in this system correspond well with the central elements of the dependence syndrome construct of the World Health Organization, thus facilitating research on this construct. Second, the criteria for antisocial personality disorder - one of the most commonly found disorders in addicts - in the DSM-III^R are more stringent than those in the DSM-III. The exclusion of some drug-related symptoms in the DSM-

those in the DSM-III. The exclusion of some drug-related symptoms in the DSM-III^R may result in a more meaningful diagnosis of ASP in this population. In addition to the DSM-III^R, the Addiction Severity Index has been increasingly used in addiction research, and should be further implemented in The Netherlands. Future studies on the Dutch version of the ASI should concentrate on the test-retest and interrater reliability and on the discriminant and predictive validity of the instrument.

The issue of hierarchical rules in classification system needs special attention in future research. Exclusion criteria play an important role in DSM-III, but empirical research on the validity of the DSM-III hierarchy has been rare (Boyd et al., 1984). Although there is some evidence providing support for the validity of the DSM-III exclusions, there are also indications that presumably unrelated disorders tend to co-occur (Boyd et al., 1984). In the present study, the strong relationship between depressive disorders and anxiety-related disorders for women, and the absence of such a relationship for men, suggests that sex-related differences may interact with patterns of co-occurrence.

In general, standardized measurement instruments that are widely used, have the advantage of facilitating comparisons between populations and across studies, both nationally and internationally. The relevance of the comparison between Dutch and American addicts conducted in the present study, is not so much that these populations are different in terms of their psychopathology, but rather that despite their obvious differences in demographic, treatment, and cultural variables, their level and pattern of psychopathology are so similar. This in turn, suggests that stable patterns of psychopathology may exist, that are relatively independent from sociological variables. Future research should concentrate on the interactions between sociological background variables, psychopathology, and the treatment process.

During the past decade, addiction research has been increasingly confronted with problems in defining polydrug use. Whereas during the 1960's heroin was the single drug for most addicts, multiple drug use is nowadays common for the majority of the addict population. To conceptualize and quantify patterns of polydrug use has proven to be an extremely difficult task. Research is needed on the prevalence of specific combinations of drugs used, and on the reasons why some combinations are preferred to others. In addition, differences in polydrug use patterns should be studied in reference to treatment selection and treatment

outcome. In this respect, ethnographic investigations of the perceived effect of drug-combinations may provide valuable information.

Many studies in the addiction field are - of necessity - retrospective in design, and thereby limited by the ability of individuals to recall the presence and sequence of events in the past. Notwithstanding these limitations, studies need to focus more attention to the time order of the events being studied. Specifically, research is needed on the relationship between the age of onset of drug use, drug dependence, and the initiation of psychiatric symptoms, to get a better understanding of the role of psychopathology in the etiology of addiction.

Finally, results from treatment evaluation studies should be more often cross-validated in independent samples, to arrive at a better understanding of the generalizability of the findings. Such samples may include future admissions to the same treatment facility, clients from other facilities, and clients from other treatment modalities.

SAMENVATTING

In hoofdstuk 1 worden de context, de onderzoeksvragen en de methodologie van de dissertatie gepresenteerd. Diverse modellen van verslaving worden beschreven, die elk een belangrijke bijdrage hebben geleverd aan de kennis op het gebied van verslaving. Aan de hand van deze modellen, en op basis van onderzoeksbevindingen, is het besef gegroeid dat verslaving een heterogeen construct is in termen van antecedenten, nevenverschijnselen en consequenties. Een belangrijke bijdrage aan de ontwikkeling van een multidimensioneel model van verslaving was de formulering van een afhankelijkheidssyndroom door de Wereld Gezondheidsorganisatie in 1981. De afgelopen tien jaar heeft onderzoek naar het afhankelijkheidssyndroom gewezen op de aanwezigheid van verschillende dimensies van verslaving, die relatief onafhankelijk van elkaar zijn. Van specifiek belang in dit multidimensionele concept is de relatie tussen druggebruik en psychopathologie. Psychiatrische stoornissen worden vaak verondersteld vooraf te gaan aan de verslaving en het verslavingsproces te versnellen. Onderzoek naar deze relatie heeft zich met name gericht op de "addictive personality" en de "zelfmedicatie" hypothese van verslaving. Hoewel deze concepten mogelijk een deelgroep van verslaafden vertegenwoordigen, is het onwaarschijnlijk dat onderliggende psychopathologie en "addiction-prone" persoonlijkheidstrekken kenmerkend zijn voor alle verslaafden.

In het afgelopen decennium is de belangstelling voor de rol van psychopathologie in de behandeling van verslaafden toegenomen. Nieuwe diagnostische instrumenten zijn ontwikkeld, zowel in de algemene psychiatrie als op het gebied van verslaving, die mogelijk voordelen bieden voor toepassing in verslavingsonderzoek en behandeling. In studies die met deze instrumenten verricht werden, zijn hoge prevalenties van psychopathologie onder verslaafden gevonden. Tevens is in deze studies gewezen op het belang van coëxistente psychopathologie voor de prognose van verslaafden in behandeling. Hierdoor is in toenemende mate het besef gegroeid dat behandelinstellingen in de verslavingszorg hun behandelmethoden dienen te verfijnen of aan te passen om tegemoet te komen aan de specifieke behoeften van de "dual-diagnosis" groep. Om de behandeling te verbeteren hebben clinici instrumenten nodig waarmee de ernst van de verslaving en de aanwezigheid van coëxistente problemen valide en betrouwbaar vastgesteld kunnen worden. Tevens hebben clinici behoefte aan

informatie over het belang van deze factoren voor de uitkomst van behandeling. Dit zijn de thema's die in deze dissertatie aan de orde komen.

Aan het einde van hoofdstuk 1 worden de specifieke onderzoeksvragen gepresenteerd en wordt een beschrijving gegeven van de algemene methodologie van de studie. Samenvattend, de studie werd uitgevoerd in het klinisch detoxificatiecentrum De Weg en de drugvrije therapeutische gemeenschap Emiliehoeve in Den Haag. Tussen 1987 en 1989 werden in totaal 321 respondenten onderzocht. Afname van de onderzoeksinstrumenten vond plaats binnen een week na opname in het detoxificatiecentrum. Het instrumentarium bestond uit de Addiction Severity Index (ASI), de Beck Depression Inventory (BDI), de Symptom Checklist-90 (SCL-90), de Nederlandse Verkorte MMPI (NVM) en het Diagnostisch Interview Schema (DIS).

In hoofdstuk 2 worden gegevens gepresenteerd met betrekking tot de aard en omvang van psychiatrische stoornissen in de onderzochte populatie en de factoren die met psychopathologie samenhangen. Prevalentiecijfers met betrekking tot lifetime en recente (zes maanden) DIS/DSM-III diagnosen werden bepaald onder 152 verslaafden. Tachtig procent van de onderzochten voldeed aan de criteria van tenminste één recente psychiatrische stoornis naast druggebruik. De drie meest prevalente stoornissen, antisociale persoonlijkheidsstoornis (ASP), depressieve stoornis en angststoornis, kwamen veelvuldig in combinatie voor. Hoewel bijna de helft van de respondenten met ASP tevens een depressieve stoornis of een angststoornis had, waren alleen depressieve stoornis en angststoornis significant aan elkaar gerelateerd. Personen met ASP waren jonger, hadden korter onderwijs gehad, en hadden een langere geschiedenis van druggebruik dan personen zonder deze diagnose. Geen van de diagnosen was gerelateerd aan recent druggebruik. Op basis van deze bevindingen worden de interacties tussen psychopathologie en druggebruik besproken, alsmede de sterke punten en beperkingen van de toegepaste onderzoeksinstrumenten.

In hoofdstuk 3 worden het concept, de bruikbaarheid en de psychometrische eigenschappen van de Nederlandse versie van de ASI besproken. De ASI is een multidimensioneel interview dat werd ontwikkeld om de ernst van problemen op een aantal gebieden die vaak met het gebruik van verslavende middelen geassocieerd worden, te kunnen vaststellen. De betrouwbaarheid van de subschalen van de Nederlandse versie van de ASI was in het algemeen bevredigend. De "subjectieve" ASI ernst-schattingen en de "objectieve" items hingen in sterke mate samen. De ASI psychiatrie schaal vertoonde matige

samenhang met diverse psychologische constructen, waaronder depressie en angst, maar bleek geen van de onderzochte constructen specifiek te meten. In overeenstemming met resultaten van in de Verenigde Staten verricht onderzoek, werd vastgesteld dat de ernst van het druggebruik in het algemeen onafhankelijk is van de ernst van medische, arbeid, juridische, sociale en psychiatrische problemen. Op basis van de ASI ernst-schattingen bleek het mogelijk de respondenten onder te brengen in subgroepen met elk een specifiek profiel van problemen. Twee van deze subgroepen leken nog het meest de klassieke opvatting over het verslavingssyndroom te vertegenwoordigen, waarbij het gebruik van drugs samengaat met ernstige problemen op de meeste andere terreinen. Op grond van het concept en de psychometrische eigenschappen wordt gepleit voor verdere invoering van de ASI in de Nederlandse verslavingszorg.

In hoofdstuk 4 wordt nader ingegaan op de bruikbaarheid van diverse dimensionele meetinstrumenten voor het screenen op psychopathologie onder verslaafden. Daartoe werden drie subschalen van de BDI, de volledige (21 item) versie van de BDI, de SCL-90 en de ASI psychiatrie schaal vergeleken op hun sensitiviteit en specificiteit met betrekking tot DSM-III recente depressieve stoornis en DSM-III recente angststoornis. In het algemeen combineerden de schalen bevredigende sensitiviteit met lage specificiteit. De ASI psychiatrie schaal voldeed van de onderzochte instrumenten het beste als screeningsinstrument voor depressie. Bij een sensitiviteit van 81%, identificeerde deze schaal 55% van de respondenten zonder een depressieve stoornis correct. Angststoornissen werden het best geidentificeerd door de SCL-90 angst schaal. Bij een sensitiviteit van 83% bedroeg de specificiteit van deze schaal 57%. Geen van de BDI schalen bleek voldoende specifiek te zijn voor het identificeren van DSM-III depressie.

In hoofdstuk 5 worden gegevens gepresenteerd met betrekking tot overeenkomsten en verschillen in zelf-gerapporteerde psychopathologie tussen een groep Nederlandse en een groep Amerikaanse heroine verslaafden in behandeling. De BDI en de SCL-90 werden afgenomen bij 47 Nederlandse en 121 Amerikaanse blanke heroineverslaafden in respectievelijk een klinisch detoxificatiecentrum en een methadon-onderhoudsprogramma. Hoewel het profiel van SCL-90 scores van beide groepen vergelijkbaar was, bleken de Nederlandse verslaafden meer en ernstiger klachten op dit instrument te rapporteren dan de Amerikaanse verslaafden. De gemiddelde BDI score van de Nederlanders was eveneens hoger dan die van de Amerikanen. Dit bleek toe te schrijven aan hogere scores op de

cognitieve en affectieve items van de BDI; er was geen verschil in scores op de somatische items tussen beide groepen.

In hoofdstuk 6 wordt een literatuuroverzicht gegeven van onderzoek naar retentie in de behandeling van verslaafden. Geconcludeerd wordt, dat het onderzoek op dit gebied gekenmerkt wordt door verschillen in conceptuele benadering van retentie, verschillen in onderzoeksdesign en methodologische tekortkomingen. Een aantal factoren die samenhangen met vroegtijdige beëindiging van behandeling op het gebied van verslaving, worden met enige mate van overeenstemming genoemd in de literatuur: laag onderwijsniveau, korte arbeidsgeschiedenis of werkeloosheid, afwezigheid van justitiele druk, psychologisch dysfunctioneren en weinig motivatie voor behandeling. In het algemeen zijn de bevindingen van retentie-studies echter te divergent om op basis hiervan een specifiek profiel van clientkenmerken te kunnen geven, dat een verhoogd risico oplevert voor drop-out.

In hoofdstuk 7 wordt verslag gedaan van een studie naar de achtergrondkenmerken, patronen van druggebruik, psychosociale kenmerken en psychiatrische stoornissen, die samenhangen met retentie in een klinisch detoxificatiecentrum en een drugvrije therapeutische gemeenschap (TG). In vergelijking tot personen die na detoxificatie de behandeling voortzetten in de TG, werden degenen die uitsluitend aan het detoxificatie-programma deelnamen gekenmerkt door meer recent gebruik van methadon, slaapmiddelen en tranquillizers, meer recente somatische klachten, minder sociale problemen en een lager onderwijsniveau. Tevens gaf het merendeel van deze groep reeds bij opname te kennen uitsluitend het detoxificatie-programma te willen volgen. Een discriminant functie, gebaseerd op deze variabelen, classificeerde 71.8% van de onderzochte personen correct in de twee behandelgroepen. Cross-validering van deze functie in een onafhankelijk sample resulteerde in een reductie van het percentage correct geclassificeerde personen van slechts 3.0%.

Drop-out gedurende de eerste drie maanden van de TG hing samen met een korter arbeidsverleden, minder sociale problemen, minder drug problemen en meer behoefte aan hulp bij alcohol problemen. Belangrijke verschillen in drop-out cijfers werden gevonden tussen personen met en zonder ASP en tussen personen met en zonder een paniekstoornis. Meer dan de helft van de personen met ASP verliet het TG programma binnen drie maanden, vergeleken met 28% van degenen zonder deze diagnose. Van de personen met en zonder een paniekstoornis verlieten respectievelijk 72% en 38% de TG binnen drie maanden.

Op basis van deze variabelen werd een discriminant functie samengesteld, die 74.2% van de totale groep drop-outs en "blijvers" in de TG correct identificeerde. Vergeleken met de "base-rate" voorspelling, was dit een verbetering van 21.8%. Op grond van deze bevindingen worden aan het slot van hoofdstuk 7 een aantal suggesties gedaan om de "holding power" van de onderzochte programma's te vergroten.

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Summary, Conclusions, Limitations, and Future Research

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