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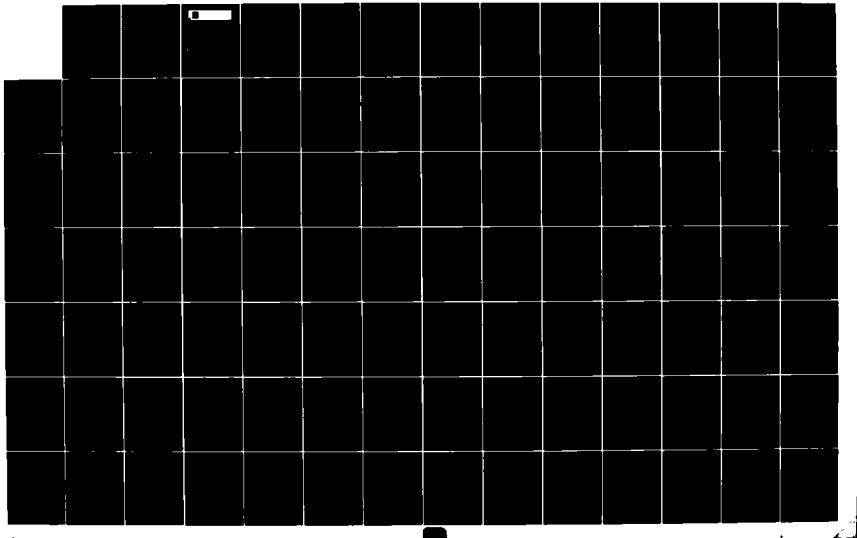

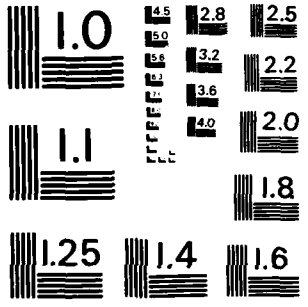

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STUDY OF PERSONALITY FACTORS IN DRUG AND ALCOHOL ABUSE

Committee on Substance Abuse and Habitual Behavior
National Research Council

February 1983

Supported by

US Army Medical Research and Development Command
Fort Detrick, Frederick, MD 21701

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Personality Factors In Substance Abuse

A Report to the U.S. Army

Final Report - Contract No. DAMD17-80-C-0185

US Army Medical Research and Development Command

Personality Factors In Substance Abuse

A Report to the U.S. Army

Committee on Substance Abuse
and Habitual Behavior

Commission on Behavioral and Social
Sciences and Education

National Research Council

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"Addictive Personality: A Viable Construct?" by Alan R. Lang appears in Peter K. Levison, Dean R. Gerstein, and Deborah R. Maloff, eds., Commonalities in Substance Abuse and Habitual Behavior (1983) Lexington, Mass.: Lexington Books.

"Screening Army Enlistees to Identify Individuals With Potential Substance Abuse Problems" by Edwin I. Megargee is available from the Committee on Substance Abuse and Habitual Behavior, 2101 Constitution Avenue, Washington, DC 20418.

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PREFACE

Problems of substance abuse and habitual behavior are the standing concern of this committee. While most of our attention has focused on scientific research questions regarding substance abuse in civilian life, there are special reasons for concern about the relationship of substance abuse to military personnel and institutions, in peacetime as well as in combat. Service in the military involves a substantial number of young adults, whose military training absorbs a heavy investment of public resources and who are in many cases entrusted with expensive, sophisticated, and powerful weaponry or other instruments, often used in demanding and difficult peacekeeping missions. The potential of substance abuse to damage morale and discipline, lives and property, security and other objectives of the military services is clear.

It is less clear how to improve the current substantial efforts of the military services to prevent such damage. Commonsense reasoning and occasional research reports encourage a desire to try weeding out by preinduction screening techniques actual or potential individual abusers before they enter military service. The U.S. Army Medical Research and Development Command in 1980 asked that this committee undertake a special review of individual personality factors in drug and alcohol abuse, with two specific objectives: to evaluate critically the major scientific studies that shed light on whether any particular, identifiable configuration of personality factors predisposes individuals to excessive substance use or abuse; and to advise the Army on the efficacy of methods for screening

inductees with personality assessment instruments to prevent the enlistment of individuals at high risk of excessive substance use or abuse.

To carry out this assignment, we commissioned and critically reviewed two state-of-the-art studies of relevant research knowledge, each examining one of these questions in depth. "Addictive Personality: A Viable Construct?" by Alan R. Lang examines the question of an addictive personality. "Screening Army Enlistees to Identify Individuals With Potential Substance Abuse Problems" by Edwin I. Megargee focuses on screening methods and personality assessment. Our report is based principally on these two studies, which were completed after detailed review and comment by the committee and are readily available to interested readers (see p. ii).

We are indebted to the authors of the studies, Alan Lang and Edwin Megargee of Florida State University, for their thorough analyses and lucid presentations as well as their rapid and constructive responses to the committee's inquiries and comments. We are grateful to Gardner Lindzey, Gerald McClearn, Charles O'Brien, and Albert Stunkard, committee members, and to Peter Levison, the committee's former study director (currently seconded to the Walter Reed Army Institutes for Research), for taking the principal role in commissioning, advising, and reviewing these special studies. We were also assisted by Christine L. McShane, editor of the Commission on Behavioral and Social Sciences and Education. Finally, we are pleased to thank Dean Gerstein, study director, who joined in drafting the committee's report and generally supervised completion of the project.

Louis Lasagna
Chairman, Committee on Substance
Abuse and Habitual Behavior

PERSONALITY FACTORS IN SUBSTANCE ABUSE

The idea of addictive personality derives from the clinical experience of psychiatrists and psychologists in treating cases of drug addiction and alcoholism. It originally described the features observed most often in the psychopathology and clinical behavior of drug addicts and alcoholics. Since psychodynamic theories have generally held that stable personality "traits" formed in early childhood make comprehensible much of the variation in individual adult (and adolescent) behavior, it was natural that clinicians and researchers with psychodynamic training should try to explain addictive behavior in terms of a common personality type (Pihl and Spiers, 1978; Cox, 1979). In contrast, later "situationist" psychologists have argued that behavior is best understood and predicted by knowing how to measure the sequence of situations that people encounter, to which they respond in situation-specific ways. An attempt to combine these contrasting views is "interactionist" psychology, which holds that behavior results from the interaction of personality factors with situational factors: Sometimes situations are so powerfully constraining as to suppress most differences arising from personality factors, while at other times personality differences can lead to behavioral variation (Bem and Allen, 1974; Mischel, 1977; Epstein, 1979, 1980).

Is enough known about the measurement of personality differences and the circumstances of substance abuse to permit useful predictions of future problem behavior at the time of induction into military service? To answer this question requires some understanding of the theory and practice of personality assessment and behavioral

prediction and review of specific applications to substance abuse in civilian and military environments.

A variety of diagnostic instruments exist for assessing personality and related aspects of psychological functioning (Wiggins, 1973; Sechrest, 1976). Most of these instruments are multiple-item questionnaires; some involve the performance of specially designed physical or cognitive- perceptual tasks. Modern views on personality assume that there are a number of fundamental, independently measurable dimensions of personality (e.g., introversion/extraversion, impulsiveness, conformity/rebelliousness, masculinity/femininity, hypochondriasis), the number varying from a few to several dozen depending on the theory, the test constructor, or the analyst. The dimensions may be theoretical constructs based on the interpreted content of a series of questions, or they may be strictly empirical--that is, aggregate scores, on the questions that most consistently discriminate one sort of person (as revealed by an independent "criterion" measure) from other sorts, with no attempt to discern further interpretive or theoretical significance in these questions. When individuals take psychometric tests, they display particular combinations of high and low scores on these different dimensions. A personality "type" is a characteristic pattern of such high and low scores, shared by a set of individuals, that differs from the general norm of scores or from the scores of some particular comparison group.

For a psychometric test to associate a particular personality type with a particular pattern of behavior, the test must have (a) applicability to all or almost all of the population of interest, (b) reliability, that is, the ability to show reasonably consistent scores for an individual at different times, and (c) criterion validity, which means that the test correlates reasonably well with an independently measured criterion behavior. The criterion behavior may be in the past, present, or future--in which cases one speaks of a test's validity being, respectively, postdictive, concurrent, or predictive.

Addictive behavior, the object or criterion of the theories considered here, is itself somewhat complex. It generally refers to ways of using psychoactive

substances that can provide short-term "highs" or changes in mood or perception but often damage health, social well-being, and psychological functioning or efficiency at work. Tolerance, dependence, and resistance to treatment efforts are also characteristic parts of the addictive syndrome, which is generally thought to involve several stages of development--beyond any one of which further development may not occur--from experimentation with one or more substances through intensified use to dependence and multiple relapses (Seevers and Deneau, 1963; Lettieri et al., 1980).

Measuring addictive behavior can be troublesome. The presence of contingent stages rather than a simple presence or absence means that measures may need tuning to relatively subtle differences. The absence or uncertainty of information about the erratic dose-potency of illegal substances, the simplifying assumption that more frequent use is equivalent to more addictive use, and the general reliance of criterion measures on self-report or on specialized samples produced by institutional treatment populations all raise cautions about the available measures for assessing addictive behavior.

Beyond the issues involved in separately measuring personality factors and addictive behavior is the problem of assessing the the relationship between them. At minimum, a test instrument ought to have convergent validity, which means that it is sensitive enough to give positive results in most cases in which the criterion behavior is observed, even though it also may give positive results for other kinds of behavior. More useful is discriminant validity, which means that, in addition to positive or convergent results when the criterion behavior is present, the test yields negative results when the criterion behavior is not observed and hence is not only sensitive but also specific to the behavior in question, capable of discriminating it from other behaviors.

Typical research approaches, such as matching a sample of clinical alcoholics or imprisoned addicts with a comparison group and examining differences between the personality assessment scores of the groups, can establish the convergent validity of a personality test, its capacity to detect the criterion behavior, on a postdictive or concurrent basis. If studies of this

sort are performed with an array of comparison groups, the level of discriminant validity (still on a postdictive or concurrent basis) may be established. But these approaches have limited utility for predictive analysis. The best way to develop predictive validity is by prospective longitudinal studies: drawing random or stratified samples of the populations of interest, testing these individuals initially, and following their behavior (and retesting with personality instruments) through later points in time.

The largest number of prospective studies have reported on precursors of alcoholism, heavy drinking, and serious alcohol-related problems (Robins et al., 1962; Jones, 1968; Fillmore, 1975; Jessor and Jessor, 1975; Kellam et al., 1980). In general, these studies indicate that, as a group, children or adolescents who later present these behavioral criteria had a general early tendency toward assertive, aggressive, nondeliberative personal styles; they valued personal independence over achievement; and generally they would have been deemed more "deviance-prone" than other children. In short, they were assessed as more impulsive, nonconforming, and liable to "act out" conflicts or hostile wishes. These early tendencies were relatively benign at the test points and represented a quantitative difference rather than a distinct qualitative type relative to the usual run of children in these samples.

Clinical and retrospective studies using the Minnesota Multiphasic Personality Inventory (MMPI) and related instruments reinforce the impression that this early, comparatively mild group tendency is relevant to later alcohol abuse (Loper et al., 1973; Apfeldorf, 1978; Clopton, 1978; Barnes, 1979; Owen and Butcher, 1979). Studies of clinical alcoholics show a considerable diversity in individual scores and do not reveal any single, universal pattern on the 10 diagnostic MMPI scales. But there is uniformly a group mean elevation in different samples on scale 4, which is labeled "psychopathic deviate" (Pd). As Alan Lang (1983) summarizes: "High scorers on this scale would appear to share common characteristics (including impulsivity, readiness to manipulate or act out, social deviance, etc.) with individuals who would probably receive a psychatric diagnosis of 'antisocial

personality.' However, the Pd scale also measures guilt and intropunitive remorse, which are not associated with such a diagnosis."

These last two MMPI-interpretive themes (also characterized as low self-esteem and anxious depression) are logical results of alcoholic life events, while the "antisocial" signs of impulsivity and nonconventional or rebellious values and additional findings of heightened "sensation seeking" seem to represent extensions of the personality predispositions identified in childhood. Thus the common elevation of scale 4 probably reflects both precursors and sequelae of alcoholism. However, the elevation of scale 4 (and scales 2 and 7, which generate the MMPI code type most often manifest in alcoholics) is also associated with incarcerated criminals, neurotics, and a number of other clinical groups without drinking problems.

Studies of substances other than alcohol are diverse, but their results move in similar directions. Studies of marijuana use are not generally focused on addictive behavioral criteria and are more social-psychological than psychodynamic in orientation (Kandel 1978; Jessor, 1979). These studies nevertheless reinforce the impression that quantitative differences in personality factors may predispose to more extensive substance use, though not necessarily to addictive behavior as such. Rebelliousness, tolerance for deviance, preference for independence over achievement, and sensation seeking are likely to be higher initially among youths who later use the most alcohol or illegal drugs, but again, these early signs are generally too benign and too common among the children studied to promise predictive discriminant validity vis-a-vis later substance abuse or addictive behavior.

Studies of heroin and polydrug addiction are virtually all based on comparisons of prison and treatment-based samples with assorted control groups. These studies show an excess of psychopathology of all sorts among addicts or very heavy users, with some degree of bias toward the "antisocial personality" configuration (Platt, 1975; Craig, 1979a, 1979b).

In summary, while no single and unique personality type seems either necessary or sufficient for substance use, substance abuse, or addictive behavior, certain broad factors--a high valuation of independence and

nonconformity versus conventional achievement goals, impulsivity, sensation seeking, and an overall deviance-prone or antisocial personality--have some degree of convergent and predictive validity. But these personality factors discriminate the criterion behaviors mainly in comparison with specialized psychiatric groups, not in relation to the general population or to groups that include delinquent or troubled individuals of less specialized sorts.

How do these findings apply to the possibility that personality assessment instruments could be used to screen inductees and predict which individuals would be likely to abuse substances or engage in problem behavior associated with substance abuse?

No studies are available that show directly whether personality assessment techniques are capable of efficiently identifying potential substance abusers among inductees, but a number of studies have demonstrated the potential benefits and drawbacks of psychological screening of inductees. These older studies illustrate that it is possible to identify groups of military inductees with psychiatric casualty rates considerably higher than the average--but that such identification in no way rules out the possibility of successful military careers (Matarazzo, 1978). Predicting behavior is never as accurate in characterizing performance as actually studying individuals in specific situations of interest. False positives and false negatives are inevitable; this consideration requires an attempt to select cutoff scores that maximize the type of correct predictions most desired and minimize the type of errors most important to avoid. In addition, practical considerations such as time and cost must influence the choice of instruments. Paper-and-pencil tests that can be administered easily to large groups and are readily amenable to quantification seem most practical. The most widely used and well-validated device of this sort is the MMPI (Megargee, 1982).

Although the regular MMPI scales and some of the specialized scales are sensitive to personality factors associated with problem drinking or drug abuse, no pattern is uniquely so associated and not all prospective alcoholics or drug abusers are likely to be detected (Owen and Butcher, 1979; MacAndrew, 1981;

Zager and Megargee, 1981). The MMPI is better able to postdictively or concurrently detect alcohol problems than to predict them, and is likely to yield a significant number of false positives. No study has been made of the practical validity of the instrument among young people motivated to present themselves favorably, such as to enhance their chances of admission into military service.

Empirical research would be necessary to establish and maximize the usefulness of the MMPI to identify present or future alcohol and drug abusers at the time of induction. An appropriately designed study among Army inductees would show how well the MMPI could predict patterns of maladjustment including but probably not limited to substance abuse. This study would have to be of longitudinal design, testing all individuals under real-life conditions, and should include one sample for deriving the best predictor scales and a second sample for cross-validation. After initial testing, the subsequent military careers of the samples should be tracked for a period of one to two years, focusing on problems related to substance abuse. The total number of participants would have to be on the order of 20,000, and several years would be required to complete the study.

As a quick, less expensive, but less definitive alternative, the Army might perform initially a rapid small-scale study of the concurrent validity of the MMPI with well-matched samples of maladjusted and well-adjusted personel, numbering around 200 each. This study would be capable of demonstrating whether the MMPI instrument was patently unsuitable for the screening mission: negative findings--insufficient degrees of discriminant validity--would constitute strong evidence against the potential utility of the MMPI, while positive results would be encouraging but not conclusive.

The MMPI could be used without further research as a screening instrument to help choose inductee candidates who should be assessed in greater depth by skilled clinicians and whose performance and behavior during basic training might merit special scrutiny. There is sufficient knowledge to permit this kind of use, but a program evaluation component would be required in order to assess cost and benefit to the Army.

REFERENCES

Apfeldorf, M.
1978 Alcoholism scales of the MMPI: Contributions and future directions. International Journal of Addictions. 13, 1/-53.

Barnes, G. E.
1979 The alcoholic personality: A reanalysis of the literature. Journal of Studies on Alcohol. 40, 571-634.

Bem, D., and Allen, A.
1974 On predicting some of the people some of the time: Search for cross situational consistencies in behavior. Psychological Review. 81, 506-520.

Clopton, J.
1978 Alcoholism and the MMPI. Journal of Studies on Alcohol. 39, 1540-1558.

Cox, W.
1979 The alcoholic personality: A review of the evidence. Progress in Experimental Personality Research. 9, 89-148.

Craig, R.
1979a Personality characteristics of heroin addicts: A review of the empirical literature with critique-Part I. International Journal of the Addictions. 14, 513-532.

Craig, R.
1979b Personality characteristics of heroin addicts: A review of the empirical literature with critique-Part II. International Journal of the Addictions. 14, 607-626.

Epstein, S.
1979 The stability of behavior I: On predicting most of the people much of the time. Journal of Personality and Social Psychology. 37, 1097-1126.

Epstein, S.
1980 The stability of behavior II: Implications for psychological research. American Psychologist. 35, 790-806.

Fillmore, K.
1975 Relationships between specific drinking problems in early adulthood and middle age. Journal of Studies on Alcohol. 42, 409-417.

Jessor, R.
1979 Marijuana: A review of recent psychosocial research. In R. Dupont, A. Goldstein, and I. O'Donnell, eds., Handbook on Drug Abuse. Washington, DC: U.S. Government Printing Office.

Jessor, R. and Jessor, S.
1975 Adolescent development and the onset of drinking. Journal of Studies on Alcohol. 36, 27-51.

Jones, M.C.
1968 Personality correlates and antecedents of drinking, drinking patterns in adult males. Journal of Consulting and Clinical Psychology. 321, 2-12.

Kandel, D., ed.
1978 Longitudinal Research on Drug Use: Empirical Findings and Methodological Issues. Washington, DC: Hemisphere Publishing Company (Halstead of Wiley).

Kellam, S., Ensminger, M., and Simon, M.
1980 Mental health in the first grade and teenage drug, alcohol and cigarette use. Drug and Alcohol Dependence. 5, 273-304.

Lang, A.R.
1983 Addictive personality: A viable construct? In P.K. Levison, D.R. Gerstein, and D.R. Maloff, eds., Commonalities in Substance Abuse and Habitual Behavior. Lexington, MA: Lexington Books.

Lettieri, D., Sayers, M., and Pearson, H.
1980 Theories on Drug Abuse: Selected Contemporary Perspectives. NIDA Research Monographs #30. Rockville, MD: National Institute on Drug Abuse.

Loper, R., Kammeier, M., and Hoffman, H.
1973 MMPI characteristics of college freshman males who later became alcoholics. Journal of Abnormal Psychology. 82, 159-162.

MacAndrew, C.
1981 What the MAC tells us about alcoholic men: An interpretive review. Journal of Studies on Alcohol. 42, 604-625.

Matarazzo, J.
1978 The interview: Its reliability and validity in psychiatric diagnosis. In B.B. Wolman, ed., Clinical Diagnosis of Mental Disorders: A Handbook. New York: Plenum Press.

Megargee, E.I.
1982 Screening Army Enlistees to Identify Individuals With Potential Substance Abuse Problems. Paper prepared for the Committee on Substance Abuse and Habitual Behavior, National Research Council, Washington, DC.

Mischel, W.
1977 The interaction of person and situation. In D. Magnusson and N. Endler, eds., Personality at the Crossroads. New York: Halstead.

Owen, P. and Butcher, J.
1979 Personality factors in problem drinking: A review of the evidence and some suggested directions. In R. Pickens and L. Heston, eds., Psychiatric Factors in Drug Abuse. New York: Grune and Stratton.

Pihl, R., and Spiers, P.
1978 The etiology of drug abuse. In B. Maher, ed., Progress in Experimental Personality Research (Vol. 8). New York: Academic Press.

Platt, J.
1975 "Addiction proneness" and personality in heroin addicts. Journal of Abnormal Psychology. 84, 303-306.

Robins, L., Bates, W., and O'Neal, P.
1962 Adult drinking patterns in former problem children. In D. Pittman and C. Snyder, eds., Society, Culture and Drinking Patterns. New York: Wiley.

Sechrest, L.
1976 Personality. Pp. 1-27, In Annual Review of Psychology. Vol. 27. Palo Alto, CA: Annual Reviews, Inc.

Seevers, M., and Deneau, G.
1963 Physiological aspects of tolerance and physical dependence. In W. Root and F. Hofmann, eds., Physiological Pharmacology. New York: Academic Press.

Wiggins, J.
1973 Personality and Prediction: Principles of Personality Assessment. Reading, MA: Addison-Wesley.

Zager, L. and Megargee, E.
1981 Seven MMPI alcohol and drug abuse scales: An empirical investigation of their interrelationships, convergent and discriminant validity, and degree of racial bias. Journal of Personality and Social Psychology. 40, 532-544.

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There are special reasons for concern about the relationship of substance abuse to military personnel and institutions, in peacetime as well as in combat. The potential of substance abuse to damage morale and discipline, lives and property, security and other objectives of the military services is clear. The U.S. Army Medical Research and Development Command in 1980 asked that the Committee on Substance Abuse and Habitual Behavior undertake a special review of individual personality factors in drug and alcohol abuse,

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with two specific objectives: to evaluate critically the major scientific studies that shed light on whether any particular, identifiable configuration of personality factors predisposes individuals to excessive substance use or abuse; and to advise the Army on the efficacy of methods for screening inductees with personality assessment instruments to prevent the enlistment of individuals at high risk of excessive substance use or abuse. To carry out this assignment, we commissioned and critically reviewed two state-of-the-art studies of relevant research knowledge, each examining one of these questions in depth. "Addictive Personality: A Viable Construct?" by Alan R. Lang examines the question of an addictive personality. "Screening Army Enlistees to Identify Individuals with Potential Substance Abuse Problems" by Edwin L. Megargee focuses on screening methods and personality assessment. Our report is based principally on these two studies, which were completed after detailed review and comment by the committee; the studies are detailed in the appendices included with the report.

Appendix 1

SCREENING ARMY ENLISTEES TO IDENTIFY INDIVIDUALS WITH POTENTIAL SUBSTANCE ABUSE PROBLEMS

Edwin I. Megargee

Florida State University

1982

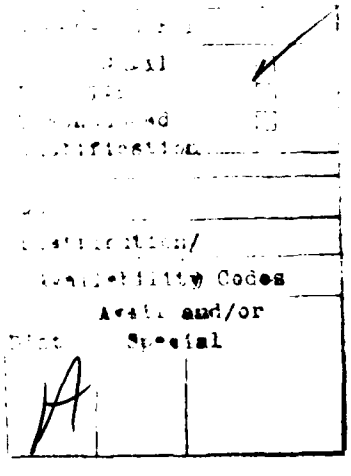

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TABLE OF CONTENTS

Preface

This paper addresses the question of whether it is possible to develop an effective screening device to identify Army enlistees prone to abuse alcohol and other substances. It has been written for the military personnel who will ultimately have to decide on the feasibility of such screening. Therefore the factors that will have to be considered are discussed and the technical terminology and concepts of personnel selection based on personality testing are explained.

Preparation of this paper was supported in part by Grant No. 13202-9 NIMH (Center for Studies of Crime and Delinquency). The writer would like to acknowledge the assistance of Randy Otto in searching the literature and Dr. Alan Lang in discussing the issues. Marie Quick spent many long hours preparing the manuscript. To all of them, he is grateful.

E.I.M.

Tallahassee, Fla.

February 2, 1982.

LIST OF TABLES

Introduction

Can the Army use psychological tests such as the Minnesota Multiphasic Personality Inventory (MMPI) to identify, prior to their induction, those men and women who are most likely to cause problems by abusing intoxicating or psychoactive substances such as alcohol, marijuana, hallucinogens, barbiturates, amphetamines and heroin? This is an empirical question, but as yet no study has been done that bears on it directly. Many researchers have examined the characteristics of alcohol and drug abusers using a variety of tests including the MMPI; however these investigations offer only indirect evidence since most have focused on people already identified as alcoholics or drug addicts who differ in a number of ways from the young men and women who typically enlist in the Army.

Although it would be possible to answer this question empirically, there is no point in undertaking an expensive and time consuming longitudinal study unless there is reason to believe that identification of people with potential substance abuse problems is practical, feasible, and cost-effective. The literature on the psychological assessment and evaluation of alcoholics and drug addicts, although not directly applicable to the problems posed by military screening, is nonetheless useful in evaluating the potential contribution such tests can make and will, therefore, be reviewed in this paper.

We will first discuss the basic issues and procedures involved in attempting to use psychological tests to predict human behavior. Some of the reasons why behavioral prediction is a necessarily imperfect science will next be explored, and the implications for military screening developed. Then the literature on the assessment and identification of problem drinking and psychoactive substance abuse with the MMPI will be reviewed to determine whether it is likely that recruits who are apt to abuse these substances can be iden-

tified. Finally, if further research appears warranted by the literature, specific recommendations for such studies will be made.

Part One: General Issues and Considerations

In the first part of this review, we shall discuss general issues, problems, and considerations involved in deciding whether or not it is feasible to screen enlistees to identify those most likely to present the Army with problems owing to alcohol or drug abuse. This discussion will focus on the psychological and scientific aspects of such screening. Legal and military considerations are beyond the scope of this paper.

Chapter One describes the nature and extent of the military substance abuse problem focusing on the Army. This is done not only to determine whether there is a need for preventive measures, but also to establish base rates to be used in estimating the number and kinds of errors that might be expected if screening were to be implemented.

Chapter Two discusses general methodological problems involved in attempting to predict behavior and the general considerations that should determine its feasibility. After pointing out that errors are inevitable in any prediction effort, the types and costs of the errors to be expected in screening inductees are discussed.

Chapter Three establishes guidelines and criteria for evaluating the usefulness of various screening techniques. After a detailed discussion of the various types of validity, the importance of practical considerations is emphasized.

Chapter One:

Nature and Extent of the Problem of Substance Abuse in the Military

It is important to examine the extent of the military substance-abuse problem for two reasons. First, any screening program designed to identify substance abusers will have certain costs associated with it. In addition to the actual costs associated with the screening process...the personnel, test forms etc....there are other costs such as the possible loss to the Army of young men and women falsely identified as potential problems. But what are the costs of not identifying such personnel? How extensive are the problems currently being experienced stemming directly or indirectly from substance abuse? If these problems and their associated costs are minimal, then it may be that the introduction of an extensive or expensive screening program would not be justified. On the other hand if substance abuse does pose a serious threat to the efficient functioning of the Army, especially if it is having an adverse impact on the ability of the Army to perform its mission, then the introduction of even moderately valid screening procedures may prove beneficial.

The second reason for exploring the extent of the substance abuse problem is somewhat subtler. Unless the psychologist has a reasonably accurate estimate of the prevalence of problem personnel, it is impossible to estimate the probable errors that will result from personnel screening. The lower the incidence or "base rate" of substance-abusing personnel in the Army, the less feasible a screening program will be; i.e. the more enlistees who will erroneously be labeled as potential problems for every actual problem identified.

Estimating the military substance abuse problem: Methodological problems.

Data Collection.

A number of methods have been used to assess the extensiveness of the problems of alcohol and drug abuse in the military services most notably the Army. None is entirely satisfactory.

Biochemical techniques. The ingestion of a chemical substance naturally influences the body's biochemistry, and, in principle, can be detected by laboratory analysis. However, this apparently simple procedure is complicated by the fact that different substances have different effects requiring different tests (Foltz, Fentiman & Foltz, 1980). Moreover, the biochemical effects vary with the size of the dose, the site of action for the particular drug, the mode and method of administration, (i.e. oral, intramuscular injection, intravenous injection, etc.), the age, weight, and gender of the individual, and the manner in which the substance is excreted from the body (Leavitt, 1974).

At best chemical analyses can indicate whether or not there was a detectable level of the drug being sought in the bodily tissue or fluid being examined at the time the sample was taken. Surveying these techniques, Lang (1982, p. 31) concluded:

> Though a useful corroborative indicator in certain situations, such detection methods are impractical in many others because of their cost, intrusiveness, etc. Moreover, most of these tests are timebound, measuring only very recent substance use. Some research (e.g., Hollinshead, Marlow & Rothberg, 1974; Hurst, Cook & Ramsey, 1975) has also suggested other flaws in chemical analyses and their application which lead them to underestimate or otherwise inaccurately identify substance use. Finally, chemical tests are not available for some substances of interest. While recent technological advances have remedied many of these problems, the expense, analytic

skill, and difficulty in obtaining suitable samples for precision testing (Foltz, Fentiman & Foltz, 1980) appear to limit the applicability of chemical tests. They are probably most appropriate as a cross-check on self-reports and other data.

Interviews and questionnaires. The most direct and straightforward way of estimating the amount of substance abuse is simply to ask the personnel involved. Several such surveys have been conducted inquiring about the amount of usage within a recent period, such as the last 30 days, and/or at any time during the military career. In-depth interviews and some questionnaires have also inquired about the circumstances surrounding alcohol and drug usage, including whether the individual was intoxicated on duty, and whether such usage caused serious problems (cf. Burt & Biegel, 1980; Cahalan & Cizih, 1976; Callan & Patterson, 1973; Hollinshead et al, 1974; Patterson, 1974; Reinstein, 1972; Tennant et al, 1972).

The obvious drawback to self-reports is that enlisted personnel and officers may be understandably less than candid reporting their use of illicit, or even licit, intoxicating substances, even when anonymity is assured. Although some may be inclined to overstate their substance abuse, it seems likely that the estimates based on self report data err on the side of conservatism.

Participant observation. Ingraham, faced with conflicting indications of the nature and degree of substance use and abuse among male soldiers in a stateside garrison, placed participant observers in the barracks whose declared purpose was to record what they observed with respect to barracks life in general and alcohol and drug use in particular (Ingraham, 1978; Sodetz, 1979). Although initially the presence of an observer no doubt had some impact on those

being observed, over time these participant-observers were uniquely able to record the circumstances associated with substance usage and the context in which such behaviors occurred. Even though such idiographic data could not be generalized greatly beyond the setting in which they were collected,these observations had a significant impact on perceptions of the role played by alcohol and drugs in the garrison army (Sodetz, 1979).

Other indicators. Other indirect indicators can be used to assess the extent of drug or alcohol abuse. These include the number of military and civilian charges for substance-related offense such as driving under the influence, the rate of self-referrals for drug or alcohol rehabilitation programs and the incidence of associated diseases such as acute viral hepatitas, especially hepatitis B which can be transmitted by the practice of sharing paraphernalia for injecting drugs (Allen et al, 1975; Cates & Warren, 1975; Hurst, et al, 1975). All of these measures have the drawback of depending on other factors such as the zeal of local law enforcement officers. They are probably better estimates of the problems associated with abuse in a particular locale and of changes over time than they are of the actual prevalence of such abuse.

Definitional problems.

Even if accurate and reliable data on the consumption of alcohol or illicit drugs could be obtained, definitional difficulties endemic to this area of research would complicate their interpretation. When should an individual be regarded as having a substance abuse problem? Some would maintain that any use of any illicit or illegal substance including marijuana constitutes a problem, even if it occurs off duty and off-base. Others would condone alcohol and possibly marijuana but draw the line at "hard drugs", while still others would

regard as problem cases only those who have developed physiological dependencies or whose use of chemical substances has progressed to the point where it seriously impairs their ability to perform their duties. Until a generally accepted definition of "substance abuse problem " is formulated, it will, of course, be impossible for any psychologist to accurately indicate how many such "problem cases" will be identifiable through psychological screening.[1]

Estimates of Substance Use and Abuse in the Military

Most enlistees are unmarried young men who will be living with one other away from home for the first time in their lives. In wartime they are apt to be subjected to high levels of stress; in peacetime to periods of boredom and inactivity. This is as true today as it was in Caesar's time, and it is not surprising that occasional excessive use of alcohol among many of these young men, and chronic alcohol abuse among some, was found among the Roman legions, their predecessors, and their antecedents down to the present day. Similar drinking patterns are found among other young adults in similar circumstances, such as college students.

Among military authorities concern about substance abuse apparently increased markedly when drugs other than alcohol, most notably heroin, began being used among on-duty personnel in an active war zone, Viet Nam. After Congressmen announced "epidemic levels" of narcotics addiction in Viet Nam, a rash of articles appeared, not only in the popular press but also in the professional literature, documenting the use of illicit drugs among U.S. military personnel (Char, 1972; Goodwin, et al 1975; Reinstein, 1972; Robins et al, 1975; Stanton, 1976). Surveys, interviews, and urinalyses of servicemen returning from Viet Nam consistently indicated that almost half had experimented with nar-

cotics during their tours of duty and about 20% had become dependent or addicted (Char, 1972; Goodwin et al, 1975; Robins, et al, 1975; Stanton, 1976). Various situational factors were cited including the stress of combat, changing cultural mores, the ready availability of drugs in Viet Nam and disenchantment with the war (Stanton, 1976).[2]

Although Frenkel et al(1977), citing similarities between military personnel using heroin in Viet Nam and in the U.S., denied that heroin use in Viet Nam was unique or had reached epidemic proportions, most authorities were quite concerned. Programs of identification and treatment of addicted soldiers were established, the most notable being urinalyses prior to leaving Viet Nam, followed by detoxification and treatment of those found with traces of opiates in their urine.

In Viet Nam, illicit drugs served many of the same functions that alcohol had served in previous conflicts; indeed Goodwin et al (1975) documented the complementary increases and decreases in the relative consumption of alcohol and opiates as personnel were transferred from the U.S. to Viet Nam and back. One reason for alarm at the high rate of heroin addiction was the abysmal cure rate that had been obtained among American "street" addicts over the years; a huge influx of hopelessly addicted former servicemen was foreseen. This, however, did not prove to be the case. Although Viet Nam veterans are more likely to abuse drugs and alcohol than other veterans, such abuse has not reached epidemic proportions. Indeed, Boscarino (1979) maintained that when social and demographic differences are controlled, the differences in abuse rates are largely eliminated.

Table 1

Incidence of Illicit Drug Usage Reported in Recent Surveys of Military Personnel

STUDY	SAMPLE	METHOD	RECENT &/OR SERIOUS	EVER OR LAST 12 MOS.
Black, Owens & Wolff, 1970	5,482 enlisted men inactive duty	Survey	----------	27%
Reinstein, 1972	1,385 soldiers of ranks.	Survey	10% used more than 10 times in last month.	48%
Tennant, Preble, Groesbeck, & Banks, 1972	3,553 soldiers in West Germany	Survey	----------	46%
Patterson, 1974	19,948 military	Anonymous Questionnaire	----------	32%
Hurst, Cook & Ramsay, 1975	17,141 enlisted men in U.S., Germany and Korea	Questionnaire	Used during last month: Marijuana 40% Hallucinogens 13% Amphetamines 15% Barbiturates 10% Opiates 9% Cocaine 8%	not reported
Hollinshead, Marlowe, & Rothberg, 1974	2,728 enlisted men	Questionnaire Interview.	12% (last 2 days)	40% by questionnaire. 60% by interview.
Cook, Hostetter & Ramsey, 1975	Stratified random sampler of 262 enlisted men at six military posts.	Interviews	----------	ca.50%
Burt & Biegel, 1980	Stratified random sample of 15,268 military personnel		Last 30 days: (Army) Marijuana 28% Hallucinogens 3% Amphetamines 6% Barbiturates 3% Opiates 2% Heroin 1% Cocaine 4%	Last 12 mos. 37% 7% 12% 6% 4% 3% 10%

Insert Table 1 About Here

In the post-Viet Nam era, surveys have shown that Army personnel continue to use and abuse alcohol and marijuana, but the use of "harder" drugs has apparently declined markedly. Estimates of illicit drug usage by military personnel based on questionnaires and interviews range from 27% to 60% (See Table 1). In evaluating these surveys it is important to remember that a self-report of smoking marijuana one time during one's service career is generally sufficient to cause one to become a statistic.

Of greater interest are the statistics on recent and/or serious drug use. When asked to indicate any substances used during the previous month, alcohol use was reported by 80%, marijuana by 40%, amphetamines by 15%, hallucinogens by 13%, barbiturates by 10%, and opiates by 9% (Hurst, Cook, & Ramsey, 1975). Daily or alternate-day use of alcohol was reported by 27%, of marijuana by 21% but of other substances by no more than 2-3%.

These rates were somewhat higher than those in a recent worldwide survey by Burt and Biegal (1980) who found 80% of the Army personnel surveyed reported use of alcohol within the last month, 28% marijuana, 3% hallucinogens, 6% amphetamines, 3% barbiturates and 2% opiates.

Problems Associated with Substance Use.

Research conducted via interviews and participant observation indicates marked differences between the functions served by alcohol, marijuana and other drugs in the peacetime Army and their usage by the stereotyped "street junkie" (Ingraham, 1978; Sodetz, 1979). In the world of the barracks in the peacetime garrison Army, alcohol and drugs...chiefly beer and marijuana...can function as

one vehicle for social interaction and bonding among single enlisted men deprived by the geographic and sociological isolation of barracks life from more socially approved mechanisms (Ingraham, 1978; Newby, 1977).

On the other hand, use of illicit drugs may have a divisive influence. Lt. Col. Frank Sodetz noted:

> The presence of drug use within our military units, and the fact that is is so resistant to our prevention and control efforts should be a source of concern for every commander, not because of the individual health and performance consequences of drug use, but because of its potential to modify the human relationships vital to sustaining the soldier on the battlefield. Drug usage alters human relationships among soldiers, their NCO's and their officers. Drug abuse becomes a readiness issue when we recognize that preparedness for a short-notice war requires the presence of unit cohesion before the outbreak of hostilities. The interpersonal bonds that will sustain a soldier for the first critical hours and days will be those that exist within his unit before that unit is deployed into combat. The commander who sees his unit fragmented into those who use drugs, those who do not and those who could care less one way or the other should give some thought to how these disparate groups will sort themselves if called upon tomorrow to risk death for and with one another (1979, p. 6 & 7).

In addition to these indirect effects, we must consider the direct effects of drugs themselves. It is beyond the scope of this paper to delineate the physiological and behavioral effects of alcohol, marijuana and the whole range of illicit substances that people ingest singly and in combination. To oversimplify drastically, suffice to say that such chemicals can and often do impair judgment and perceptual-motor functioning, attributes that are of great importance in soldiering and in operating complex, dangerous, military equipment. Some may lead to physiological as well as psychological dependence.

Some of the deleterious effects of alcohol and drug abuse were documented in the survey by Burt and Biegel (1980) cited earlier. With respect to alcohol

abuse, this survey indicated that 22% of the Army respondents could be regarded as heavy drinkers of beer, 8% of wine and 12% of spirits; 8% of the overall Army respondents and 11% of the E-1 through E-5 personnel were classified as "alcohol dependent". As a result of alcohol usage, 27% reported work impairment such as absenteeism, intoxication on duty, or tardiness during the preceding year, and 11% reported having experienced serious adverse consequences from excessive drinking, such as arrests, being passed over for promotion, marital difficulties and the like.

Turning to drug abuse, the survey estimated that 4% of the respondents were physiologically and/or psychologically drug dependent at some time during the previous 12 months, and that 22% of the Army respondents in the E-1 through E-5 category reported work impairment resulting from drug usage, the most frequent being high while working. Serious consequences stemming from drug abuse were reported by 11%, with a median of three adverse consequences per respondent reporting any such results.

Substance abuse can result in a variety of adverse consequences to the user. As already noted, Allen et al (1975) and Cates and Warren (1975) have documented heavy outbreaks of viral hepatitis presumably associated with sharing drug paraphernalia among soldiers stationed in Texas and in Germany respectively. In a longitudinal study, Rothberg and Chloupek (1978) documented that 1600 enlistees who were identified as drug users by the Army's urine screening program had significantly higher rates of hospitalization than a control group of 2400 who tested negative; moreover the drug users were signficantly less likely to complete their tours of duty. Ratliff and Eads (1978) noted a strong association between drug abuse and court maritals for AWOL and disrespect in

addition to charges stemming directly from use, possession, or sale of illegal substances.

This leads us to yet another potential cost of substance abuse. Once an enlistee has been inducted and served for 90 days, the Government assumes substantial responsibilities for that man or woman's continuing health care while in the service and after discharge. In 1980, the cost of the Army's alcohol abuse program was over $50 million (March, 1979). The increased health risk associated with substance abuse must be added to the potential costs. It may be, as some authorities have asserted, that the rates of illness associated with substance abuse are no higher than those found in comparable civilian populations; however, in the latter instance the public does not assume an obligation for continuing health care.

To summarize, substance abuse among service personnel poses all of the same problems found in private business and industry including absenteeism, impaired judgment and performance, and reduced productivity. However, substance abuse in the military poses added risks as a function of the military mission. In wartime intoxicated personnel obviously pose serious problems, but some military operations are also hazardous in peacetime and lives and equipment can be endangered if personnel are not alert and efficient. In addition, whereas industry can simply fire the employee whose performance or health is impaired by substance abuse, the military assumes a greater and longer lasting obligation with respect to mental and physical health care. In the pages that follow, we shall examine the question of whether some of these costs could be decreased by a program of mass screening of inductees designed to identify those most prone to develop alcohol or drug-related problems.

Chapter Two

Psychological Screening of Prospective Service Personnel: Methodological Issues and Considerations

Substance abuse, like any other behavior, is the product of an individual interacting with the environment. Preventive efforts must focus on both aspects. On the individual side of the equation, prevention could include attempting to educate recruits to the dangers of alcohol or drug abuse and providing rehabilitation programs for those identified as having developed patterns of abuse. Environmental measures can include attempts to eliminate the sources of illicit substances, and efforts to ameliorate the conditions leading to drug or alcohol abuse, such as providing meaningful work, decreasing the isolation of the garrison soldier, furnishing closer supervision and better leadership.

Psychological screening is a preventive measure concerned with the individual side of the equation. It has been proposed that some individuals are more likely than others to develop chemical dependencies...that there exists, as it were, an "addiction prone personality"....and, moreover, that prospective recruits with such personalities can be identified by means of psychological assessment procedures.

What then? Things get a little fuzzy if one asks what one course of action should be adopted toward enlistees so identified. The usual implication is that they should be excluded from the Army. Other alternatives would be to assign those identified to special counseling or training programs designed to inoculate them from developing abusive patterns and to place them in settings which are least conducive to such behavior. These considerations are academic, however, unless it can be established that psychological assessment techniques

have the potential for accurately identifying such personnel at the time of induction.

Studies on the psychiatric screening of military inductees.

As noted at the outset, the question of whether or not current psychological assessment techniques are capable of identifying potential substance abusers is ultimately an empirical one; it can only be answered by data...data that so far have not been collected. There are, however, other sources of information relevant to this issue. One such source is the longitudinal studies of the effectiveness of psychiatric screening of military inductees conducted in World War II and thereafter.

A number of these studies, most of which were carried out by the Navy, were recently summarized by Matarazzo (1978) who noted, "Although often overlooked by most reviewers of the literature on the validity of psychiatric diagnosis, the studies carried out by Hunt and Wittson and their colleagues in a U.S. Navy neuropsychiatric unit...are classic examples...of good validity research." (p. 72)

These studies clearly demonstrated the potential benefits as well as the drawbacks of screening inductees. One set of studies compared the attrition rates among men who went through three Naval training centers during World War II. In the first, the neuropsychiatric (N.P.) unit was free to discharge any recruits they felt were unsuitable; at a second the N.P. unit was asked to keep their discharge rate under 4%, and in the third the commanding officer, who was not sympathetic to N.P. screening, permitted few psychiatric discharges.

Long term follow ups on the personnel who passed through these three installations showed that the more men who were screened out as "unsuitable for

the service", the lower the subsequent rate of breakdown on active duty. It also showed a diminishing rate of returns--doubling the discharge rate lowered the casualty rate only one sixth (Hunt, 1951).

In another study, 944 men identified by enlisted personnel administering vocational tests as having possible psychiatric problems were briefly interviewed and classified by the psychiatric unit as having "mild", "moderate" or "severe" symptoms. Follow ups of their subsequent careers indicated that whereas the usual psychiatric discharge rate in the Navy was only 1.6%, the "mild" cases had an attrition rate of 6.5%, the moderate cases 20.2% and the severe cases 89.7%! (Wittson & Hunt, 1951).

In a peacetime study of 2406 unselected recruits, those diagnosed in boot camp as having no psychiatric problems had a subsequent psychiatric or bad conduct discharge rate of 2.45% compared with rates of 5.74% and 7.36% for those diagnosed as having mild or moderate problems (Hunt, Hermann, & Noble, 1957).

In an experiment conducted in 1960-1961 (Plag & Arthur, 1965), 134 Naval enlisted men deemed unsuitable for the service were nonetheless graduated into the fleet so their subsequent careers could be compared with those of 134 matched controls who had been found suitable. After two years the discharge rate for the unsuitable group was almost twice that of the controls, 27.6% vs. 14.2%.

These results are not peculiar to the Navy. Egan, Jackson and Eanes (1951) followed up 2054 men who had been initially rejected by the Army as nuero-psychiatrically unsuitable but who were subsequently inducted in 1942-1946. They reported 18% had to be given neuropsychiatric discharges, a rate three times that for the Army as a whole during that period (Matarazzo, 1978).

The studies reviewed by Matarazzo (1978), are, of course, not directly applicable to the present question. They took place at a time when the military situation differed greatly, and, they involved using neuropsychiatric interview techniques to identify men prone to develop psychiatric problems. But these data do provide cause for both optimism and concern:

1) They illustrated that mental health practitioners, using techniques available two to four decades ago, were able to identify groups of military inductees who had psychiatric casualty rates several times greater than average.

2) They also illustrated that most of the men diagnosed as having potential psychiatric problems nevertheless had "successful" military careers; i.e. were not discharged for psychiatric breakdowns or misconduct. (The converse of casualty rates ranging from 6% to 27% is "success" rates of 94% to 73%.) In short, these data suggest that those who would institute screening of enlistees must be prepared to deal with the problem of "false positives" i.e. the possibility of excluding large numbers of men or women who could have had successful military careers to eliminate those "true" positives who would have actually had problems. This issue is one that will arise again and again throughout this paper.

General Issues In Screening

Why errors are inevitable

Whenever we try to predict behavior, we are trading accuracy for expediency. If we want to find out if men or women will make good soldiers the most accurate method is to induct them into the Army and later evaluate their performance. This, in essence, appears to be the method currently in use. It has the advantage of giving everyone a chance and eliminating errors in predic-

tion (since no predictions are made). The disadvantages are that the Army has to suffer from the mistakes of failures or misfits and these individuals may waste time and experience avoidable failures.

Once we attempt to predict behavior, we are inevitably letting ourselves in for errors, as any one who has ever lost a bet on an athletic contest or an election can testify. In making predictions, we take a sample of past or present behavior and use it to estimate what a person will do in the future. Such sampling necessarily involves errors. Polling is a form of sampling. We know polls involve error. The amount of error depends upon the extensiveness of the poll, the care with which the questions were chosen and the responses collected, and the amount of time that elapses between the prediction and the actual election. The same principles are involved in sampling individuals' traits and characteristics to make inferences about their future behavior. A brief review of the procedures involved in psychological assessment will illustrate why sampling errors are inevitable.

Step One: Identifying the variables to assess. The first step in identifying potential substance abusers by means of psychological tests is to determine their characteristics. Are they introverted or extroverted, active or passive, optimistic or pessimistic, happy or depressed? The more homogeneous the constellation of personality attributes associated with alcohol and/or drug abuse and the more these characteristics are uniquely associated with these problems (rather than being symptomatic of the general human condition), the better the chances of identifying such individuals by measuring these traits. On the other hand, the more variegated the patterns associated with substance abuse, the greater the chances for error in this inital stage of the assessment

process. One of the first steps has been to examine people who are already alcoholics or drug addicts. One problem with such studies is that one can not be sure if the tested personality patterns preceded or stemmed from the substance abuse. A number of such studies have been performed using the MMPI and will be summarized in this paper. For obvious reasons there are far fewer longitudinal investigations of people who subsequently develop chemical dependencies, although these predictive data are those most relevant for screening purposes.

Step Two: Measuring the relevant variables. Once one has decided what personality characteristics to measure, the next step is selecting or constructing reliable and valid tests to assess these variables. This is far from easy. No measurement instrument is perfect, and to the extent the instruments chosen lack reliability or validity, the more measurement errors one can expect. A major portion of this review will be devoted to evaluating the many alcohol and drug abuse scales that have been constructed for the MMPI.

Step Three: Integrating the data. Even if the psychologist has done the impossible and has perfectly selected the relevant personality attributes and, moreover, has constructed or selected test scales that are absolutely reliable and perfectly valid, (another impossibility), further problems arise when it is time to examine the test scores and make predictions. Suppose an individual is high on the Sensation Seeking Scale, which many think is related to substance abuse, but is also opposed to using alcohol on religious grounds. How should these opposing tendencies be weighted? What anxieties will this conflict engender? (Will these anxieties in themselves be enough to drive this person to using tranquilizers?) All these questions provide the psychologist with more chances to make errors.

Clinicians weigh and evaluate all the various data and create a dynamic portrait of each individual's personality functioning from which they then make behavioral predictions. Not surprisingly clinicians vary in their ability to integrate data and some do better than others.

For mass screening of thousands of people, such clinical integration of the data in each individual case is both unreliable and impractical. Actuarial decision formulas are required; these may be derived from clinical acumen or from statistical procedures such as multiple regression or discriminant function analyses in which the test patterns of people who are known to abuse drugs or alcohol are simultaneously compared on all the measures and a formula derived which best discriminates the criterion groups in this particular sample. This formula must later be tested ("cross-validated") on independent samples. Not surprisingly, errors can easily be made in interpreting and integrating the test scores, whether this is done clinically or actuarially. These errors accumulate along with any made in choosing traits and selecting scales to measure them.

Step Four: Making the predictions. The three steps outlined thus far, if all done perfectly, should produce a perfect personality portrait or diagnosis of the individual being assessed. Obviously, this is impossible, but even if a perfect personality description could be constructed, predictions based only on that perfect portrait would be subject to error because, as we have stressed, behavior stems from the interaction of personality factors with environmental variables. For example, from our personality profile, we may have correctly determined that a given inductee is a well-adjusted, extroverted person with no noteworthy anxieties or conflicts. Like most young people, he or she is a friendly individual who wishes to be liked and accepted by his or her peer group

and does not want to be labeled as a nonconformist or perceived as being anti-social...thus far a constellation of traits that most NCOs would probably agree are desirable in a new recruit. Is such a soldier likely to develop an alcohol or drug abuse problem? That depends to a great extent on the setting in which this person will live and the cultural mores of the peer group. If their peers strongly reinforce getting drunk on weekends or smoking pot in the barracks, then it is likely that men or women with the attributes described above will tend to go along with the group rather than risk being labeled as outcasts. On the other hand, and for the same reason, if the peer group rejects such behaviors and those who engage in them, then it is more likely that such people will refrain from such activities.

In evaluating and discussing the problems of substance abuse in the Armed Forces, a number of authorities have cited situational (as opposed to personality) factors as being very influential. In Viet Nam the stress of combat, the lack of strong unit cohesion and esprit de corps, and the ready availability of inexpensive drugs have been cited as factors that might operate both to increase motivation and decrease inhibitions to abuse substances (Stanton, 1976). In peacetime, being away from home and family, peer pressure, frequent parties, lack of other recreational outlets and improved finances have all been noted as causative factors (Cahalan & Cizih, 1976: Ingraham, 1978; Sodetz, 1979; Stanton, 1976). To the extent that situational factors such as these influence abusive behavior, predictions based solely on personality data will be subject to error.

Errors and usefulness: Base Rates, Selection Ratios and Cutting Scores.

Obviously errors can occur at each and every stage of the screening process

outlined above. In the first stage we may choose to assess some traits or behaviors that are not relevant to the problem, overlooking others that are. In the second stage, the measures we choose or develop will have certain inherent inaccuracies, especially, as we shall see, if they are applied to people who differ from those for whom the instrument was originally developed. In the third stage, the different indicators might be inconsistent and errors may be made in making inferences from these conflicting test signs. Finally, situational circumstances can alter personality functioning and strongly influence behavior.

Types of prediction errors. Two types of prediction errors can result from these inevitable imperfections: "false positives" and "false negatives". A "false positive" is a person for whom it is erroneously predicted that a particular problem, in this case alcohol or substance abuse, will develop. (The term was derived from medical tests for the presence or absence of a disease). A "false negative", conversely, is a person for whom it is erroneously predicted that no such problems will occur.

Actuarial research, such as that engaged in by insurance companies, can estimate the cost of false negatives, including the time lost from work because of substance abuse, accidents or mishaps stemming from intoxication, and the expenses associated with treatment and rehabilitation.

The cost of false positives is harder to determine. It depends on what policies are adopted toward those who are identified as actual or potential substance abusers in the course of screening. If they are excluded, the cost to the Army is the loss of their services; to this must be added the social costs involved in depriving these people of the benefits they would have derived from joining the service as well as the impact on their self esteem. Other decision

functions, such as special counseling programs, will have different costs associated with them.

Base rates and selection ratios. In psychological screening it is usually the false negatives that attract the most attention...the parolee who commits a heinous crime or the air traveler who manages to hijack an airplane. However, when rare events are being predicted, it is the false positives who are more numerous and comprise most of the errors (Meehl & Rosen, 1955; Megargee, 1976). This was evident in the military screening studies reviewed by Matarazzo (1978) in which psychiatric breakdowns were predicted for many more men than were actually discharged for this reason.

A few simple calculations will quickly demonstrate why false positives will be more numerous when infrequent events are being predicted. The best studied and most highly regarded measure of substance abuse is the MacAndrew (1965) Alcoholism Scale for the MMPI (Apfeldorf, 1978; Butcher & Owen, 1978; Clopton, 1978; Miller, 1976; Owen & Butcher, 1979). Seven studies recently reviewed by Owen and Butcher (1979) reported false positive rates for MacAndrews scale ranging 10% to 37.1% with a median of 18%. The false negative rates ranged from 7.0% to 10% with a median of 8.5%. However, the reason for the pernicious effects of the false positive rate is not the fact that these rates tend to be higher, but instead the fact they cause many more errors when applied to infrequent phenomena.

It will be recalled that Burt and Biegel's (1980) survey indicated that 11% of the E-1 through E-5 Army personnel surveyed could be classified as "alcohol dependent" and that 11% also reported serious adverse consequences from alcohol abuse. Let us then use 11% as the base rate for serious alcohol problems in the U.S. Army, and project the number and kinds of errors that might be made if the MacAndrew Alcoholism Scale was applied to 100,000 prospective inductees in

an effort to identify those most likely to develop such problems in the service.

Of the 100,000 prospective recruits we would expect 11,000 (11%) to develop serious alcohol problems on the bases of the DOD survey. Using the median values reported in the studies surveyed by Owen and Butcher (1979), we would expect a false negative rate of 8.5% and a false positive rate of 18%[3]. If these rates held up among enlistees, in this hypothetical example the MacAndrew would detect 10,065 true positives (91.5%) and miss 935 false negatives (8.5%), an excellent "hit" rate. (See Table 2).

Insert Table 2 about here.

Turning to the 89,000 who would not develop alcohol-related problems, we would expect the scale to classify correctly 72,980 (82%) and to misclassify as false positives 16,020 (18%). False positives would thus be 17 times as frequent as false negatives, and the consequence would be that over 26,000 applicants would be labeled potential alcoholics, less than half of whom would actually develop drinking problems.

Obviously it would require a longitudinal study on actual enlistees to determine the correct true and false positive and negative rates. (Moreover, as we shall see, there is good reason to believe that with the MacAndrew scale some of the false positives who do not develop alcohol-related problems might nevertheless be unsatisfactory soldiers for other reasons, such as abuse of other substances, authority conflicts, AWOL, and criminal behavior.)

In any event, if a screening program is implemented using the MacAndrew or any other device, someone, somewhere, will, at sometime, have to decide what are acceptable false positive and false negative rates, or, to put it another way, whether it is worth excluding "X" number of men and women who will not present

Table 2

Hypothetical Application of the

MacAndrew Alcoholism Scale

to Army Screening.

		ACTUAL BEHAVIOR		
		ALCOHOL PROBLEM	NO ALCOHOL PROBLEM	TOTAL
PREDICTED BEHAVIOR	ALCOHOL PROBLEM	10,065 (true positive)	16,020 (false positives)	26,085
	NO ALCOHOL PROBLEM	935 (false negatives)	72,980 (true negatives)	73,915
	TOTAL	11,000	89,000	100,000

Hits = 83,045 (16,020 false positives)

Misses = 16,955 (935 false negatives)

serious problems in order to avoid admitting "Y" number of people who will. These are value judgments, not empirical questions. Scientists can only inform decision makers of the number of errors to be expected with various screening techniques and cutting scores. It is up to policy makers to determine what rates are socially and/or economically acceptable or unacceptable.

Selection ratios and cutting scores. The potential value of any screening procedure will be strongly influenced by "selection ratios", externally imposed constraints which determine how many individuals should be hired or inducted. In the ideal situation, the psychologist adjusts the cutting score to produce the greatest proportion of hits relative to the number of misses, but selection ratios and the costs and consequences associated with false positives as opposed to false negatives exercise great influence in real-world situations.

The more the number of applicants exceeds the number of positions available, the more selective the cutting score that can be imposed. Many qualified people may be rejected, but the organization can be virtually assured that those chosen will succeed. This was the was happy situation for those harged with selecting of the original Mercury astronauts since they had over a thousand applicants for seven available slots. Given the fact that over 99% of the applicants would have to be rejected in any case, the NASA selection team did not have to lose any sleep over the fate of the false positives. All they had to worry about was false negatives...any unqualified people who might slip through the screening procedures and be selected.

This situation is reversed when the number of positions to be filled equals or exceeds the number of applicants. False positives then became the primary concern. If the Army urgently needs 150,000 recruits and only 100,000 apply, it is unlikely that 26,085 potential inductees would be rejected because they

scored 23 or higher on the MacAndrew scale. In this situation, the cutting score would be moved upwards so that only those virtually certain to fail would be excluded.[4]

Chapter Three

Guidelines for Evaluating the Usefulness of Possible Screening Methods

How should we evaluate the potential usefulness of possible screening devices such as MMPI? Accuracy is, of course, an essential requirement, but it is not the only one. Before reviewing the literature on measures that might identify soldiers inclined to abuse chemical substances, we shall discuss some criteria for evaluating such tests and attempt to establish some guidelines to aid us in judging their potential utility.

Validity.

In the context of psychological testing, "validity" refers to whether a test measures what it is supposed to measure. Does the MacAndrew Alcoholism Scale (MAC), for example, measure alcoholism? There are two components to validity: a) whether a scale such as the MAC does correlate with the behavior it is supposed to assess, i.e. excessive drinking; and b) whether it does not correlate with other extraneous behavior that it is not supposed to assess, i.e. general maladjustment or criminal tendencies. The former component is called "convergent" and the latter "discriminant" validity.

Convergent validity. Convergent validity is established by correlating test scores with an independent measure of the same behavior. A frequent technique for testing the convergent validity of the MAC, for example, has been to compare the MAC scale scores of a known alcoholic sample, such as patients committed to a state hospital for alcoholism, with a non-alcoholic comparison group, such as patients committed for other problems. If the mean MAC scores for the alcoholics are significantly higher than the mean for other patients, and if application of the suggested cutting score correctly classified more sub-

jects than one would expect on the basis of chance, then the validity of the scale has been suppported.

Peeling another layer off the onion, we find that convergent validity can be subdivided according to the method by which it is established. In tests being considered for practical applications, such as screening enlistees, the temporal dimension is the most salient. To put it simply, a test that can forecast future behavior is much more useful than one that simply confirms what we already know (Meehl, 1959).

"Predictive" validity, that is the ability of a test to forecast future behavior, is difficult to establish. It typically requires a longitudinal study in which a large number of people are followed up over time. "Concurrent" validity, that is whether or not a test relates to an independent measure of the same behavior obtained at the same time, is much easier and less expensive to evaluate, and, for that reason, is used much more often (Myers, 1959).

In evaluating the literature on a test or screening device, one must remain aware of the difference between predictive and concurrent validation and the different implications of the results of the two types of studies. Predictive validity is a much more impressive indication of a test's potential usefulness than is concurrent. In the concurrent comparison of the hospitalized alcoholics with other nonalcoholic patients used as an example above, finding that the MAC scale could correctly classify the two groups of patients significantly better than a person flipping a coin (i.e. chance) does not provide very strong evidence of the scales' practical usefulness. After all, one could have sorted these patients more accurately and with less effort by simply checking their charts (Meehl, 1959).

However, failure to establish concurrent validity furnishes powerful negative evidence and casts serious doubts on a scale's validity or usefulness. If a scale lacks concurrent validity, we can be virtually certain that it will not be useful; if it has adequate concurrent validity, then it may be useful, but it will generally require a long, expensive predictive validity study to determine how useful it will be.

Screening applicants for enlistment into the Army, is a special case in which a test with concurrent validity may have practical utility because, unlike the hospital example, the criterion data may not be readily available. No doubt some enlistees will already have developed habits of alcohol and drug use and abuse. These individuals will be likely to continue (and probably increase) these patterns in the service (Char, 1972; Ratliff & Eads, 1978; Reinstein, 1972; Tennant et al, 1972). Although direct observations or reports of their established patterns of alcohol and drug usage would be the most desirable data, extensive field checks are not feasible, and it is doubtful that individuals motivated to enter the service would frankly admit substance abuse problems. For these reasons, the indirect evidence provided by tests with established concurrent validity for this population and setting might be helpful in identifying those who are already substance abusers.

Discriminant validity. Turning from convergent validity, some of the scales we shall discuss have been criticized for lacking discriminant validity; that is they measure factors they should not. Several alcoholism scales, for example, have been described as being broad measures of general maladjustment rather than specific predictors of alcoholism, while others seem to relate as much to drug abuse as to alcoholic tendencies. Scientists interested in pure

measures of alcoholic tendencies ("construct validity"), are correctly concerned about this apparent lack of discriminant validity, but from a practical standpoint our major concern is whether these instruments can accurately identify individuals who will have serious problems in the service. If a soldier who obtained a deviant score on one of these scales is found hallucinating while on guard duty, it doesn't make a great deal of difference whether the hallucinations stemmed from LSD or delirium tremens.

Another aspect of discriminant validity is more salient. In our concern over identifying potential substance abusers, we must not lose sight of the broader purpose of any inductee screening program, namely to provide the best personnel for the Armed Services. For this reason we must guard against any scales that may identify potential substance abusers but discriminate against superior combat personnel.

How could this occur? It may be that substance abusers and good combat soldiers have some traits in common--sensation seeking, boldness, an interest in new experiences. Similarly, some who refrain from alcohol and other substances may share some traits that are undesirable in a warrior--timidity or excessive concern over one's health perhaps. If good combat personnel do share certain traits with those who use alcohol or other substances to excess, then people who would make good soldiers as well as people who might abuse such substances might obtain similar scores.[5] For this reason, psychologists evaluating potential screening devices will have to examine the data from the standpoint of discriminant as well as convergent validity.

Suitability and appropriateness.

Any selection instrument will have to be appropriate and suitable for the

population to which it is being applied, namely young adult men and women of all races and ethnic groups. In addition to manifesting overall convergent and appropriate discriminant validity, a screening instrument must be demonstrated to be free of unwarranted gender, racial or ethnic bias. This is particularly important since a number of studies have indicated that blacks are apt to obtain spuriously high scores on certain MMPI clinical scales (c.f. Costello et al, 1972; 1973; Costello, 1973; Penk et al, 1978; Gynther, 1972; Strauss et al, 1974), although others have demonstrated considerable validity among black groups (Elion & Megargee, 1975). Interestingly, some of the MMPI's substance abuse scales appear to differ from this pattern; a recent study indicated more discrimination against whites than blacks on these scales (Zager & Megargee, 1981). In any event, there is a positive burden on those evaluating tests to be used in screening to determine whether they are appropriate for the population in general and free of unwarranted social, sexual, or ethnic bias in particular. Since most studies to date have used predominantly white male subjects who are considerably older than any inductees, it is essential that implementation of any technique be preceded by empirical studies on actual recruits.

Setting and set. In evaluating various screening techniques, we must determine not only that the method in question is appropriate insofar as the demographic characteristics of the samples studied thus far are concerned, but also that the motivational set which the subjects bring to the test is similiar. Most research on the psychometric assessment of drug abusers and alcoholics has, unfortunately, been conducted in circumstances that differ greatly from military selection or screening.

Most studies have used subjects who were already hospitalized, incar-

cerated or in treatment programs. Such subjects have no reason to conceal their problems, a situation quite different from that encountered in selective screening for the military or any other job. In today's volunteer Army, it can be assumed that those being inducted want to join the service and would be motivated to minimize or even conceal any factors that might prevent their enlistment; that is, there would be a strong incentive for positive dissimulation or "faking good". On the other hand, if the draft should be reinstated, it is likely that a significant number of conscripts might be motivated to put their worst foot forward and "fake bad". For example, in a recent article on the draft (Craig, 1982) a 20 year old registrant was quoted as saying, "If they lean on me to get drafted, man, I'll vanish. Or become crazy. All of a sudden I won't be able to count to two. I'll throw water on the registration officer, kiss the sergeant--anything to get me out." He might also distort answers on a screening battery. In short, the settings and motivation in the vast majority of the validation studies reported in the literature differ from the circumstances that would be found in military screening, and it can be expected that the results would differ accordingly.

This point was supported by a series of studies comparing the scores of various groups of addicts and nonaddicts in different settings (Gendreau, Andrews & Wormith, 1977; Gendreau & Gendreau, 1970; Penk & Robinowitz, 1976; Sheppard et al, 1973; Sutker, 1971; Sutker & Allain, 1973). A major factor influencing the patterns of scores obtained in these investigations was whether the addicts were being treated on a voluntary or involuntary basis (Penk & Robinowitz, 1976).

Some assessment instruments are more vulnerable to dissimulation than

others. A number of instruments have been developed for the direct assessment of substance use and abuse.[6] Generally designed for use in clinical settings in which people are seeking help for their problems and, presumably, have no reason to dissumulate, they straightforwardly ask the respondents to indicate the amount of alcohol or other drugs they consume and ask whether they have experienced such problems as blackouts, physical dependency, flashbacks, delirium tremens etc. Since it does not require an extraordinary degree of sophistication to surmise that the Army probably prefers its soldiers to be sober, common sense would suggest that such instruments could easily be manipulated by those who did or did not want to be inducted. The degree of fallibility is, of course, an empirical question. Although Goldberg (1974, p. 354) dismissed the MAST as a test, "...which appears to work wonders at detecting those who admit drinking a good deal...", Selzer (1971) reported that it was able to identify alcoholics who had been told to try to conceal their alcoholism (Miller, 1976). Nevertheless, the present reviewer would share Goldberg's skepticism about the usefulness of such direct assessment devices in screening until more convincing data regarding their usefulness in this setting have been gathered.

To cope with problems posed by possible dissimulation, two strategies have been adopted: a) devising indirect scales of alcohol and drug abuse that are less obvious and, presumably, more difficult to distort and b) constructing validity scales to identify tests on which it is likely the respondent faked positively or negatively or answered randomly. It appears likely to this reviewer that scales or tests incorporating both these features would be less vulnerable and potentially more useful for selection and screening.

Practical considerations.

Most of the guidelines that we have been discussing thus far have, ultimately, concerned themselves with the accuracy of various assessment methods. Accuracy, however, cannot be our sole concern. With thousands of potential candidates to screen, practical considerations including time, effort, and costs must also influence the choice of instruments.

Studies of substance abusers in the military indicate that many, if not most, of those who have had serious problems with drugs or alcohol had already begun using alcohol, marijuana and "harder" drugs before they entered the servcie (Char, 1972; Callan & Patterson, 1973; Patterson, 1974; Tennant et al, 1972). Kolb et al (1974) indicated that heavy pre-service drug usage was "...predictive of in-service drug abuse and generally was incompatible with effective military performance." They reported that many of these heavy pre-service users introduced their peers to drugs while in the service, and recommended more intensive screening of incoming volunteers.

The implication of these findings is that a thorough evaluation of current drug or alcohol usage would be one of the most accurate predictors of subsequent drug usage in the service. No doubt a thorough field check of each incoming enlistee, including interviews with parents, friends, former employers and associates by trained investigators, would identify most of the prospective recruits who had already established patterns of substance abuse. The problem, of course, is that the time, effort and cost of making such checks is prohibitive. We might eventually have the government employing more investigators than soldiers if such a program was to be implemented.

Behavior or situational assessment is another evaluation technique that

practical considerations forbid. During World War II, the OSS used a three day live-in assessment procedure during which candidates for clandestine missions were subjected to a number of situational evaluations, including a cocktail party to help evaluate drinking behavior (OSS Assessment Staff, 1948). This procedure, which permitted intensive evaluation in an informal setting, could not be easily adapted to pre-induction screening of large numbers of men and women.[7]

Biochemical measures might also be useful in the early identification of actual or potential substance abusers. Rothberg and Chloupek (1978) reported that 1600 men whose urinalyses indicated recent drug use at the time of induction had significantly more medical problems and were less likely to complete their tours of duty than a cohort of men who were drug-free when they reported for induction. Biochemical testing is not a panacea, however. The reliability of these procedures has been criticized (Hollinshead et al, 1974; Hurst et al, 1975), and although recent technological advances in gas chromatography/mass spectrometry have improved the accuracy of these measures, considerable technical skill is required in obtaining the samples and conducting such tests (Foltz, Fentiman & Foltz, 1980). As already noted, biochemical testing is also time bound; only relatively recently ingested substance are typically detectable. These considerations limit the usefulness of biochemical procedures in screening (Lang, 1982).

Medical examinations or background checks to determine the current extent of alcohol or drug use should be employed if such methods are practical, effective and ethical. Those who are "stoned" or intoxicated when they report for induction, obviously constitute a high-risk group (Rothberg & Chloupek, 1978).

However not all soldiers who pose substance abuse problems appear for induction having recently ingested detectable amounts of such substances. These individuals would have to be identified in some other manner.

Although direct samples of behavior are the most valid data on which to base predictions, practical considerations indicate that a program of mass screening would have to use less accurate but more convenient techniques. Self-report data, if they could be validly obtained, would provide an excellent basis for estimating the current degree of drug and alcohol involvement. In-depth interviews would probably be the most valid source of such information; however, like background investigations, they pose the problem of having to train large numbers of interviewers. Moreover, such techniques introduce the problems of possible subjectivity and inter-rater unreliability. Direct paper-and-pencil instruments such as the Michigan Alcoholism Screening Test (Selzer, 1971) would be more practical and would allow for the establishment of standard cutting scores that could be universally applied.[8]

The problem with such direct measures, is, as we have just noted, their obviousness and consequent susceptibility to distortion. In essence, they simply ask the respondents if they drink too much, use dope, or have problems stemming from substance abuse. Their usefulness as military screening devices is, of course, an empirical question and if a comparative study of possible instruments is ever undertaken, it would be worthwhile to include a direct scale of this type.

Practical considerations thus dictate the use of indirect paper-and-pencil tests that can be administered to large groups and which are amenable to quantification so that standard cutting scores and decision functions can be

applied. (This would rule out projective tests and other subjectively evaluated instruments [Freed, 1976]). The most widely used and most valid such device is the Minnesota Multiphasic Personality Inventory (MMPI). In Part Two this instrument will be described and its potential usefulness in identifying people prone to substance abuse evaluated.

Part Two:
Identifying Potential Substance Abusers with the MMPI.

Having discussed the general issues involved in screening Army inductees, we now turn our attention to the question of the MMPI's potential usefulness in this endeavor.

Chapter Four provides the reader with a brief description of the MMPI including an introduction to the MMPI scales and the use of the test in clinical practice. Recognizing the unintelligibility of MMPI jargon to those who have not been initiated into what is facetiously known as the "Mult Cult", this chapter is designed to furnish the reader with the basic information needed to understand the detailed review of the literature that follows.

Chapter Five reviews MMPI research on alcoholism and problem drinking. Although no studies have been done investigating the usefulness of the MMPI in preinductee screening, a number of MMPI studies on alcohol-related problems have been carried out. The first part of this chapter deals with studies utilizing the regular MMPI scales, while the second evaluates a number of special scales that have been derived for the assessment of problem drinking and the identification of alcoholics.

Chapter Six turns from alcohol to illicit substances. The performance of various types of drug addicts and substance abusers on the regular MMPI scales is presented in the first part of the chapter and then special MMPI scales for evaluating heroin usage and drug abuse are discussed.

Chapter Four

Description of the MMPI[9]

First published in 1941 by Hathaway and McKinley, the Minnesota Multiphasic Personality Inventory is a standardized personality inventory of 566 true-false items designed to assist psychiatric diagnosis by providing the examiner with a set of quantitative evaluations of the subject's "personality status and emotional adjustment" (Dahlstrom et al, 1972). A self-administered paper-and-pencil test, it can be scored by hand using templates or by using a computer program, a number of which are commercially available.

The MMPI has 14 commonly scored scales: 10 clinical scales which measure different personality dimensions and 4 validity scales which measure test-taking attitudes that could influence the validity of the scores on the clinical scales. The four validity scales are: "Qu" (Cannot say), "L" (Lie), "F" (Frequency or Infrequency), and "K" (Correction). The 10 clinical scales are referred to by both the abbrevation of the scale name and by number; they are Scale 1, "Hs" (Hypchondriasis); Scale 2, "D" (Depression); Scale 3, "Hy" (Hysteria); Scale 4, "Pd" (Psychopathic Deviate); Scale 5, "Mf" (Masculinity-Feminity); Scale 6, "Pa" (Paranoia); Scale 7, "Pt" (Psychasthenia); Scale 8 "Sc" (Schizophrenia); Scale 9, "Ma" (Hypomania); and Scale 10, "Si" (Social Introversion). High scores on each reflect the type of pathology indicated by the scale name. Low scores are relatively meaningless; they do not reflect superior adjustment. These 14 MMPI scales are described in Table 3.

Insert Table 3 about here.

Table 3

Minnesota Multiphasic Personality Inventory Scale Descriptions

Scale	Name	No. of Items	Description of High Scoring People
		Validity Scales	
Abbreviation			
Qu	Cannot say	--	Total number items which the test taker marks both "true and "false" or omits.
	Lie	15	Measures deliberate attempts by the subjects to present himself in a good light.
F	Frequency or infrequency	64	These items are rarely answered in the scored directions by normals. Indicates random responding or deliberate attempts by the subject to present himself in a bad light.
K	Correction	30	Indicates a general test-taking attitude of defensiveness about psychological weaknesses. The K-score is used as a correction to certain clinical scales (1,4, 7, 8, 9) to improve their ability to discriminate normal from abnormal profiles.
		Clinical Scales	
Number and Abbreviation			
1 (Hs)	Hypochondriasis	33	Reflects abnormal concern over bodily functions and preoccupation with physical complaints.
2 (D)	Depression	60	Reflects a pessimistic world view, feelings of hopelessness, and self-depreciation, possible considerations of suicide. Frequently elevated among alcoholics.
3 (Hy)	Hysteria	60	Measures the tendency to use physical or mental symptoms to avoid stressful conflicts. Often accompanied by an unwillingness to accept adult responsibilities.

4 (Pd)	Psychopathic Deviate	50	Measures the tendency toward conflicts with authority figures, disregard of social conventions and laws, inability to learn from experience, and shallowness in personal attachments; the most frequently elevated scale among juvenile delinquent and criminal populations and among alcohol and substance abusers.
5 (Mf)	Masculinity femininity	60	Differentiates tendency toward traditional masculine or feminine interests, attitudes, and forms of self-expression.
6 (Pa)	Paranoia	40	Reflects abnormal suspiciousness and sensitivity, possible delusions of persecution or grandeur.
7 (Pt)	Psychasthenia	48	Measures the tendency toward obsessive ruminations, guilty feelings, anxiety, indecision and worrying, and compulsive ritualistic behavior.
8 (Sc)	Schizophrenia	78	Reflects bizarre or unusual thinking and behavior, interpersonal withdrawal and alienation, inappropriate affect, possible hallucinations or delusions. Frequently elevated among polydrug users.
9 (Ma)	Hypomania	46	Reflects high activity level often without productivity, emotional agitation, possible euphoria and flight of ideas.
0 (Si)	Social introversion	70	Reflects shyness, social withdrawal and insecurity, and disinterest in others.

The items comprising the 10 clinical scales were selected from an initial pool of 1,000 possible items through empirical item analyses in which the responses of carefully defined clinical groups, such as depressed patients or schizophrenics, were contrasted with the typical responses of a normal population. Those items which consistently discriminated the clinical sample from the normative group were selected for the scale, even when the content of the item or the direction of the scoring did not bear any obvious relationship to the clinical syndrome. (It is this subtlety that makes the MMPI potentially more useful than direct self-report measures in military screening.)

Laymen reading the MMPI items comprising a clinical are apt to be surprised by the fact that many of them deal with perfectly ordinary matters; when they discover that their own personal responses to some items are in the keyed direction (i.e. scored on a clinical scale) they either tend to reject the validity of the scale or start worrying that they may have some pathological tendencies of which they previously had been unaware. Neither alternative is correct.

Everyone taking the MMPI responds to some of the items on each scale in the scored or keyed direction. The average man, for example answers 16 or 17 items on Scale 2, D (Depression), in the keyed direction, and his raw scores on this scale may range from as low 12 to as high as 22 without signifying anything more than chance deviations from the normal pattern of responding. As his Depression scale score increases to 25 or 30, it becomes less and less likely that his pattern of responding is a chance deviation from the norm and more likely that he is responding to the test in the same fashion as depressed people do.

The rationale behind the test is that if this sample of behavior, namely marking true-false items, is similiar to the test-taking behavior of depressed

individuals, then it is likely that other aspects of the respondent's behavior will also resemble that of moderately depressed people: that they will be pessimistic, apathetic, feel blue, and have trouble eating or sleeping. As Depression scale scores increase to the point where they resemble those of severely depressed people, clinicians would hypothesize that the respondents too might manifest more serious depressive symptoms such as despair and hopelessness and that they might even be contemplating suicide.

Similarly, elevated scores on the other clinical scales lead to inferences that the test taker might engage in behavior typical of the groups used to derive these scales. An elevation on Scale 4, Pd (Psychopathic Deviate), suggests that the individuals taking the test might manifest behavior and attitudes similar to the group of juvenile delinquents used to derive that scale: that they might be impulsive, hedonistic, break rules, engage in illegal behavior and feel antagonistic toward authorities. Thus, a high score on Scale 4 does not necessarily mean that an individual is a delinquent or a crimimal, any more than a high score on Scale 8, Sc (Schizophrenia), means that a person is schizophrenic; high scores are simply indications that the test taker is likely to share some of the characteristics of the clinical groups used in deriving the elevated scales. Understandable confusion over this point is the primary reason why most MMPI experts now refer to the scales by number rather than name.

To the extent that alcoholics or drug abusers are characterized by a relatively homogeneous constellation of measurable traits, the standard MMPI clinical scales would prove helpful in identifying them. If the typical alcoholic is depressed, antisocial,and impulsive, for example, then he or she should

have high scores on MMPI scales 2, 4 and 9 which assess these characteristics. As we shall see, although these tendencies exist, there is no unique or pathnognomic association between the regular MMPI scales and substance abuse. That is, not all alcoholics have elevations on these scales and not all people with "249" profiles are alcoholics.

Since the original publication of the MMPI, other investigators have used these techniques and the MMPI item pool to produce hundreds of other specialized or experimental scales. Twenty years ago, the writer somewhat facetiously predicted that if then-existing trends continued, the number of MMPI scales might someday approach the number of MMPI items (Megargee & Mendelsohn, 1962). That prediction has long since been fulfilled. Although the MMPI still has only 566 items, the latest MMPI Handbook listed more than 530 scales (Dahlstrom et al, 1972, 1975). Among the newly derived scales are several devised specifically for the identification of alcoholics and drug addicts.

In order to simplify the interpretive process, the raw scores on MMPI scales are converted to T-scores, standardized scores with a mean of 50 and a standard deviation of 10. A T-score of 70 is typically taken as the point at which a score assumes clinical significance because one would expect less than 3% of a normal population to obtain a score of this magnitude on the basis of chance alone. In the three decades that have passed since the MMPI was published, considerable research has accumulated so that the characteristics of individuals with elevated scores on the various scales are now well known (Dahlstrom et al, 1972, 1975).

Of course, people may obtain elevated scores on any of the clinical scales for other reasons. They may have misunderstood the directions or answered care-

4 is typically elevated in these samples, but that 4 is more apt to be elevated in conjunction with scales 2 and 7 among alcoholics, with 8 among heroin addicts and with 8 and 9 among multiple drug abusers. The punctuation marks show that higher mean elevations (signifying greater deviance and pathology) are more common among the drug users than the alcoholics.

With this description of the MMPI and introduction to the arcane art of profile analysis, let us turn to the literature on alcohol and substance abuse.

lessly, placing their pencil marks in the wrong place. Perhaps they were unable to read or understand the items adequately. Or, for some reason, they may have deliberately tried to distort the personality test results, to appear better or worse than they are. The four validity scales were developed to identify such improperly answered MMPI protocols.

Typically, individual scales are not evaluated alone, but rather in the context of the overall configuration of high and low elevations on all 14 scales (Dahlstrom et al, 1972). Considerable research has focused on the characteristics of groups with certain recurring code patterns. In "coding" an MMPI, the numbers of the 10 clinical scales are first arranged in order of elevation from the highest to the lowest. Scales which are within one point of one another are underlined. Next, punctuation marks are inserted to indicate the elevation of the scores: an asterisk (*) signifies that the scales to the left equal or exceed a T-score of 90, double quotation marks (") mean they equal or exceed 80, a single quotation mark (') signifies they equal or exceed 70, a hyphen (-) signifies they equal or exceed 60, a slash (/) indicates they equal or exceed 50 and so on.

Some investigators have focused on the two or three highest scales ("two point codes" and "three point codes") and have ascertained that some recurring code combinations are associated with certain modal patterns or characteristics. In the next section a series of tables will be presented reporting the mean MMPI profiles reported in the literature for groups of alcoholics, heroin addicts, polydrug abusers and the like. The present writer has calculated and included the "three point codes"associated with these average profiles. The reader will note certain similarities and differences--that Scale

Chapter Five:

The MMPI and Alcohol Abuse

Since the MMPI is the most widely used psychiatric assessment device and alcoholism a pervasive psychiatric problem, it is not surprising that the MMPI performance of alcholics has been studied in a variety of settings including state and VA hospitals (Hill, Haertzen, & Davis, 1962; Hodo & Fowler, 1976; Overall & Patrick, 1972; Rohan, 1972; Whitelock, Overall & Patrick, 1971; Zelan, Fox, Gould & Olsen, 1966), inpatient and outpatient clinics specializing in the treatment and rehabilitation of alcoholics (Horn & Wanberg, 1969; Hoyt & Sedlacek, 1958; Huber & Danahy, 1975; Lachar, Gdowski & Keegan, 1979; Soskin, 1970) and in prisons and correctional facilities (Holland, 1977; Laudeman, 1977; MacAndrew, 1979). Several comprehensive reviews of the literature on the use of the MMPI among alcoholic samples have also appeared in recent years (Apfeldorf, 1978; Butcher & Owen, 1978; Clopton, 1978; Miller, 1976; Owen & Butcher, 1979), and the reader is referred to those reviews for more detailed and comprehensive surveys of this extensive literature.

Performance of alcoholics on the regular clinical scales.

One of the most pervasive questions in the literature on alcoholism and substance abuse has been whether alcoholics and/or other chemically dependent people have distinctive constellations of personality characteristics. Some behavioral scientists have proposed the existence of a general "addiction-prone personality", whereas others have suggested that there are distinctive personality patterns associated with each chemical dependency...alcohol, cocaine, heroin, amphetamines and so forth. In attempting to test the hypothesis of an addiction-prone personality type, some investigators have used the MMPI,

reporting the average profiles of various samples of alcoholics. Others have administered the MMPI to determine if the test could be used to differentiate alcoholics from psychiatric patients, other substance abusers or from normals. Still others have applied the MMPI to alcoholic samples in an effort to chart the progress of treatment or determine if it is possible to differentiate those who remain in therapy from those who drop out. Unfortunately none of these researchers chose to study whether the MMPI could be used in military screening to identify soldiers would manifest drinking problems during their tours of duty. A potpourri of mean MMPI profiles from a variety of investigations seeking all these various objectives is presented in Table 4, along with the associated three-point codes as calculated by the present reviewer. The 19 samples in Table 4 ranged in size from 20 to 1,009; in all 2,328 subjects' MMPIs are represented. Except for two youthful samples, the mean ages ranged from 39 to 48, twice the age of the typical Army recruit. Scales 4 and 2 were the most prominent in these averaged profiles. The elevation of these mean profiles was clearly in the clinical range, with one or more mean scores over 70 in most samples, but the degree of pathology among these older alcoholics was considerably less than that associated with the samples of youthful drug abusers to be discussed later.

Insert Table 4 about Here.

A number of reviewers have commented on the consistency of the mean MMPI profiles found among alcoholic samples (Butcher & Owen, 1978; Miller, 1976; Owen & Butcher, 1979). The most recent of these reviews, commenting on the profiles

Table 4

Mean MMPI Profiles and Three Point Codes of Nineteen Samples of Alcoholics

	STUDY	SAMPLE	N	SEX	RACE		MEAN AGE	VALIDITY SCALES L	F	K	CLINICAL SCALES 1 (Hs)	2 (D)	3 (Hy)	4 (Pd)	5 (Mf)	6 (Pa)	7 (Pt)	8 (Sc)	9 (Ma)	10 (Si)	THREE POINT CODE
1.	Bean & Karasievich, 1975	pts tested 5th day of treatment	207	M	---	---	47	48	67	49	73	75	68	74	61	63	71	71	65	56	241'
2.	Black & Heald, 1975	servicemen in treatment program	40	M	---	---	38.9	48	64	49	61	68	62	70	58	60	64	64	67	53	4' 29-
3.	Button, 1956	Alcoholic pts	64	-	---	---	--	53	55	55	57	63	56	69	57	53	56	53	55	51	42-15/
4.	Curlee, 1970	Inpatients at Treatment Center	100	M	---	---	47.7	46	60	53	57	68	62	67	61	62	66	61	60	51	247-
		" " " "	100	F	---	---	46.8	50	60	53	56	69	63	69	45	62	65	63	58	56	247-
5.	Hill, Haertzen & Davis 1962	State Hospital patients	184	-	W		44	49	59	51	58	66	59	69	55	59	59	58	58	--	42-67/
6.	Horn & Wanberg, 1969		1009	M	W		43	47	62	49	63	73	64	73	--	62	67	65	62	--	24' 7-
7.	Hoyt & Sedlacek, 1958	Chronic alcoholics in treatment	177	M	W		--	--	--	--	55	61	58	62	52	52	57	52	45	--	42-31
8.	Huber & Danahy, 1975	pts who completed VA treatment	67	M			46.5	47	59	51	64	69	65	70	59	58	62	60	61	55	4' 23-
		pts who quit VA treatment	35	M				48	62	50	66	74	65	75	56	61	67	65	58	58	42' 1-
9.	Lachar, Gdowski & Keegan, 1979	Inpatients who volunteered for treatment.	65	M	49%W	51%B	42.2	50	65	47	64	74	64	69	60	--	67	71	65	--	28' 4-
10.	Laudeman, 1977	Young men arrested for drinking offenses.	27	M	---	---	--	--	--	--	53	57	56	69	54	64	60	69	65	52	48 9-
11.	MacAndrew, 1979	Young men arrested for drinking offenses.	91	M			19	50	68	51	54	58	56	62	57	65	60	71	70	--	89' 6-
12.	Soskin, 1970	VA pts in voluntary treatment	41	M			46	47	61	51	63	75	66	75	58	61	69	62	58	56	24' 7-
		programs.	41	M			45.6	46	60	51	61	71	65	72	57	61	66	63	62	54	42' 7-
13.	Zelen, Fox, Gould & Olson, 1966	Committed inpatients	20	M			39.8	49	56	55	56	64	61	70	--	58	59	56	57	--	4' 23-
		Committed inpatients	20	F			41.4	54	53	56	51	56	57	68	--	60	55	55	55	--	46-3/
		Voluntary clinic patients	20	M			39.9	46	66	51	64	76	65	76	--	61	75	75	65	--	2478'
		Voluntary clinic patients	20	F			40.4	51	73	50	62	72	67	78	--	66	68	72	64	--	428'

in Table four as well as others in the literature described the typical findings as follows.

> The first, and primary, characteristic noted about problem drinkers is the typically high elevations on Scale 4 (Pd). Scale 4 reflects personality characteristics which are sociopathic in nature, i.e. an apparent inability to learn from past negative experience, difficulty in estabishing long term stable relationships, lack of expressed anxiety, and difficulties with authority (Dahlstrom, Welsh & Dahlstrom, 1972). Since 1943 (Hewitt), it has been shown time and time again that elevations on scale 4 characterizes (sic) samples of alcoholics, whether one looks at simple single scale elevations or overall configuration. This consistency appears to hold true regardless of sex, subcultural or cross-cultural origin or inpatient or outpatient status...If one reads each of the 90 studies on the MMPI and problem drinkers since 1972 (Owen, 1979), scale 4 elevations would be found, regardless of the primary focus of the study. The ubiquitous nature of scale 4 elevations has been amply noted by other reviewers as well (Clopton, 1978; Graham, 1978; Hoffman, 1976; Butcher & Owen, 1978).
>
> Not only are problem drinkers similar, with respect to the MMPI, on scale 4 elevations, but on other scale elevations as well. When composite MMPI profiles are drawn, showing the average MMPI profile of a given sample of problem drinkers, striking similarities are seen. Specifically, scales 2 and 7 are often predominant in the configuration as well as scale 4...Elevations on these scales indicate a component of anxiety, sadness, and emotional stress. Again the consistency of this overall pattern is not limited to white, American problem drinkers. For example, Butcher and Pancheri (1976, p. 137) compared groups of alcoholic and non-alcoholic men in the United States, Switzerland, and Italy, using a discriminant function analysis, and found that MMPI scales 2, 4, and 7 discriminated betwen the problem drinkers and normals in all three countries. The problem drinkers in each country were similar to each other, in spite of cultural and language differences. Kristianson (1976) found elevations on scales 2 and 4 to be characteristic profiles (sic) of two samples of problem drinkers in Sweden. Kline, Rozynko, Flint, and Roberts (1973) report elevations on clinical scales 4, 2 and 8 to be prevalent in their sample of American Indian problem drinkers (Owen & Butcher, 1979, pp. 68 & 69).

Can this distinctive pattern of elevations on MMPI scales 4, 2, and 7 as noted in the above review and in Table 4, be used to forecast alcohol abuse

among Army inductees? Not with sufficient accuracy that would justify its implementation. There are three problems involved: 1) lack of specificity, 2) profile heterogeneity, and 3) postdiction as opposed to prediction. Let us discuss each in turn.

Lack of specificity. Although the average MMPI profiles obtained from a variety of samples of alcoholics consistently manifest elevations on scale 4, and often secondary elevations on scales 2 and 7 as well, this code type is not uniquely associated with the development of drinking problems. Recently incarcerated criminals, acting-out neurotics and a number of other clinical groups may also have individuals with this profile pattern. (Of course, if one is more interested in identifying individuals who will present problems than singling out those people who will develop problems specifically related to alcohol abuse, this is less troublesome.)

Profile heterogeneity. Athough the reviewers cited above agree on the consistency of the averaged profiles reported in the literature, they also unanimously point out that there was considerable diversity and heterogenity among the individuals whose profiles were averaged in these studies. The fact that alcoholics consistently produced the same mean profile does not necessarily imply that there is a single homogeneous alcoholic personality, any more than the fact that every can of "V-8" juice tastes the same implies that there is a single kind of vegetable, "V-8", from which the juice was extracted.

Hodo and Fowler (1976), for example, reported that although the mean profile for Horn and Wanberg's (1969) 1009 alcoholic subjects was in the classic 42' pattern, 79% of the individual profiles had a different two-point code. Similarly, McLachlan (1975b) reported that the MMPIs of the 2200 detoxified

chronic alcoholics he studied scattered across 22 separate two-point code types. Although the 24/42 code type was the largest single grouping, it accounted for only 13% of the profiles. Clearly considerable heterogeneity underlies the apparent uniformity of the typical mean profile.

Another index to the diversity of alcoholics' MMPI profiles is the number of homogeneous subtypes that have been reported. One of the earliest studies (Goldstein & Linden, 1969) identified four alcoholic subtypes, each with its own distinctive MMPI profile; 45% of the subjects in their original sample and 42% in their replication sample could be classified into one of these four types. Several subsequent studies have also delineated four subtypes (Bean & Karasievich, 1975; Stein, Rozynko & Pugh, 1971; Whitelock, Overall & Patrick, 1971) but other investigators have reported finding three (Rohan, 1972), five (Mogar, Wilson & Helmes, 1970), seven (Eshbaugh, Hoyt & Tosi, 1978) and eight (Skinner, Jackson & Hoffman, 1974) profile types.

Postdiction vs. prediction: Cause or effect? Even if the MMPI profile patterns noted in the studies thus far reviewed are uniquely associated with alcoholism and problem drinking, it is questionable whether they would be useful in screening young adults. For example, scale 2, reflecting anxiety and depression, was found to be characteristically elevated among the chronic alcoholics studied. Did this anxiety and pessimism precede or follow the problem drinking? Was it a cause or an effect? As King (1978, p. 935) recently pointed out, "Many investigators make the mistake of attributing aberrant profiles of alcoholics and other drug abusers to personality factors that precede drug ingestion...when they could just as easily and perhaps more likely be a result of drug ingestion and subsequent life problems."

There is good reason to believe that many of the characteristics associated with alcoholics' MMPIs stem from the problem drinking. The two studies using young adult problem drinkers in Table 4 (Laudeman, 1977; MacAndrew, 1979) both reported lower mean profiles than those using older subjects; moreover, both lacked the distinctive elevation on scale 2 typically found on older samples.

More cogent evidence was provided in a comparison of MMPI profiles obtained before and after problem drinking developed. Capitalizing on the fact that for many years virtually all the students who matriculated at the University of Minnesota were required to take the Minnesota Multiphasic Personality Inventory, a team of investigators searched the records of two of the major Minneapolis alcoholism treatment centers for patients who had once attended that university. After tediously cross-checking thousands of records they managed to identify a small group of white male alcoholic patients who, years earlier, had taken the MMPI as freshmen before they had developed a drinking problem.

Comparing 32 of these pre-alcoholic profiles with those of 148 randomly selected classmates, Loper, Kammeier and Hoffman (1973) found their prodromal profiles were significantly higher on scales F, Pd and Ma. However, Kammeier, Hoffman and Loper (1973) reported that the prealcoholic profiles obtained when the men were twenty-year-old freshmen were lower on each and every one of the clinical scales than the retests obtained 13 years later when they had developed serious drinking problems. Whereas the early mean profiles were quite benign, with mean T-scores ranging from 48 to 61, the later ones were elevated, with T-scores ranging from 56 to 74. This investigation suggests that much of the elevation noted in studies of serious problem drinkers follows the onset of the drinking. For those who would use the MMPI to predict alcohol-

related problems among young adults, this finding is most discouraging.

MMPI Alcoholism Scales.

A number of special scales to assess alcoholism or identify alcoholics have been published in the last 20 years. Table 5 provides brief descriptions of seven such scales, Al (Hampton, 1953), Am (Holmes, 1953), Ah (Hoyt & Sedlacek, 1958), MAC (MacAndrew, 1965), ARev (Rich & Davis, 1969), ALF (Finney et al, 1971), ARos (Rosenberg, 1972) and ICAS (Atsaides et al, 1977), along with two drug abuse scales that will be discussed later, DaS (Panton & Brisson , 1971) and He (Cavior et al, 1967). It can be seen from Table 5 that hospitalized male alcoholic patients with mean ages over 40 served in the criterion groups for most of the alcohol scales. The contrast groups were typically normals or psychiatric patients without significant drinking problems. The criterion groups and the settings used in deriving these scales thus differ from those found in pre-enlistment screening in several important respects.

Insert Table 5 about here.

As part of a larger study evaluating the validity of these scales for detecting alcohol and drug abuse among a sample of 1048 youthful offenders, Zager and Megargee (1981) intercorrelated and factor analyzed five of these alcohol scales (Ah, ARos (also known as CAK) MAC, Al, and ICAS) and the two drug scales (DaS and He). The results are presented in Table 6. Considering the fact that all of the these scales were derived to assess substance abuse, the lack of convergence among them was rather surprising.

Table 5[a]

The MMPI Alcohol and Drug Scales

Scale Author	Year	Name	Original Derivation Sample		Mean Age	SD	No. Items
Hampton	1953	Al	AA members (N=84)	Normals (N=84)	44		125
Holmes	1953	Am	Inpatient alcoholics (N=72)	Minnesota normals			59
Hoyt & Sedlacek	1958	Ah	Inpatient alcoholics (N=98)	Normals (N=139) and other inpatients (N=54)			68
MacAndrew	1965	MAC	Outpatient alcoholics (N=300)	Psychiatric outpatients (N=300)	42	9.19	49
Rich & Davis	1969	AREV	Combination of items on previous				40
Finney et al	1971	ALF	Combination of items on previous scales				85
Rosenberg	1972	AROS	Combination of items on previous scales			8.8	27
Atsaides et al	1977	ICAS	Inpatient alcoholics (N=70)	Neurotic inpatients		10.62	8
Panton & Brisson	1971	Das	Prison inmates with history of abuse (N=118)	No history (N=118)	21	5.5	36
Cavior et al	1967	He	Prison inmates with history of abuse (N=160)	No history (N=160)	40	5.4	57

[a]The scale items were published by Button (1956).

Insert Table 6 about here.

Zager and Megargee (1981, p. 536) described their results as follows;

> Hoyt and Sedlacek's (1958) Alcoholism (Ah) Scale and Rosenberg's Composite Alcoholism Key (CAK) correlated positively (r = .70) with one another but negatively or negligibly with the remaining alcoholism scales, whereas the scales developed by MacAndrew (1965), Hampton (1953) and Atsaides et al (1977) (MAC, Al and ICAS) had moderate positive correlations ranging from .33 to .44 with one another. The two drug abuse scales, Panton and Brisson's DaS and Cavior et al's He, correlated positively with one another (r = .51) and had zero-order to moderate correlations ranging from -.03 to .38 with the five alcoholism scales.
>
> As might be expected from the correlational data, the factor analysis yielded three factors. Ah and the CAK had their principal loadings on the first factor which accounted for 46% of the variance, while MAC, Al and ICAS defined the second factor, which accounted for 37% of the variance. The two drug abuse scales, DaS and He, defined the third factor, which accounted for the remaining 17% of the variance.
>
> Although it was not unexpected that the drug abuse scales would cluster separately from the alcohol scales, a finding which is consistent with their discriminant validity, the subdivision of the alcohol abuse scales into two negatively correlated subgroups had not been anticipated. This subdivision was not readily attributable to consistent differences in methods of scale derivation. Instead, it appeared due to differences in the samples used in the derivation and the vagaries of empirical item analyses. Inspections of the items revealed that some are common to different scales but are scored in the opposite direction.

Whether or not Zager and Megargee's (1981) explanation of the possible reasons for the differences among the scales was correct, it is clear that although these measures were all derived from the same inventory, they are not interchangable and must be evaluated individually. The alcohol scales will be discussed in this section and the drug abuse scales evaluated in the next.

Table 6[a]

Intercorrelations of Seven Alcohol and Drug Abuse Scales

SCALES	Ah	CAK	MAC	Al	ICAS	DaS	He
Ah	--	.70	-.17	-.53	-.22	-.01	-.01
CAK	.70	--	.11	-.08	.08	.19	.21
MAC	-.17	.11	--	.33	.43	-.03	.33
Al	-.53	-.08	.33	--	.44	.27	.27
ICAS	-.22	.08	.43	.44	--	.06	.38
DaS	-.01	.19	-.03	.27	.06	--	.51
He	-.01	.21	.33	.27	.38	.51	--

[a]Reprinted from Zager & Megargee, 1981.

Hampton's (1953) Al scale. Hampton's Al scale was the first alcoholism scale to be published. [Holmes' Am scale was also derived in 1953 but did not appear in the literature until it was published by Button in (1956.)] Miller (1976, p. 651) noted, "Hampton (1953) used a highly selected criterion group to develop his alcoholism (Al) scale, requiring membership in AA, hospitalization or imprisonment, and diagnosis as alcoholic. Eighty-four such alcoholics were contrasted with an equal number of non-alcoholics to produce a 125-item scale. On cross-validation, with 100 alcoholics and 150 non-alcoholics, the test produced significant mean differences."

Vega (1971) reported that the Al scale significantly differentiated alcoholics from control samples consisting of non-alcoholic psychiatric patients and normals, but this finding runs counter to the experience of a number of investigators who failed to obtain significant differences between alcoholic and nonalcoholic psychiatric patients (MacAndrew & Geertsma, 1963; Rich & Davis, 1969; Rotman & Vestre, 1964; Uecker, Kish & Ball, 1969). Apfeldorf and Hunley (1976) found no difference on Al between domiciliary patients with drinking problems and disciplinary problems, but reported the alcoholics did score higher than the problem-free patients. Among youthful offenders in a Federal Correctional Institution, Zager and Megargee (1981) found no convergent validity for the Al scale among whites, but reported that among the black inmates the heavy alcohol abusers scored higher than the samples of moderate alcohol abusers, heavy and moderate drug abusers and non-significant substance users. Conley and Kammeier (1980) used Al in an attempt to differentiate admitted alcoholics from other types of psychiatric patients and normals. They reported it correctly identified 57% of the men and 55% of the women, rates poorer than

those reported for the other scales evaluated.

Because Al was more successful at discriminating alcoholics from normals than from psychiatric patients, MacAndrew and Geertsma (1963) charged that Al assessed general maladjustment rather than alcoholic tendencies *per se*. This position was supported by Rosenberg's (1972) finding that Al correlated highly ($r = .89$) with Welsh's factor A scale, long accepted as a measure of general maladjustment variance on the MMPI, and reviewers such as Apfeldorf (1978), Butcher and Owen (1978), and Miller (1976) have reiterated this conclusion. Clopton (1978) disagreed, citing Al's lack of correlation with Am and Ah, also damned as measures of general maladjustment. Zager and Megargee (1981) sided with Clopton after finding their heavy-drug-using group, whom they presumed to have the greatest degree of maladjustment, obtained the lowest Al scores in their investigation. Measure of general maladjustment or not, it appears clear from the literature that the Al scale is one of the MMPI's least satisfactory or useful measures of alcoholic tendencies, and that it would probably not be helpful in screening recruits.

Holmes (1953) Am scale. Although Holmes' criterion groups were less rigorously selected than Hampton's, the Am scale has generally achieved better results. Holmes contrasted the MMPI responses of 22 alcoholics committed to a state institution with those of the Minnesota normative sample on which the MMPI was standardized. On cross-validation the 59-item scale successfully discriminated alcoholics from normals. Subsequently significant differences between alcoholics and various nonalcoholic groups were reported by Apfeldorf and Hunley (1976); Atsaides et al (1977); Conley and Kammeier (1980); MacAndrew and Geertsma (1963); Rich and Davis (1969); Uecker et al (1969); and Vega (1971).

Nevertheless, Am is not highly regarded. Rotman and Vestre (1964) failed to find significant differences, and those reported by MacAndrew and Geertsma (1963), although significant statistically, were of such small magnitude that their practical usefulness was doubtful. (They reported a point biserial correlation between Am and the dichotomous criterion of alcoholism of only .34. Moreover, this correlation shrank to .22 when MacAndrew and Geerstma, attempting to make the scale more subtle, removed the MMPI items bearing an obvious and direct relation to drinking problems. They concluded that Am, like Al, assesses only maladjustment. Butcher and Owen (1978) agreed, but Rosenberg (1972), citing a minimal correlation with the Welsh A scale, disagreed. In terms of potential value for military screening, although the evidence for the convergent validity of the Am scale is stronger than that for Al, it has been overshadowed by other scales with stronger support that would probably prove more valuable.

Hoyt and Sedlacek's (1958) Ah scale. Hoyt and Sedlacek (1958) derived their 58 item Ah scale by contrasting the responses of 98 inpatient alcoholics with those of 54 other patients as well as 139 normals. They cross-validated the resulting scale using 79 hospitalized alcoholics, and 50 normals. Only men were used in the derivation and validation.

Although MacAndrew and Geertsma (1963) found a small but significant correlation (.33) between Ah and the criterion measure and Uecker et al (1969) reported significant mean differences between the Ah scores of male alcoholics and psychiatric patients, a number of other investigators have been unable to obtain statistically significant results (Apfeldorf & Hunley, 1976; Johnson & Cooke, 1973; Rich & Davis, 1969; Rotman & Vestre, 1964; Vega, 1971; Zager & Megargee, 1981).

MacAndrew and Geertsma (1963) included Ah among the three scales they suggested assessed general maladjustment, but Rosenberg (1972) failed to find a significant correlation with Welsh's A scale and Johnson and Cooke (1973)

reported significant negative correlations with such MMPI measures of maladjustment as scales F, D, Pa, Pt, Sc, and Si. Zager and Megargee also (1981) reported significant racial bias, with whites scoring significantly lower than blacks. All in all Ah does not appear to be a promising device for screening inductees.

MacAndrew's (1965) MAC scale. The MacAndrew (1965) Alcoholism scale is by far the best regarded and most thoroughly studied of the special MMPI substance abuse scales. Whereas previous investigators had begun by contrasting the MMPI responses of alcoholics with those of normals in an effort to identify alcoholics, MacAndrew's technique was to compare the responses of outpatient alcoholics with those of other psychiatric outpatients to shed light on the question of whether alcoholics constitute a unique syndrome or are simply neurotics who drink excessively (MacAndrew, 1979). Miller (1976, p. 651) described MacAndrew's procedure:

> Recognizing that previous scales had been developed only to distinguish alcoholics from normals, MacAndrew (1965) offered yet another MMPI-derived instrument. By contrasting his 300 alcoholic and 300 psychiatric outpatients, he found 51 items which discriminated the two groups ($p < .01$). MacAndrew decided to exclude the two most discriminating items from his scale because of their obvious relation to alcohol intake. These two items are: "I have used alcohol excessively" and "I have used alcohol moderately (or not at all)." The final 49-item scale was cross-validated on a comparable sample and generated a record-breaking level of significance for mean differences ($p < .000000001$). Correct assignment was 81.5%, which was increased to 84% if the two alcohol-related items were included. MacAndrew maintained that these items should be deleted, however, arguing that the same increment in discrimination would be more than offset by the potential validity shrinkage if subjects should falsify them. The MacAndrew scale (MAC) thus contains 49 items. In general these items indicate that alcoholics typically report themselves to be outgoing and social, to have few problems with concentration, sex, or self-image, to have had school

problems, to have religious beliefs, and to experience bodily effects of excessive alcohol intake (MacAndrew, 1967).

Two comprehensive reviews of the validational literature on the MAC have recently appeared (Apfeldorf, 1978; Owen & Butcher, 1979), and a third (by MacAndrew) is in press. Since these studies present detailed summaries of the designs and results of all but the most recent studies of the MacAndrew scale (Conley & Kammeier, 1980; Clopton, Weiner & Davis, 1980; Rathus, Fox & Ortins, 1980; Zager & Megargee, 1981), the present review will simply summarize the overall findings noted in these reviews, adding the details of the most recent studies. The reader wishing more detailed information on the earlier literature should consult these secondary sources or the primary sources summarized therein.

Most of those studies evaluated the concurrent validity of the MAC by comparing the scores of known alcoholics (typically middle aged white male inpatients) with contrast groups consisting of other psychiatric patients or, occasionally, normals. In most studies the mean scores of the two groups were compared, and in some the number of subjects correctly classified using MacAndrew's recommended cutting score of 24 or greater was also reported. Owen and Butcher's (1979) review reported the true and false positive rates as well as the overall number correctly identified.

In his review, MacAndrew (in press) summarized the results obtained with 28 samples comprising 2045 alcoholic subjects with an average age of 42.74. In these studies the overall mean MAC score was 28.84 and the overall detection rate 85.9%. In the individual studies he reviewed, the MAC scale means ranged from 26.8 to 30.9 and the overall hit rates from 79.0% to 97.5%. In the studies reviewed by Owen and Butcher (1979), most of which were also included in

MacAndrew's review, the overall hit rates ranged from 55% to 95%; the false negative rates ranged from 7.0% to 10.0% with a median of 8.5% and the false positive rates from 10.0% to 37.1% with a median of 18%. Owen and Butcher (1979) noted that there was reason to question the validity of the criterion samples used in the studies with high false positive rates. For example, in the study reporting a false positive rate of 37.1% (Wisler & Cantor, 1966), the "normals" consisted of domiciliary residents who had not been screened for possible drinking problems. It is possible, therefore, that some of the apparent false positives were, in fact, true positives.

Turning to the more recent studies not included in these reviews, Conley and Kammeier (1980) compared the discriminating ability of the MAC with that of several other scales (A1, Am, Ah, ALF and ARos). Among men, they reported the hit rate for the MAC was better than those for A1, Am and Ah, but not as good as for ALF or ARos. Among women, the MAC scale was superior to all the others. The best discrimination of both the male and female alcoholic patients in this study was provided by seven face-valid MMPI items that dealt obviously with drinking problems. This findings supports the general notion that direct measures of drinking behavior or drug abuse would provide the most accurate identification of people with such problems if veridical answers could be obtained.

Clopton et al (1980) also compared alcoholic and non-alcoholic psychiatric patients in a state hospital. These investigators reduced their overall population to 112 matched pairs of alcoholic and psychiatric patients, then randomly divided this sample in half. They used 56 pairs to derive a discriminant function optimally combining the 13 regular MMPI scales and cross-validated this

equation on the remaining 56 pairs. Not surprisingly the discriminant function outperformed the MAC on the subsample from which it had been derived, but failed to do as well on the cross validation subsample.

The hit rate for the MAC was 68% on the first sample and 66% on the second. The major problem with Clopton et al's study was that the MAC apparently had false positive rates of 41% and 50% in the two non-alcoholic samples, even when the unusually high cutting score of 27 was used. This false positive rate is considerably higher than any others in the literature and would be disastrous in screening large numbers of enlistees.

The final recent study is another one that is more negative than those included in the comprehensive reviews. Based on in-depth interviews obtained as part of a larger longitudinal study, Zager and Megargee (1981) classified 1048 black and white youthful offenders at a Federal Correctional Institution into five groups: Heavy Alcohol Users, Moderate Alcohol Users, Heavy Drug Users, Moderate Drug Users, and Non-significant Substance Users. They then compared the mean scores of these five groups on a number of the MMPI drug and alcohol abuse scales. There were no significant differences among the MAC scores of the five groups in either the white or the black sample. This study is disquieting because it is one of the few to use subjects comparable in age (17 to 27) to the recruits who would participate in Army screening and therefore raises the possibility that the MAC may be effective only in detecting substance abuse problems among older subjects.

An alternative explanation, which receives some support from the fact that all of the groups in this study had mean MAC scores well into the clinical range (25 or higher), is that this population's criminality wiped out the inter-group

differences, for there is considerable evidence that criminals and drug abusers as well as alcoholics obtain elevated MAC scores. Whatever the explanation, Zager and Megargee's (1981) results underscore the need to test even a scale as thoroughly studied as the MAC before applying it to a new population.

This leads us to our next major finding in the MAC literature. It is clear that the MAC is not a scale that only identifies alcoholics; a number of studies have reported that drug abusers and other socially deviant people such as juvenile delinquents and adult criminals also obtain elevated MAC scores (MacAndrew, in press). Summarizing the empirical findings with his scale, MacAndrew recently concluded:

> ...(1)...the MAC scale taps a fundamental bipolar dimension of character; (2)...the character orientation which is indexed by high MAC scale scores---while not specific to alcoholism, to substance abuse, nor even to addiction in its broadest rendering---is present either as tendency or "full-blown" in a relatively stable majority of aproximately 85% of the members of diverse samples of independently verified alcoholics; (3)...this character orientation is also present as a tendency or "full blown" in a similarly stable majority of approximately 85% of the members of of diverse samples of independently verified drug abusers; (4)...the presence of this character orientation in such ones predates the onset of the sorts of substance usage and/or of substance usage-related comportment which leads to a diagnosis of "alcoholism" and/or "drug abuse/addiction; (5)...a stable minority of independently identified alcoholics give every appearance of being "neurotics-who-also-drink-too-much..." (MacAndrew, in press).

Noting that he had developed the MAC "on and for men", and limiting his generalizations accordingly, MacAndrew went on to differentiate two types of alcoholics, bold, assertive, "primary" alcoholics who obtain high scores on the MAC and more passive, neurotic, "secondary" alcoholics who do not score high on the scale. In short, instead of tapping alcoholism or problem drinking

per se, the MAC scale may assess a characterological deficit, a rather psychopathic orientation, that is common to many alcoholics, drug abusers and criminals. Since all of these groups are rather undesirable and share a propensity for causing problems in the military, this could make the MAC scale of even greater potential value in Army screening than if it merely measured drinking behavior. Certainly, of the scales discussed thus far, the MAC appears to have the greatest potential and an empirical test of its usefulness in military induction would appear warranted.

Rich and Davis' (1969) A Rev scale. Rich and Davis produced the first of the combined alcoholism scales by comparing the item lists for Al, Am, and Ah, creating a new scale consisting of 40 of the 42 items common to at least two of these three scales (Miller, 1976). The MMPIs of samples of 60 male and 60 female alcoholics, along with equal-sized samples of psychiatric patients and normals (including a particularly inappropriate subsample of college student volunteers) were scored for this new "A Rev" scale, as well as for Al, Am, Ah, and MAC, and the concurrent validities of these five scales were compared. The MAC scale was the best at differentiating the 60 female alcoholics from the 60 female psychiatric patients, but in all the other comparisons A Rev proved superior.

Miller (1976, p. 653) criticized Rich and Davis' investigation for a failing common to many such studies, namely using equal numbers of subjects in the criterion and contrast groups: "The base rate of alcoholism in this research sample should be noted, though. For both comparisons (alcoholic versus normal and alcoholic versus psychiatric control), the expected value was .50, whereas in any standard normal or psychiatric sample, the base rate of alcoho-

lism is much lower. This elevated base rate probably provides exaggerated estimates of the power of these tests to identify alcoholics within a general clinical setting." (The present writer would substitute "certainly" for "probably" and refer any doubting readers to Table 2 of the present monograph.)

Little has been done with A Rev since its derivation. If an investigator was to administer the MMPI in an attempt to determine its usefulness in screening, it would be worth scoring it for A Rev as well as for MAC to test the scale's usefulness further.

Finney, Smith, Skeeters and Auvenshine's (1971) ALF Scale. Finney et al (1971) manufactured a second combined scale, ALF, this one combining items from four previously described scales (AL, Am, Ah, and MAC) as well as Haertzen, Hill and Monroe's (1968) AAF scale designed for differentiating alcoholics from drug addicts. Little research has been reported on the 85-item ALF scale. In a recent study (Conley & Kammeier, 1980) it compared favorably with the MAC scale, differentiating alcoholics from normals and psychiatric patients somewhat better than Al, Am, or Ah, but not as well as yet another combined scale, A Ros.

Rosenberg's (1972) ARos scale. Rosenberg (1972) attempted to derive a combined alcoholism scale that would not be influenced by overall maladjustment. Using a sample of 111 male veterans in an alcoholic treatment unit and a comparison group of 56 psychiatric patients originally tested by Uecker (1970), Rosenberg scored the protocols for the Ah, Am, Al, and MAC scales as well Welsh's Factor A scale. Finding that Al correlated +.89 with Welsh's A scale, he eliminated it from further consideration, reasoning it merely tapped the degree of general adjustment. He noted the remaining three scales, Ah, Am and MAC had low intercorrelations with one another; deducing from this that each

tapped somewhat different sources of variance, he selected the six items common to all three scales and the 21 items common to two of the three for his "Combined Alcoholism Key "(CAK, more often referred to in the literature as ARos). He found this scale discriminated the psychiatric patients from the hospitalized alcoholics.

Conley and Kammeier (1980) compared ARos with Al, Am, Ah, MAC, and ALF in its ability to discriminate 903 male alcoholics from 153 male psychiatric patients as well as 324 female alcoholics from 240 female psychiatric patients...base rates far removed from those typically found. They found that ARos correctly identified 70.5% of the men and 64.8% of the women. This made ARos the most successful of the scales tested in discriminating among the male patients, but less successful than MAC among the women.

Zager and Megargee (1981) found that their heavy alcohol users had the highest scores on ARos, followed closely by heavy drug users. Among their white subjects, the scores of these two groups were significantly higher than those of the moderate alcohol, moderate drug and non-significant users; in the black sample, however, the differences only approached statistical significance ($p = .07$). Moreover, the races differed significantly, with each of the black samples scoring significantly lower than their white counterparts.

Hoffman, Loper and Kammeier (1974) also reported that ARos was one of only two scales (MAC being the other) that significantly differentiated the pre-alcoholic University of Minnesota freshmen from their classmates who did not subsequently develop drinking problems. It would thus appear that the ARos scale should be one of those included in any feasibility study of the MMPI for use as a screening device.

Atsaides, Nueringer and Davis' (1977) ICAS Scale. The last and also the least scale (insofar as the number of items is concerned) is Atsaides et al's eight item Institutionalized Chronic Alcoholic Scale (ICAS). Atsaides et al (1977) maintained [on the basis of Whisler and Cantor's (1966) study of domiciliary patients] that the MAC scale was inadequate. [We have already noted the deficiencies in the contrast group used in that study, and Clopton (1978) in his review rebuked them for ignoring the many studies in the literature supporting the usefulness of the MAC scale.]

Atsaides et al (1977) selected 70 42-year-old inpatient alcoholics and a contrast group of 70 41-year-old inpatient neurotics. These two samples were divided in half and the responses of each subsample of 35 alcoholics and 34 neurotics were item analyzed. Only eight items were statistically significant ($p < .05$) in both analyses and they were selected for the ICAS scale. They then scored the total sample of 140 MMPIs on the new scale to establish the optimal cutting score. So far, no problem. However they next compared the hit rate using this optimal score with the number of correct classifications obtained using the published cutting scores for the Am, Ah, and MAC scales. Not surprisingly, the ICAS outperformed the others, correctly classifying 86% of the alcoholics and 84% of the neurotics. The surprising aspect is that subsequent reviewers (cf. Clopton, 1976) have failed to point out that this was a totally inappropriate comparison since the new scale was being applied back to original derivation samples, thereby enjoying a considerable "home court" advantage. In a subsequent cross-validation, comparing 40 alcoholics with 40 neurotics, the ICAS held up remarkably well, correctly identifying 85% of the former group and 87.5% of the latter.

Relatively little subsequent research has yet been published using the ICAS. Although it was derived on an older population, Zager and Megargee (1981)

reported that among their white youthful offenders the heavy alcohol group scored significantly higher than each and every one of the other five groups, including the heavy drug users. Similar, but somewhat less clearcut, mean differences were obtained among their black subjects. The good news was that application of the recommended cutting score correctly identified 82% of the heavy alcohol users in the white sample, and 87% among the black. The bad news was that this cutting score resulted in false positive rates of 46% and 54% among the white and black nonsignificant users respectively. Increasing the cutting score to reduce the number of false positives would, of course, also decrease the number of true positives as well.

Summary and Conclusions

Personality factors only partly determine problem drinking and alcoholism. As Owen and Butcher (1979, p. 84) recently noted, "Any attempts to understand personality factors in addictive behavior that fail to take into account the situational context in which the individual is immersed, and the environmental stressors acting upon them (sic) are doomed to incomplete results. One of the most powerful determinants of problem drinking is environmental support for problem drinking (Cahalan, 1976)." Nevertheless, despite the admitted importance of the situational factors, the literature on the MMPI has shown that the regular clinical scales and some of the specialized scales for the assessment of alcoholism are sensitive to personality factors that are reliably associated with problem drinking.

This association is far from perfect. There is no MMPI pattern or scale that is uniquely associated with alcoholism. The literature indicates that there are various types of alcoholics, only some of whom may be detectable by the MMPI. Moreover, the MMPI patterns most closely associated with problem

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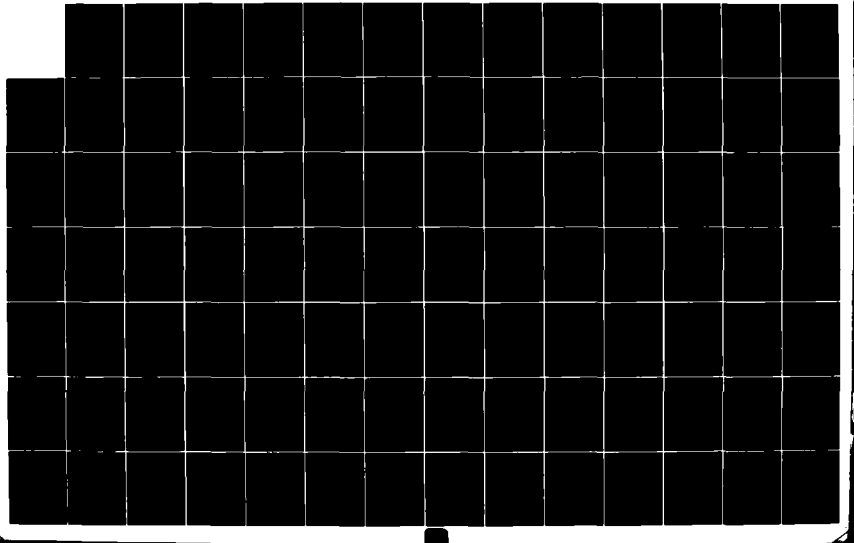

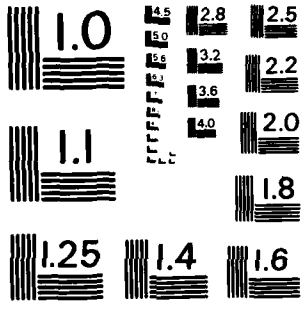

MICROCOPY RESOLUTION TEST CHART
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drinking, as well as high scores on the scales devised to identify problem drinkers, are also found among other deviant groups such as drug abusers and criminals. If we assume that the Army is interested in identifying these other types of social deviants as well as problem drinkers, this lack of discriminant validity is less worrisome.

Of greater concern is the age of most of the alcoholics studied. Most samples were considerably older than the young adults who would be assessed in the course of military screening. Undoubtedly, the MMPI is much better able to postdict than to predict alcohol related problems. Indeed many of the scales include some items directly reflecting problem drinking. However, the author of the most widely used and best regarded MMPI alcoholism scale, the MAC, deliberately excluded these items from his scale.

Another major concern is the number of false positives to be expected in military screening. Unless the selection ratio is so high that the Army can afford to be extremely choosy, it appears that adopting an MMPI-based discriminant function or a special MMPI scale would result in misclassifying many people who would not develop drinking problems...some of whom, it should be pointed out, may be among those more inclined to drug abuse or other authority conflicts. If the Army enjoys a favorable selection ratio with several applicants for each position, a high false positive rate is no problem. If not, it may be that the MMPI could be used as one criterion in a more comprehensive selection battery, perhaps to flag people who should receive closer scrutiny from physicians and mental health professionals.

Any use of the MMPI as the primary selection device for the identification

of soldiers with alcohol-related problems or propensities should be preceded by an empirical study to determine the validity of the instrument among young men and women who are motivated to present themselves favorably so as to enhance their chances of admission into the service. Without such an empirical study, it would be difficult to justify the use of the MMPI for any purpose other than the identification of the most seriously disturbed and maladjusted applicants. Exclusion of such individuals would benefit the Army, no doubt, but it would be unlikely to make much of an impact on the overall problem of substance abuse that is the main concern of the present chapter.

Chapter Six

The MMPI and the Use of Illicit Drugs

With the ratification of the 21st Amendment to the Constitution on December 5, 1933, alcohol was restored to its former status as a legal, self-prescribed drug. Its use is not only permitted but promoted among adults in our society (Megargee, 1973). Those who use alcohol to excess and develop problems stemming from drinking are different from others quantitatively rather than qualitatively.

While alcohol was becoming legalized, the Uniform Drug Act passed by the various states in 1932 and 1933 classified marijuana as a narcotic and attached criminal sanctions to the possession or use of all narcotics (Levine, 1973). Today, marijuana use enjoys a wide degree of social acceptance among young adults, but its possession and use are still subject to criminal penalties in most states, as is the case with less accepted potent psychoactive drugs: barbiturates, cocaine, amphetamines, LSD, heroin and the like. Those who engage in the use of such prohibited substances are not only departing from traditional social mores, but also subjecting themselves to the possibility of penalities at the hands of both military and civilian authorities.

To be sure, it appears that many soldiers use drugs recreationally and that the military drug user differs in many salient respects from the "street addicts" and "junkies" typically studied in psychological research (Ingraham, 1978; Sodetz, 1979). To the extent that this is the case, then we would expect that the MMPI findings on the characteristics of soldiers who use illicit drugs to differ from the data on samples studied in drug rehabilitation centers and state hospitals. Nevertheless, with the exception of marijuana smokers, it

seems likely that, like their civilian counterparts, soldiers who abuse drugs are more socially deviant than those who abuse alcohol and should be more readily identifiable on tests such as the MMPI.[10] This is, of course, an empirical question, and just as the validity of the MMPI for detecting alcohol-related problems would have to be determined for Army recruits, so, too, would its ability to detect actual and potential drug abusers.

Performance of drug-abusing samples on the regular MMPI scales

A number of studies have examined the performance of various samples of drug users and abusers on the regular clinical scales on the MMPI.[11] Some have been designed, in part, to evaluate the hypothesis that there is a different personality type associated with each drug and, have, therefore, selected samples according to their preferred substance. Others have simply used heterogeneous samples. In this section we shall examine the mean MMPI profiles associated with three broad groupings: heroin addicts, polydrug user, and other drug users.

Heroin addicts. Because of its great potential for creating physiological addiction, heroin has been one of the most feared of the illicit drugs. The reader will recall it was the widespread abuse of heroin among American military personnel in Southeast Asia that was a major source of national concern.

The mean profiles of fifteen samples of heroin addicts totalling 1016 subjects are presented in Table 7. All but one of the samples is male, and their demographic characteristics more closely resemble the young adults who would be involved in military screening than did those of the alcoholics whose profiles were included in Table 6. Not only are they considerably younger, but several samples include blacks as well as whites.

Insert Table 7 about here.

It can be seen from Table 7 that the average profiles of heroin addicts differ in certain important respects from those of alcoholics. Their greater social deviance is reflected in higher mean elevations, with more scales exceeding the T-score of 70 which is generally considered the clinically significant level. Scale 8 (Schizophrenia) is more prominent in the profiles of these heroin addicts, as is scale 9 (Mania). These scales both suggest the use of psychotic defenses such as withdrawal and denial, and are indicative of more alienation and psychopathology than was found among the problem drinkers.

One issue addressed by several of these investigations was whether one obtained different MMPI profiles from addicts who were taking the test voluntarily as opposed to involuntarily. (It was thought that this distinction might underlie some of the differences obtained between addicts seeking treatment and addicts who were incarcerated.) In the best-controlled test of this hypothesis, Penk and Robinowitz (1976) found that VA patients voluntarily seeking treatment were tested as being substantially higher than VA patients being treated involuntarily on several MMPI scales including Pd, Pt, Sc, and Ma.

Assuming that voluntariness was the key issue accounting for the differences in these MMPI profiles, the implications are disturbing for those who would use the MMPI as a screening device. The results suggest that much more benign MMPI profiles are found when the test is administered to people who may be motivated to minimize their psychopathology.

Also noteworthy is Kojak & Canby's (1975) study of U.S. servicemen in

Table 7

Mean MMPI Profiles and Three Point Codes of Fourteen Samples of Heroin Addicts

	STUDY	SUBJECTS SAMPLE	N	SEX	RACE	MEAN AGE	VALIDITY SCALES L	F	K	CLINICAL SCALES 1 (Hs)	2 (D)	3 (Hy)	4 (Pd)	5 (Mf)	6 (Pa)	7 (Pt)	8 (Sc)	9 (Ma)	10 (Si)	THREE POINT CODE
1.	Kojak & Canby, 1975	US Servicemen in Thailand	25	M	---	18-25	49	59	50	57	61	58	64	57	61	60	62	63	50	426-
2.	Kwant, Rice & Hays, 1976	Prisoners in Methadone Program	76	M	56% White	25.8	48	67	49	68	74	64	76	59	61	69	72	69	59	428'
			21	F	25% Black 20% Mexican	27.9	47	64	47	60	67	63	74	49	63	63	65	68	57	4'28-
3.	Penk & Robinowitz 1976	VA pts volunteering for treatment	34	M	not reported	21.9	47	76	45	72	77	69	81	63	71	74	85	80	56	849"
		VA pts not volunteering for treatment	34	M	" "	20.2	52	59	54	55	58	57	69	58	57	60	62	70	55	9'48-
4.	Penk et al 1978	VA pts volunteering for treatment	120	M	W	28.2	46	72	48	70	76	67	79	62	66	73	77	72	59	482'
		" " " " "	252	M	B	30.9	49	68	50	69	71	64	74	60	64	68	73	69	54	482'
5.	Penk, Fudge, Robinowitz & Neman, 1979	VA first admissions	65	M	W	23	50	69	51	49	52	48	68	55	59	64	64	70	48	9'478-
6.	Penk, Woodward, Robinowitz & Parr, 1980	VA first admissions	132	M	W	ca.25	48	65	49	50	70	64	75	61	63	68	72	70	55	4829'
7.	Sheppard, Ricca, Fracchia & Merlis, 1973	State Hospital voluntary commitments	42	M	---	--	50	49	50	61	72	59	77	60	63	68	73	70	57	482'
8.	Sutker, 1971	Prisoners	40	M		27	47	62	49	64	75	65	81	58	62	69	69	68	55	4"2'78-
9.	Sutker & Allain, 1973	Prisoners	35	M	---	27	49	62	50	53	64	55	76	58	59	59	62	68	50	4'92-
		"Street Addicts" seeking treatments	82	M	---	27	48	63	50	67	73	65	79	58	61	69	68	69	55	42'79-
10.	Zuckerman, Sola, Masterson & Angelovic 1975	Pts who stayed in treatment	28	M	57% W/44% B	22.4	--	69	47	60	71	62	76	64	64	66	72	72	55	489'
		Pts who quit treatment	30	M	60% W/40% B	23.8	--	73	46	64	71	63	78	64	70	74	80	76	57	8"49'

Thailand whose addiction was discovered through urinalysis screening. Although their three point code is similar to that of the other addicted groups, the average elevation found among these servicemen was considerably lower with no scales approaching a mean T score of 70. When Kojak and Canby (1975) compared these profiles with those of 50 randomly chosen servicemen with negative urinalyses, they found no significant differences. This is a further indication that the personality test data obtained on drug abusers in military settings may differ considerably from the patterns that have been found among civilians.

Polydrug samples. Table 8 presents the mean profiles for 33 samples of patients who used a wide variety of drugs. Compared with the previous tables, many more women are included among these 2416 subjects, and the average ages are quite young, with many groups being in their teens.

Insert Table 8 about here.

The most striking aspect of these mean profiles is the extraordinarily elevated scores on scales 4, 8, and 9. Most mean profiles are rather benign and insipid, as many of the extreme deviations found in individual profiles are lost in the process of averaging. Not so with these means. To yield mean T-scores exceeding 75 and even 80, the individual profiles comprising these samples must be truly extraordinary. The most deviant profiles are found among the youngest samples. (This stems from the application of adult rather than adolescent norms.)

Given the heterogeneity of these 33 samples and the broad array of settings in which they were evaluated, it is not surprising that the profiles and their associated three point codes are more heterogeneous than those found among the

Table 8

Mean MMPI Profiles and Three Point Codes for Thirty Polydrug Samples

STUDY	SAMPLE	N	SEX	RACE	MEAN AGE	VALIDITY SCALES L	F	K	CLINICAL SCALES 1 (Hs)	2 (D)	3 (Hy)	4 (Pd)	5 (Mf)	6 (Pa)	7 (Pt)	8 (Sc)	9 (Ma)	10 (Si)	THREE POINT CODE
1. Berzins, Ross & Monroe, 1971	Civily committed addicts	200	M	57%W; 43%B	ca30	--	63	56	65	72	67	73	61	65	69	72	64	53	428'
	Voluntarily committed addicts	204	M	53%W; 47%B	"	--	64	55	66	76	66	77	61	64	69	71	66	54	428'
	Addicts on probation	210	M	57%W; 43%B	"	--	64	53	62	72	63	78	60	64	66	71	65	55	428'
	Addicts in prison	213	M	23%W; 77%B	"	--	63	54	63	68	62	75	62	62	64	69	67	53	4'82-
2. Black & Heald, 1975	Servicemen in treatment program	50	M	---	20.7	52	68	53	63	64	63	72	64	66	68	75	72	52	849'
3. Burke & Eichberg, 1972	Inpatient adolescent drug users	53	M		19.7	47	83	48	65	81	70	82	75	75	82	96	74	64	8*47"
	" " " "	34	F		18.7	46	83	48	62	71	69	81	48	76	71	87	71	64	84"6'
	Outpatient adolecent drug users	34	M		17.2	45	76	51	59	66	65	79	74	67	72	86	74	55	8"49'
		36	F		17.0	45	74	47	54	65	63	77	46	69	68	77	69	61	48'69-
4. Gendreau, Andrews & Wormith, 1977	Canadian Prisoners (Mostly burglary)	23	M		--	47	72	46	55	63	56	76	57	66	67	71	70	57	489'
5. Hill, Haertzen & Davis, 1962	Addicts in state hospital 40% voluntary; 60% sentenced	192	M		37.4	50	58	53	61	68	60	74	58	57	60	60	62	--	4'29-
6. Holland, 1977	Prisoners: Low Alcohol-High Drug	43	M			54	56	57	54	59	58	70	58	59	57	58	58	53	4'-26/
	Prisoners: High Alcohol-Low Drug	45	M		26.5	52	60	54	59	62	59	71	58	60	60	61	60	54	4'28-
	Prisoners: High Alcohol-High Drug	61	M			52	62	53	54	60	57	72	60	60	62	62	65	53	4'9 78-
7. McGuire & Megargee, 1974	Federal Prisoners Heavy Multiple Drug Users	24	M	79%W; 21%B	22	51	62	55	56	62	63	76	65	61	62	66	69	48	4'98-
8. Panton & Behre, 1973	State Prisoner addicts	32	M	50%W; 50%B	--	--	--	--	61	63	61	76	64	59	60	63	67	47	4'95-
9. Patalano, 1980	Abusers in residential treatment	80	F	50%W; 50%B	20.7	48	68	48	61	69	62	78	65	65	69	76	72	57	489'
	Center	80	F	50%W; 50%B		46	70	45	58	65	58	78	49	68	65	73	71	63	489'
10. Penk & Robinowitz, 1976	VA pts admitted voluntarily	34	M		21.7	47	72	48	68	74	69	83	69	68	76	84	76	55	84"79'
	VA pts admitted involuntarily	34	M		20.0	53	64	58	61	64	61	71	59	59	63	70	66	53	48'9-
11. Penk, Woodward, Robinowitz & Parr, 1980	VA inpatients, first admissions	122	M		25	50	68	49	66	71	65	75	62	64	70	74	68	56	482'
12. Ross & Berzins, 1974	Committed addicts		F		27.8	--	60	56	60	65	64	71	53	63	61	65	62	54	4'28-
	Voluntary hospitalized addicts	395	F		35.3	--	62	49	64	68	65	72	53	64	62	65	64	60	4'38-
	Federal prisoners		F		29.4	--	62	49	59	62	59	73	56	65	59	64	64	60	4'689-
	Probationers		F		30.2	--	63	49	60	66	61	76	54	65	63	67	65	60	4'82-
13. Schoolar, White & Cohen, 1972	Pts seeking treatment at drug clinic	53	M		19.2	48	74	51	64	73	67	80	68	69	76	85	73	59	84"7'
	" " " " " "	27	F		19.2	47	67	49	61	66	65	79	49	65	67	72	69	57	48'9-
14. Stein & Rozyuko, 1974	Voluntary admissions state hospital 91% used heroin on daily basis 35% admitted present addiction 70% used other drugs	201	M	67%W 17%B 12%Chicano	25.5	47	72	47	50	82	64	68	64	65	49	54	--	--	
15. Zuckerman, Sola, Masterson & Angelovic, 1975	Pts who stayed in treatment	14	F	71%W; 29%B	20.1	--	72	47	63	71	66	83	50	73	70	80	74	57	48"9'
	Pts who quit treatment	14	F	93%W; 7%B	17.7	--	88	35	73	73	71	81	54	83	76	90	80	65	8*64"

heroin addicts. There is little evidence of any unitary "addiction-prone" personality type, and, as we shall see when we discuss typological studies, most investigators found considerable diversity among the individual profiles that were averaged.

Profiles associated with specific drug preferences: Amphetamines, Barbiturates, LSD, Marijuana. In searching for personality types associated with specific substances, some investigators have tested groups characterized by particular drug preferences. (See Table 9.) Some, for example, have sought to test the notion that amphetamine users are depressed and need stimulation, whereas barbiturate and heroin users are anxious and require sedation. These hypotheses have generally not been supported (Gendreau et al, 1977; Henriques et al, 1972; Pittel, 1971). Instead, it appears that once a person moves beyond alcohol and marijuana into the use of harder drugs, specialization seems less common; people tend to use what is available, although those who are physiologically dependent will seek those substances that will best satisfy their physical craving.

Insert Table 9 about here.

Marijuana is, of course, the exception to most of these generalizations regarding illicit drugs. Since it has achieved considerable social acceptance in many elements of society, especially among younger adults, its use is not associated with the same degree of social deviance as other illicit drugs and, not surprisingly, the tested personality characteristics of those who have experimented with marijuana or use it with some degree of regularity are con-

Table 9

Mean MMPI Profiles and Three Point Codes for Eleven Samples with other Drug Preferences

PREFERRED DRUG	SUBJECTS: STUDY	SAMPLE	N	SEX	RACE	MEAN AGE	VALIDITY SCALES L	F	K	CLINICAL SCALES 1 (Hs)	2 (D)	3 (Hy)	4 (Pd)	5 (Mf)	6 (Pa)	7 (Pt)	8 (Sc)	9 (Ma)	10 (Si)	THREE POINT CODE
Amphetamines	Brook, Szandorowska & Whitehead, 1976	Chronic users at residential treatment center	86	M	W	Range	47	79	46	71	83	70	83	--	72	83	92	74	64	8*247"
			31	F		15-26	45	60	43	66	75	70	87		77	78	92	75	67	8*4"7'
	Gendreau, Andrews & Wormith, 1977	"Light"-using Canadian prisoners	21	M	W	---	48	67	47	56	59	59	70	60	62	61	71	70	53	849'
		"Heavy"-using Canadian prisoners	34	M	W	---	47	74	47	63	66	62	75	57	63	69	77	76	55	894'
	Penk, Fudge, Robinowitz & Neman, 1979	Daily-using first admission VA inpatients	45	M	W	23	48	74	46	55	65	55	77	61	68	74	75	67	57	487'
Barbiturates	Penk, Fudge, Robinowitz & Neman, 1979	Daily-using first admission VA inpatients	34	M	W	23	51	71	46	57	62	55	68	60	63	68	75	68	58	8'49-
L.S.D.	Keller & Redfinger 1973	Average use: 90 times Range: 5 to 490 times	60	M & F		--	--	--	--	57	60	62	70	75/89	62	63	71	69	63	584'
	Zuckerman, Sola, Masterson & Angelovic 1975	"soft"drug pts who stayed in treatment	27	M	96%W;4%B	19.6	--	69	46	62	74	63	80	69	66	74	76	69	63	4"827'
		"Soft"drug pts who quit treatment	32	M	84%W;16%B	19.4	--	81	45	65	83	66	83	64	77	82	91	74	64	8*24"
Marijuana	McGuire & Megargee 1974	Federal prisoners: used occasionally	24	M	79%W;21%B	22	50	56	54	54	57	57	69	55	57	59	57	69	49	49-7/
		Federal prisoners: used regularly	24	M	79%W;21%B	22	54	55	58	57	59	60	64	63	58	58	56	58	61	450-

sistently found to be more favorable than those of people who use other illicit substances (Brill, Crumpton & Grayson, 1971; Greene & Haymes, 1973; Hogan, Mankin, Conway & Fox, 1970; Kurtines, Hogan & Weiss, 1975; McAree, Steffenhagen & Zheutlin, 1969; 1972; McGuire & Megargee, 1974; Steffenhagen, Schmidt & McAree, 1971). Indeed some studies among college students and other young adults have shown the marijuana users to be better adjusted in certain respects as a group than their peers who absolutely refrain from any use of marijuana.

Profile heterogeneity. As was the case with alcoholics, the individual MMPI profiles of samples of drug abusers deviated markedly from their groups' mean profiles. Black (1975) reported considerable variability among the mean profiles of Army personnel identified as heroin addicts. Penk et al (1980), found that the MMPI profiles of individual heroin addicts scattered over 17 different two-point codes, while those of polydrug users spread over 18. The most common code type (824) accounted for no more than 16% of the cases. On the basis of this diversity, Penk et al concluded, "...the extraordinary variety of personality types found for both heroin and polydrug abusers was interpreted as unequivocally refuting the notion that one personality type is addiction prone (1980, p. 299)."

As one would expect, researchers have cluster-analyzed the MMPI profiles of drug abusers to differentiate homogeneous subtypes. Some have isolated two (Berzins et al, 1974; Heller & Mordkoff, 1972) or three (Collins, 1979) types, but others have differentiated as many as ten (Stein & Rozynko, 1974). Whatever the number, these findings are discouraging for those who would seek a unitary personality profile uniquely associated with illicit drug abuse or addiction.

As we have noted, a number of alcohol abuse scales have been derived for the MMPI, some of which also identify people who abuse illicit substances. In addition to these alcohol scales, two scales have been specifically derived to identify drug abuse, Panton and Brisson's (1971) Drug Abuse scale (DaS) and Cavior, Kurtzberg and Kipton's (1967) Heroin (He) scale. Each will be examined in turn.

Panton & Brisson's (1971) Drug Abuse (DaS) Scale. Panton and Brisson (1971) compared 118 North Carolina prison inmates with a history of drug abuse with 118 other prisoners with no such history. They found the two groups differed on a number of social and demographic characteristics as well as in their responses to psychological tests. Using empirical item analysis techniques they derived a 36 item scale to identify drug users. Applied back to the derivation sample, a cutting score of 16 correctly identified 75% of the drug users and 81% of the non-users.

Muschewske (1972) applied the DaS to a sample of Kansas State prisoners; increasing the cutting score to 18, he reported that 68% of the overall cross-validation sample was correctly classified.

In the most comprehensive validation study of this scale to date, Zager and Megargee (1981) tested the DaS on their five samples of youthful Federal prisoners: Heavy Drug Users (HDU); Moderate Drug Users (MDU); Heavy Alcohol Users (HAL), Moderate Alcohol Users (MAL) and Non-significant Substance Highly Users (NSU). Highly significant differences were found among these five groups in both the white and the black samples. Among the whites, the two drug-using groups obtained mean scores significantly higher than those of the other three groups, thereby demonstrating discriminant as well as convergent validity.

Using the suggested cutting score of 16, 81% of the HDU and 71% of the MDU groups were correctly identified, with a false positive rate of 39% among the NSU groups.

Highly significant differences were also obtained among the black groups and, as in the white sample, the HDU group attained the highest scores. However, unlike the white sample, the black HDU group was not significantly higher than the other black drug and alcohol-using groups, although it did exceed the NSU group reliably. Using the recommended cutting score of 16, 66% of the HDU group was identified, but only 32% of the MDU group; the false positive rate among NSU subjects was 30%. Finally, significant racial differences were observed, with the whites scoring higher than the blacks at similiar levels of substance usage.

The DaS scale, derived on state prisoners, thus showed good convergent and fair discriminant validity when applied to Federal offenders. It remains to be seen how well it can discriminate among substance abusers outside correctional settings. Based on the data collected thus far, it should be included among those scales included in any empirical test of screening effectiveness.

Cavior et al's (1967) Heroin (He) Scale. Cavior et al (1967) compared the MMPI protocols of 160 prisoners with histories of heroin use with those of 160 with no such histories to derive their 40-item Heroin scale. The problem with evaluating this scale is the specificity of the criterion. For example, if individuals abusing drugs other than heroin should score high on the scale, should they be counted as a true or false positive? Does it depend on how closely allied the drug is to heroin? If we test abusers of alcohol, marijuana, barbiturates, methadone, and heroin, where do we cross the line from an

incorrect to a correct classification?

Sutker (1971) compared the He scores of 40 heroin addicts with those of a matched sample of 40 nonaddicted prisoners and obtained data supporting the scale's validity. Similarly, Sheppard (1972) found higher scores among male heroin addicts admitted to a state hospital than among male alcoholics admitted to a state hospital or male veterans admitted to an alcoholic treatment unit. Kwant et al (1976) compared the He scores of male and female heroin addicts to those of vocational rehabilitation clients. Finding that He correlated +.41 with group membership, they concluded, "The success of the He scale in discriminating addicts from non-addicts has been demonstrated." Unfortunately they also demonstrated racial bias, with black subjects scoring lower than the whites and Mexican Americans.

Burke and Marcus (1977) compared the MAC and He scales' abilities to discriminate among black and white alcoholics, drug abusers and general medical patients. They ascertained that 10 of the 13 patients (77%) with diagnoses of drug abuse scored at or above the cutting score of 36, while 57 of 72 patients (79%) with no such histories were correctly classified by scoring below 36. Although He successfully discriminated these patients, the investigators concluded that it was not powerful enough to be used as a general screening device.

Zager and Megargee (1981) evaluated the He scale by subdividing their Heavy Drug Use group into those who were strongly involved in heroin (HNARC) and those who were more oriented toward other drugs (MNARC). Significant overall mean differences were obtained in both white and black samples with the MNARC having the highest scores, although these scores were not significantly higher

than those attained by the MNARC group. The investigators suggested that if He was regarded as strictly a heroin scale it lacked discriminant validity, but that it was useful as a more generalized measure of substance abuse including alcohol. They also noted significant racial differences in favor of the blacks.

Summary and conclusions.

The MMPI drug abuse literature resembles the alcohol research in certain salient respects and differs in others. Like alcoholics, drug abusers as a group have elevated MMPI profiles with elevations on Scale 4 being a common, although hardly universal, feature. As with alcoholics, considerable diversity underlies these mean profiles with virtually every conceivable two-point code being represented.

The drug-abusing samples studied were, for the most part, considerably younger than the alcoholics and much closer in age to the young adults who would be screened for the Army. This means that the cause-effect issue is less important among the drug-using subjects than it was among the alcoholics. Whether serious personality problems lead to drug abuse or the drug abuse leads to the personality problems is immaterial if the problems are reflected in the MMPI profiles at the time of screening.

The drug literature highlighted the problems of motivation and set more clearly than the alcohol literature since not all samples participated freely and voluntarily. Those samples that were not seeking treatment typically had much more normal profiles. Were their problems simply less serious, which is why they were not motivated to seek therapy? Or were they presenting themselves in an overly favorable light, i.e. faking good? Both factors may have been at work, but in either case it suggests the MMPI profiles of drug abusing subjects

who are not actively seeking treatment are apt to be rather benign. Since these are the types of drug abusers (and alcoholics) who are most likely to be taking the MMPI in pre-induction screening, these data imply that we might expect a higher false negative rate in the screening situation. Empirical research is required to test this hypothesis.

Possession of marijuana is illegal, so that any use whatsoever may pose a problem for military authorities. However recreational use of marijuana is so widely accepted among young adults in this country that it can hardly be considered socially deviant in this population. Most subjects who occasionally use moderate amounts of marijuana and/or alcohol are not suffering from detectable psychopathology and cannot be effectively identified by means of personality tests such as the MMPI.

Chapter 7

Conclusions and Recommendations

The MMPI is a proven device for the detection of current psychopathology. To be sure, not all disturbed people obtain elevated scores, and not all those who score in the clinical range have serious problems, but overall there is a clear association between present psychopathology and MMPI elevations.

The MMPI is not as good at forecasting future disturbance. There is evidence in the literature that the MMPI profiles of people who later develop psychiatric disturbances differ from matched samples who do not, but these discriminations are much weaker than those relating to current functioning. People change, situational circumstances can have a profound effect, and many of those who at one point in their lives may have been steering toward adjustment problems alter their courses or weather the storms successfully. By the same token, some of those who appeared to have clear sailing may unexpectedly find themselves in hazardous waters and founder.

Could the MMPI be used to help identify Army inductees who will present serious adjustment problems? The amount the MMPI could contribute, is, of course, partly a function of the effectiveness of the present methods used to screen inductees. If the Army is currently using sophisticated, effective screening devices that leave little room for improvement, then the MMPI may add relatively little. On the other hand, if present screening methods are virtually nonexistant or ineffective the MMPI might contribute significantly. The writer has not been able to obtain a thorough description of current Army screening practices, but the impression received from informal interviews is that current screening is minimal.

Can the MMPI be used to identify present and/or future alcohol and drug abusers? The answer to this question is a definite, "Maybe". The literature certainly indicates that distinctively elevated MMPI profiles and high scores on certain substance abuse scales have been repeatedly obtained among many samples of alcoholics and drug abusers. However, there are some important reservations about the relevance of this literature to military screening. First, although the ages of the heroin addicts and polydrug abusing samples were similiar to the ages of the men and women seeking admission into the Army, the alcoholics were considerably older. Moreover, longititudinal studies indicated that the MMPI profiles of prealcoholic college freshmen were considerably more benign than the profiles obtained later after they had developed serious drinking problems.

Second, most of the distinctively elevated MMPI profiles were found among subjects who were actively seeking treatment and readily acknowledged their drinking and/or drug abuse problems. It can be assumed that many of these individuals were taking the MMPI at a low point in their lives, a time when their substance abuse problems had become overwhelming and were causing them great difficulties and distress. In such circumstances, they would more likely to emphasize than minimize their problems while taking the MMPI.

The circumstances are far different for young men and women who are actively seeking admission into the armed forces. Those who may have what others would regard as drug or alcohol problems may not have acknowledged such problems to themselves; even if they have, they would be motivated to minimize them so as to maximize their chances for acceptance. The MMPI is sensitive to such nuances and it is probable that the profiles of inductees prone to substance abuse would be significantly less pathological than those of people in treatment. In

these circumstances, a malignant profile would certainly be cause for concern, but a more benign one would not guarantee good adjustment. (Indeed, extreme elevations on the validity scales indicating positive dissimulation might render many profiles virtually useless.)

The third issue that must be discussed is the fact that there are no MMPI profile patterns or scales that are uniquely associated with alcohol or drug abuse. At best, the MMPI pattern can place one in a pool of people who have an excessive rate of substance abuse problems. (Such people may also have an above average rate of other problems, as well, such as authority conflicts, criminal behavior, and, in all likelihood, AWOLs.) However, some people with these test characteristics will never develop any such problems (or, if they do develop them, never be detected).

This leads us to the central question of whether the MMPI can be used as a screening device by the Army to identify potential substance abusers at the time of induction. This involves two sets of considerations. The first is the feasibility of any such screening. This includes such issues as the relative costs of false negatives and false positives, the current ratio of applicants to personnel needs, and the consequences to those identified as potential substance abusers. These issues are beyond the expertise of the present reviewer; the Army must weigh the comparative costs of instituting such screening against the costs of <u>not</u> instituting such a program. The second set of considerations is whether the MMPI should be included as a screening device if such a program is adopted. Although the MMPI literature has never squarely addressed this question, it seems likely the MMPI <u>could</u> make a contribution to such a screening program, especially if the target population was broadened to include other

types of maladjusted behavior that would be detrimental to the Army.

However, the empirical research that would definitely establish the feasibility of the MMPI for this task remains to be done. The actual cutting scores and discriminant functions must yet be determined. Most specifically, predictive validity and cost-effectiveness, based on the actual numbers of true and false positives and negatives, must yet be established. This leads us to consider the nature of the research that needs to be done to determine the MMPI's potential contribution, and the question of what, if any, role it can play in the interim.

Research recommendations[12]

The study that needs to be done to determine the potential effectiveness of the MMPI for military screening is classic both in its simplicity and the problems it probably would face in being accepted. In essence, it simply involves obtaining test data on a cohort of inductees at time of enlistment under real-life screening conditions, following up their performance for a year or two to determine who develops substance abuse or other problems, and using these data to derive discriminant functions or cutting scores. These scores would then be used to predict the performance of a second cohort which would also be followed up so the accuracy of the predictions could be determined. If their validity is satisfactory, the procedure can be implemented. If not, new methods must be developed.

The only trouble with this classic personnel-selection procedure is that the consumers typically want an instrument that can be implemented immediately, not three, four or five years hence. Their general attitude is that such a study would be marvelous if it only had been started several years ago so the results were now available, but beginning a long term study now is pointless.

(Of course, four or five years hence someone else will say the same thing if it isn't begun now.)

In this section the writer will describe the broad outlines of a predictive investigation to determine the usefulness of the MMPI (or any other test) for screening Army inductees. Before embarking on a such a long term study, the Army might wish to conduct a brief feasibility study that would quickly indicate if the MMPI is hopelessly unsuitable for this task; such a quick concurrent investigation will also be described.

Predictive study to determine the feasibility of the MMPI for identifying patterns of maladjustment among Army inductees. The purpose of this study is to derive and cross-validate predictive equations or scales that will enable the Army to identify as accurately as possible those who are most likely to present serious problems in the military because of their abuse of alcohol and drugs as well as those who may pose other problems.

Two large samples of recruits will be needed, one for derivation and one for cross-validation. The former sample will be used to construct predictive equations using multivariate techniques; the latter will be used to test the accuracy of these predictive tools. The larger the samples are, the better the study will be. There should be at least 1000 subjects in the substance-abusing criterion group; several times this number would be desirable. This may seem like a large number, but by the time 1000 subjects are subdivided according to race, gender and type of abuse, even with 1000 soldiers, some categories such as black, female heroin abusers will still be too scarce to provide reliable data. Since the surveys appear to indicate base rates of about 11% for alcohol and illicit drug use respectively, it will be necessary to test and follow about

10,000 enlistees to secure data on 1000. To double or triple the number of substance abusers, it would be necessary to test 20,000 or 30,000 recruits.[13]

An alternative strategy that would be more economical but would also involve some distortion of the base rates would be to use a stratified procedure, testing a set quota of black men, black women, white men and white women. (It might also be desirable to sample Hispanics separately as well. The cross-validation sample could be smaller than the derivation sample, although in any longitudinal study there is safety in large numbers.

In order to ensure that the results will be applicable to military selection, all individuals must be tested under "real life" conditions, i.e. those that will prevail if the MMPI is actually adopted for screening. Although it would be appropriate to obtain signed informed consent forms from all recruits authorizing the use of their tests for research, the subjects must not be told that the test is "only for research purposes". Instead they must believe it will be used to help select those who will graduate from basic training and, perhaps, influence the nature of their eventual assignment. However, in this research phase, once the test data are obtained, they must not be used for actual decision-making. Ideally, the research should be carried out by an independent group so that those who are actually involved in selection and training will have no knowledge of the test results, thereby avoiding any possible criterion contamination.

After testing, the subsequent military careers of the derivation and cross-validation samples should be tracked for an appropriate length of time such as two years, with particular attention to data indicating problems associated with substance abuse. This follow up can simply make use of existing unobtrusive

measures (sick call, efficiency reports, disciplinary proceedings, premature discharges, etc.) or, if a more extensive study is desired, it might be possible to arrange for special ratings and evaluations to be obtained. Pre-discharge interviews or questionnaires inquiring about substance abuse while in the service might be especially valuable data.

Once the criterion data on the first cohort are in hand, the MMPI and other data obtained at the time of induction[14] can be analysed and various discriminant functions and predictive equations or scales derived. Once the best predictors have been derived and their optimal cutting scores established, they can be used to make predictions about the second, cross-validation, cohort. Using the follow-up data collected on this second cohort, the accuracy of these predictions can then be determined and cost-benefit analyses undertaken to determine the usefulness of the MMPI as a screening device, either alone or in conjunction with other predictors.

Such a study might take place over a five year period with a time-table such as this:

Year One: After an initial six months spent hiring staff and completing arrangements, 10,000 subjects, including at least 2500 white men, 2500 black men, 2500 white women and 2500 black women will be tested at the time of induction with the full MMPI and any other selection devices such as direct substance abuse measures. (These numbers are chosen to provide about 250 substance abusers in each category.)

Year Two: Data will be collected on the first year of service of Cohort One and Cohort Two will be tested at the time of induction in the same manner as Cohort One.

Year Three: Collect second year follow-up data on Cohort One and first year follow-up data on Cohort Two.

Year Four: Using the second year follow up data on Cohort One, various predictive equations and scales will be derived and optimal postdictive cutting scores established. Predictions will then be made about the performance of Cohort Two based on their testing.

Second year follow-up data are collected on Cohort Two.

Year Five: Using the second year follow up data on Cohort Two, the predictive validity of the equations, scales and decision functions derived on Cohort One are determined. Cost benefit analyses are undertaken, taking into account the true and false positive and negative rates and the existing selection ratios and base rates. Based on these considerations a final decision is made on using the MMPI as part of a screening procedure.

In subsequent years, of course, the needs of the Army will no doubt change, as will the base rates of various problems. (If the screening is successful, the base rates for personality problems should decrease.) An ongoing program of research will need to be implemented to evaluate the continuing effectiveness of the screening procedures, making appropriate changes and adjustments as needed.

Two problems typically arise with respect to a classic predictive study of this type. The first concerns the amount of time required. It would be possible to cut a year to a year and a half off the projected timetable by testing 20,000 people in Year One and randomly assigning them to derivation and cross-validation groups. (The advantage to the successive cohort design is that it prevents any temptation to "peek" at the cross-validation data by requiring the predictions to be made before the cross-validation data are

available for analysis.)

Further reductions in the time required could be made by reducing the observation period from two years to one, or possibly even six months. These latter shortcuts compromise the design since they effectively limit the researchers to predicting short-run problems, missing those that only emerge later in the military career. If one is going to all the trouble and expense to do a longitudinal predictive study, it makes sense to take the extra time to do it as well as possible.

Although one can compromise somewhat with respect to the timetable, there should be no compromise on the second typical problem, criterion contamination. In personnel research such as this there is almost invariably pressure from the client to implement the findings prematurely. Examining the MMPI profiles from the first cohort, for example, the researchers will no doubt encounter some which are so deviant that it appears to be virtually certain that the subjects who produced them will be absolute disasters in the Army and should be screened out immediately. However, once the test data start to be used in decision making, the study is contaminated and the data will not be able to provide definitive answers to the questions originally posed. (The best way to avoid criterion contamination is to have the study run by independent researchers who do not even score the MMPIs until after the criterion data have been collected at the end of the third year.)

Concurrent feasibility study. The predictive study just outlined involves considerable time, effort, and expense, although the advent of automated, computerized testing procedures makes it vastly more economical than it would have been only a few years ago. Before undertaking this major effort, the Army might

want to consider a small scale concurrent feasibility study. This study will not and can not establish with any degree of certainty whether a potential predictive device can be used effectively in screening, but it should be able to indicate if it can not.

In this study, a sample of maladjusted people who are already in the service will be identified and compared with a well adjusted sample. In a postdictive study like this, it is feasible to use a 50% base rate, so many fewer soldiers will have to be tested. In all 400 subjects would be adequate: 50 white men, 50 white women, 50 black men and 50 black women in both the adjusted and the maladjusted (substance abusing) samples. As in the predictive study they should be administered the MMPI under conditions that approximate as closely as possible the preinduction situation. At the very least they should believe that the outcome of the MMPI testing will have important real-life implications for them.

The first question that the feasibility study will investigate is the suitability of the MMPI for this population. If the results were all biased or virtually unusable because of extreme fake-good tendencies, it would cast serious doubt on the potential utility of the MMPI.

The second question would concern the concurrent validity of the MMPI scales and profiles to discriminate the adjusted from the maladjusted subjects. If this discrimination is made successfully, it would suggest that the MMPI does have the potential to be useful in pre-induction screening, although the predictive study outlined above would still be needed before it could actually be implemented. On the other hand, if the MMPI did <u>not</u> discriminate the subjects known to be maladjusted from their well adjusted peers, such negative findings

would constitute strong evidence against its potential usefulness. Given such negative results, it would probably not be worth the effort and expense to undertake the predictive study using the MMPI.

Immediate implementation of the MMPI

What about immediate implementation of the MMPI without further research? On the one hand there is a considerable body of research, numbering over 6000 published studies, showing the MMPI to be a valuable clinical instrument. On the other hand there is the fact that little of this research deals with the MMPI's usefulness for this particular screening task. In the absence of such data, it would be inappropriate to rely on the MMPI as a primary screening instrument. (This is further underscored by the possible legal implications of relying on an instrument which has often been charged with racial bias.)

The studies reviewed by Matarazzo (1978) showed that brief psychiatric interviews did reduce the rate of psychiatric casualities although at the expense of many false positives. If the need for immediate pre-induction screening was pressing, the MMPI could be used as one source of information in the hands of competent clinicians familiar with both the MMPI and the situations to be found in the military. Inductees with extremely deviant MMPI profiles that clearly suggest psychopathology could then be assessed in greater depth by these skilled clinicians, with the final decisions to be based on these evaluations and, perhaps, performance and behavior during basic training. As always, the externally imposed selection ratio will be an important consideration; if the sheer pressure of numbers is such that many will have to be turned away simply because the Army has more applicants than it can use, then the negative consequences of high false positive rates will be much less than

in the reverse situation.

If such a program is adopted, then in order to test the validity of these predictions, at least one group of the enlistees for whom failure was predicted should nevertheless be admitted, as was done in the Navy study by Plag and Arthur (1965). This would permit a retrospective test of predictive validity and some cost-benefit estimates.

Whatever screening procedure is adopted, whether or not it is based on the MMPI and whether or not it is preceded by appropriate feasibility studies, it is strongly recommended that a program evaluation component be included so that subsequently the costs and benefits can be determined and the Army can decide empirically whether or not the screening accomplished its objectives and should be continued.

Bibliography

Allen, A.M., Irwin, G.R., Karwachi, J.J., Warren, D.C., & Levine, R.S. Epidemic hepatitis B: A sustained outbreak in a large military population. American Journal of Epidemiology, 1975, 102, 545-552.

Allen, L.R. Self esteem of male acoholics, Psychological Record, 1969, 19, 381-389.

Apfeldorf, M. Alcoholism scales of the MMPI: Contributions and future directions. International Journal of the Addictions, 1978, 13, 17-53.

Apfeldorf, M., & Hunley, P.J. Exclusion of subjects with F scores at or above 16 in MMPI research on alcoholism. Journal of Clinical Psychology, 1976, 32, 498-500.

Atsaides, J.P., Nueringer, C., & Davis, K.L. Development of an Institutional Chronic Alcoholic Scale. Journal of Consulting and Clinical Psychology, 1975, 45, 609-611.

Bean, K.L. & Karasievich, G.O. Psychological test results at three stages of inpatient alcoholism treatment. Journal of Studies in Alcohol, 1975, 36, 838-852.

Berzins, J.I., Ross, W.F., & Monroe, J.J. A multivariate study of the personality characteristics of hospitalized narcotic addicts on the MMPI. Journal of Clinical Psychology, 1971, 27, 174-181.

Black, F.W. Personality characteristics of Vietnam veterans identified as heroin abusers. American Journal of Psychiatry, 1975, 132, 748-749.

Black, F.W. & Heald, A. MMPI characteristics of alcohol and illicit drug-abusers enrolled in a rehabilitation program. Journal of Clinical Psychology, 1975, 31, 572-575.

Black, S., Owens, K.L. & Wolff, R.P. Patterns of drug use: A study of 5,482

subjects. Journal of American Psychiatry, 1970, 127, 420-423.

Boscarino, J. Current drug involvement among Vietnam and non-Vietnam veterans. American Journal of Drug and Alcohol Abuse, 1979, 6, 301-312.

Bowden, C.L. & Langenauer, B.J. Success and failure in NARA addiction program. American Journal of Psychiatry, 1972, 128, 853-856.

Boyatzis, R.E. The predisposition toward alcohol-related interpersonal aggression in men. Journal of Studies on Alcohol, 1975, 36, 1196-1207.

Brill, N., Crumpton, E. & Grayson, H. Personality factors in marijuana use. Archives of General Psychology, 1971, 24, 163-165.

Brook, R., Szandorowska, B., & Whitehead, P.C. Psychosocial dysfunctions as precursors to amphetamine abuse among adolescents. Addictive Diseases: An International Journal, 1976, 2, 465-478.

Brooks, M.L., Walfish, S., Stenmark, D. & Canger, J. Personality variables in alcohol abuse in college students. Journal of Drug Education, 1981, 11, 185-189.

Burke, E.L., & Eichberg, R.J. Personality characteristics of adolescent users of dangerous drugs as indicated by the MMPI. Journal of Nervous and Mental Disease, 1972, 154, 291-298.

Burke, H.R., & Marcus, R. MacAndrew Alcoholism Scale: Alcoholism and drug addictiveness. Journal of Psychology, 1977, 96, 141-148.

Burt, M.R., & Biegel, M.M. World wide survey of non-medical drug use and alcohol use among military personnel: 1980. Final Report of: Contract No. MDA 903-79-C-0667 prepared by Burt Associates, Inc., 4340 E.W. Highway, Suite 506, Bethesda, Maryland, 20014., November 14, 1980. Distributed by Defense Technical Information Center, Defense Logistics

Agency, Cameron Station, Alexandria, Virginia, 22314.

Butcher, J.N., & Owen, P.L. Objective personality inventories. In B.B. Wolman (Ed.), Clinical diagnosis of mental disorders: A handbook. New York: Plenum, 1978.

Butcher, J.N. & Pancheri, P. A handbook of cross national MMPI research. Minneapolis: University of Minnesota Press, 1976.

Button, A.D. A study of alcoholics with the Minnesota Multiphasic Personality Inventory. Quarterly Journal of Studies on Alcohol, 1956, 17, 263-281.

Cahalan, D. Problem drinkers. San Francisco: Jossey-Bass, 1976.

Cahalan, D., & Cizih, I. Navy surveys personnel attitudes and behavior concerning alcohol and problem drinking. Journal of Alcohol and Drug Education, 1976, 22, 25-28.

Callan, J., & Patterson, C. Patterns of drug abuse among military inductees. American Journal of Psychiatry, 1973, 130, 260-264.

Canter, F.M. Motivation for self-confrontation in alcoholic patients. Psychotherapy: Theory, Research and Practice, 1969, 6, 21-23.

Canter, F.M. Simulation on the California Psychological Inventory and adjustment of the simulator. Journal of Consulting Psychology, 1963, 27, 253-256.

Cates, W. Jr., & Warren, J.W. Hepatitis B in Nuremburg, Germany: Epidemiology of a drug-associated epidemic among U.S. Army soldiers. Journal of American Medical Association, 1975, 234, 930-934.

Cavior, H., Kurtzberg, R.L., & Lipton, D.S. The development and validation of a heroin addiction scale for the MMPI. International Journal of the Addictions, 1967, 2, 129-137.

Char, J. Drug abuse in Viet Nam. American Journal of Psychiatry, 1972, 129, 463-465.

Clopton, J.R. Alcoholism and the MMPI: A review. Journal of Studies on Alcohol, 1978, 39, 1540-1558.

Clopton, J.R., Weiner, R.H., & Davis, H.G. Use of the MMPI in identification of alcoholic psychiatric patients. Journal of Consulting and Clinical Psychology, 1980, 48, 416-417.

Cohen, A., McKeever, W., Cohen, M. & Stimmel, B. Use of an alcoholism screening test to identify the potential for alcoholism in persons on methadone maintenance. American Journal of Drug and Alcohol Abuse, 1977, 4, 257-266.

Colbach, E. Marijuana use by GIs in Vietnam. American Journal of Psychiatry, 1971, 204-207.

Collins, H.A. Personalities of addicts. Psychological Reports, 1979, 44, 603-608.

Collins, H.A., Burger, G.K., & Taylor, G.A. An empirical typology of heroin abusers. Journal of Clinical Psychology, 1976, 32, 473-476.

Comrey, A.L., Backer, T.E. & Glaser, E.M. A sourcebook for mental health measures. Los Angeles, CA: Human Interaction Research Institute, 1973.

Conley, J. & Kammeier, M.L. MMPI item responses of alcoholics in treatment: Comparisons with normals and psychiatric patients. Journal of Consulting and Clinical Psychology, 1980, 48, 668-669.

Cook, F.R., Hostetter, R.S. & Ramsay, D.A. Patterns of illicit drug use in the Army. American Journal of Psychiatry, 1975, 132, 1013-1017.

Corotto, L.B. An exploratory study of the personality characteristics of alco-

holic patients who volunteer for continued treatment. Quarterly Journal of Studies on Alcohol, 1963, 24, 434-442.

Costello, R.M. Item level racial differences on the MMPI. Journal of Social Psychology, 1973, 91, 161-162.

Costello, R.M., Fine, H.J. & Blau, B.I. Racial comparisons on the Minnesota Multiphasic Personality Inventory. Journal of Clinical Psychology, 1973, 29, 63-65.

Costello, R.M., Tiffany, D.W., & Gier, R.H. Methodological issues and racial (Black-white) comparisons on the MMPI. Journal of Consulting & Clinical Psychology, 1972, 38, 161-168.

Craig, P. The draft: Growing fear of active duty hampers registration. Pacific News Service article published in the Florida Flambeau, Feb. 4, 1982, pg. 1.

Craig, R.J. Personality characteristics of heroin addicts: A review of the empirical literature with critique--part II. International Journal of Addiction, 1979, 14, 607-626.

Curlee, J.E. A comparison of male and female patients at an alcoholism treatment center. Journal of Psychology, 1970, 74, 239-247.

Dahlstrom, W.G., Welsh, G.S., Dahlstrom, L.E. An MMPI handbook (2nd ed.) Vol. 1: Clinical interpretation. Minneapolis: University of Minnesota Press, 1972.

Dahlstrom, W., Welsh, G., & Dahlstrom, L. An MMPI handbook (2nd ed.), Vol. 2: Research applications. Minneapolis: University of Minnesota Press, 1975.

Degroot, W.G. & Adamson, J.D. Responses of psychiatric inpatients to the MacAndrew Alcoholism Scale. Quarterly Journal of Studies on Alcohol,

1973, 34, 1133-1139.

Edwards, D., Bucky, S.F. & Schuckit, M. Personality and attitudinal change for alcoholics treated at the Navy's Alcohol Rehabilitation Center. Journal of Community Psychology, 1977, 5, 180-185.

Egan, J.R., Jackson, & Eanes, R.H. Study of neuropsychiatric rejectees. Journal of the American Medication Association, 1951, 145, 466-469.

Elion, V.H., & Megargee, E.I. The validity of the MMPI Pd scale among black males. Journal of Consulting and Clinical Psychology, 1975, 43, 173-178.

Eshbaugh, D.M., Tosi, D.J. & Hoyt, C. Some personality patterns and dimensions of male alcoholics: A multivariate description. Journal of Personality Assessment, 1978, 42, 409-417.

Finney, J., Smith, D., Skeeters, D., & Auvenshine, C. MMPI alcoholism scales, factor structure and content analysis. Quarterly Journal of Studies on Alcohol, 1971, 32, 1055-1060.

Fitzgibbons, D.J., Berry, D.F. & Shearn, C.R. MMPI and diagnosis among hospitalized drug abusers. Journal of Community Psychology, 1973, 130, 1379-1380.

Foltz, R.C., Fentiman, Jr., A.F., & Foltz, R. GC/MS Assays for abused drugs in body fluids. Rockville, MD, NIDA Research Monograph Series (No. 32), 1980.

Frances, R.J., Timm, S., & Bucky, S. Studies of familial and nonfamilial alcoholism: Demographic characteristics. Archives of General Psychiatry, 1980, 37, 564-566.

Freed, E. Alcoholism and the Rorschach test: A review. Journal of Studies on Alcohol, 1976, 37, 1633-1654.

Frenkel, S.I., Morgan, D.W. & Greden, J.F. Heroin use among soldiers in the

United States and Vietnam: A comparison in retrospect. International Journal of the Addictions, 1977, 12, 1143-1154.

Friedrich, W.N., & Loftsgard, S.O. A comparison of the MacAndrew Alcoholism Scale and the Michigan Alcohol Screening Test in a sample of problem drinkers. Journal of Studies on Alcohol, 1978, 39, 1940-1944.

Gendreau, P., Andrews, D.A. & Wormith, J.S. Personality characteristics of incarcerated speed abusers. Canadian Journal of Behavioral Science, 1977, 9, 341-347.

Gendreau, P., & Gendreau, L. The "addiction-prone" personality: A study of Canadian heroin addicts. Canadian Journal of Behavioral Science, 1970, 2, 18-25.

Goldberg, L.R. Objective diagnostic tests and measures. In M.R. Rosenzweig & L.W. Parker (Eds.), Annual review of psychology, Vol. 25, Palo Alto, CA: Annual Reviews, Inc., 1974.

Goldstein, S.G., & Linden, J.D. Multivariate classification of alcoholics by means of the MMPI. Journal of Abnormal Psychology, 1969, 74, 661-699.

Goodwin, D.W., Davis, D.H., & Robins, L.N. Drinking amid abundant illicit drugs: The Vietnam case. Archives of General Psychiatry, 1975, 32, 230-233.

Graham, J.R. MMPI characteristics of alcoholics, drug abusers, and pathological gamblers. Paper presented at the 13th Annual MMPI Symposium, Mexico, March, 1978. (Cited by Owen & Butcher, 1979).

Greene, L.L., & Haymes, M. Value orientation and psycho-social adjustment at various levels of marijuana use. Journal of Youth and Adolescence, 1973, 2, 213-231.

Gunderson, E.K., Russell, J.W. & Nail, R.L. A drug involvement scale for classification of drug abusers. Journal of Community Psychology, 1973, 1, 399-403.

Gynther, M.D. White norms and Black MMPIs: A prescription for discrimination? Psychological Bulletin, 1972, 78, 386-402.

Haertzen, C.A. Hill, H.E. & Monroe, J.J. MMPI scales for differentiating and predicting relapse in alcoholics, opiate addicts and criminals. International Journal of Addiction, 1968, 3, 91-106.

Hampton, P.J. A psychometric study of drinkers: The development of a personality questionnaire for drinkers. Genetic Psychology Monograph, 1953, 48, 55-115.

Hampton, P.T., & Vogel, D.B. Personality characteristics of servicemen returned from Vietnam identified as heroin abusers. American Journal of Psychiatry, 1973, 130, 1031-1032.

Harmatiz, J.S., Shader, R..I., & Salzman, C. Marijuana users and nonusers: Personality test differences. Archives of General Psychiatry, 1972, 26, 108-112.

Heller, M.E., & Mordkoff, A.M. Personality attributes of the young, non-addicted drug abuser. International Journal of the Addictions, 1972, 7, 65-72.

Henriques, E., Arsenian, J., Cutter, H., & Samuraweeka, A.B. Personality characteristics and drug of choice. International Journal of the Addictions, 1972, 7, 73-76.

Herzog, M.A., & Wilson, A.S. Personality characteristics of the female alcoholic. Journal of Clinical Psychology, 1978, 34, 1002-1004.

Hewitt, C.C. A personality study of alcohol addiction. Quarterly Journal of Studies on Alcohol, 1943, 4, 368-386.

Hill, H.E., Haertzen, A., & Davis, H. An MMPI factor analytic study of alcoholics, narcotic addicts and criminals. Quarterly Journal of Studies on Alcohol, 1962, 23, 411-431.

Hodo, G.L., & Fowler, R.D. Frequency of MMPI two-point codes in a large alcoholic sample. Journal of Clinical Psychology, 1976, 32, 487-489.

Hoffman, H. Personality measurement for the evaluation and prediction of alcoholism. In R.E. Tarter and A.A. Sugerman, (Eds.), Alcoholism: Interdisciplinary approaches to an enduring problem. Reading, Mass: Addison-Wesley, 1976.

Hoffman, H., Loper, R.G., & Kammeier, M.L. Identifying future alcoholics with MMPI alcoholism scales. Quarterly Journal of Studies on Alcohol, 1974, 35, 490-498.

Hogan, R., Mankin, D., Conway, J., & Fox, S. Personality correlates of undergraduate marijuana use. Journal of Consulting and Clinical Psychology, 1970, 35, 58-63.

Holland, T.R. Multivariate analysis of personality correlates of alcohol and drug abuse in a prison population. Journal of Abnormal Psychology, 1977, 86, 644-650.

Hollinshead, W.J., Marlowe, D.H., & Rothberg, J.M. Defining drug involvement in an Army population. Paper presented at the 102nd annual APHA meeting, New Orleans, LA., Oct. 20-24, 1974.

Horn, J.L., & Wanberg, K.W. Symptom patterns related to excessive use of alcohol. Quarterly Journal of Studies on Alcohol, 1969, 30, 35-58.

Hoyt, D.P., & Sedlacek, G.M. Differentiation alcoholic normals and abnormals with the MMPI. Journal of Clinical Psychology, 1958, 14, 59-74.

Huber, N.A. & Danahy, S. Use of the MMPI in predicting completion and evaluating changes in a long-term alcoholism treatment program. Journal of Studies on Alcohol, 1975, 36, 1230-1237.

Hunt, W.A. An investigation of naval neuropsychiatric screening procedures. In H. Guetzkow (Ed.), Groups, leadership, and men. Pittsburgh: Carnegie Press, 1951.

Hunt, W.A., Hermann, R.S., & Noble, H. The specificity of the psychiatric interview. Journal of Clinical Psychology, 1957, 13, 49-53.

Hunt, W.A., Wittson, C.L. & Hunt, E.B. The relationship between definiteness of psychiatric diagnosis and severity of disability. Journal of Clinical Psychology, 1952, 8, 314-315.

Hurst, P., Cook, R.F. & Ramsay, D.A. Assessing the prevalence of illicit drug use in the Army. (Tech. Paper 264). 1300 Wilson Blvd., Arlington, VA. 22209: U.S. Army Research Institute for the Behavioral and Social Sciences, Dept. of the Army, July, 1975.

Ingraham, L. The boys in the barracks. Observations on American common soldiers in garrison. Walter Reed Army Institute of Research. Draft copy, 1978.

Jabara, F.R. & Curran, S.F. Comparison of the MMPI and Mini-Mult with drug users. Journal of Consulting and Clinical Psychology, 1974, 42, 739-740.

Jarvis, L.G., Sumnegar, R.R. & Traweek, A.R. An MMPI comparison of U.S.A.F. groups identified as drug users. Psychological Reports, 1975, 37,

1339-1345.

Johnson, N., & Cooke, G. Relationship of MMPI alcoholism, prison escape, hostility control, and recidivism scales to clinical judgments. Journal of Clinical Psychology, 1973, 29, 32-34.

Jones, M.C. Personality correlates and antecedents of drinking patterns in adult males. Journal of Consulting and Clinical Psychology, 1968, 32, 2-12.

Jones, M.C. Personality antecedents and correlates of drinking patterns in women. Journal of Consulting and Clinical Psychology, 1971, 36, 61-69.

Kammeier, M.L., Hoffman, H., & Loper, R.G. Personality characteristics of alcoholics as college freshmen and at time of treatment. Quarterly Journal of Studies on Alcohol, 1973, 34, 390-399.

Keller, J. & Redfering, D.I. Comparison between the personalities of LSD users and nonusers as measured by the Minnesota Multiphasic Personality Inventory. Journal of Nervous and Mental Disease, 1973, 156, 271-277.

Khavari, K., & Farber, P.D. A profile instrument for the quantification and assessment of alcohol consumption: The Khavari Alcohol Test. Journal of Studies on Alcohol, 1978, 39, 1525-1529.

King, G.D. Review of the Minnesota Multiphasic Personality Inventory. In O.K. Buros (Ed.), The eighth mental measurements yearbook, Vol. 1. Highland Park, N.J.: Gryphon Press, 1978.

Kish, G.B. & Timmons, G.I. CPI descriptions of alcoholics differing in alienation. Perceptual and Motor Skills, 1971, 33, 569-570.

Kline, J.A., Rozynko, V.V., Flint, G., & Roberts, A.C. Personality characteristics of male native American alcoholic patients. International

Journal of the Addictions, 1973, 8, 729-732.

Kojak, G. Jr., & Canby, J.P. Personality behavior patterns of heroin-dependent American servicemen in Thailand. American Journal of Psychiatry, 1975, 132, 246-250.

Kolb, D., Nail, R.L. & Gunderson, E.K. Pre-service drug abuse as a predictor of in-service drug abuse and military performance. Military Medicine, 1974, 140, 104-107.

Kranitz, L. Alcoholics, heroin addicts and non-addicts: Comparisons on the MacAndrew Alcoholism scale of the MMPI. Quarterly Journal of Studies on Alcohol, 1972, 33, 807-809.

Kristianson, P. Classification of the MMPI profiles of two alcoholic groups. Acta Psychiatrica Scandinavia, 1976, 54, 359-380.

Krug, S.E., & Henry, T.J. Personality, motivation, and adolescent drug use patterns. Journal of Counseling Psychology, 1974, 21, 440-445.

Kurtines, W., Hogan, R., & Weiss, D. Personality dynamics of heroin use. Journal of Abnormal Psychology, 1975, 84, 87-89.

Kwant, F., Rice, J.A. & Hays, J.R. Use of Heroin Addiction Scale to differentiate addicts from rehabilitation clients. Psychological Reports, 1976, 38, 547-553.

Lachar, D., Berman, W., Gisell, J., & Schooff, K. The MacAndrew alcoholism scale as a general measure of substance abuse. Journal of Studies on Alcohol, 1976, 37, 1609-1615.

Lachar, D., Gdowski, C.L. & Keegan, J.F. MMPI profiles of men alcoholics, drug addicts and psychiatric patients. Journal of Studies on Alcohol, 1979, 40, 45-56.

Lang, A.R. Addictive personality: A viable construct? Unpublished manuscript prepared for National Academy of Science, Subcontract No. ABASS 23-82-1, February, 1982.

Laudeman, K. Personality, drinking patterns and problem drinking among young adult offenders. Journal of Drug Education, 1977, 7, 259-269.

Leavitt, F. Drugs and behavior. Philadelphia: W.B. Saunders, 1974.

Lerner, S.E., & Wesson, D.R. The Haight-Ashbury drug-using subculture and the MMPI psychopathic scale. International Journal of Addictions, 1973, 8, 401-402.

Lester, D., & Narkunski, A. Methodological problems in describing the addictive personality. Psychological Reports, 1978, 43, 134.

Levine, S.F. Narcotics and drug abuse. Cincinnati: W.H. Anderson Co., 1973.

Long, J.R., Hewitt, L.E., & Blane, H.T. Alcohol abuse in the armed services: A Review. I: Problem areas and recommendations. Military Medicine, 1977, 142, 116-128.

Loper, R.G., Kammeier, M.L., & Hoffman, H. MMPI characteristics of college freshman males who later became alcoholics. Journal of Abnormal Psychology, 1973, 82, 159-162.

MacAndrew, C. The differentiation of male alcoholic outpatients from non-alcoholic psychiatric patients by means of the MMPI. Quarterly Journal of Studies on Alcohol, 1965, 26, 238-246.

MacAndrew, C. On the possibility of the psychometric detection of persons who are prone to the abuse of alcohol and other substances. Addictive Behaviors, 1979, 4, 11-20.

MacAndrew C. What the MAC scale tells us about alcoholic men: An interpretive

review. Journal of Studies on Alcohol, in press.

MacAndrew C., & Geertsma, R.H. A analysis of responses of alcoholics to scale 4 of the MMPI. Quarterly Journal of Studies on Alcohol, 1963, 24, 23-38.

Manson, M.P. The Alcadd Test. Beverly Hills, CA: Western Psychological Service, 1949.

March, R.M. Alcohol abuse programs in the military. Health Social Work, 1979, 4, 60-83.

Matarazzo, J. The interview: Its reliability and validity in psychiatric diagnosis. In B.B. Wolman, (Ed.), Clinical diagnosis of mental disorders: A handbook. New York: Plenum, 1978.

McAree, C.P., Steffenhagen, R.A., & Zheutlin, L.S. Personality factors in college drug users. International Journal of Social Psychiatry, 1969, 5, 102-106.

McAree, C.P., Steffenhagen, R.A., & Zheutlin, L.S. Personality factors and patterns of drug usage in college students. American Journal of Psychiatry, 1972, 128, 890-893.

McGuire, J.S., & Megargee, E.I. Personality correlates of marijuana use among youthful offenders. Journal of Consulting and Clinical Psychology, 1972, 42, 124-133.

McLachlan, J.F.C. An MMPI discriminant function to distinguish alcoholics from narcotic addicts: Effects of age, sex, and psychopathology. Journal of Clinical Psychology, 1975, 31, 163-165.

McLachlan, J.F.C. Classification of alcoholics by an MMPI actuarial system. Journal of Clinical Psychology, 1975, 31, 145-147.

Meehl, P.E. Some ruminations on the validation of clinical procedures.

Canadian Journal of Psychology, 1959, 13, 102-128.

Meehl, P.E., & Rosen, A. Antecedent probability and the efficiency of psychometric signs, patterns or cutting scores. Psychological Bulletin, 1955, 52, 194-216.

Megargee, E.I. The prediction of dangerous behavior. Criminal Justice and Behavior, 1976, 3, 3-21.

Megargee. E.I. How to do publishable research with the MMPI. In G. Dahlstrom et al (Eds.), Clinical Notes on the MMPI. Nutley, N.J.: Roche Psychiatric Service, 1979.

Megargee, E.I., & Bohn, M.J. with Meyer, Jr., J., & Sink, F. Classifying criminal offenders: A new system based on the MMPI. Beverly Hills, CA.: Sage, 1979.

Megargee, E.I., & Hokanson, J.E. (Eds.), The dynamics of aggression: Individual, group and international analyses. New York: Harper & Row, 1970.

Megargee, E.I., & Mendelsohn, G.A. A cross-validation of 12 MMPI indices of hostility and control. Journal of Abnormal and Social Psychology, 1962, 65, 431-438.

Miller, W.R. Alcoholism scales and objective assessment methods: A review. Psychological Bulletin, 1976, 83, 649-674.

Mogar, R.E., Wilson, W.M., & Helms, S.T. Personality subtypes of male and female alcoholic patients. International Journal of Addiction, 1970, 5, 99-113.

Mulford, H.A., & Miller, D.E. Drinking in Iowa: IV. Preoccupation with alcohol and definitions of alcohol, heavy drinking and trouble due to drinking.

Quarterly Journal of Studies on Alcohol, 1960, 21, 279-291.

Muschewske, R. A cross-validation of the MMPI Drug Abuse Scale. Correctional Psychologist, 1972, 23, 33-36.

Myers, C.R. Prediction in clinical psychology. Canadian Journal of Psychology, 1950, 4, 97-108.

Nace, E.P. Meyers, A.L., Rothberg, J.M., & Maleson, F. Addicted and nonaddicted drug usage patterns. Archives of General Psychiatry, 1975, 32, 77-80.

Newby, J.H., Jr. Small group dynamics and drug abuse in an Army setting: A case study. International Journal of Addiction, 1977, 12, 287-300.

O.S.S. Assessment Staff. The assessment of men. New York: Rinehart, 1948.

Overall, J.E. MMPI personality patterns of alcoholics and narcotic addicts. Quarterly Journal of Studies on Alcohol, 1973, 34, 104-111.

Overall, J.E., & Patrick, J.H. Unitary alcoholism factor and its personality correlates. Journal of Abnormal Psychology, 1972, 79, 303-309.

Owen, P.L. Bibliography of MMPI research. In J.N. Butcher (Ed.), New directions in MMPI research. Minneapolis: University of Minnesota Press, 1979.

Owen, P., & Butcher, J. Personality factors in problem drinking: A review of the evidence and some suggested directions. In R. Pickens & L. Heston (Ed.), Psychiatric factors in drug abuse. NY: Grune & Stratton, 1979.

Panton, J.H., & Behre, C. Characteristics associated with drug addiction within a state prison population. Journal of Community Psychology, 1973, 1, 411-416.

Panton, J., & Brisson, R. Characteristics associated with drug abuse within a state prison population. Corrective Psychiatry and Journal of Social Therapy, 1971, 17, 3-33.

Patalano, F. Comparison of MMPI scores of drug abusers and Mayo Clinic normative groups. Journal of Clinical Psychology, 1980, 36, 576-579.

Patterson, C.D. Self-reported unpleasant effects from illicit use of fourteen substances. British Journal of Addiction, 1974, 69, 249-255.

Penk, W.E., Fudge, J.W., Robinowitz, R., & Newman, R.S. Personality characteristics of complusive heroin, amphetamines, and barbiturate users. Journal of Consulting and Clinical Psychology, 1979, 47, 583-585.

Penk, W.E., & Robinowitz, R. Personality differences of volunteer and non-volunteer heroin and non-heroin drug users. Journal of Abnormal Psychology, 1976, 85, 91-100.

Penk, W.E., Woodward, W.A., Robinowitz, R., & Hess, J.L. Differences in MMPI scores of Black and White compulsive heroin users. Journal of Abnormal Psychology, 1978, 87, 505-513.

Penk, W.E., Woodward, W.A., Robinowitz, R. &, Parr, W.C. An MMPI comparison of polydrug and heroin abusers. Journal of Abnormal Psychology, 1980, 89, 299-302.

Pittel, S.M. Psychological aspects of heroin and other drug dependence. Journal of Psychedelic Drugs, 1971, 4, 40-45.

Plag, J.A., & Arthur, R.J. Psychiatric re-examination of unsuitable naval recruits: A two-year follow-up. American Journal of Psychiatry, 1965 122, 534-541.

Plag, J.A., & Goffman, J.M. Characteristics of Naval recruits with histories of drug abuse. Military Medicine, 1973, 138, 354-359.

Platt, J. "Addiction proneness" and personality in heroin addicts. Journal of Abnormal Psychology, 1975, 84, 303-306.

Raines, G.N., Wittson, C.L., Hunt, W.A., & Herrmann, R.S. Psychiatric selection of military service. Journal of the American Medical Association, 1954, 156, 817-821.

Ratliff, B.W., & Eads, J. Drug abuse among military offenders. Journal of Drug Education, 1978, 8, 345-356.

Rathus, S.A., Fox, J.A., & Ortins, J.B. The MacAndrew Scale as a measure of substance abuse and delinquency among adolescents. Journal of Clinical Psychology, 1980, 36, 579-583.

Reinstein, M. Drugs and the military physician. Military Medicine, 1972, 137, 122-125.

Rich, C.C., & Davis, H.G. Concurrent validity of MMPI alcoholism scales. Journal of Clinical Psychology, 1969, 25, 425-426.

Robins, L.N., Helzer, J.E., & Davis, D.H. Narcotic use in Southeast Asia and afterward: An interview study of 898 Vietnam returnees. Archives of General Psychiatry, 1975, 32, 955-961.

Rohan, W.P. MMPI changes in hospitalized alcoholics: A second study. Quarterly Journal of Studies on Alcohol, 1972, 33, 65-76.

Rosen, A.C. A comparative study of alcoholic and psychiatric patients with the MMPI. Quarterly Journal of Studies on Alcohol, 1960, 21, 253-266.

Rosenberg, N. MMPI alcoholism scales. Journal of Clinical Psychology, 1972, 28, 515-522.

Ross, W.F., & Berzins, J.I. Personality characteristics of female narcotic addicts on the MMPI. Psychological Reports, 1974, 35, 779-784.

Rothberg, J.M., & Chloupek, R.J. A longitudinal prospective study of U.S. Army inductees: Interim results. Paper presented at the North American

Congress of Alcohol and Drug problems, San Francisco, California, Dec. 12-18. 1974.

Rothberg, J.M., & Chloupek, R.J. A longitudinal study of military performance subsequent to civilian drug use. American Journal of Public Health, 1978, 68, 743-747.

Rotman, S.R., & Vestre, N. The use of the MMPI in identifying problem drinkers among psychiatric hospital admissions. Journal of Clinical Psychology, 1964, 20, 526-530.

Ruff, C.F., Ayers, J., & Templer, D.I. Alcoholics' and criminals' similarity of scores on the MacAndrew Alcoholism Scale. Psychological Reports, 1975, 36, 921-922.

Sanders, C.R. Doper's wonderland: Functional drug use by military personnel in Vietnam. Journal of Drug Issues, 1973, 3, 65-78.

Schneider, R.J., & Rothberg, J.M. Predicting involvement with illicit drugs. Part I: Development of the instrument. Educational and Psychological Measurement, 1976, 36, 1055-1062.

Schoolar, J.C., White, E..H., & Cohen, C.P. Drug abusers and their clinic-patient counterparts: A comparison of personality dimensions. Journal of Consulting and Clinical Psychology, 1972, 39, 9-14.

Schuckit, M.A., & Gunderson, E.K. The use of alcoholic subtype diagnoses in the U.S. Navy. Diseases of the Nervous System, 1974, 35, 563-567.

Selzer, M.L. The Michigan Alcoholism Screening Test: The quest for a new diagnostic instrument. American Journal of Psychiatry, 1971, 127, 1653-1658.

Sheppard, C., Ricca, E., Fracchia, J., & Merlis, S. Personality characteristics of urban and suburban heroin abusers: More data and another reply to

Sutker and Allain. Psychological Reports, 1973, 33, 999-1008.

Skinner, H.A., Jackson, D.N., & Hoffman, H. Alcoholic personality types: Identification and correlates. Journal of Abnormal Psychology, 1974, 83, 658-666.

Sodetz, F.J. A research perspective on drug and alcohol use in the Army. Paper read at the USAFORSCOM ADCO Conference, November, 1979. (Place not specified.)

Soskin, R.A. Personality and attitude change after two alcoholism treatment programs; Comparative contributions of Lysergide and human relations training . Quarterly Journal of Studies in Alcohol, 1970, 31, 920-921.

Spiegel, D., Hadley, P.A., & Hadley, R.G. Personality test patterns of rehabilitation center alcoholics, psychiatric inpatients, and normals. Journal of Clinical Psychology, 1970, 26, 366-371.

Stanton, N.D. Drugs, Vietnam and the Vietnam veteran: An overview. American Journal of Drug and Alcohol Abuse, 1976, 3, 557-570.

Steffenhagen, R.A., Schmidt, F.E., & McAree, C.P. Emotional stability and student drug abuse. Journal of Drug Education, 1971, 1, 347-357.

Stein, K.B., & Rozynko, V. Psychological and social variables and personality patterns of drug abusers. International Journal of the Addictions, 1974, 9, 431-446.

Stein, K.B., Rozynko, V., & Pugh, L.A. The heterogeneity of personality among alcoholics. British Journal of Social and Clinical Psychology, 1971, 10, 253-259.

Strauss, M.E., Gynther, M.D., & Wallhermfechtel, J. Differential misdiagnosis of blacks and whites by the MMPI. Journal of Personality Assessment,

1974, 38, 55-60.

Sutker, P.B. Personality differences and sociopathy in heroin addicts and nonaddict prisoners. Journal of Abnormal Psychology, 1971, 78, 247-251.

Sutker, P.B., & Allain, A.N. Incarcerated and street heroin addicts: A personality comparison. Psychological Record, 1973, 32, 243-246.

Sutker, P.B., Brantley, P.J., & Allain, A.M. MMPI response patterns and alcoholic consumption in DWI offenders. Journal of Consulting and Clinical Psychology, 1980, 48, 350-355.

Tennant, F.S., Preble, M.E., Groesbeck, C.J., & Banks, N.I. Drug abuse among American soldiers in West Germany. Military Medicine, 1972, 137, 381-383.

Trevithick, L., & Hosch, H.M. MMPI correlates of drug addiction based on drug of choice. Journal of Consulting and Clinical Psychology, 1978, 46, 180.

Uecker, A.E. Differentiating male alcoholics from other psychiatric inpatients. Quarterly Journal of Studies on Alcohol, 1970, 31, 379-383.

Uecker, A.E., Kish, G.D., & Ball, M.E. Differentiation of alcoholism from general psychopathology by means of two MMPI scales. Journal of Clinical Psychology, 1969, 25, 287-289.

Vega, A. Cross-validation of four MMPI scales for alcoholism. Quarterly Journal of Studies on Alcohol, 1971, 32, 791-797.

Wang, R.I., Heib, E., & Wildt, C. Characteristics of drug abuse patients at a Veterans Administration Hospital. International Journal of Addiction, 1976, 11, 1019-1030.

Wardell, D., & Mehra, N. Prediction of marijuana usage among students in a university residence. Journal of College Student Personnel, 1974, 15, 31-33.

Whitelock, P.R., Overall, J.E., & Patrick, J.H. Personality patterns and alcohol abuse in a state hospital population. Journal of Abnormal Psychology, 1971, 78, 9-16.

Williams, A.F., McCourt, W.F., & Schneidger, L. Personality self-descriptions of alcoholics and heavy drinkers. Quarterly Journal of Studies on Alcoholism, 1971, 32, 310-317.

Wisler, R.H., & Cantor, J.M. The MacAndrew alcoholism scale: A cross validation in a domiciliary setting. Journal of Clinical Psychology, 1966, 22,

Wittson, C.L., & Hunt, W.A. The predictive value of the brief psychiatric interview. American Journal of Psychiatry, 1951, 107, 582-585.

Zager, L.D., & Megargee, E.I. Seven MMPI alcohol and drug abuse scales: An empirical investigation of their interrelationships, convergent and discriminant validity, and degree of racial bias. Journal of Personality and Social Psychology, 1981, 40, 532-544.

Zelen, S.L., Fox, J., Gould, E., & Olson, R.W. Sex-contingent differences between male and female alcoholics. Journal of Clinical Psychology, 1966, 22, 160-165.

Zuckerman, M., Sola, S., Masterson, J. & Angelovie, N.V. MMPI patterns in drug abuse before and after treatment in therapeutic communities. Journal of Consulting and Clinical Psychology, 1975, 43, 286-296.

Footnotes

1. As a general rule, individuals whose substance abuse is associated with general maladjustment including marital and legal problems, physical illness, or dependency, or inability to perform duties adequately, will be more detectable at the time of induction than people whose use of psychoactive substances is confined to off-duty recreational and social use of the more benign and socially accepted substances such as beer and marijuana. In short, the more severe and pervasive the problem, the more likely it can be detected or predicted.

2. It should be noted that insofar as situational determinants are respon sible for substance abuse, such abuse will be undetectable by psychological instruments designed for assessing personality traits.

3. Actually, it is extremely unlikely that the MacAndrew scale would do this well since these false positive and negative rates were derived from post-dictive studies of older chronic alcoholics, most of whom freely admitted their drinking problems; prediction of future alcoholism among young men and women who would be motivated to conceal any problems would probably be much less successful. In particular, we could anticipate a much higher false negative rate.

4. The reader will recall the study by Egan et al (1951) in which manpower needs during World War II dictated that over 2,000 men initially rejected as being unsuitable for the service were nevertheless eventually inducted into the Army.

5. One is reminded that when complaints regarding Gen. U.S. Grant's drinking reached Lincoln's ears, the President inquired as to General Grant's favorite brand so that he could send a case to each of his other generals.

6. Direct devices for the assessment of alcoholism include the Alcadd Test

(Manson, 1949), the Iowa Scale of Preoccupation with Alcohol (ISPA) (Mulford & Miller, 1960), the Khavari Alcohol Test (Khavari, 1978), the Michigan Alcoholism Screening Test (MAST) (Selzer, 1971) and a 39 item questionnaire recently reported by Cohen et al (1977). Moreover, Gunderson, Russell and Nail (1973) recently reported the construction of a drug involvement scale designed for use with military personnel.

7. An alternative that would preserve some of the advantages of behavioral assessment and still be cost-effective would be to postpone actual induction until the successful completion of basic training as was the procedure for Peace Corps volunteers. This would provide an opportunity to obtain data on excessive drinking or illicit drug use during this period. As in the Peace Corps, final selection could then use evaluations of performance and behavior during the training program.

8. Comrey, Baker and Glaser (1973) list dozens of self report scales of alcohol and drug abuse that have been devised by social scientists working in NIMH-funded research projects.

9. This section, including Table 3, is reprinted with minor modifications from Megargee and Bohn with Meyer and Sink (1979, pp. 75-80).

10. Those chemical substances that are less rapidly excreted than alcohol should also be more detectable through random biochemical testing procedures such as urinalyses.

11. In the last decade a substantial and varied literature has accumulated on the characteristics of various types of drug-using groups tested in a broad array of settings. Whereas there have been several excellent reviews of the MMPI literature alcoholism, this is not true of the area of drug abuse litera-

ture, so the reader is forced to go directly to the primary sources. In order to avoid bogging down the text with a seemingly endless list of citations, the primary sources used in this section will be listed alphabetically in this footnote: Berzins, Ross, & Monroe, 1971; Black, 1975; Black & Heald, 1975; Brill, Crumpton & Grayson, 1971; Brook, Szandorowska & Whitehead, 1976; Burke & Eichberg, 1972; Collins, 1979; Fitzgibbons, Berry & Shearn, 1973; Gendreau, Andrews & Wormith, 1977; Gendreau & Gendreau, 1970; Heller & Mordkoff, 1972; Henriques, Arsenian, Cutter & Samuraweeka, 1972; Holland, 1977; Jarvis, Sumnegar & Traweek, 1975; Keller & Redfering, 1973; Kojak & Canby, 1975; Kwant, Rice & Hays, 1976; Lachar, Gdowski & Keegan, 1979; Lerner & Wesson, 1973; McAree, Steffenhagen & Zheutlin, 1969 & 1972; McGuire & Megargee, 1974; MacLachlan, 1975; Overall, 1973; Panton & Behre, 1973; Patalano, 1980; Penk, Fudge, Robinowitz & Newman, 1979; Penk & Robinowitz, 1976; Penk, Woodward, Robinowitz & Heass, 1978; Penk, Woodward, Robinowitz & Parr, 1980; Pittel, 1971; Ross & Berzins, 1974; Sheppard, Ricca, Fracchia & Merlis, 1973; Spiegel, Hadley & Hadley, 1970; Steffenhagen, Schmidt, & McAree, 1971; Stein & Rozynko, 1974; Sutker, 1971; Sutker & Allain, 1973; Trevithick & Hosch, 1978; Zager & Megargee, 1981; Zuckerman, Sola, Masterson & Angelovie, 1975.

12. See Megargee's (1979) monograph, "How to do publishable research with the MMPI" for detailed guidelines on methodology.

13. The cost of administering and scoring the MMPI is low. As noted above, it can be administered to large groups of recruits by Army personnel with reusable test booklets. Computerized scoring services with retention of the data on research files are available commercially for less then two dollars a subject. Similarly, if the follow up used data already available in Army per-

sonnel computers, the cost of using large samples such as these should not be prohibitive. (The primary costs, i.e. those of the research staff, will be about the same, regardless of the sample size.)

14. Given the effort involved in this overall study, it would be desirable to include some other initial measures as well in order to make the study as cost-effective as possible. Among these measures there should be included one of the many direct assessment scales of alcohol and drug use that has been developed so that its forecasting ability can be determined as well as that of the MMPI. It would also be advisable to obtain urinalyses and other laboratory data that might indicate recent usage on all subjects as soon possible after they report for induction.

Appendix 2

ADDICTIVE PERSONALITY: A VIABLE CONSTRUCT?*

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Preface

This paper was prepared as a background report to discuss the question of whether personality factors might form the basis of a predisposition to use and/or abuse substances, including alcohol and other drugs. If the answer to this question is yes, and if the relevant personality factors can be specified and measured, then a foundation for the development of a psychological screening device for evaluating Army and other military personnel for potential substance abuse problems would be established. The present paper deals with conceptual and feasibility issues in this matter, while a companion paper by Dr. Edwin Megargee focuses on the pragmatic issues involved in developing and testing an actual instrument for screening purposes.

The writer would like to thank Dr. Megargee for his initiative and collegial collaboration in this project. He is also grateful to Beth Michalec and Cindy Smoke for their respective contributions in the necessary literature search and manuscript preparation.

A. R. Lang

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INTRODUCTION

The title of this paper asks a question, and indeed questions abound when considering the viability of the construct "addictive personality." At the simplest level one might ask: "Whence came the notion of addictive personality? Why does it persist in the apparent absence of supporting evidence? What might its utility be, if any?" We will begin with these questions. From there, the plan will be to define or characterize the critical components of the construct--addictive behavior and personality--and to examine their possible interplay. Finally, the bulk of the paper will consist of a critical review of the concepts and methods employed in the study of addictive personality, along with a highlighting of the major findings to date. The author makes no pretense of providing an exhaustive coverage of the relevant literature. Considering that Knox's (1976) review of research dealing exclusively with objective psychological measures of alcoholics' personalities cited 86 references in the two years 1971-1972 alone, such a task would assume epic proportions. The result, however, would probably be little more than a trivial annotated bibliography. Thus, the focus here will be on issues and problems in studying and applying the construct of an addictive personality.

To expedite the review process, a major emphasis will be placed on personality factors in problem drinking. This is justifiable because alcohol-related problems are the most costly and pervasive in this society, and because the alcoholic personality has been the most widely studied in the addiction literature. However, due to the fact that other addictive substances have distinctive pharmacological actions and psychosocial significances, it is acknowledged that their use and abuse may be associated with uniquely different personality correlates as well. To accommodate this possibility, personality factors related to both marijuana and heroin use will be considered in some

detail, along with occasional reference to other substances.

Origin of the Addictive Personality Construct

Virtually every theory has as its genesis simple observation. This is no less true of theories in clinical psychology than it is of those in other disciplines. However, in clinical psychology a good deal of the observation has been carried out by clinicians who, at least historically, have often been steeped in the tradition of psychoanalysis. The practical implications of this state of affairs for the development of a construct of addictive personality are several. First, the observers dealt primarily with psychopathologic rather than normal personalities. Second, they observed addicts on a case by case basis in a therapeutic context. Third, and most important, their paradigmatic bias led them to look for the cause of addiction within the psyche of the individual. In short, the observers "wanted" personality to be the basis of addiction and were operating under circumstances which made apparent support for this foregone conclusion rather easy to obtain. Eventually, a number of these clinicians, drawing on extensive therapy experience, derived and perpetrated theories to explain the psychic determination of addiction. Not too surprisingly, the esoteric nature of such enterprises resulted in a maze of confusing and contradictory positions (see Pihl & Spiers, 1978, for a summary). If the unreliability, method reactance, and biased sampling of the serial case study method had not been enough, surely the difficulty of operationalizing psychodynamic concepts and the basically post-dictive nature of psychoanalysis would have ensured the scientific untenability of a construct so derived. Given this situation, one would hardly expect addiction (or any other complex human phenomenon or syndrome) to be so constant and so powerful as to influence clinical observations and perceptions in anything approaching a uniform manner.

So it was that the community of scientists threw out the baby (addictive personality) with the proverbial bathwater (psychoanalysis). Because of the origin of the construct and the way in which it was (and not infrequently still is) studied, the death knells for addictive personality have been heard--and heard often--over the last three decades or more. For example:

> No satisfactory evidence has been discovered that justifies a conclusion that persons of one type are more likely to become alcoholics than persons of another type. (Sutherland, Schroeder & Tordella, 1950, p. 559).

> From the psychological standpoint such an assumption (that alcoholics are a homogeneous population) implied that alcoholism was probably the manifestation of a more or less unique constellation of personality characteristics which could be designated the 'alcoholic' personality! It is safe to say that a number of different lines of investigation have either demolished these notions or, at any rate, made them inexpedient to entertain as a basis for research. (Popham & Schmidt, 1962, p. 3).

> The evidence of heterogeneity of personality factors among alcoholics is quite striking. (Stein, Rozynko & Pugh, 1971, p. 258).

> ...the extraordinary variety of personality types found for both heroin and polydrug abusers was interpreted as unequivocally refuting the notion that one personality type is addiction-prone. (Penk, Woodward, Robinowitz & Parr, 1980, p. 299).

Persistence of the Addictive Personality Construct

Despite pessimistic conclusions suggesting nonexistence, the search for addictive personalities has continued unabated, and has even expanded. What can account for such staying power? Perhaps it is only that clinicians choose to ignore science or at least question its applicability to what they "know" about people. But, then again, maybe it is something more than that. Sadava (1978) has suggested that a role for personality in understanding substance abuse may

be "theoretically necessary, logically defensible, and empirically supportable." Without some type of addictive personality construct we are left with two rather unsettling "null" hypotheses: (1) given comparable environmental factors, every individual is equally vulnerable to addiction, and (2) those who are addicted differ from others only in the particulars of their substance abuse. Admittedly, these statements imply a rather limited range of possible causes for addictive behavior neglecting, e.g., constitutional variables. But they do, nevertheless, point to the need for a consideration of personality factors in any comprehensive theory of addiction. In essence, it appears that we must know more about the nature of individuals and their differential motivations if we are ever to understand substance abuse problems fully. Furthermore, if we fail to adopt a perspective broad enough to include individual differences we seem doomed to attempt to control addiction through strictly external means, a tactic which has not proved too effective to date. For these reasons, then, personality seems likely to persist in analyses of the addictions, though it probably will be assigned a contributing role rather than being held up as the primary cause of addiction. The position taken in this paper is consistent with the former, multivariate point of view.

Utility of the Addictive Personality Construct

Suppose that some specific connections between personality and addictive behavior could be delineated. What would their utility be? Cox (1979) has suggested a number of possible applications. Besides providing a clearer explanation of etiology and a possible disentangling of certain cause and effect relations, we might be able to classify or subtype deviant populations better. Such separation of addicts according to their personality characteristics could permit development and refinement of differential (optimal) treatment strate-

gies, with corresponding improvement in case disposition and in prediction of outcomes. In another application, discovering personality differences between addicts and other groups could aid in detection of potential and/or active but surreptitious substance abusers so that more appropriate decisions could be made in areas such as personnel screening and assignment. Finally, a personality-based system for estimating the probability of addictive behavior might allow better identification of high-risk populations so that prevention/early intervention programs could be more effectively applied before problems reached the critical stage. In general, it appears that there are good reasons for a continued interest in personality factors in addictive behaviors, over and above the purely academic concerns of basic research scientists. Let us turn, then, to definition and characterization of the two elements comprising the construct under consideration, viz., addictive behavior and personality.

ADDICTIVE BEHAVIOR AND PERSONALITY

Addictive Behavior

In recent years there has been an increasing tendency for theorists and researchers to begin to examine commonalities among such apparently diverse problems as alcoholism, drug abuse, smoking, overeating, and even compulsive gambling and certain sexual deviations. These behaviors have often been subsumed under the general rubric "addictions" and parallel processes have been identified. While the present paper deals only with alcohol and drug abuse, it may be instructive to examine some of the general common characteristics of addictive behaviors as well as those specific to the topic at hand.

A number of authors (e.g., Marlatt, 1980; Miller, 1980) have noted that a distinguishing feature of addictive behaviors is that they all involve some form of immediate gratification or pleasure, but are accompanied by longer term adverse consequences. The short-term gratification may be referred to as a "high," a "rush," a "trip," a "release," a "relief," or any of a variety of terms which describe an alteration in one's state of consciousness and/or affect. The long-term negative consequences typically include deterioration of functioning in important life areas such as health, vocation, and social relations.

Another common ground in the addictions is that there appears to be a certain transferability of indulgences, with people often having a cluster of more than one of the problems. Some of the apparent reciprocal relation between smoking and overeating, may be accounted for in behavioral terms; and, anyone who has ever been on an alcoholism treatment unit can attest to the high rate of nicotine and caffeine consumption in this population. More empirically based reports indicate that poly- and multi-drug abuse, either sequentially (Kandel,

1975) or concurrently (Braucht, Kirby & Berry, 1978), are quite prevalent in the world of addictions. Mello (1977) has noted further that it is not uncommon for substance abusers to use two or more drugs with demonstrably different pharmacological effects, e.g., alcohol + methadone or amphetamines + barbiturates. Extrapolating from this observation, she has suggested that the common goal which ties many addictions together may be the simple desire for a change in one's subjective state, with the direction of that change--up or down--being more or less incidental. In any case, it is clear that while most serious addicts have a preferred substance, many will freely substitute when their first choice is unavailable. The choice of specific alternatives may, in turn, be affected by the degree of cross-tolerance (i.e., reduced responsivity) the individual has developed to certain other substances because of his or her normal usage patterns (cf. Seevers & Deneau, 1963). Thus, practical as well as theoretical commonalities among the addictions seem apparent.

Among the common elements or defining characteristics more specific to the substance abuse addictions are those outlined by Schuster and Johansen (1974), including the possibility of: (1) physiological dependence, evaluated in terms of tolerance with increasing use and withdrawal symptoms upon cessation of use, (2) behavioral (or psychological) dependence, demonstrated through the disruption of normal behavior patterns when the substance is withheld, with a resumption of them if it is reapplied, (3) behavioral and physiological "toxic consequences" from substance self-administration, presumably referring to adverse effects of addiction on the important areas of life functioning described earlier, and (4) self-administration of substances for nonmedical purposes, indicating motivations other than those officially approved by the dominant culture.

The substance abuse disorders are also marked by more or less consistent stages of involvement which might be regarded as separate components to be addressed by any theory of addiction. These stages include: (1) initial use, (2) continuation of use, (3) transition from use to abuse, (4) cessation or control of abuse, and (5) relapse (cf. Lettieri, Sayers & Pearson, 1980). Despite these parallels, the substance abuse disorders are not linked by any single, definitive, and parsimonious etiologic paradigm (e.g., an addictive personality) which has demonstrated validity. Interestingly, however, progress in the study of each of the addictions has probably been hampered by an ill-advised overemphasis on and stubborn adherence to particular unitary cause approaches.

Finally, it is evident that substance abuse disorders share the lack of any treatment method which has a reasonable degree of documented efficacy. This deficiency is underscored by the poor maintenance records, i.e., high relapse rates, of those addicts whose indulgences have been temporarily controlled. Hunt and Matarazzo (1973) have presented data revealing remarkably similar and dismal relapse patterns in alcoholics, heroin addicts, and smokers following treatment-induced abstinence. And, Marlatt (1980) has also identified striking commonalities in the psychosocial stressors which are often antcedents to relapses in the addictions.

Given the preceding, it seems safe to say that the addictive behaviors have a good deal in common. However, as Maisto and Caddy (1981) among others have pointed out, there appear to be significant differences in the substance abuse addictions as well. First, the pharmacological properties of the substances themselves vary considerably in their abilities to induce physiological dependence. The amount of time required for addiction to occur, the magnitude of

tolerance developed, the intensity of withdrawal symptoms experienced, and the probability that any given individual using a particular drug will become addicted, all differ across substances. Moreover, the various drugs often have quite distinctive directions and natures to their particular pharmacological actions. They may be stimulating, depressing, psychedelic, euphoria-inducing, etc. as well as differing in the duration of their effects, their intrinsic dangerousness or lethality, and the degree to which they interfere with psychosocial functioning.

Predominant models of etiology for addiction reflect decidedly different directions too, including physical disease, underlying psychological problems, and socially learned patterns of behavior. These contrasts, in turn, have implications for issues of responsibility and control in substance abuse problems. Perhaps the differences mainly reflect sharp divergences in the general acceptability, social meanings, and practical consequences of use of the various substances. Alcohol consumption, e.g., is both legal and normative behavior for adults in the U. S., whereas heroin use is illegal and statistically deviant. Certain substances (e.g., marijuana) may be associated with particular political reference groups, while others (e.g., cocaine) may represent socioeconomic status. Hallucinogens are used primarily for intrapersonal experience, but the use of alcohol has more interpersonal implications. It also might be argued that use of more dangerous drugs is linked to severe personality problems, but nondangerous drug use is simply a social phenomenon. Regardless, the point is that while the similarities among the addictions might suggest general commonalities in personality and other causal or correlated factors, the obvious differences would appear to argue for greater specificity in the role these same factors play in each particular substance abuse problem. In

any event, it would seem wise to keep the multiplicity of variables in mind.

From an empirical standpoint, there is a need to specify clearly the phenomena of interest when conducting research on any of the addictive behaviors. While this may seem a straightforward task, the multiple dimensions and complexities of substance abuse have often made it difficult. To begin with, distinctions among substance use, abuse, and dependence are invariably arbitrary, and the typically inconsistent application of these labels confuses comparisons across studies. In general, simple use denotes consumption without long-term undesirable consequences. As implied earlier, however, the particular characteristics of various substances (e.g., LSD) may make even a single use problematic, while for other substances (e.g., alcohol) this is less likely. For this reason, choice of substance, itself complicated by differential availablity and accessibility and by multi- or poly-drug selection and sequencing patterns, needs more precise specification before other classification can be undertaken.

Widely used classification systems, such as the one described in the Diagnostic and Statistical Manual of Mental Disorders (DSM III: American Psychiatric Association, 1980), have sought to distinguish substance "abuse" from substance "dependence" in terms which include the nature of and processes involved in consequences of their use. Abuse is associated only with a pathological pattern of use having a minimum duration and producing adverse effects on social and/or occupational functioning. Dependence, on the other hand, must also include demonstrable signs of physical dependence, viz., tolerance and/or withdrawal symptoms. Despite ambiguities in these criteria, and conceptual problems in the classification system's attempt to employ discrete categories where a continuum of variation actually exists, the effort at objective defini-

tions considering both consumption and consequences is laudable. Unfortunately, most psychosocial research, and particularly that dealing with personality variables, has not applied this approach. Instead, great confusion continues because investigators do little more than assign esoterically-derived labels to widely divergent patterns of substance use, neglecting to consider either the quantity/quality/variability of use or the attendant consequences of such use. One common assumption seems to be the more <u>often</u> one uses a substance or substances, the worse the problem.

To illustrate the problems of the crude descriptive classification methods currently in use, consider the following. Brill, Crumpton, and Grayson (1971) found the personality characteristics of "casual or occasional" marijuana users (= maximum of twice per month) to be quite similar to those of nonusers, but not frequent users. In a later study, Knecht, Cundick, Edwards and Gunderson (1972) showed the personality attributes of "occasional users" (= maximum of four "joints" per week, regardless of frequency) assumed an intermediate position between nonusers and heavy users, differing from both. Finally, Kimlicka and Cross (1978) reported that "casual users" (= maximum of three occasions per week) did not differ from chronic or daily marijuana users on personality characteristics. Obviously, a lack of uniformity in operational definitions may account for these apparently contradictory results--regardless of their actual validity. Even employing a more sophisticated "rate over period of time" definition would probably not eliminate such misleading conclusions since the massed use of certain substances (cf., "binge" drinking) is usually associated with more problems than regular, spaced usage (e.g., a cocktail with dinner each day), despite equivalent rates of consumption across time. Uncertainties about the pharmacological potency of most illicit substances also serves to obscure

the meaning of simple frequency of use measures even further.

Still another index of the pervasiveness and significance of a substance use problem is the variety of contexts in which it is used. Sadava (1975) has suggested that, independent of consumption rate or legality issues, substance use which is restricted to solitary or select private settings and/or special occasions is probably quite different from that which seems to occur in almost any place at nearly any time. A perhaps associated dimension is that of the phase or stage of use, mentioned earlier. Age of initiation or onset of substance use may be a critical determinant of future drug involvement. Consideration should also be given to one's position in the general life cycle of substance abuse since many patterns seem to be self-limiting, apparently subject to a "burnout" phenomenon. These aspects of substance abuse are often overlooked in popular descriptions of the problem which focus on absolute frequency or the like.

In sum, it appears that an adequate characterization of the addictive behaviors phenomena should incorporate multidimensional and multimethod measurement of substance type, quantity/frequency/variability of use of substances with identified potency, stage and context of use, and the adverse consequences associated with the particular pattern. Furthermore, it should be recognized that for the most part each of these factors is best treated as a continuous variable which has significant potential for interaction with the others. While obviously such a prescription smacks of idealism, at least a rudimentary application of it might reduce the chaos and equivocation so evident in the personality and addictive behavior literature reviewed later.

Personality

In the broadest sense, personality is concerned with both the universal

characteristics of human beings and the specific differences among them. With such latitude of coverage, there is really little in the experience and behavior of people that personality could not touch. Consequently, the variety of possible theoretical perspectives and preferences for conceptualizing man and his activities is reflected in the absence of any widespread consensus about how "personality" should be defined. Given this ambiguity, personality might best be characterized as a complex hypothetical construct which provides a partial framework in which to explore the tenets and systematize the observations of any particular theory of human psychology and behavior. It emphasizes relatively enduring cognitive and behavioral patterns characteristic of the individual, but the goals of its application could be said to parallel those of psychology as a discipline, viz., to enhance understanding of subjective experience and to improve prediction (and perhaps control) of behavior. Unfortunately, these two goals often seem incompatible because of the nature of epistemological assumptions and typical research tactics involved in each. The result has been that the frequent paradigm clashes in psychology have had a profound influence on the way personality variables are viewed by practitioners and scientists in the substance abuse field.

Classical personality theorists, represented largely by psychodynamically-oriented clinicians, have focused on understanding the internal workings of their troubled patients. They postulate that personality in general is a complex product of innate biological instincts or impulses whose expression is modified by early (mostly interpersonal) developmental experiences. Adult personality is regarded as a relatively stable and all-encompassing entity whose essence can be understood through intensive study of the individual (the idiographic method). Verbal accounts, gathered via interview and case history,

provide the data. Resulting self-reports and descriptions are reviewed, analyzed, and interpreted to develop a set of inferences about the organization of and relations among various conscious and unconscious personal characteristics (psychological processes and states) of the subject. The interplay of these underlying instincts and motives is then presumed to be the primary determinant of behavior. For instance, disturbances in libidinal development and concomitant concerns about homosexuality might yield an "oral dependent" personality regarded by some psychoanalysts as a necessary precondition of alcohol and other drug problems. In any case, as a consequence of the assumption of innerdirectedness or psychic determinism of behavior, classical personality theorists expect consistency in the actions of individuals across situations.

Global theories of personality in the psychodynamic tradition have as their principal virtue a potential for enhancing our understanding of human experience. This attractive characteristic should not be overlooked since it is often absent from the more "scientific" theories of psychology. Nevertheless, the psychodynamic approach suffers from excessive dependence on isolated. unrepresentative, and unverified idiographic data. This shortcoming, coupled with extensive networks of assumptions and inferences about unobservable internal dynamics, has rendered such theories untestable and unsuitable for most predictive and other practical uses. Finding a referent for the psychodynamic term "addictive personality," for example, would simply be no mean feat.

Trait theories of personality, unlike psychodynamic ones, have been developed mainly from the study of large groups of adults from the normal population. Most posit a primarily congenital origin for traits (dimensions of personality like "extroversion"), though developmental contributions are theoretically possible. The method of trait theorists is to gather data pertinent

to a variety of human states, preferences, and behaviors using tests, questionnaires, and/or rating scales. The resulting scores are then factor analyzed and individuals' rank-order or position on a given trait factor or constellation of them provides a personality description or profile. These, in turn, can be correlated with other attributes or can be used to try to predict behavior.

From a scientific point of view, trait theories have a definite advantage over psychodynamic ones in their ability to make direct comparisons across subjects using common metrics collected in a standardized manner. However, it should be noted that both approaches share an assumption about the inner directedness of human behavior. The practical consequence of this orientation is that behavior is expected to be generally reflective of one's internal disposition, and hence, relatively consistent across a variety of situations. Moreover, these personality theories assume the existence of individual differences important in maintaining stable contrasts among people regardless of context. Persons scoring high on traits associated with addiction, e.g., should always be more likely to be abusing substances than those low on such traits.

While there are alternative ways of conceptualizing personality, e.g., by attempting to arrive at a consensus among observers as to what traits characterize a target individual, the other major force in theories of human behavior is really an anti-personality position termed "situationism." Mischel (1968) has championed this approach by pointing to the fundamental weakness of traditional personality theories, viz., their lack of predictive validity. Citing numerous studies to support his argument, he has contended that the assumption of cross-situational consistency in individual behavior is untenable. Instead of behaving in a stable fashion across time and circumstance, people tend to exhibit remarkable specificity (inconsistency), apparently as part of their

efforts to adjust to the unique demands of situations in adaptive ways.

According to situationists, heredity can for the most part only account for individuals' basic response potentials. Beyond this, situational demands, against the backdrop of earlier environmental experience and conditioning history, shape individual behavior. The assumption is one of outer directedness, i.e., the prepotency of the external stimulus configuration, with individual differences cropping up only occasionally to embarrass the paradigm. The primary method of situationist research is the experiment, which has as its goal the development of principles for predicting the behavior of groups of subjects or people in general (the nomothetic method). Implicit in this approach is the assumption that it is not personality that determines addictive behavior, but rather the stimulus properties and response options of the environment in which the individual finds himself.

The situationist or environmental determinism viewpoint, with its heritage of experimentation, has a good deal to be said in its favor. It has alerted us to the fact that behavior does not occur in a vacuum and has, through its application, permitted some impressive improvements in prediction. However, its total commitment to empiricism appears to impede the understanding that often comes only from going beyond that which is directly observable. Perhaps more important, the neglect of individual differences or "subject variables" may have resulted in the unnecessary assignment of some of the variance in predictive efforts to the error category. At least some consideration or reconsideration of the person and personality would seem warranted.

Noting that much of the psychologically interesting variance in human behavior may be found in the interaction between the person and the situation, a number of theorists and investigators (e.g., Endler & Magnusson, 1976) have

proposed an interactionist psychology of personality. This perspective is probably not novel, having forerunners in classical personality theory (see Ekehammar, 1974, for a historical review) and even in the "person variables" of Mischel's (1973) revision of the situationist position. Yet, its potential for improving not only the accuracy of behavioral prediction, but also our understanding of the behavior under consideration, remains largely untapped. The interactional approach seeks to supplant both the clinical psychodynamic/trait view (locus of causality in the person) and the situationist/structuralist view (locus of causality in the environment). It does this by positing that actual behavior is the product of continuous and multidirectional interactions of person variables and situation variables.

Acknowledging the importance of situations, interactionist theorists' attention to person variables is predicated on research. For example, in a classic study of personality, Bem and Allen (1974) showed "...that it is possible to identify on a priori grounds those individuals who will be cross-situationally consistent and those who will not..." (p. 506). This being the case, it would seem ill-advised to attend only to the assessment of the situation when trying to predict behavior. Among the factors to be considered is the relevancy of a predictor trait to a particular situation since this will probably mediate its predictive ability. It could make a difference, e.g., if one restricted the study of personality variables in addictive behavior to the cognitive realm (beliefs, attitudes, expectations) when individual differences in affective states, psychopathology, and/or general personality functioning were actually more pertinent to the situation about which the prediction was being made. Several recent reviews (Epstein, 1979; 1980) also have concluded that the reliability and predictive value of traits can be enhanced considerably

by indexing and testing them across an aggregate of subjects, stimuli/ situations, trials/ occasions, and measures, instead of depending on the "one shot" evaluations so common in personality research. Finally, again at the level of methodology, there is a need for some sort of combination of idiographic and nomothetic techniques (see, e.g., Bem & Funder, 1978; Kenrick & Stringfield, 1980), since the former may be more appropriate to person assessment while the latter has its role in the evaluation of situations.

In considering both personality and situation factors simultaneously we may discover, as Mischel (1977) has suggested, that individual differences strongly determine behaviors in certain (ambiguiously or loosely structured) situations, while strong influences in the immediate environment can overwhelm personality factors in others. Or, we may find that only particular kinds of person x situation interactions are important. In any case, an adequate evaluation of these kinds of propositions will be difficult to make unless researchers are willing to incorporate both experimental and subject variables which are theoretically meaningful in the same designs. Sadly, this avenue to achieve better understanding of basic processes, as well as better prediction from individual differences, has rarely been taken in personality research. Such neglect continues to impede progress in clarifying the role of personality in addictive behavior.

CONCEPTUAL ISSUES IN THE STUDY OF PERSONALITY AND ADDICTIVE BEHAVIOR

What can we reasonably expect to learn about the relation between personality and addictive behavior? So far, personal and situational variables have been discussed as the principal determinants of any behavior, and by deduction any addictive behavior. Each of these variables, however, can be analyzed further. For example, while personality is often viewed as the distinctive psychosocially-based behavioral tendencies an individual brings to a situation, it may also reflect genetically transmitted inclinations and propensities. Thus, several recent reviews of the familial alcoholism literature (e.g., Goodwin, 1979) have included considerable speculation about the possible role of genetic predispositions to alcoholic behavior. Other mainly physiologic aspects of individual differences, such as health or organismic status of the person, probably contribute to the likelihood of substance use problems too.

One cannot ignore the unique long- and short-term effects of situational factors either. Correlational studies by Cahalan and Cisin (1976), among others, have documented a powerful association between sociocultural variables (demographic characteristics, subcultural identification, etc.) and drinking patterns. At the same time, experimental research (e.g., Pliner & Cappell, 1974) has revealed how the immediate circumstances surrounding drinking (solitary vs. social) can exert a strong influence on the affective consequences of alcohol consumption. Finally, the environment can have a significant indirect impact or substance use by acting <u>through</u> personality, since social psychological elements represent a major component of the personality construct.

Almost regardless of the framework in which they are conceptualized, indi-

vidual differences clearly interact with addictive behaviors -- even when environmental conditions are held constant. Franks (1967), for instance, has shown that the psychological and behavioral effects of both stimulants and depressants vary across several dimensions of personality. Fisher (1970) reported similar findings, and Bachman and Jones (1979) found personality variables could be used to predict withdrawal symptoms following cessation of controlled administrations of cannabis. Moreover, despite the crucial role of learning in substance use, people still choose and perceive their learning environments in idiosyncratic ways. Thus, while recognizing the validity and utility of strictly biological and social/environmental factors, it is incumbent on us to determine the role of psychological personality variables in addictive behaviors. Analogous efforts are already underway in the exploration of bio-psychosocial interactions in physical disease processes (cf. Engel, 1977); and, an agent-host-environment model for the study of alcoholism was proposed over ten years ago (Mendelson & Mello, 1969). How then shall we proceed?

First, we must acknowledge two things: (1) Personality is a developmental and changeable phenomenon, never totally fixed but rather in continuous dynamic interaction with other factors including age, family, other people, culture, health, stress, and, substance use, to name a few. (2) Addictive behavior also has a temporal dimension in that it involves a number of distinctive, if not discrete and invariant, stages or phases. The practical implication of these two facts is that the interplay of personality and addictive behavior may take on wholly different complexions at different points in time. There is good reason to believe, e.g., that the personal reasons for one's initiation into substance use (e.g., susceptibility to social influence) may be vastly different from those personality factors playing a role in the maintenance of substance

abuse (e.g., gross psychopathology) at some later date. Thus, it appears there is still validity of Allport's (1937) observation that compulsive behaviors (such as addiction) tend to assume a "functional autonomy", whereby motives originally underlying a behavior often bear little relation to those contributing to its continuation. It is unreasonable to expect that ignoring the dynamic interactions of personality and addictive behavior in the temporal/developmental context can be done without sacrificing both understanding and predictive accuracy relevant to these phenomena.

Given the complexity and multivariate determination of addictive behavior, it would be relatively easy to defend the assertion that discovery of a definitive cause or causes for addictive behavior, whether involving personality or not, is highly unlikely. However, we should be cognizant of the fact that this is mostly because in the study of addictive behaviors we cannot ethically attempt to manipulate, i.e., directly experiment with, the variables of interest in order to create the problem. We do not "give" people certain personality characteristics and see if they become addicts; nor do we stimulate addiction and watch for personality changes. Hence, our etiological studies will always be correlational in nature. Conceding this restriction, however, it should be emphasized that an array of correlational methods is available and that each has a different level of inferential confidence associated with it.

The clinical method, utilized in the vast majority of addictive personality studies, is particularly susceptible to the problems of correlational research. Though it can take many specific forms, this approach has two main ingredients: (1) a clinical sample of "addicts," already identified by some other means such as a psychiatric diagnosis or simply their participation in a treatment program for substance use problems; and (2) one or more personality tests, which may be

structured (i.e., "objective" or having limited response options) or unstructured (i.e., "projective" or having little or no restriction on responses). Following administration of the personality measure(s) to the clinical group (and perhaps to a comparison group of "nonaddicts"), efforts are made to characterize an addictive personality. This may be done in several ways. First, a descriptive profile can be developed by rational analysis of addicts' test responses on the assumption that they directly correspond to the internal states, feelings, and traits of the individuals who made them. Alternatively, instrumental analysis seeks to distinguish the patterns of addicts' test responses from those of nonaddict comparison subjects on a strictly empirical basis, without inference about the meaning of the items themselves. Finally, substantive analysis presumes that test responses are indicators of personality constructs (theoretical entities hypothetically representing traits postulated to exist within people). Regardless of the method of analysis, if results show a respectable degree of relation between some aspects of personality description or test response pattern and addictive behavior, they are often interpreted as having revealed the crucial variable(s) underlying the substance use problem.

Problems with such a conclusion are manifold. The inherently selected nature of clinical samples and the usually unmatched comparison standards or groups make statistically significant findings relatively easy to obtain. Indeed, Pihl and Spiers (1978) have suggested an inverse relation between methodological rigor and the likelihood of obtaining differences in such studies; and, Keller (1972) has gone so far as to propose a law about research on the personalities of alcoholics: "The investigation of any trait in alcoholics will show that they have either more of it or less of it" (p. 1147). Cross-validation of demonstrated relations using new clinical samples might help

detect some spurious results, but many problems of interpretation would still remain. For example, if a given trait or profile associated with addiction were also correlated with everything from baldness to severe menstrual cramps, its explanatory value would be compromised.

The potential contribution of clinical personality studies of addicts to the understanding of etiological processes and/or the prediction of substance use problems in the general population is probably quite limited. The obvious though often overlooked reason for this is that, even if a particular personality trait or characteristic were to be reliably observed in clinical "addicts," it would be impossible to determine whether it preceded, followed, or developed simultaneously with the addictive behavior problem. Each of these competing interpretations about the sequencing of the variables of interest is quite feasible given the developmental nature of both personality and addictive behavior. For instance, it is not difficult to imagine that a depressed individual with low self-esteem might find drugs more attractive and might be more susceptible to social pressures to use various substances, and hence development of a clinical addiction problem would be more probable. On the other hand, experiencing chronic substance intoxication and a life of failure and disapointment secondary to substance abuse problems could easily lead to depressive low self-esteem as an end state. These two sets of variables might also complement each other as part of an insidious process of general deterioration. Such inferential uncertainties, coupled with a marked tendency toward serious methodological problems, appear to minimize the value of clinical studies for purposes other than personality subtyping as a possible aid in treatment planning.

Several alternatives representing efforts to disentangle the sequencing of personality characteristics and addictive behaviors have been utilized (cf.

Williams, 1976). One is the cross-sectional method in which the characteristics of different age groups of addicts are studied simultaneously (e.g., Williams, McCourt & Schneider, 1971). Here it is typically assumed that the consequences of substance use will be less evident in young addicts than old ones. A variation of this approach is the comparison of personalities of known addicts with those of former addicts now in remission, on the assumption that traits which are found in active addicts, but which are not present after long periods of abstinence, must be consequences of substance use (e.g., Kurtines, Ball, & Wood, 1978). Third, retrospective longitudinal studies attempt to uncover antecedent personality variables and other characteristics usually by examining archival data or by querying the addict and/or informed collateral sources about what the individual was like prior to the onset of substance use difficulties (e.g., Johnson, 1973). A problem all of these strategies have in common with the clinical study method is that they all begin with identified addicts and hence may confound personality antecedents with personality consequents. Other conceptual and methodological weaknesses specific to each approach, e.g., biased or incomplete reporting by subjects in retrospective studies, further erode confidence in these methods whose general characteristics already preclude direct inferences about cause and effect.

Prospective longitudinal studies, in which data on personality and other variables are collected on the same sample of the population at several points in time before and after any substance use occurs, represent the ideal correlational method. If appropriate measures are taken, they are capable of accurately specifying the sequence or evolution of personality and addictive behavior, though follow-ups must be sufficiently frequent and long-term if they are to capture the essence of these developmental phenomena. The prospective longi-

tudinal study also can avoid problems associated with sampling exclusively from clinical populations. However, cost and convenience often dictate the need to sample from populations not precisely representative of all potential substance users. The low baserates of serious substance use problems, e.g., may necessitate selection of subjects from groups thought to be at high risk for addictive behavior. On the other hand, the highest risk individuals (e.g., truants and dropouts) may be systematically excluded from studies because they are absent from or underrepresented in the "normal" institutions such as schools where data can be collected most easily. Attrition of subjects over time may also be biased because addicts often are the most difficult to track and to keep interested in participation. Even though the representativeness of samples faces such impediments, it far outstrips that of the methods discussed previously. And, despite the need to consider the impact of historical, cultural, and maturational changes on the variables of interest, the prospective longitudinal study still has the greatest explanatory and predictive potential.

With all the advantages of the prospective longitudinal study, it is important to reiterate that such research cannot be expected to produce complete explanations of addictive behavior or definitive statements about the causal role of personality in it. The results are only correlational, so that while temporal sequencing may be highly suggestive of causality, antecedent events do not in themselves explain subsequent events. There is always the possibility that some third variable or an interaction of variables is responsible for changes in both personality and addiction. Thus, it would appear wise to explore personality factors primarily in the context of other variables theoretically relevant to addiction, even when the prospective longitudinal study method is applied.

One promising route to better understanding and prediction is more careful attention to individuals' motives for substance use and to the function such use might serve for them in a given situation, psychological state, and point in time. Experimental studies, ideally those which consider individual differences along with situational manipulations, could make an important contribution to the elucidation of these factors (e.g., Lang, Searles, Lauerman & Adesso, 1980). But, at the broader level, the overall strategy needs to be one which is multivariate in nature. Selecting a specific personality trait, or even personality as a construct, and attempting to evaluate its unique impact on addiction in isolation from other potentially causative and interactive factors, seems ill-advised. To be meaningful, personality traits must be part of personality theories which, in turn, must be part of fundamental psychological theories incorporating biological and social variables.

The explanatory and predictive role of personality in addictive behavior is limited. As this review will show, no unique personality trait or profile is <u>necessary</u> for addiction in general, nor is one consistently associated exclusively with addiction to any substance(s) in a way which would suggest it is a <u>sufficient</u> cause. Moreover, even if a broadly defined personality "predisposition" to addiction were to emerge, two difficult tasks calling for multivariate strategies would remain: (1) discovery of the stressors or other factors which activate it, and (2) determination of why in some persons it leads to the choice of one substance, and in others, another. Related to this second issue of specificity is the possibility that the identified predisposition may have alternate outcomes other than substance use. Then, there would be a need to ascertain the reasons why some individuals with it have alcohol or other drug problems while others become video game "freaks," "workaholics,"

etc. The greater the specificity of the proposed role of personality in addictive behavior, the more prediction is impeded by the natural diversity of people. On the other hand, the greater the generality of the proposed role, the more one is forced to explain occurrences of alternative modes of expression for the personality trait, characteristics, or style.

In sum, while personality may be neither a necessary nor sufficient condition for addictive behavior, it is still capable of contributing to it. In order to understand what this contribution is, the extent of it, and how, when, where, why, and for whom it is made requires complex research strategies. A truly multivariate approach, couched in a comprehensive theoretical framework, appears to have the greatest potential for answering these questions. Such studies may call for more sophisticated techniques for data analysis. These might even include new and different (nonlinear) statistical and methodological tactics which individualize prediction for generally homogeneous subgroupings of persons and/or addictive behavior patterns. This could permit more precise analysis of interactive effects as well as better comparisons across subgroups (cf. Dunnette, 1976; Kandel, 1978). Unfortunately for purposes for this review, very little of the literature on personality and addictive behavior reflects application of these conceptual and research approaches. Moreover, as the next section demonstrates, the more specific methodological problems of most studies in the existing literature are often so severe that the findings are difficult to interpret even within limited conceptual frameworks. Hence, any conclusions drawn about the role of personality in understanding and predicting addictive behavior will be necessarily tentative.

METHODOLOGICAL ISSUES IN THE STUDY OF PERSONALITY AND ADDICTIVE BEHAVIOR

Personality and addiction, partly because they are constructs lacking clear definitions and having multiple dimensions, are exceedingly difficult to measure. Their developmental and interactive nature complicates this problem further. Yet, measurement is the sine qua non if we are to learn about these phenomena and the relation between them. The conceptual issues and broad investigative strategies discussed in the preceeding section are important. But, regardless of one's perspective, the conclusions drawn from research and their generalizability depend on each study's operational definitions, sampling procedures, methods and circumstances of measurement, and evaluative or data analytic techniques. The present section examines the extent to which research on personality and addictive behavior has dealt adequately with these considerations.

Operational Definitions and Measurements of Constructs

Ideally, the operational definition and measurement of complex constructs should involve a variety of dimensions and should also employ multiple measures using different measurement methods. This is especially critical if we are to draw valid conclusions about constructs involving psychological components (as personality and addiction do) because of the high level of method variance typically associatd with their measurement (cf. Campbell & Fiske, 1959). Unfortunately, most addictive personality researchers have ignored these principles. Instead, their tendency has been: (1) to select a specific dimension or set of dimensions without providing theoretical justification, and (2) to proceed to apply only one of the sometimes problem-ridden measurement methods described below.

Addictive Behavior Measurement

Whether one considers addiction in a univariate or multivariate framework, and whether one is concerned with use, abuse, or dependence, the addiction-relevant terms need operational definitions if they are to be measured. Even very simple and specific definitions are legitimate so long as conclusions drawn from research employing them are limited to the domains they tap. In any event, the particular method(s) for measuring the defined constructs may be important determinants of the results obtained.

Self-reports. Self-report methods are by far the most frequently used measurement techniques for assessing addictive behavior. The most common forms of this approach are interviews and questionnaires, with the latter including both group and individually administered instruments. Compared to alternatives discussed later, self-report methods are convenient and economical to apply, and often show a reasonable degree of reliability though obviously this must be evaluated in each case. Self-monitoring, i.e., the recording of self-reports by the individual as the behavior of interest occurs, may provide a check on the reliability (and increment the validity) of retrospective reports.

Validity is the major problem with self-report measures. In clinical interviews this is always a problem because of interviewer bias regarding inclusion/exclusion of relevant data. Even structured interview data are generally hard to interpret since published reports about them seldom provide sufficient detail on instrument construction, administration, scoring, etc. However, the most critical difficulty with self-reports is inaccurate reporting by the respondents in both interviews and surveys. Because of the stigma, illegality, and possible untoward consequences associated with detection of substance use and its effects, underreporting is an everpresent threat to

validity when respondents are identified. Despite evidence suggesting anonymity makes little difference to validity (e.g., Haberman, Josephson, Zanes & Elinson, 1972; Luetgert & Armstrong, 1973), some research supports concern about underreporting. For example, Hoan, Westcott, Vetovich, and Swisher (1974) compared data from separate interviews about either legal or illegal drug use with corresponding data obtained through anonymous surveys of the same population. They found consistent reporting of legal substance use across methods, but 23% less illegal drug use was acknowledged by those interviewed (identified) than by those completing the survey (unidentified).

Aside from intentional biasing, the validity of self-reports by very heavy substance users is also open to question because they may not be capable of accurate reporting due to brain damage, memory impairment, or other difficulties they suffer secondary to substance abuse. Normal forgetting, even in nonclinical populations can also compromise accuracy. Finally, a perpetual problem of survey-based research is its dependence on subject cooperation. Even if return rates exceed 80 or 90%, the probability that those most seriously involved in substance use are overrepresented in the nonresponding group is high. Hence, there is a potential undermining of the validity of both drug use prevalence estimates and conclusions about how substance use relates to other variables included in the survey. This is not to say self-reports should be discarded, but that the limits of the method should be realized and supplementary methods employed.

Collateral reports. One way the credibility of self-reports might be enhanced is by comparing them with reports of knowledgeable informants who are in a position to observe some indices of substance use in the target individuals. This specific method for assessing addictive behavior per se has not been used extensively, though longitudinal studies of adolescents (e.g., Kandel,

Kessler & Margulies, 1978) sometimes report sending questionnaires regarding other matters to parents. While parents appear to be relatively poor sources of information on their children's drug use (Kandel, 1974), one study (Smart & Jackson, 1969) has indicated that the estimates by classroom representatives of the marijuana use of their peers corresponded fairly well with self-reports of use by members of the same class. In any case, it is clear that collateral methods deserve consideration. Again, it is also worth noting that just as the reliability and validity of self-reports might be increased by self-monitoring, collateral reports could also be improved by having informants record data as the target behaviors actually happen.

Direct chemical testing for substances. It is logical to assume that if one wishes to know about the substance use of an individual, the most valid test of it may come through direct chemical analysis. Urine tests for opiates, e.g., can measure traces up to several days old. Though a useful corroborative indicator in certain situations, such detection methods are impractical in many others because of their cost, intrusiveness, etc. Moreover, most of these tests are timebound, measuring only very recent substance use. Some research (e.g., Hollingshead, Marlow & Rothberg, 1974; Hurst, Cook & Ramsey, 1975) has also suggested other flaws in chemical analyses and their application which lead them to underestimate or otherwise inaccurately identify substance use. Finally, chemical tests are not available for some substances of interest. While recent technological advances have remedied many of these problems, the expense, analytic skill, and difficulty in obtaining suitable samples for precision testing (Foltz, Fentiman & Foltz, 1980) appear to limit the applicability of chemical tests. They are probably most appropriate as a cross-check on self-reports and other data.

Physiological and psychophysiological measures. These measures differ from direct chemical tests in that they examine effects, i.e., responses and adap-

tations to the substances, rather than traces of the substances themselves. Miller (1976) has reviewed the validity of concurrent physiological measures in alcoholism, including tolerance/withdrawal symptoms and such variables as alcohol metabolism, galvanic skin response reactivity, and other effects of chronic alcohol ingestion (changes in hepatic function, memory, sleep, general metabolism, etc.). He concluded that these may be useful diagnostic correlates of excessive drinking, but cannot stand alone as prima facia evidence of alcoholism. In any case, the costs, including the time and subject discomfort involved, probably prohibit the widespread use of these methods despite the importance of individuals' physical condition or organismic state as a defining component of addiction.

Performance testing. Known effects of particular substances on performance of various psychomotor, intellectual, and other tasks can provide a basis for measuring substance use. Behavioral tolerance, demonstrated by unimpaired performance on complex tasks despite high substance levels in the blood stream (e.g., 200 mg of ethanol per 100 ml of blood, cf. Mello, 1972), would suggest extensive experience with the substance in question. Logistical problems of testing and difficulties in controlling for subject motivation, however, reduce the attractiveness of this method.

Archival data. One often neglected source of data on addictive behavior and its correlates is the records of public institutions. Information gleaned from (1) police/court reports of accidents, arrests, and convictions, (2) school reports of achievement, absenteeism, discipline and dropout, and (3) clinic/hospital records of illness, psychological problems, and subsequent treatments, can all provide corroborative evidence of the pervasiveness of substance use problems. For both practical and ethical reasons, however, it is sometimes tedious and difficult to obtain these data which are often incomplete and may

be totally lacking for some subjects, particularly those with the most severe problems. Nevertheless, besides validating self-reports and indicating the intensity of addictive behavior, archival data have some potential to provide clues about the etiology of substance use problems.

Direct observational measures. A final and obvious method of measuring addictive behavior is through the actual observation of it. This may be accomplished either in the laboratory or in naturalistic settings. Marlatt (1978) has identified a number of ways behavioral methodology can be employed in the laboratory to measure drinking behavior. These techniques could also be applied to populations other than drinkers. First, operant methods require subjects to perform some activity, from simple motor tasks to complex personal or social behaviors, in order to obtain the desired substance. The amount of work an individual will do to obtain the "pay off" is taken as an index of motivation for, or the reinforcing value of, the substance. Similar procedures permit testing of the relative potency of the substance as a reinforcer compared to other sources of reinforcement such as food, money, or social contacts. The operant methods parallel "real-life" situations in that the addict typically must put out some effort to get the substances he uses in everyday life.

Other behavioral measures of addiction include observation of individuals given free access to specific substances in a research setting. Their behavior may be studied for the brief, circumscribed period of an experiment or over the course of several weeks to investigate conditions related to various patterns of substance use and to determine subjects' routine intake. Finally, detailed observational and rating scale systems have been developed for the natural setting (cf. Reid, 1978). These methods permit unobtrusive recording of addictive behaviors, such as drinking, in the situations where they ordinarily occur. Of course, such measures may be easier to obtain for legal than for illegal

drugs.

Direct observational measures are generally difficult and expensive to obtain. Furthermore, unless the observation is unobtrusive, there is a distinct possibility that it will affect the behavior under investigation. These methods, however, appear to have a contribution to make in the delineation of individual differences related to addictive behavior.

Summary. There are clearly many ways to operationalize and assess addictive behavior. The point being made here is that single or collected self-report measures, regardless of their multidimensional nature, need to be supplemented with measures involving other methods if construct validity is to be increased significantly. Collateral reports and archival data would appear to be the most likely candidates for large scale investigations. Few prospective longitudinal studies have employed these alternatives to any great extent, though Kandel et al. (1978) queried parents, and Jessor and Jessor (1977) collected information on academic performance in their studies of student drug use. One clinical study of heroin addicts (Platt, 1975) was also exemplary in its requirement of multimethod criteria (agreemeent of diagnostic interviews, medical and arrest records, and self-reported addiction of minimum 6 month duration) for subject inclusion. Beyond these efforts, the selective utilization of at least several other methods (e.g., chemical tests and performance testing) on a randomly or specially chosen subgroup of the larger sample under study would be highly desirable. In short, it is maintained that the common practice of defining addictive behavior solely in terms of self-report and/or involvement in some sort of treatment program is no longer defensible. It simply does not do justice to the complexity of substance use phenomena nor the variety of people involved in them.

Personality Measurement

A comprehensive analysis and critique of personality measurement is well

beyond the scope of this monograph, and others have already performed the service with some eloquence (e.g., Wiggins, 1973; Sechrest, 1976). Thus, only a few comments are made under this heading. Many of the same general methods and criticisms discussed in connection with operational definitions of addictive behavior apply to personality measurement as well.

The nature of personality measures (tests). With very rare exceptions (e.g., Smith & Fogg, 1978), personality measures used in systematic research on addictive behavior have involved subjects' completion of questionnaires and personality tests almost exclusively. There are other ways to measure personality (e.g., peer ratings, behavioral analysis, and other observation-based approaches), but apparently the convenience and tradition of individual self-report methods mas made them the overwhelming favorite. However, as self-reports, these measures are susceptible to all the weaknesses associated with overreliance on self-report methods for assessing addictive behavior--and more. Multimethod evaluation is especially critical in personality and addiction research because the role of personality as a causal factor, as well as a complex construct in need of description, is often being scrutinized.

For the most part, questionnaire and personality test methods use one of two strategies mentioned earlier: empirical or construct. Empirical approaches, in their purest form, are concerned only with criterion correlations. Test items are selected or retained solely on the basis of their ability to predict or correlate with some criterion behavior of interest. For example, special MMPI scales for alcoholism have been developed by administering the entire inventory to samples of alcoholics and nonalcoholics to determine which items can be used to discriminate between the groups. In empirical tests, the items often have low face validity (i.e., bear little surface resemblance) rela-

tive to the criterion behavior and consequently the tests are sometimes labeled "indirect." This discrepancy is presumed to reflect our lack of knowledge about how test response verbal behavior relates to other behavior outside the test situation. The item "I like to cook." (true or false), for instance, is on a special scale for alcoholism (MacAndrew, 1965) because alcoholics and neurotics respond to it in different ways. Understanding why responses differ on this particular seemingly irrelevant item is incidental to the criterion correlation goal of the empirical test. Often, however, theorists may propose explanations through content and factor analysis of the items and subsequent development and testing of the inferred personality traits (e.g., Finney, Smith, Skeeters & Auvenshire, 1971).

In any case, there are two important things to remember about the application of empirical personality tests: (1) Unless the users explicitly indicate that they view test responses only as samples of verbal behavior, they usually implicitly assume the items represent signs of internal personality characteristics which are elements of or determinants of the criterion behavior; and (2) As measures, these tests are only as good as the validity of the criteria with which they are being correlated. If, for example, the criterion behavior is alcoholism, but its operational definition is poorly conceived and/or unrepresentative (e.g., based on self-report or participation in alcoholism treatment only), then the test will probably be of limited utility.

Construct approaches by definition assume that item responses on personality tests represent manifestations of an underlying personality construct. However, construct approaches focus on specifying or understanding that underlying trait or quality, rather than on correlations with criterion behavior. Personality constructs generally refer to some attribute which is not fully

"operationally defined" because no criterion or universe of content adequately captures its essence. Nevertheless, scores on personality construct tests, e.g., the Personality Research Form (PRF; Jackson, 1967), can be correlated with behaviors such as substance use for purposes of description or prediction as well as construct validation. It should be reiterated, however, that when such efforts are made they too will be limited by the adequacy of the criterion, just as was the case with empirical tests.

Uses of personality tests. Whether empirical or construct, the two main applications of tests for investigation of personality factors associated with addictive behavior are in clinical studies and predictive studies. In clinical studies, differences between the test results of identified substance users and nonusers are analyzed in an effort to identify unique attributes of users. If these differences are robust, they may be useful in the later diagnosis and classification of new, mixed groups of individuals when alternative methods for identification are unavailable, uneconomical, difficult to apply, and/or are of questionable validity for some reason. Results of clinical studies may also provide some basis for the understanding of personality functioning in addicted individuals. Whatever the application, however, it is important to note the contemporary character of clinical studies. They are useful primarily as descriptors of persons who are already experiencing addictive behavior, which was or could have been measured by some other means. Obviously, what is described may be an effect or simple correlate of substance use rather than its cause.

Predictive studies involve the measurement of personality sometime prior to the onset of addictive behavior. Most often the subjects are subsequently followed over time so the development of substance use can be monitored. Then,

earlier personality measures are correlated with later data on addictive behavior to determine which personal qualities or characteristics appeared to contribute to "addiction proneness." Here, the traits of the "pre-addictive personality" might be analyzed and compared to those found in individuals not developing problems to enhance our understanding of how personality is involved in sustance use. An interesting corollary approach would be the study of traits which appear to insulate people against addiction.

Selection of personality tests. There are literally thousands of personality tests, both objective and projective, purporting to characterize the whole of personality, to measure psychopathology, and/or to identify specific needs, attitudes, values, propensities, moods, etc. which might be related to addictive behavior. Other psychological tests are alleged to measure intellectual functioning, perceptual processes, and various attributes which are regarded by some as elements of personality and possible correlates of substance use. How does one choose and evaluate the best test for clinical description or longitudinal prediction? In the construct approach, a theoretical rationale for selection of some particular trait(s) as primary should be provided, (though often it is not). Regardless, just as in the empirical approach, there will be a need to demonstrate that the test works. But then, what exactly does "works" mean?

First, a test must be appropriate or applicable for the entire population of interest. In other words, it should not discriminate against some subgroup in the way many have maintained that commonly used intelligence tests are unsuitable for Blacks. Everyone to whom one wishes to apply the results of a study must be represented in both the study at hand and the standardization sample used in developing the test measures if test norms are to be the basis

for comparison.

Second, the test should be reliable, i.e., it should provide consistent results. Reliability can be determined in a number of ways, but for purposes of addictive personality research, the criterion of relative constancy of measurement over time and testings should suffice. Some perspectives on personality would permit exceptions to this if an individual has experienced developmental events believed to be capable of altering basic patterns of personality. Changes in test results occurring rapidly and/or without dramatic circumstances, however, would lead to the conclusion that the test is unreliable or that it measures states rather than traits.

Finally, validity or the ability of a test to measure what it says it measures, is essential. One very significant type of validity is "criterion-related validity," which can take two forms. When independent assessment devices are found to be measuring the same thing at the same time, they are said to have "concurrent validity." An example would be the essentially simultaneous identification of addicts using an indirect personality scale and self-report measures of addictive behavior. Obviously, concurrent validity is most relevant to clinical studies. On the other hand, "predictive validity" refers to the ability of a measure to predict the occurrence of the criterion behavior of interest at some time in the future. Showing, for instance, that scores on a rebelliousness scale obtained in junior high school correlate highly with the same individuals' initial use of marijuana some years later would provide evidence of predictive validity. Predictive validity is clearly more difficult to demonstrate, but offers greater utility both in practical and theoretical terms.

Another perspective on validity is the convergent/discriminant validity

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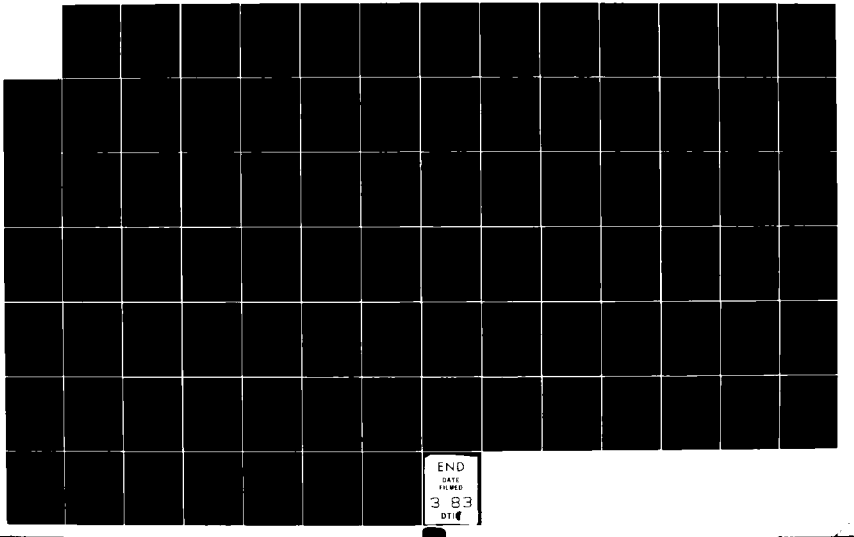

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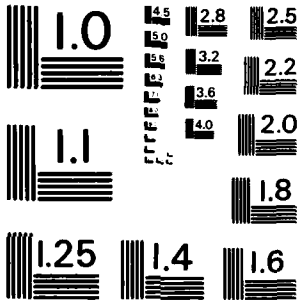

MICROCOPY RESOLUTION TEST CHART
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dichotomy. The most common way to think of test validity is as the correlation between a test score and some independent indicator of the criterion behavior. This is "convergent validity." "Discriminant validity," however, is quite important to establishing the exclusiveness of a construct like "addictive personality." A personality trait which is highly correlated with substance use, but not with anything else (e.g., delinquency, gambling, sexual promiscuity, etc.), would have a high degree of specificity and hence high discriminant validity. On the other hand, if a trait correlated with substance use and also with a marked inclination toward self-indulgence, criminality, general maladjustment, etc., it would lack discriminant validity, and at best would characterize a general tendency toward addictive behavior. Obviously then, additional explanatory and causative factors specific to substance use would need to be identified.

Problems of personality tests. Difficulties with applicability, reliability, and the various forms of validity, of course, threaten the utility of personality tests. But, what factors might contribute to these and other problems?

We know that situational and environmental variables account for a large portion of the variance in behavior, and since test-taking is a behavior, it should be influenced accordingly. While data concerning the specific effects of setting on test results are lacking, it would be logical to assume that individuals being evaluated in police stations, schools, clinics, or their own homes might respond somewhat differently in each place. Perhaps these differences would reflect their inferences about the purposes and implications of the testing, and the consequent mental sets or motivations could distort responses in specific ways.

There can be little doubt that intentional distortion and other sources of

invalidity are both possible and evident in personality testing. The use of empirical tests with low face validity can help reduce such problems to below the level seen in self-reports of substance use, but difficulties still remain. Teasdale, Segraves and Zacune (1971) showed that the profiles of addicts whose identities were associated with their responses to a personality test turned out more benign than those produced anonymously by addicts from the same sample. In a similar vein, the common use of test administrators and scorers not blind to subjects' condition introduces the possibility of "experimenter bias" (Rosenthal, 1969). Research on both manipulated instructional sets (Hoffman & Nelson, 1971) and confusion over instructions when addicts cannot decide if they are to respond as "intoxicated" or "drug free, sober" (Henrigues, Arsenian, Cutter & Samaraweera, 1972; Partington, 1970) suggest a potential role for experimenter and respondent alike in producing unreliable and/or invalid test results.

One approach to coping with distortion and invalidity problems is through inclusion of indices of them right in the personality assessments. The MMPI and a number of other tests include such features, though even these "validity scales" can be circumvented by sophisticated respondents (Kroger & Turnbull, 1975). While the successful validity scale might permit selection of only "good" scores for analysis, it should be noted that such selection is not without liabilities. First, it introduces a source of subject attrition which may also reduce the representativeness of the samples utilized in the study. This, in turn, diminishes the instrument's coverage, i.e., its ability to classify all cases of interest. For example, Lester and Narkunski (1978) found 44% of their heroin addict subjects produced invalid profiles on one or both personality tests used in their research, and hence could not be described.

Second, the accuracy figures or classification and description might be distorted by excluding invalid profiles from analyses. This is especially problematic if, as is often the case, exclusions are not equally distributed across addict and comparison groups (cf. MacAndrew, 1979; Wallace & Hinder, 1974). Some researchers (e.g., Apfeldorf & Hunley, 1976) have challenged the significance of invalidity exclusions by showing the discriminating power of an MMPI alcoholism scale was not diminished much by including invalid profiles, but the potential for problems is still evident.

Reliability and validity might also be affected by the time of the testing. In clinical studies, testing is usually done only once, very shortly after admission to treatment facilities. Unfortunately, available data (Libb & Taulbee, 1971; Page & Linden, 1974) suggest that, at least where alcoholics are concerned, a waiting period of two weeks or more should precede testing if results of personality assessment are to be stable. Apparently, detoxification is incomplete and/or the events leading up to the admission so intense that signs of psychopathology are significantly higher on early than on later testing.

Summary. Clearly, personality measurement is not without its problems. An infusion of multiple methods, perhaps including physiological and behavioral indices to supplement self-reports would be helpful to construct validity. Likewise, more careful attention to the legitimate uses of data from clinical (concurrent validity) and predictive studies is advised. Special consideration of discriminant validity is also essential for evaluating the generality-specificity of any addictive personality construct. Ideally, tests should be selected for their theoretical relevance and employed in such a way that problems of extraneous influence, distortion, and invalidity are minimized.

Sampling and Comparison Groups

Selective sampling. Assuming one has identified an adequate set of criterion measures and predictor variables relevant to addictive behavior and personality, the next step is to select population samples for testing and measurement. The most common source of subjects for addictive personality studies is institutions. Reasons for this choice are obvious: easy access, convenient data gathering, and (in clinical studies) presence of confirmed substance users. But, exclusive dependence on institutionally-identified persons is accompanied by serious compromises in the interpretation of research data. The severity of problems associated with samples from institutions, of course, is a function of the nature of the institution and the method of sampling. These factors tend to vary with the type of study.

Longitudinal studies concerned with personality and addictive behavior often sample from schools. Schools represent a fairly broad-based cross-section of "normal" populations and hence are more representative than, e.g., prisons which cater to special groups. However, school samples are not without problems. First, schools demand a reasonable level of social adjustment, and the restrictiveness of this requirement and other correlates of school involvement tend to increase as the level of schooling increases. Exclusion of absentees and dropouts reduces the representativeness of samples, and research has shown that each of these groups has a higher than average rate of illicit substance use (Smith & Fogg, 1976; Johnston, 1974). Differential user-nonuser attrition rates in follow-ups also compound problems of representativeness. At the college level, the undue homogeneity of school samples is particularly critical. College students have a relatively narrow range of IQ, distractibility, impulsivity, etc. which diminishes the predictive power of these personality-relevant characteristics. While the ideal of probability sampling (i.e., an

equal chance that each individual in the population of interest will be included in the sample) is rare indeed, even for simple surveys (e.g., Cahalan, 1970), it needs to be utilized more widely if generalizable results are to be obtained.

The sampling bias of clinical studies tends to be much worse than that of longitudinal research. In excess of 90% of the clinical studies reviewed for this report employed subjects who were hospitalized or at least in some form of institutionally-based treatment. Individuals who are "in treatment" comprise a group which is unique in many ways and may be grossly unrepresentative of the general population of substance users. First, it is important to note that "in treatment" addicts, whether attempting to meliorate their substance abuse problems or serving time for drug-related offenses, are there because they have problems. Whether these problems are a cause or effect of addictive behavior is a moot point. In either case, they are correlated with substance use <u>for these individuals</u>. But, are identified problems typical of everyone engaged in addictive behavior? It is an empirical question, however anecdotal reports suggest that addicts who admit to problems are the exception rather than the rule. Regardless, the fact that having problems led to "in treatment" status which, in turn, led to inclusion in addictive personality research, has important implications for interpretation of clinical studies.

To illustrate these problems of interpretation, consider the clinical studies of addicts, employing the MMPI as well as some of its special scales. Reports from such research have frequently characterized alcoholics in treatment as "psychopathic" or antisocial characters, sometimes having depressive or neurotic features (cf. Megargee, 1982). Some (e.g., MacAndrew, 1979; 1981) have further suggested two subtypes of alcohol and drug abusers: 85% characterological "unstable extroverts" (pleasure seekers) and 15% depressive

"neurotic introverts" (pain avoiders), classifications reminicent of those observed by Whitelock, Overall, and Patrick's (1971). Given such descriptions, one could easily trace the likelihood of "in treatment" status and the proportional representation of subtypes in clinical samples to associated problem behaviors. Antisocial personalities are highly visible troublemakers with a propensity for authority, legal, and family conflicts which often occur in connection with substance use. When such problems do occur, the likelihood of institutional treatment specifically related to addictive behavior is high. Hence, antisocial personalities may be overrepresented in clinical studies. Neurotic depressives, on the other hand, generally attract little attention to themselves. Their substance use problems need to be extraordinary for them to be assigned to treatment for addiction. Thus, they may be underrepresented in clinical populations.

A related issue is that of the impact volunteering for treatment has on the representativeness of clinical samples. A number of studies have compared the tested levels of psychopathology of volunteer alcoholics (McArdle, 1974) and heroin addicts (Gendreau & Gendreau, 1973; Penk & Robinowitz, 1976) with those of persons coerced into treatment for substance use problems or those remaining on the street despite such problems. Results suggested that persons volunteering for treatment either actually have more psychological problems or at least are more willing to report them. In either case, the overreliance on addict volunteers in treatment appears capable of distorting the picture of personality characteristics of those involved in addictive behavior.

Other methods of identifying known addicts for research purposes need to be developed. Some could be derived from comments made in the earlier section on "addictive behavior measurement." Other available options include adver-

tisements, personal referrals by persons with knowledge of addicts (Becker, 1968), recruitment in areas where substance use is prevalent (Allen & West, 1968), and demographic quota sampling (Chein, Gerard, Lee & Rosenfeld, 1964). Probability sampling could also be utilized. Obviously, none of these methods is fool proof (all require subject cooperation) and some are more broadly representative than others. However, each offers an increment in the opportunity to study personality variables in relation to the addictive behaviors of persons not necessarily, by definition, suffering emotional and/or legal problems. Less reliance on selective (particularly restricted institutional) sampling is essential to better understanding and prediction of addiction and its personality correlates.

Comparison groups. Once measures of addictive behavior and personality are collected on some sample, they have meaning only in a relative sense. In other words, results need to be compared to those obtained using some other group(s) if legitimate conclusions about the significance of the data are to be drawn. Thus, in his review Craig (1979) called it "astonishing" that 40% of the personality studies on heroin addicts were interpreted without reference to any specified external referent. Another 9% were compared only to test norms, a totally inappropriate strategy since the tests' standardization samples invariably did not include identified heroin addicts. In any case, Craig's figures square nicely with the finding of this review that just over half the clinical studies employed no comparison group at all. The results of such research are of little value except perhaps in hypothesis generation. The same can be said of retrospective longitudinal studies which do not include control groups.

When comparisons have been made in addictive personality research, they

typically have employed one or more of the following groups: college students, other normals such as hospital staff or community groups, groups addicted to some other substance, physical/psychiatric illness patients, and prisoners. The obvious question which arises in connection with these comparison groups is to what extent do they introduce additional sources of variance, other than addictive behavior itself, which might contribute to different personality test results? To answer this question one must understand the factors which could influence group differences in personality assessment and in addictive behavior diagnosis. We have already seen that volunteering for treatment might be a biasing factor. Another potentially quite important, but difficult to control, factor is access to the substance(s) of interest. Accessibility or availability of alcohol and other drugs is enmeshed in a complex array of demographic and social variables, yet must be controlled because it is obviously a necessary prerequisite for substance use. Moreover, because it is correlated with certain characteristics of the individual, his reference group, and his environment, it may also be associated with personality test results.

Age and intelligence have been shown to correlate with personality test results of alcoholics (Hoffman & Nelson, 1971) and thus they must be controlled too. Age is especially critical when comparisons are made among groups of addicts since the average age of alcoholic samples is in the 40s, while for most illicit drug users it is in the 20s.

Race is another demographic variable which apparently must be controlled. A number of studies show systematic racial differences on both construct personality tests (Sutker, Archer & Allain, 1978) and empirical tests (Penk, Woodward, Robinowitz & Hess, 1978), using polydrug abusers and heroin addicts, respectively. Zager and Megargee (1981) also found that MMPI special scales for

alcohol and drug abuse showed systematic racial bias in a youthful offender sample. As was the case with age and intelligence, the direction of racial bias in psychological tests has not always been clear, but it seems to be an ever-present danger. Marital status and personality test results in addicts reveal a similarly complex pattern of interrelationships (e.g.,Hoffman, Jansen & Wefring, 1972).

A host of other variables might be candidates for matching across addict and comparison group because they predict differences in personality test results and/or addictive behavior. Among these are socioecnomic status, educational level, religiosity, criminal record, cultural background/ethnicity, health status/history, peer/family relations, etc. Finally, gender could be a critical factor. It obviously affects MMPI test results because a separate profile is used for each sex. This variable was not mentioned earlier because it rarely comes up in addiction research--the vast majority of studies have been done using only males as subjects. Whatever the reason for this bias, when research does include both sexes, control for gender will probably be necessary.

The challange for researchers is to discover which extraneous group differences make a difference so that they can be eliminated as sources of variance. Boscarino (1979), e.g., showed that controlling for sex, age, income, marital status, and education effectively eliminated differences in the prevalence rates of "abusive drinking" between veterans (11%) and nonveterans (5%). Two important, exemplary studies of personality factors in "addiction proneness" by Gendreau and Gendreau (1970) and Platt (1975) also showed that systematic personality differences between heroin addicts and comparison groups were all but eliminated when factors like age, IQ, socioeconomic status, criminal record, educational achievement level, religion, marital status and opportunity for drug

use were either matched for or statistically controlled (by analysis of covariance), respectively.

In summary, most clinical studies in the published literature fail to attend to even the simplest of matching procedures when selecting comparison groups. However, even sophisticated attempts at matching may be inadequate because one can never match for all the potentially important variables, given the post hoc nature of such research. As a result, clinical studies are of limited value in determining the role of personality in addictive behavior since tested differences are likely to reflect factors other than those attributable to personality. Empirical studies suffer a related problem in that their ability to distinguish addicts from one group (e.g., neurotics) may compromise their ability to differentiate addicts and another group (e.g., criminals). This limited discriminant validity minimizes what can be learned about personality contributions to addictive behavior through the study of already addicted individuals. Longitudinal studies, while much more difficult to carry out, have far greater potential for understanding and prediction.

Miscellaneous Design and Analysis Considerations

A few methodological issues remain which did not fit neatly in one of the preceding sections. Most apply to design and conduct of clinical studies, with a few comments pertaining to data analysis. These are briefly summarized below without comment or pertinent citations.

1. Adequate research design for group comparisons demands that the number of subjects studied be sufficiently large to rule out significant biasing by theoretically meaningless idiosyncracies of one or more individuals. Moreover, to the extent possible all subjects should be treated in a like manner. Designs must not create systematic (but spurious) differences between groups, whether by

intentional (e.g., one group gets paid and the other does not) or unintentional (e.g., test administrators/scorers are not blind to subjects' group and hence may behave differently toward each) actions.

2. The ability of empirical tests to discriminate clinical populations from comparison groups should be expressed as percents of accurate classification and data on rates of false positives and false negatives should be provided so the costs of each of these types of errors relative to the benefits of using the test may be evaluated. Simple presentation of mean differences between clinical and comparison groups, even when accompanied by statistical significance data, is inadequate for most practical purposes.

3. In the development of empirical tests, attention to baserates of the phenomenon of interest in the comparison group is essential. Data on the accuracy of classification may be distorted if the comparison group is not large enough to be expected (on a probablistic basis) to contain a number of true positives equal to the number of subjects in the clinical group.

4. Before the adequacy of an empirical test is established, it has to be crossvalidated on a new sample totally independent of that used in its development.

5. Statistical procedures applicable only to random samples should be used only when random selection has occurred.

6. Selection of legitimate statistical procedures sometimes involves subjective factors which might influence outcomes (e.g., in subtyping groups through factor analytic or related techniques). When this is the case, investigators are obliged to justify their selection of data analysis methods.

Summary

Methodological problems in the existing literature on personality and

addiction severely limit the conclusions which can be drawn from it. Particularly critical are inadequacies in the operational definitions and confounds in the measurement methods for the basic addictive behavior and personality constructs. Selective, unrepresentative sampling from the populations of interest and ill-conceived group comparisons also plague interpretation of research results. Finally, design and analysis flaws further erode confidence in the validity of reported findings. All these problems do not, however, rule out a potential role for personality in understanding and predicting addictive behavior. They simply make it impossible to determine much about what that role might be at this time.

HIGHLIGHTING OF THE PERSONALITY AND ADDICTIVE BEHAVIOR LITERATURE

As indicated in the introductory paragraph of this paper, its purpose is not to provide an exhaustive or comprehensive review of the literature on personality and addictive behavior. There is simply too much of it. Instead, the stated goal was to apprise the reader of the issues and problems in research seeking to explore the viability of an "addictive personality" construct and to summarize the findings from broad areas of the relevant literature. The important conceptual issues and methodological problems have now been detailed, so the task that remains is to highlight the empirical evidence.

Several major principles guided this literature summary and each should be made explicit. First, the review was organized around alcohol, marijuana, and heroin as the preferred or primary substance used by the target individuals. These three drugs have been the most widely researched and represent a cross-section of substances ordinarily identified with addictive behavior. At the same time, it is important to note that the research on these drugs differs in potentially critical ways. Alcohol and heroin research, e.g., has a relatively long history and has been conducted mostly with severely addicted subjects. In contrast, the great majority of marijuana and other nonopiate drug studies took place in the late 60s and early 70s and focused mainly on simple use by adolescents and college students.

At a second level of organization, two basic types of research on personality and addictive behavior have been recognized: longitudinal and clinical. A sampling from both types was made, but with a decided emphasis on longitudinal studies, where they were available. This choice reflects the opinion that such studies are the most informative, providing data on preaddictive personality characteristics as well as individual attributes present in clinically

addicted persons. In any case, information and conclusions from major published reviews were relied on heavily for all but the most recent studies.

Finally, the general tenor of this selective review section is one which might be termed the "Carl Rogers approach." That is to say, the studies covered are merely described and summarized, with little comment or conceptual/methodological critique. Presumably, to the extent that the analysis presented to this point has been successful, the reader will be sufficiently well aware of the multiplicity of issues and problems to be able to assess and evaluate their implications for himself/herself.

1. Alcohol

Alcohol consumption is, of course, a legal activity in U. S. society and as such it differs from the use of other substances to be discussed, though many alcoholics abuse other drugs as well. (See Freed, 1973, for a review.) It is also a substance whose use is normative, with the great majority of adults being at least occasional imbibers. As a consequence of these two facts, "problematic use of alcohol" is far more likely to be defined in terms of quantity used and attendant problems than is the case with illegal drugs for which any use may characterize one as having an addictive behavior problem. Applying the quantity-consequence criterion, a probability sample survey by Cahalan and Room (1974) described 15 to 43% of adult males and 4 to 17% of adult females as having at least some drinking problem. With such a large portion of the population accounted for in these figures, one might anticipate that finding specific personality factors relevant to problem drinking would be difficult. Reducing the numbers by tightening requirements for inclusion may help somewhat, but any behavior problem directly affecting an estimated 10 million individuals is bound to involve considerable diversity across personality dimensions. Yet

clinicians and other observers see some commonalities in the personalities of alcohol abusers. What might these be?

Longitudinal Studies

Prospective. Though there were some earlier attempts at retrospective self-report (Wittman, 1939) and archival demographic (Wahl, 1956) studies of alcoholics, the first major prospective longitudinal study to look at precursors and developmental factors in alcoholism was by McCord and McCord (1960; 1962). These psychoanalytically-oriented researchers used trained social workers in a 5 year observation from 225 lower class Boston boys (age 9-14), their families, and others with whom the boys had frequent contact. Archival data were also obtained. Twenty-nine of the boys later developed alcoholism problems as defined by community records of alcoholism referral/treatment or more than one arrest for public intoxication. Their personalities were compared with those of 158 boys who had no alcoholism or criminal record. The prealcoholic boys were characterized as active, self-confident, lacking abnormal fears, high in unrestrained aggression, somewhat sadistic, sexually anxious, and disapproving of their mothers. The authors interpreted these findings as suggestive of a facade of intense masculinity with underlying dependency conflicts. Based on a later follow-up study (McCord, 1972), including 11 more boys who as adults now fit the alcoholism criteria, the McCords hypothesized that a poor self-concept born of maternal ambivalence, weak parental expectations, and less affectionate mothering, may predispose boys to alcoholism.

The next significant longitudinal study was that by Jones (1968) who followed predominantly middle-class children in the Oakland Growth Study through three assessments (junior high, high school and adulthood). As adults (aged 38-43) all 52 of the subjects were classified as problem, heavy, moderate or

light drinkers, or abstainers, using detailed frequency data from two self-report interviews and medical records to arrive at categorizations. Results of California Q-sort personality measures, interviews, observational ratings, and projective tests showed the pre-problem drinker boys were more expressive, hostile, limit testing, self-indulgent, undercontrolled, and less fastidious than the other groups. These ratings were consistent across the three assessments. The authors noted no evidence of depression, isolation, self-pity or destructive urges in pre-problem drinkers.

Jones (1971) also examined female subjects from the Oakland Growth study and found that extreme groups (later problem drinkers and abstainers) shared traits suggesting inadequate coping mechanisms. Heavy drinking women were social but manipulative as girls, while moderates and lights shared positive social attributes. The point here seemed to be that women with extreme patterns of either drinking or nondrinking exhibited a comparable rigidity or lack of flexibility which has often been cited as a precursor of maladaptive behavior of many kinds.

Robins, Bates, and O'Neal (1962) selected a cohort of 524 white children who were referred to a child guidance clinic for behavior problems, comparing this group with a normal public school sample. Agency records were the primary data source for descriptions of the children, all of whom were interviewed as adults. Comparing the 15% of problem children who later had serious alcohol problems (three times as many males as females) with problem children who did not, the former group was found to have a history of antisocial behavior often serious enough to yield legal consequences. They also differed on a number of childhood sociocultural and demographic factors and measures of their parents' adjustment, suggesting multiple causality of alcoholism. The selection of

persons with childhood behavior problems as having high risk for problem drinking was supported by the almost 4 to 1 ratio of later alcoholism in the problem child vs. the normal child sample.

More recent prospective longitudinal studies have shifted toward prediction of problem drinking in the adolescent and college years, rather than advanced stages of alcoholism in later adulthood. These projects typically have assumed a broader social psychological perspective in which personality variables play just one part along with behavioral, sociocultural, and other environmental factors. Often the use of drugs other than alcohol has been measured simultaneously. Different age groups have been followed for various periods of time in such studies.

Kellam and his colleagues started by collecting data on 705 first graders in a poor, black Chicago neighborhood and then these children were reexamined at four points in a 10-year follow-up (Kellman, Ensminger & Simon, 1980). Criterion measures were any use of drugs (from a list of 13 including alcohol and tobacco): (1) ever, and (2) within the last two months. Frequency data were taken on the second measure and heavy, moderate or no use scores were derived. Predictor variables included teacher ratings of "social adaptation status" and tested scores for IQ and school readiness. Results showed heavy (frequent) drug use was predicted by high IQ and/or school readiness scores (for both sexes), by being male, and by rated aggressiveness (as opposed to shyness). The best adapted first graders were most likely to be moderate drug users as adolescents. Generally, these outcomes were clearer for males and were to some extent mediated by involvement in antisocial behavior as a teenager.

In a report dealing exclusively with the development and onset of ado-

lescent drinking and its psychosocial correlates, Jessor and Jessor (1975) discussed findings of a four year study of 432 junior and senior high students. Self-reports of drinking behavior at each of four points were collected along with personality, perceived social/environmental, and behavioral system measures. A theoretical framework of "transition-proneness" was supported by data showing that the onset of drinking correlated with personality measures indicating lower value on achievement relative to independence (= unconventional), lower expectations for success, higher tolerance for deviance, lower religiosity, and reduced perceptions of drinking as negative. Interacting social-environmental and behavioral systems also were implicated. From a developmental point of view, unconventional patterns of motivation, alienation, and a minimum of personal controls tended to be increased by initiation into drinking. In other words, they changed with, as well as predicted, the onset of drinking. It was also noteworthy that involvement in other "deviant" behavior (sexual experimentation, marijuana use, activist protest participation) correlated with problem drinking in this population. These findings supported a psychosocial commonality in the basis for each of these fairly common expressions of adolescent assertiveness or striving for autonomy. This study essentially replicated earlier work by Jessor, Collins and Jessor (1972). Later theorizing by Jessor (1978) and Jessor and Jessor (1977) further suggested individual difference correlates of "problem" vs. "normal" drinking may lie in the extent of deviance proneness, as described above, coupled with the <u>functions</u> of alcohol use (e.g., to escape or cope with problems) and the <u>pervasiveness</u> of reasons for drinking in one's life.

The preceding sample of prospective longitudinal studies of drinking reflects remarkable diversity in the populations studied, methods of measure-

ment, and theoretical perspectives. Particularly salient are differences in the psychopathology orientation and interview/observation methods of early research, contrasted with a later focus on cognitive aspects of personality (beliefs, values, expectations, etc.) in a psychosocial framework using survey methodology. Despite the mix, one might discern a pattern of nontraditional/ unconventional values and nonconformist acting out behavior patterns in those most prone to substance use. Whether these characteristics are a manifestation of underlying conflicts, reflect a need for stimulation, represent a rejection of the dominant society or are indicative of some as yet unspecified variable, the commonality is striking. The ability of such a vague predisposition to predict alcohol problems specifically, however, is suspect.

Retrospective and other life history approaches. One series of retrospective longitudinal projects was based on the serendipitous discovery that 100 alcoholics in two Minnesota treatment facilities had taken the MMPI an average of 13 years earlier while freshman at the University of Minnesota. In the first two studies (Kammeier, Hoffman & Loper, 1973: Loper, Kammeier & Hoffman, 1973) about one third of the alcoholics' college MMPIs were located and found to be scorable. Results of these tests were compared with profiles obtained on admission to the alcohol treatment units (Kammeier et al., 1973) and with the profiles of 148 randomly selected freshman classmates who also had taken the MMPI during college admission orientation (Loper, et al., 1973). Unfortunately, no follow-up testing was conducted on the controls. The authors reported a general increase in all the clinical scales across the two testings of the alcoholic group. All the differences were significant except scales 8 (schizophrenia) and 9 (hypomania), suggesting a broad-based increase in psychopathology. The modal high point code for clinical alcoholics was a 2-4 (depressed psycho-

pathic deviate), but there was great diversity over all. Looking at contrasts between the college scores of prealcoholics and their classmates, it was found that prealcoholics' profiles were different (higher) on only 2 of 10 clinical scales. They were seen as more rebellious, impulsive, aggressive, unconventional, energetic and nontraditional (a 4-9 profile) but not generally more maladjusted.

Later, in a related MMPI study, Hoffman, Loper and Kammeier (1974) examined the scores of prealcoholics and controls on a number of empirically-derived special scales designed to discriminate between clinical alcoholics and other groups. They found that prealcoholics scored higher than controls on both the MAC (MacAndrew, 1965) and the ARos (Rosenberg, 1972) MMPI alcoholism scales before the onset of drinking problems, and that these scores differed little from those obtained at follow-up. In fact, 72% of persons in these groups could be accurately classified (prealcoholic or control) based on the MMPI data obtained on them as college freshmen.

Taken together, results from longitudinal MMPI studies of problem drinkers suggest that: (1) much of the psychopathology observed in the MMPI scores of clinical alcoholics may represent a change concomitant with increased drinking, though the absence of follow-up data on control subjects makes even this documented increase in signs of psychopathology difficult to interpret, (2) premorbid clinical scale profiles of later alcoholics were generally benign, yielding minimal evidence of deviance, and (3) at least for this sample of the population, certain special alcoholism scale scores seemed to tap a relatively stable dimension of personality which exhibited a significant correlation with later involvement in alcoholism treatment.

In a mixed cross-sectional study, Williams, McCourt and Schneider (1971)

compared the psychological test responses of alcoholics (mean age = 38) in two kinds of treatment facilities with those of heavy drinking college students and heavy/ moderate/light/no drinking medical clinic and psychiatric hospital patients. All subjects completed a battery of personality inventories including the MMPI, the California Personality Inventory and the Omnibus Personality Inventory. Alcoholics and heavy drinkers were similar in scoring high on impulsivity, antisocial behavior, order, aggressive sociability and excitement, most of which distinguished both groups from the "normal" drinkers. Generally, alcoholics were more moralistic and socially apprehensive than the heavy drinkers. The authors argued that these data were strong enough to indicate similar personality make-ups in all heavy drinkers, whether alcoholic or not.

Cahalan and Room (1974) reported results of a retrospective study of selected personality attributes of problem drinkers identified in their national probability sample alcohol use study. Respondents with drinking problems indicated their earlier life was characterized by impulsive acting-out and sad, difficult childhoods often with disrupted family units.

Fillmore (1975), working with the same research group, analyzed 20 year follow-up data on college men and women who had reported some heavy drinking problems. She found that early histories of frequent heavy drinking and/or psychological dependence on alcohol were the best predictors of later alcoholism. Early exposure to alcohol-related legal or accident consequences, however, attenuated this relation in a significant minority of the subjects. Clark and Cahalan (1976) also observed spontaneous, but inconsistent changes in alcohol problems in their four year study of drinkers.

Finally, a number of researchers have attempted to use personality variables to predict outcomes of alcoholism treatment. In one example, O'Leary,

Rohsenow and Chaney (1979) tested Rotter's Internal-External Locus of Control scale and five factor-analytically derived measures from the MMPI. They found high levels of pretreatment depression predicted patient attrition as did internal locus of control, to a lesser extent. This sort of study makes a practical contribution to treatment planning, while offering a theoretical clue to personality/psychopathology factors in the cessation-relapse phase of addictive behavior.

Before turning to the clinical studies of alcohol use, abuse, and dependence, let us consider the contributions of longitudinal and related research, and assess the prospects for future answers to questions about personality and drinking (cf. Freed, 1979). First, this research has sensitized us to the fact that personality factors do not arise or express themselves in a vacuum. Consideration of environmental factors and their interactions with personality is essential. Second, the data suggest a general rather than specific vulnerability to alcohol problems, so we must determine the variables controlling the timing, direction, and precipitation of alternate expressions of the predisposition. Third, many of the personality attributes antecedent to clinical alcoholism appear to be quite different from those concurrent with it. Little is known about the transitional stages in this change process. There is also a paucity of clues about what qualities of individuals prevent drinking problems. Some evidence, e.g., Jones (1971) and Kellam et al. (1980), suggested that total abstinence from alcohol may indicate rigidity of personality structure potentially as maladaptive as problem drinking itself. Perhaps the principle of moderation should be more widely applied! Finally, if we may be optimistic, recent improvements in data storage and retrieval could reduce the need for lengthy and expensive prospective studies. Instead, we might tap into massive

data sets which document the developmental and personal histories of many individuals.

Clinical

Clinical studies of the alcoholic are of two basic types: those which use tests empirically, simply to distinguish alcoholics from other populations; and those which add to this a theoretically-based description of how and why the groups differ besides in the fact that they use and perhaps respond to alcohol differently. A significant literature also utilizes each of these approaches as they pertain to various subtypings of alcoholic populations. For the most part, empirical classification studies use indirect (low face validity) tests like the MMPI, or direct inquiries about drinking and alcohol-related consequences such as those tapped by the Michigan Alcoholism Screening Test (MAST; Selzer, 1971). The latter, direct tests probably reveal little about personality and so will not be discussed here.

Personality description studies, because they are tied to theory, typically employ tests which are relevant to either a particular dimension of personality under scrutiny or a broad personality structure of interest. Hence, much of this research is organized around dynamic or other etiologic themes often linked to specific personality tests. Examples of themes and their testing strategies are many. Some employ projective tests of "unconscious" factors, e.g., Thematic Aperception Tests (TAT) of power or dominance needs (cf. McClelland, Davis,. Kalin & Wanner, 1972). Others focus on more straightforward testing of characteristics like mood, e.g., by examining the Beck Depression Inventory (cf. Levine & Zigler, 1981) for signs of depression. Finally, survey researchers often use questions about attitudes, values, or beliefs to examine cognitive aspects of personality, such as rebelliousness, which might fit a social psycho-

logical perspective on alcohol use and addiction. Evidence from each approach will be examined.

The range and the confusing and contradictory nature of studies of personality and problem drinking is truly amazing, as indicated by Miller's (1976) observation that what we are looking for in the typical alcoholic is:

> ...a passive, overactive, inhibited, acting-out, withdrawn, gregarious psychopath with a conscience, defending against poor defenses as a result of excessive and insufficient mothering (p. 657).

The following brief summary does not address all these themes or all the relevant evidence, but merely samples from the vast literature on psychological testing of clinical alcoholic populations. The reader interested in more detail is directed to recent comprehensive reviews by Barnes (1979) and Cox (1979), among others. As a guide to evaluating alcoholic personality research employing psychological tests, one might keep two things in mind (cf. Barnes, 1979). First, the tests should identify commonalities among alcoholics (convergent validity). Second, the tests should distinguish alcoholics from other groups (discriminant validity). Discriminant validity should be demonstrable for comparison groups of appropriately matched nonalcoholics and other clinical groups. For our purposes, tests' ability to separate alcoholics from other substance abusers may not be too important because a failure to do so might simply suggest a broader "addictive personality" construct.

MMPI. Since the relevance of the widely-used MMPI to problem drinking has been the subject of several comprehensive reviews in recent years (Apfeldorf, 1978; Butcher & Owen, 1978; Clopton, 1978; Owen & Butcher, 1979), and since the utility of the MMPI in predicting and identifying substance abuse is the primary focus of a companion paper (Megargee, 1982), only a brief overview of it is provid. nere. Attention is called to common approaches, findings, and problems of

interpretation in MMPI-alcoholism research.

The MMPI is a 566 item true-false inventory which yields scores on 10 clinical scales empirically correlated with psychiatric diagnoses of mental patients. The scales include: 1. hypochondriasis (Hs), 2. depression (D), 3. hysteria (Hy), 4. psychopathic deviance (Pd), 5. masculinity-femininity (Mf), 6. paranoia (Pa), 7. psychasthenia (Pt), 8. schizophrenia (Sc), 9. hypomania (Ma), and 10. social introversion (Si). Several "validity scales," indexing omitted items, probable lying, unusual responses, and defensive response styles are also included to assist in making accurate discriminations between "normal" and "abnormal" respondents. Subsets of items found to identify certain characteristics of groups of individuals have frequently been used to form "special scales." In any case, it should be borne in mind that the MMPI is psychopathology-based, though it has often been used for general personality description. Interpretation of MMPI scores is both art and science and ranges from simple comparison of single scale elevations to complex discriminant function or multiple regression type analyses of profile patterns which control for inter-scale correlations.

Research on the characteristic "average" clinical profile of alcoholics has indicated that scale 4 (Pd) is the most commonly elevated, though it is by no means always the highest in any given sample of alcoholics (Owen & Butcher, 1979). High scorers on this scale would appear to share common characteristics (including impulsivity, readiness to manipulate or act out, social deviance, etc.) with individuals who probably would receive a psychiatric diagnosis of "antisocial personality." However, the Pd scale also measures guilt and intropunitive remorse which are not associated with such a diagnosis. Other scales frequently elevated in alcoholics' profiles are 2 (D) and 7 (Pt), adding ele-

ments of psychic distress (anxiety and/or depression) and rigid, obsessive-compulsive traits to the clinical picture (Barnes, 1979). Indeed, sophisticated statistical analyses of profiles (Spiegel, Hadley & Hadley, 1970) suggest an elevation of scales 2, 4, and 7 is best for discriminating alcoholics from normals and psychiatric controls. Megargee (1982), among others, has pointed out, however, that this configuration lacks specificity (is associated with many other clinical groups besides alcoholics), and is based on <u>average</u> profiles of alcoholics (who actually show quite diverse individual patterns). In general, one can only conclude that there is no single typical alcoholic profile on the MMPI.

Recognizing this, a number of researchers have attempted to find homogeneous subtypes of alcoholic personalities (e.g., Conley, 1981; Donovan, Chaney & O'Leary, 1978; Eshbaugh, Hoyt & Tosi, 1978; Goldstein & Linden, 1969). While some of these efforts have replicated the clustering found in the others, this has not always been the case and the number of subtypes has varied from two to seven. Perhaps such distinctions are useful in case treatment, but they only attest to the diversity of alcoholics' personality/psychopathology as measured by the MMPI.

Special MMPI scales designed specifically for diagnosing alcoholism now number at least eight: Atsaides, Neuringer and Davis (ICAS; 1977); Finney, Smith, Skeeters and Auvenshire (ALF; 1971); Hampton (Al; 1953); Holmes (Am; 1953); Hoyt and Sedlacek (Ah; 1958); MacAndrew (MAC; 1965); Rich and Davis (ARev; 1969); and Rosenberg (ARos; 1972). Some of these scales were constructed by using the most discriminating items from previous scales in cross-validations on different samples. At any rate, the researchers have contrasted scores of mostly middle-aged alcoholics with those of one or more diverse populations

including normals, criminals, other addicts, and either inpatient or outpatient psychiatric groups. It might be mentioned that in many cases observed differences could have resulted from the frequent failure to match comparison groups on age (cf. Sutker, Archer, Brantley & Kilpatrick, 1979). But, perhaps the most remarkable finding in the research on these special scales is their lack of convergence with each other. In Zager and Megargee's (1981) validity study, using a sample of youthful offenders, it was shown that 5 of these special scales clustered in two negatively correlated groups, neither of which was very successful at separating problem from nonproblem drinkers in this population. The authors observed that certain items common to several of the empirically-derived scales were sometimes scored in opposite directions. Apparently this was a consequence of unique characteristics of comparison group samples and/or the alcoholic samples themselves.

Finney et al. (1971) have attempted a factor analysis of the personality variables tapped by special alcoholism scales and have noted that their factor loadings differed. The role of comparison groups was implicated in this difference. For example, psychiatric outpatients generally are high in anxiety and relatively low on the boldness and compulsiveness factors, while criminals or heroin addicts might tend to be high in both anxiety and boldness and low in compulsiveness. As a result, the MAC, designed to distinguish alcoholics from neurotics, naturally loads on different personality factors than a scale designed to separate alcoholics from criminals and addicts (e.g., Haertzen, Hill & Monroe, 1968). Accordingly, the MAC makes alcoholics and heroin addicts look alike, but different from neurotics (cf. Burke & Marcus, 1977; Lachar, Berman, Grisell & Schooff, 1976). On the other hand, the Haertzen et al. (1968) scale makes neurotics and criminals/addicts look alike. Thus, the special alcoholism

scales, typically designed to differentiate alcoholics' personality characteristics from those of only one or two other groups generally do little more than just that. They break down when new comparison groups are introduced, sometimes making apparently simple cross-validations quite difficult. In short, these scales reveal no consistent picture of either a unique alcoholic or a general addictive personality. Sometimes, depending on comparison groups, a general propensity for antisocial deviance (alcohol and drug abuse, delinquency and criminality, etc.) has been detected, but nothing more specific than that (cf. MacAndrew, 1981a; Rathus, Fox & Ortins, 1980). While such findings can be theoretically useful, they need much refinement before successful integration into predictive formulae can be expected.

California Personality Inventory (CPI). The CPI shares nearly half of its items with the MMPI, so it should not be too surprising that results of clinical studies using it generally parallel those of the MMPI. Williams, et al. (1971), e.g., showed that an antisocial personality profile was most characteristic of the alcoholic sample they studied. Otherwise, the most common finding was a variety of subtypes in alcoholic personalities, perhaps with distinctive patterns of psychological and adjustment evident at each stage of recovery (Kurtines, Ball & Wood, 1978).

Sixteen Personality-Factor Questionnaire (16 PF). Another true-false inventory type instrument is Cattell's 16 PF which also correlates highly with the MMPI. The 16 PF has been used in a number of studies, mostly lacking comparison groups. Lind (1972) was perhaps most optimistic in suggesting that underlying anxiety manifested in weak, passive-dependent, inadequate, low self-concept personalities described most alcoholics. Unfortunately, no data have been presented which would appear to support the ability of the 16 PF to make discrim-

inations between alcoholics and other clinical groups, especially neurotics whose personalities probably overlap considerably with the "alcoholic" traits. Moreover, a sampling of recent reports on 16 PF alcoholic personality research suggested a trend toward using the test to subtype alcoholics rather than find commonalities among them (e.g., Costello, Lawlis, Manders & Celistino, 1978; Neriano, 1976; Replogle & Hair, 1977). These studies, identifying 3 to 7 alcoholic subtypes would appear to discourage talk of a general alcoholic personality.

Edwards Personal Preference Scale and the Jackson Personality Research Form (PRF). Both the EPPS and PRF are rationally, as opposed to empirically, derived inventories intended to survey motivations and "needs" patterned after Murray's (1938) system. Comparisons among alcoholics, nonalcoholic psychiatric patients, and "normals" using the EPPS have yielded only a few largely unreplicated results (e.g., Fitzgerald, Pasework & Tanner, 1967; Gross, Morosko, & Sheldon, 1968; Pryer & Dietefano, 1970). However, Reiter (1970) did show many differences between heavy and light drinkers, with heavy drinkers having more hostile and aggressive needs. Early PRF research (Hoffman, 1971) called attention to the role of alcoholics' dependency needs, lack of self-confidence and need for close social contacts. These results were partially corroborated by Carroll (1980) who characterized his alcoholic sample as high in affiliative needs with a tendency for self-blame following failure. They also showed a greater conformity to societal norms so that together these traits suggested a passive-dependent personality. Unfortunately, this apparent convergence was not reliable across different age groups of alcoholics in the Hoffman study and would appear to have little discriminant validity when applied to clinical populations versus normals. Other problems with the instability of PRF tests

results in alcoholic populations due to varying instructional set, time of testing, and intelligence have also been noted (Pihl & Spiers, 1978).

Differential Personality Inventory. The DPI like the PRF is a construct personality test, but it is designed to measure psychopathology rather than motivational needs. Hoffman and Jackson (1974) used the DPI to contrast the problems associated with alcoholism in men (viz., character disorders) with those accompanying alcoholism in females (viz., neurotic disorders). Members of this same research team (Hoffman, Nelson & Jackson, 1974) noted further that while detoxification reduced psychopathology on the DPI, the basic character structure of the individuals remained constant. However, their claim that these personality traits represented a unitary configuration in alcoholics was inconsistent with earlier work by Johnson (1969) who found 5 distinct DPI subtypes in a large alcoholic sample.

Eysenck Personality Inventory (EPI). The EPI was designed to measure two basic dimensions of personality: introversion-extroversion (actually, an index of the ease with which one acquires and loses conditioned responses) and neuroticism (a measure of the ease with which one becomes emotionally aroused). Alcoholics have been shown to be more neurotic than normals (Keehn, 1970; Orford, 1976), but this contrast is not particularly distinctive. Moreover, alcoholics did not differ on introversion-extroversion, though they reported perceiving themselves as more impulsive and outgoing while intoxicated (Keehn, 1970). Brain damage attendant to chronic alcoholism may also produce greater extroversion in the individual. While the results of EPI clinical testing have been generally disappointing, MacAndrew (1981b) has proposed that the EPI personality dimensions might enhance understanding of alcoholic subtypes identified by other means such as special scales of the MMPI. Specifically, he

argued that high scorers on the MAC (MacAndrew, 1965) are unstable extroverts (reward or stimulation seekers similar to antisocial personalities); and low scorers are unstable introverts (punishment avoiders not unlike neurotics). While this constitutes only a hypothesis at this time, its merits make it one worthy of further consideration.

Rotter's Internal-External Locus of Control (I-E). Given alcoholics' difficulty in controlling their drinking and theories of their passive dependency, it is natural to predict that they might attribute control of events to forces external to themselves. Attempts to demonstrate such a perception using Rotter's I-E Scale have, however, produced very equivocal results. In their review of the relevant literature, Rohsenow and O'Leary (1978) noted that a number of studies (e.g., Costello & Manders, 1974) found just the opposite, with highly significant internal locus of control scores evident in many alcoholics. Butts and Chotlos (1973), however, criticized these counter-intuitive results by pointing out methodological weaknesses such as nonexistent or poorly matched control groups. Indeed, better designed studies have produced strong externality findings for heavy vs. light drinking army recruits (Naditch, 1975), youths (Jessor, Young, Young & Tesi, 1970), etc., though some studies have shown no differences at all (Carman, 1974). In sum, it appears that the popularity of I-E and related measures in personality and addictive behavior research is not supported by any decisive results they have produced. Such narrowly conceived indices of personality would appear to be of limited value, especially when studied in isolation.

Projective tests. Overall, neither the convergent nor the discriminant validity of projective personality tests (i.e., those using ambiguous or unstructured stimuli to elicit relatively free-ranging responses hypothesized to

"project" unconscious psychic processes) applied to clinical alcoholics has been impressive. These results may be more a product of poor research strategies, the generally low reliability and validity of projective tests, and the difficulties in empirically grounding psychodynamic theories underlying projective tests, than they are a reflection of the absence of "real" personality differences. Moreover, methodological problems such as experimenter bias due to nonblind individual administration and scoring of these instruments often confound the clinical studies.

In his 1976 review of the alcoholicm and Rorschach Inkblot Test literature, Freed noted a general tendency toward testing specific content responses of theoretical relevance to drinking. "Oral" and "water" themes, e.g., have sometimes been reported more frequently in the protocols of alcoholics vs. normals (Weiss & Masling, 1970), though there are many contradictory findings. Signs of "latent homosexuality" and "dependency conflicts" have also been investigated, with mixed results. Even if such constructs were supported, their vague referents would limit their descriptive or explanatory value, and their predictive utility (though not tested to date) would still be suspect. Perhaps more general dimensions like high anxiety and perceptual field dependence, suggested by Barnes (1979), would be more meaningful than specific content analysis. In sum, any Rorschach-based conclusion of a unitary oral, dependent personality in alcoholics is unwarranted given the looseness of the construct and the variety of results on potentially relevant indicators.

The Thematic Aperception Test (TAT), more than other projective tests, has been employed in investigations of a fairly well worked out theory of problem drinking. McClelland et al. (1972) hypothesized that men drink to excess because intoxication increases their (often minimal) sense of personal power or

ability to dominate others in the social arena. These researchers tested their hypotheses by administering alcohol to male subjects with various drinking histories, and then having them complete TAT testing. The results of several studies suggested that aggressive or dominance power fantasies increased after drinking. Others (e.g., Key, Cutter, Rothstein & Jones, 1972) have stressed the role of alcoholics' inhibition level as the major determinant of their drinking and have produced some confirmatory TAT results showing increased action/power orientation after drinking, though it was not specifically dominant or aggressive in nature. Wilsnack (1974) extrapolated from dominance theories of male drinking to hypothesize that female alcoholism accompanies women's feelings of uncertainty about their femininity. Drinking is seen as an attractive "time-out" from sex-role conflicts in these individuals since Wilsnack has shown that it leads to increased feelings of "womanliness" as measured by TAT responses. Thus, despite questions of the psychometric characteristics of the TAT, there does appear to be a modest convergence in alcoholic personality research imploying it: persons who drink excessively may do so to gain access to a state of congruence with traditional sex-role stereotypes. Whether this pattern is an antecedent, concomitant, or consequent of problem drinking, however, is unknown.

Projective techniques involving picture drawing have yielded a number of significant differences between alcoholics and normals in such things as portrait size, the ordering of multiple drawings, etc., but the relevance of these contrasts to alcoholics' personalities is unclear (Cox, 1979). However, one study of young Norwegian navy men (Irgens-Jensen, 1971) included drawings of both male and female figures so an examination of their relationship could be made. Problem drinking was shown to correlate with portrayals showing such

things as incomplete, obscene, dominant, larger, and poorly delineated female figures. These authors speculated that such differences might suggest greater sex role conflicts and lower self-confidence in heterosexual relations for the men who were problem drinkers. These kinds of results and their accompanying conjectures summarize the role of projective tests in the study of alcoholic personalities. They may have some heuristic value, but in and of themselves are not likely to produce much of consequence.

Tests of affect and self-concept. Research into the moods and self-perceptions of alcoholics is predicated on the assumption that these individuals drink to escape aversive states. This theory really has two assumptions: (1) alcoholics are more anxious and depressed than normals and have lower self-concepts; and (2) alcohol consumption will alleviate these states at least temporarily. A variety of psychological tests have been used in both simple assessment and experimental examinations of these assumptions. A few examples should be sufficient to illustrate the paradigms and findings.

Some research on the self-concepts of alcoholics has employed the Tennessee Self-Concept Scale (TSCS), to differentiate alcoholics from others. It showed they have a below normal view of their bodies, their health, their physical appearance, and their sexuality, and that alcoholics' commitment to moral-religious principles was below average (Yakichuk, 1978). Alcoholics' self-descriptions also yield some fairly consistent patterns in terms of their tendency to view themselves in the context of a primary relationship with another and to reveal a generally disorganized and disintegrated self (Connor, 1962). Other analyses of male college problem drinkers (Kalin, 1972) and female alcoholics (Herzog & Wilson, 1978) have shown men in the first of these groups describe themselves as acting out, lively, and disorganized, while drinking by

women in the second group correlated only with acting out. Carroll (1980) and Carroll, Klein and Santo (1978) compared the self-concepts of alcoholics with those of other drug addicts and found striking similarities in their moral-ethical guilt related to family, their general sense of inadequacy/failure, etc. Alcoholics did appear to be more acquiescent and less positive about themselves, showing more signs of psychic distress, though this difference may reflect incomplete matching of the comparison groups. Greater real-ideal self discrepancies in alcoholics compared to normal and even psychiatric comparison groups are common too (Berg, 1971). Overall, there is a reasonable research consensus that alcoholics report low self-esteem, often correlated with increased anxiety and depression. In many cases, however, the social/behavioral incompetence of alcoholics would appear to justify their views of themselves as inadequate, particularly where social skills are involved (cf. O'Leary, O'Leary & Donovan, 1976).

Regardless of the consistency or legitimacy of low self-esteem found in alcoholics, the impact of drinking on the affect of these individuals is a question surrounded by considerable controversy. Alcoholics themselves often report that they are more assertive and less inadequate when drinking (MacAndrew & Garfinkel, 1962; Blume & Shepard, 1967). However, experimental research (e.g., Mayfield & Allen, 1967) has revealed that alcoholics actually experience increases in self-reported anxiety and depression almost immediately after they begin drinking in a laboratory setting. Indeed, comprehensive reviews of the literature on alcohol and stress reduction (e.g., Brown & Crowell, 1974; Cappell & Herman, 1972; Higgins, 1976) provide little support for theories of the tension reducing properties of ethanol. Likewise, while people may drink more when depressed (Noel & Lisman, 1980), it does not appear to reduce depression

significantly.

In sum, it seems safe to assert that alcoholics are often anxious and depressed, and have low self-concepts. Moreover, they appear to drink partly because they believe it will alleviate these aversive conditions. However, in the absence of pertinent longitudinal data it is impossible to determine if these emotional dispositions predated problem drinking, were concomitants or consequences of it, were present only in alcoholics seeking treatment, etc. Furthermore, experimental data indicating that drinking may reduce anxiety and/or depression only in certain, circumscribed situations underscores the need for further research clarifying the conditions necessary for these effects.

Tests of perceptual processes. Two measures of perceptual style, the Rod and Frame Test (RFT) and the Embedded Figures Test (EFT), have been among the most discriminating tests applied to alcoholic and normal samples. Developed by Witkin and his colleagues (Witkin, Lewis, Hertzman, Machover, Meissner & Wapner, 1954), these instruments were designed to measure the construct of field-dependence/independence in perception, a construct presumably related to personality. High scorers on field-independence view parts of the perceptual field as distinct from the background and hence perform better on tasks requiring this ability (e.g., adjusting a rod in a complex perceptual field). Field-independence is alleged to be associated with clearer perceptions of body image, and more differentiated, independent personalities. Field-dependent persons, on the other hand, are expected to have distorted self-images, and undifferentiated, dependent personalities more likely to be controlled by external forces. Dependency theories of the alcoholic personality (e.g., Blane, 1968) naturally would predict that alcoholics are field dependent in their perceptual styles.

Witkin, Karp and Goodenough (1959) were among the first to demonstrate the high field dependence of alcoholics. Using the RFT, EFT and a third measure, the Body Adjustment Test, they differentiated alcoholics from nonalcoholic psychiatric controls. A half dozen other studies have replicated this difference in new samples of alcoholics and controls. The field dependence quality of problem drinkers has also been shown to be relatively stable over time, drinking history, and even experimental intoxication treatments. Some data suggest field-dependence may predispose people to a variety of addictive behaviors, including heroin addiction (Arnon, Kleinman & Kissin, 1974), though no prospective longitudinal studies of this trait have as yet been undertaken, and there are contradictory findings in other drug abusers (Weckowicz & Janssen, 1973). This is important since a few reports have challenged the stability of field dependence traits. Goldstein and Chotlos (1965; 1966), e.g., showed alcoholics' field dependence could be reduced by several months of psychiatric treatment and also presented data suggesting that field dependence in this population may be an artifact of brain damage secondary to excessive alcohol intake. Further, there are indications the trait is age-related with field dependence increasing as one gets older (Schwartz & Karp, 1967).

A fair summary of the research on field dependence/independence testing would be that it produces remarkably reliable differences between alcoholics and some other groups, though test norms of questionable representativeness have often been used in comparisons. In addition, the differences appear to be relatively stable and may even predate problem drinking. A critical question, however, is what does this difference mean? Tests of the dependent personality theory of alcoholism (Blane & Chafetz, 1971) have found predicted field dependence/independence differences, but failed to get convergent validity

on more direct tests of personal dependency (the Dependency-Situation Test). It may well be that the field dependence/independence measure is of little theoretical or practical significance because it merely reflects one of many possible, but trivial, differences between a highly select population (inpatient alcoholics) and the more general population. Additional research will be needed to resolve this question.

Two final aspects of perception which fit only marginally well under this heading are "stimulus intensity modulation" and "sensation seeking." They do, however, deserve some mention in this context. First, there appear to be individual differences in the ways in which persons modulate the intensity of stimuli producing pain and other sensations. Petrie (1967), e.g., has shown that those with high sensitivity ("augmenters") can be differentiated from those with low sensitivity ("reducers") based on their size estimations of physical objects they touch after receiving tactile stimulation (the kinesthetic figural after-effect test). It also has been demonstrated (Petrie, 1967) that augmenters experience a marked decrease in sensitivity to pain or other stimulation when intoxicated. Reducers, on the other hand, maintain fairly constant perceptions when given ethanol. One study has shown that alcoholics tend to be augmenters and it has been theorized that they may imbibe alcohol to get some relief from their "hypersensitivity," i.e., they may drink to self-regulate. This intriguing hypothesis seems worthy of further exploration.

In a possibly related theory, Zuckerman (1979) has proposed that individuals differ in their need or desire for novel, varied or complex experiences. The Sensation Seeking Scale (SSS) was developed to measure characteristic preferences for cognitive and emotional activity and positive emotional tone. It has been hypothesized that persons indulge in sensation-seeking behaviors in

part to attain optimal levels of psychophysiologic arousal. Those scoring high on the SSS naturally are expected to engage in more sensation seeking behavior, and accordingly might be viewed as less conforming (deviance is exciting) and more likely to experiment with alcohol and other drugs to alter states of consciousness and physical sensations. In a significant study employing the SSS, along with a variety of other personality measures (Kilpatrick, Sutker & Smith, 1976), the sensation seeking index performed as the best discriminator of different levels of sub-stance use. SSS scores were highest for regular drug users followed by (in declining order) problem drinkers, occasional alcohol and other drug users, and nonusers of substances. Others, e.g., Segal (1975), have replicated this finding with enough consistency to make it worth pursuing as a personality factor in addictive behavior. Again, it is suggested that some substance use may be a form of self-regulatory behavior. In all probability, if sensation seeking is a valid predictor, it will be as a generalized predisposer to deviant behaviors, of which substance use is only one type.

Surveys: Value and attitude correlates. A final set of psychological factors perhaps relevant to personality and alcohol use are those cognitive and psychosocial variables often explored in survey research. Two recent, illustrative large scale studies have examined the role of personal values and attitudes in alcohol use and abuse. First, in a national survey of over 15,000 junior and senior high school students, Donovan and Jessor (1978) collected data on frequency of drunkenness and frequency of negative alcohol-related consequences to define their "problem drinker" criterion group. Other questions asked about personality, environmental, and behavioral systems theoretically relevant to problem drinking. Students prone to problem drinking (as well as other deviance) were found to value independence more and achievement less, and to

have lower expectations for academic achievement. These persons also had fewer personal controls against deviance (greater tolerance of transgressions, less religiosity, and less emphasis on negative effects or functions of drinking). In short, the youthful problem drinkers were unconventional, not conforming to the established institutional goals and values, but instead emphasizing personal autonomy. Environmental (e.g., drinking models) and behavioral (e.g., general deviant activity) systems had independent and interactive effects, forming a multivariate network accounting for a substantial portion of the variance in adolescent drinking. The results were remarkably consistent across different definitions of problem drinking and various segments of the overall population. Interestingly, an almost identical set of psychosocial correlates of marijuana use was found in a related survey (Jessor, Chase & Donovan, 1980), with behavior-specific environmental factors such as the particular type of substance available and usage modeled by parents or peers accounting for differences in choice of drug.

Wingard, Huba, and Bentler (1979) surveyed 1634 Los Angeles junior high students, inquiring about the use of 13 different substances including cigarettes and three forms of alcoholic beverages, as well as various illicit drugs. A five point scale of usage frequency was employed. In this age group fewer than 10% had ever used illicit drugs. In order, beer, wine, cigarettes, and liquor had been tried by in excess of 50%, with marijuana about 30%. Personality assessment was carried out using the Bentler Personality Inventory, a 28 dimension index of personal characteristics, interests, attitudes, etc. A cross-validation procedure was conducted within the sample. General substance use in this adolescent population was found to correlate with the dimensions of "non-abidance with the law, liberalism, leadership, extraversion, lack of dili-

gence, and lack of deliberateness" (p. 139). There was a fairly high overlap of personality factors and drug use overall, but the ability of personality characteristics to account for specific substance choice was relatively low. In general, the personality attributes found important to substance use (mostly alcohol use) in this study could be described as nonconformity and nonconventionality. Two theoretical themes accounting for such a connection are (1) substance use is part of a broad socialization into adulthood which often involves "problem behaviors" in the service of developing identity and autonomy (cf. Jessor & Jessor, 1977), and (2) substance use is tied to the sensation seeking quest described by Zuckerman (1979) and, as such, there may be unique significance to both actual drug effects and nonconformity, each of which has exciting, arousing properties (cf. Segal, Huba & Singer, 1978). Both these hypotheses, however, clearly involve the combination of social environmental, and behavioral variables in interaction with individual difference forces.

Summary

Is there anything definitive that can be said in defense of a distinctive prealcoholic or alcoholic personality construct? The answer is probably no, largely because of the conceptual and methodological flaws in virtually all the available research. However, if we adopt a "meta-analytic" approach and examine the literature as a whole, assuming the errors of one researcher to some extent cancel out those of another, a few suggestions can be ventured. First, alcoholics appear to be "different" throughout their life spans. More specifically, they often seem to act out, showing signs of undercontrol or impulsivity, sometimes accompanied by aggression. Nontraditional and unconventional attitude and action is a common theme. Affectively, they seem troubled by anxiety and/or depression in the clinical setting, though the origin of these moods in unknown.

Sexual concerns, independence conflicts, and lack of self-confidence are implicated in a number of theories.

Despite some apparent consensus, all of the preceding comments are tentative and are tainted with contradictory or at least inconclusive research findings. Perhaps there are lessons to be learned. Single trait explanations of problem drinking, whether power or dependency or orality or whatever, are not compelling when taken in isolation. Integration and interaction are what personality research in general, and alcoholic personality research in particular, is missing. The best evidence of a role for personality variables in addictive behavior points to general predispositions toward problem drinking. The key to understanding how these types of variables operate is through examining the function of substance use for any given individual, considering his or her social learning and the time, place, and circumstance of use. There may be a commonality in such function or perhaps a few subfunctions or subtypes. Indeed, a variety of lines of research seemed to converge on two subtypes: (1) anxious, depressed neurotic, and (2) unstable antisocial personality. The function of drinking for the first might be analgesia (time out for the "augmenter"?), while for the second it could be thrills and excitement for self-regulation of arousal (sensation seeking?). Such theoretical perspectives need refinement, though creating many more subtypes is probably not the answer for in doing so the advantages of clustering and aggregation are lost. In sum, we are only now at the threshold of understanding how personality influences addiction. The volumes of research which have preceded us probably contribute little substantively, but can be invaluable if we learn from the mistakes chronicled therein.

2. Marijuana

Little more than a decade ago, there was neither any widespread concern nor even any survey data on marijuana use (National Commission on Marijuana and Drug Use, 1972). It was, of course, an illegal substance, but one used primarily by jazz musicians and other equally select groups. More recent national survey statistics (Parry, 1979), however, indicate that 28% of youths age 12 to 17 have used marijuana (16% in the last month), and the figures for 18 to 25 year old adults (60% ever; 28% last month) suggest that "some use" is approaching cultural normalcy in many youthful groups. For these persons, smoking "pot" may be a casual and socially acceptable activity. In sharp contrast, among older adults (26 up) only 15% have ever tried marijuana and 3% or fewer have used it in the last month. So what we are examining here is a youth phenomenon perhaps tied to recent social change, whereas with alcoholism the research focus was on middle-aged populations as it has been for many years. These differences alone could be enough to overwhelm any personality commonalities which may exist in alcohol and marijuana use, at least as they might be revealed by the existing literature.

Other differences between alcohol and marijuana research further complicate comparisons of findings across these two most heavily abused substances. Obviously, the legal dimension is important, leading operational definitions of "marijuana abuse" to emphasize simple use-nonuse categorizations with less consideration of quantity, frequency, consequences, etc. This, in turn, influences the nature of research tactics. Alcohol studies are mostly clinical, but since there are few "marijuana treatment units," this convenient way of accessing subjects is not available. Thus, nearly all the marijuana use literature is survey-based, an outcome which despite obvious weaknesses has some advantages in terms of representative sampling.

Partly because of its nonclinical orientation, marijuana research investigating personality factors has stressed sociocognitive variables (attitudes, beliefs, expectations, values, etc.), rather than affective measures and underlying dynamics of personality traditionally associated with psychopathology. In other words, personality has been more broadly defined as a relatively constant set of general attributes or styles which play a role in determining not only substance use behavior, but many other behaviors as well. When investigations have explored pre-existing and/or concomitant signs of maladjustment in marijuana users, the results have typically been rather weak and equivocal. Paton, Kessler & Kandel (1977) found, e.g., that depression was a modest predictor of transitions from nonuse to use of marijuana and of further experimentation with other illicit drugs. O'Malley (1975), on the other hand, found no connection between "psychological problems" and later drug use. McGuire and Megargee (1974) found that, among youthful offenders, regular marijuana users (= more than weekly) were the best adjusted according to the MMPI scores, though heavy users (= daily + other drugs) showed the most psychopathology. Given its widespread use and acceptance as a recreational drug, one could hardly expect simple use of marijuana to be any more of an index of maladjustment than social drinking. It is the high quantity-frequency and consequences of substance use one might properly associate with psychopathology. Indeed, very heavy users of marijuana have been shown to exhibit more psychological problems, but even then the comparison is confounded by their inevitable use of other, more dangerous drugs at the same time (e.g., Cross & Davis, 1972).

Finally, it appears that for the most part, marijuana research is more sophisticated than alcohol research. It is characterized by broader psychosocial perspectives and interactional models, and sports far more well-conceived

longitudinal studies, though these are still few in absolute number. Developmental studies of marijuana and other drug use are also evident and potentially quite important in efforts to uncover phases and stages of usage patterns.

The highlighting of the marijuana literature that follows draws heavily on points made in several excellent reviews. Braucht, Brakarsh, Follingstad and Berry (1973) provided an overview of deviant drug use in adolescents, while Gorsuch and Butler (1976) examined psychosocial factors in initial drug use. Kandel (1978) has summarized and integrated the major longitudinal studies dealing mainly with marijuana. Finally, Jessor (1979) provided an overview of recent marijuana-psychosocial factors research. The specific "clinical" or concurrent correlates literature has not been reviewed separately in the past several years, so a few more original sources were sampled where appropriate. This section is organized around themes and the findings relevant to those themes, rather than around designs and methods, as was the case with alcohol. Marijuana research has greater convergence so this is more efficient. A variety of personality characteristics related to marijuana use have been suggested by other authors, including: rebellious, independent, poor sense of psychological well-being, low self-esteem, and low academic aspirations/ motivation (Kandel, 1978); and, unconventional/nontraditional/nonconforming, flexible/open to experience, and having low expectations for achievement/ satisfaction (Jessor, 1979). The themes presented here more closely parallel Jessor's (1979), but emphasize the function of marijuana use in connection with each trait cluster. Persons having the personality dispositions and expectations about marijuana outlined, would be predicted to be users more often than others in comparable environments.

An Expression of Poor Socialization

One common predictor and concomitant of marijuana use is an individual's lack of conventional or traditional values. This attribute is indicative of poor socialization by the dominant culture, and marijuana use may hence be viewed as one way of expressing the consequent nonconformity. Naturally, as marijuana use becomes more accepted and normative, its value in this capacity may diminish.

In one of the most extensive longitudinal studies of personality and adolescent marijuana use, Smith and Fogg (1978) collected both self- and peer-ratings of the personalities of 651 junior and senior high school students whose self-reported drug use was followed for up to 5 years. Early onset, frequency, and extent of drug use were all positively correlated with self- and peer-descriptions of subjects as "rebellious" prior to initial drug use. Similarly, low scores on "obedient/law abiding" were excellent predictors of the degree of later marijuana involvement. Jessor, Jessor and Finney (1973) also found high school and college students who subsequently used marijuana were more critical of society and expressed a greater sense of alientation from it. Both a tendency toward acting-out aggressively and a high value and expectation for, and self-description of, independence were evident in O'Malley's (1975) youthful marijuana users. Further, as already noted for alcohol use, a lack of religiosity (Jessor, 1976) and a greater tolerance for deviance (Brook, Lukoff & Whiteman, 1980) were characteristic predictors of initiation into substance use, including marijuana. So was a liberal or left-wing political stance (e.g., Gordon, 1972). In a prospective study of college students covering their four years of matriculation, Kay, Lyons, Newman, Mankin and Loeb (1978) showed marijuana use was consistently correlated with

lower scores on responsibility, socialization and conformity as measured by the CPI and other standardized psychological tests. Finally, the tendency of prospective marijuana users to shun a societally promoted achievement orientation, and especially to value independence highly relative to achievement, have been amply demonstrated in both high school and college populations (e.g., Jessor et al., 1973). In sum, the potential role of marijuana use in the expession of general nonconformity borne of poor socialization seems well documented by prospective longitudinal studies of college and secondary school populations.

A few retrospective and clinical-survey studies might also be mentioned in the context of the expression of the poor socialization theme. Gulas and King (1976) showed that college seniors who were marijuana users had scored higher than nonusers on scales of "ascendency" (independence) and "irresponsibility" taken earlier in their academic careers. Brill et al. (1971) examined the MMPI scores of 18 and 19 year old students as a function of their level of marijuana use, finding heavier use correlated with rebelliousness (elevated Pd) and higher scores on an "ego strength" special scale. In a similar study of undergraduates, Knecht et al. (1972) found that increasing marijuana use was associated with lower social conformity scores on the CPI. Thus, several divergent methodologies produced analogous results showing the part marijuana use might play in expressing nonconformity or the lack of socially inculcated values and controls.

An Alternative Coping Response

Jessor (1979) has noted that research on prospective and current users of marijuana suggests that they not only reject traditional values about achievement, but also express lower expectations about their ability to attain satisfaction through pursuit of achievement-oriented goals. Thus, marijuana use may

represent identification with an alternate set of goals, and/or it may be viewed as a way of coping with the perception that frustration and failure are imminent (cf. Carman, 1974). Within the latter perspective, one might expect below average self-esteem and a reduced sense of psychological well-being to accompany the perceived lack of self-efficacy. For such individuals marijuana use may serve as a "self-handicapping strategy" (cf. Jones & Berglas, 1978) designed to obscure the meaning, and hence diminish the impact, of failure. It provides a convenient excuse or rationalization for any untoward outcome because of the widespread belief that being "high" reduces motivation and ability to perform many personally and socially significant tasks. In this way marijuana may function to insulate users against potentially aversive information about themselves. Naturally, marijuana might also be used more directly to cope with tension, anxiety, depression, etc. In either case, the theory is predicted on the assumption that degree of marijuana use is correlated with one's sense of psychological comfort and self-efficacy.

As indicated earlier, few studies of marijuana use have included measures of affective aspects of personality or psychopathologic states. When they have, the results have not been impressive in either predicting or correlating them with marijuana use. A critical variable seems to be the level of marijuana use. Haagen's 1970 retrospective study of college students showed frequent users tested two years earlier had been more anxious, apprehensive, conflicted and generally dissatisfied than infrequent users. Kilpatrick et al. (1976) found "regular" drug users (mostly marijuana) were more anxious (both state and trait measures) than occasional users in a random sample of male veterans admitted to a VA hospital. And, McGuire and Megargee (1974) noted that maladjustment appears to occur mainly those youthful offenders who used drugs to extremes.

Other data, however, even including some from studies with level of usage controls (e.g., Orive & Gerard, 1980), have produced no differences in anxiety, depression, etc. Yet, Segal (1977) found that a substantial portion of collegiate marijuana users he sampled indicated that a frequent reason for their use was to deal with psychological conflicts and cope with poor self-concepts.

Looking more specifically at self-esteem and self-efficacy, Haagen (1970) noted that "frequent" users had previously suffered from low self-esteem. Kaplan (1975) assessed junior high students at 3 points and found a lowering of self-esteem between times 1 and 2 predicted greater drug involvement in the next time interval. Smith and Fogg (1978) observed that adolescent marijuana use often reflected a low sense of capability. Finally, cross-sectional research (Norem-Hebeisen, 1975) found a sense of well-being, based mainly on a standard self-esteem measure, contrasted normal adolescents and those with drug use problems. Some studies, however, have not replicated the finding of lower self-esteem in marijuana users, though the reasons for this are unclear (Jessor & Jessor, 1978; Kandel, Kessler & Margulies, 1978; Naditch, 1975; O'Malley, 1975). Perhaps changes in self-efficacy are rather transient and situationally determined, making them difficult to assess. In any case, Segal's (1977) finding that many marijuana smokers indicate their drug use is related to psychological stress, would appear to make the theme of marijuana use as a coping response worth pursuing.

An Indication of Desire for New Experiences

So far, the two themes discussed as personality predictors or correlates of marijuana use have a pejorative ring to them. Nonconformity is generally frowned upon and the implication that some people "need" to use drugs to cope is not flattering. Kandel (1978) has also pointed out that beliefs about substance

use leading to criminality and/or "amotivational syndrome" (lethargy, loss of interest, etc.) enjoy a large audience despite some contrary evidence for each (Johnston, O'Malley & Eveland, 1978; Brill & Christie, 1974, respectively). It is no wonder drug use has a bad name. Yet there are some positive correlates as well. Creative and artistic people have a reputation for substance use and represent a sharp contrast to the stereotypic conservatism, rigidity and closed-mindedness of the abstainer (e.g., Grant, 1981). One personality characteristic which may underlie the apparent spontaneity and openness to experience of drug users is sensation seeking. Segal (1977) found that, in addition to using marijuana to deal with conflict and poor self-concepts, the majority of users indicated that they sought its effects to change and enhance social relations and to intensify positive experiences. Even in and of itself, altering one's state of consciousness may be intrinsically reinforcing. Many people comment on the "high" they get from meditation, jogging, skiing, etc. in a very positive way. Perhaps people simply differ in their desire for such stimulation and hence may find marijuana and other drug use attractive to varying degrees.

In their longitudinal study of college students, Kay et al. (1978) found marijuana users were more spontaneous, flexible and desirous of change than nonusers as indexed by the CPI and an adjective checklist measure. In two retrospective studies of college marijuana users, Goldstein and Sappington (1977) showed that preusers' MMPIs suggested adventurous pleasure seeking, while Haagen (1970) found infrequent marijuana users to be spontaneous, insightful, and seeking change/new experience.

Surveys correlating scores on the Sensation Seeking Scale with marijuana use corroborate the findings cited above. Results of the Kilpatrick et al. (1976) study of hospitalized veterans have already been mentioned, and Segal

(1975) also found sensation seeking was correlated with marijuana use in college students. Finally, Brill et al. (1971) found the more frequent the marijuana use the higher the SSS scores. More supportive studies could be cited and no significant contradictory evidence was turned up in the present review. Thus, it would appear that sensation-seeking or the desire for new experiences is a fairly robust correlate of marijuana use.

Summary

Though internal-external locus of control (I-E), introversion-extroversion, field dependence-independence, and a number of other personality traits outside the three themes or clusters discussed here have been investigated, each has received no better than marginal support. Even the dimensions or themes noted here (expression of nonconformity, coping response, and sensation seeking) all appear to be continuously distributed in the population, resulting in quantitative rather than qualitative differences among people. Indeed, as Jessor (1979) has pointed out, comparative studies of the personalities of marijuana users and nonusers (e.g., Huba, Segal & Singer, 1977), have tured up no difference in their organization of traits, only the magnitude of their various attributes.

In assessing the role of personality factors in marijuana use, several conclusions can be drawn. First, users profiles tend to be fairly benign with respect to traditional psychopathology, though some marijuana use is probably stress related. Second, even considering personality as a complex system of beliefs, motives, instigators, and personal controls (cf. Jessor & Jessor, 1977), its total contribution to prediction of high school and collegiate marijuana use is not more than 25%. This amount is substantially less than environmental contributions which seem to increase as the level of schooling rises,

presumably because in college drugs are more available and their use is more normative. Related to this is Nurco's (1979) notion that:

> The earlier the onset of deviant behaviors, the more malignant the process invoked and the more ominous the prognosis...The younger the age of onset, the more intense and committed the addictive career (p. 321).

Thus, it should not be too surprising to learn that Lucas (1978), among others, has demonstrated that the personality and other variables salient in initial drug use at various ages and times differed significantly. Moreover, since the social meaning (and hence the pleasure and utility) of a substance like marijuana is not likely to remain static (cf. Kovacs, 1976), it is unlikely that proponents of even the most sophisticated formulae for relating person x situation variables to its use will be able to stand pat. Still, consideration of personality factors can help us to understand and predict substance use, and may even help us prevent its abuse, so their contribution cannot be ignored.

3. Other Illicit Drugs: Heroin

While there is a good deal which might legitimately separate heroin from other illicit drugs (besides marijuana), it is the chosen representative for this section. It is not so subject to fads, trends and transient social meanings as, say, hallucinogens. Yet it, like many other illicit drugs (e.g., amphetamines, sedatives, etc.), is undoubtedly a dangerous substance and one which is highly addictive (though not inevitably addictive; see Zinberg, 1979). It is also associated with severe penalties for possession, sale or use. Finally, it represents a sort of endpoint in substance use--there is no further step to take. As Kandel (1975) has demonstrated, the usual sequence of involvement in drug use (for adolescents) starts with beer and/or wine, progresses through hard liquor and cigarettes to marijuana, and finally "terminates" with

other illicit drugs. At this fourth phase one finds heroin use, but with frequent substitutions of other drugs when the preferred one is unavailable. Hence, the typical heroin user has at least tried other dangerous, illicit drugs if he or she is not a poly- or multi-drug user as a rule.

One more characteristic which ties heroin and illicit drugs (other than marijuana) together is the low baserate of their usage. According to Parry's (1979) national survey, no substance in this group was reportedly used by more than 4% of any age group in the preceding month. This fact, coupled with the other exceptional characteristics of illicit drugs other than marijuana, has important implications for research. First, it means that research subjects will be exceedingly difficult to locate except through treatment and/or correctional institutions. Furthermore, social sanctions applied to those using heroin and the high cost of addiction are liable to force users into very deviant subcultures and lifestyles. Finally, the low baserates of such illicit drug use all but rules out prospective longitudinal studies as impractical. Indeed, only a handful of longitudinal studies of any kind, including long-term follow-ups of heroin rehabilitation patients (e.g., Valliant, 1966), has ever been conducted. And, unfortunately for our purposes, the best longitudinal study of opiate use, Robins' (1973) work with Vietnam veterans, did not collect data on personality variables. So, what is the status of knowledge on personality factors in the use of serious, illicit substances?

The literature on heroin and illicit drugs, and their personality/psychopathology correlates, is in a sorry state. Most subjects examined were incarcerated at the federal "treatment" facility at Lexington, Kentucky, and the vast majority of studies consist of methodologically confounded efforts to use the MMPI for: (1) clinical descriptions and/or subtyping of the psychiatric

status of addicts; or (2) discrimination between heroin addicts and other groups (polydrug abusers, alcoholics, criminals, psychiatric patients, etc.). Let us examine what has been learned from these endeavors.

Clinical Profiles

Perhaps the greatest consensus in the heroin and personality literature is that these addicts exhibit psychopathology in excess of that observed in the other substance use groups we have reviewed. Sutker (1971) reported that only 12% of her heroin addict sample produced normal MMPI profiles. Monroe, Ross and Berzins (1967) noted similar findings in a major MMPI study of four sources of patients for the NIMH center at Lexington: (1) civil commitment admissions, (2) prisoners from federal courts, (3) volunteers, and (4) probationers from municipal court proceedings. Committed patients were the most severely disturbed, but all groups had substantial representation of diverse clinical syndromes: neuroses, psychoses, antisocial personalities, and other personality disorders. Elevated 4 scales (psychopathic deviate) were common with some high 2 scales (depression) as were seen among alcoholics. However, greater evidence of psychosis was also evident in a pattern of elevated 8 (schizophrenia) and 9 (mania) scales commonly associated with disorganized and expansive thinking. Similar, though even more extreme 4-8-9 patterns have been seen in polydrug abusers, evaluated in a variety of settings (Megargee, 1982). Again, however, the profile heterogeneity underlying these average highpoints was both statistically and practically significant, as evidenced by repeated efforts to develop multiple personality subtypes within addicted samples. These have ranged from just two subtypes with 60% or more unclassifiable (Berzins, Ross, English & Haley,1974) to 17 or 18 subtypes of heroin or polydrug abusers, respectively (Penk, Woodward, Robinowitz & Parr, 1980). To complicate matters further, it

has been shown that the profiles produced by addicts may be systematically biased by subjects' race (Penk et al., 1978) and volunteer status (Penk & Robinowitz, 1976). In sum, it would be safe to say that addicts in institutional settings manifest psychopathology at an above average rate, though with considerable diversity in its expression. In this heterogeneous group, a small but significant bias toward classic antisocial personality characteristics, but with considerable anxiety, might be distilled from available data (Craig, 1979).

Other Personality Characteristics

Platt and Labate (1976) have reviewed the heroin-personality literature through 1975, and little has been added since then. A brief, updated sampling of the more popular traits investigated follows.

Low self-esteem and low self-concept have been associated with addiction in the theories of many authors who believe heroin use is a way to minimize threats to the self (e.g., Laskowitz, 1961). However, early research by Schift (1959), using a Q-sort procedure to detect discrepancies in real and ideal self, showed young addicts' self-esteem did not differ from young nonaddicts, but that both these groups had higher self-esteem than corresponding older groups. In a related study, Ogborne (1974) inquired about the effects of heroin use on psychological and interpersonal functioning and found two subtypes of respondents. There were "enhancers" who used heroin to increase awareness and general well-being, and there were "avoiders" who took it to reduce awareness and responsibilities and to escape problems. Perhaps, these functions also change with age in a way that would account for the findings of Schift (1959).

Needs, values, and attitudes have also received some attention in the heroin and personality literature. Application of the EPPS of needs suggested that addicts wished to be free from restraint and responsibility and also

desired new experiences more than nonusers (Sheppard, Ricca, Fracchia & Merlis, 1974). However, Miller, Sensenig and Reed (1972) found that desire for new experience did not extend to risk-taking situations. Instead, avoiding losses and putting one's own safety ahead of that of loved ones were characteristic values of addicts. These individuals also ranked trust very low (Blumberg et al., 1974) and exhibited a very short-sighted time perspective (Laskowitz, 1961). Overall, such needs, attitudes, and values would seem to characterize an antisocial personality style.

Locus of control issues and consequent use of Rotters' I-E scale for measurement are second only to psychopathology and the MMPI in the heroin addiction literature. Craig (1979) reviewed 9 studies of locus of control in addicts, 5 showing addicts more internal, 3 more external, and 1 no differ ent. On closer inspection, however, it can be noted that the studies producing externality results had no control groups, whereas those with internality findings all did. Interestingly, addicts move even more toward internality after treatment, apparently feeling even greater power, self-satisfaction, confidence, independence, etc. All these post-treatment traits again seem consistent with the egocentricism and antisocial, self-indulgence of addicts (cf. Berzins & Ross, 1973).

In perhaps the best designed study in the heroin and personality literature, Platt (1975) investigated sensation seeking, among other attributes in a sample of youthful offenders. Fifty-eight consecutive cases yielded complete data on 27 addicts and 20 nonaddicts, with addiction defined by multimethod criteria. Blind data collection and analysis were carried out on 34 personality variables, including measures of self-evaluation, social self-esteem, anomie, locus of control, death concern, self-description (adjective checlist), and

sensation seeking. Potentially confounding variables (cf. Gendreau & Gendreau, 1970) such as age at first arrest, number of arrests, IQ, achievement test scores, religion and marital status were controlled as covariates in the analysis. Results showed addicts differed from the comparison group by having higher sensation and experience seeking, greater death concern, and more heterosexuality, exhibitionism, and autonomy. In discussing these findings, Platt argued that they did not provide sufficient evidence of an addictive personality because: (1) the significant results did not fit a coherent theory, (2) many predicted results did not materialize, and (3) the results offered no clues about which came first, the addiction or the traits.

Summary

In general it would appear that no distinct addictive personality is evident in the literature on heroin addiction. Moreover, attempted subtyping by psychopathology has produced many divergent groups. Only a broadly defined personality style with antisocial or psychopathic elements, such as selfishness and sensation seeking, and a significant level of general psychopathology seems to capture much of the variance in clinical heroin addiction. The absence of prospective longitudinal data makes it impossible to say any more.

Similarities and Differences in Substance Use

At this point one can only be pessimistic about finding a unique set of personal characteristics to associate with any particular substance. Indeed, even attempts to tie psychological conditions to drugs whose pharmacological actions should logically benefit them have met with little success. Using the MMPI, e.g., Henrigues, Arsenian, Cutter and Samaraweera (1972) failed to find anxiety in heroin or barbiturate users, or depression in amphetamine users. Fitzgibbons, Berry and Shearn (1973) found mainly general maladjustment in the

various drug users they tried to match in a similar effort. Gordon (1980) had the same problem in trying to get sharp distinctions between sedative/hypnotic abusers and polydrug abusers using the Rorschach. Others, however, have claimed a bit more success. For instance, Overall (1973) was able to differentiate the clinical profiles of alcoholics and narcotics addicts, with only a 15% case overlap. Penk, Fudge, Robinowitz and Newman (1979) replicated his finding for heroin addicts, but Trevithick and Hosch (1978) did not. Further, deterioration in the reliability of drug-specific clinical profiles seems to occur as the populations of addicts diverge. Thus, the subtype patterns for drug abusing prisoners (Holland, 1977) were different again, in still other ways. The lesson seems to be that it is not too difficut to arrive at clinical decision rules for classifying drug abusers so long as one does not try to apply them while visiting another institution.

An alternative approach is to look for personality commonalities across many drugs, trying to contrast them with attributes of nonusers of drugs. Special scales derived from the MMPI have been the major vehicle for this endeavor. Especially significant was MacAndrew's (1965) MAC alcoholism scale, which has been reasonably successful at identifying both alcoholics and drug abusers in broader psychiatric populations where it was developed (Burke & Marcus, 1977; Kranitz, 1972; Lachar et al., 1976; Lachar, Gidowski & Keegan, 1979). Unfortunately, when this scale is applied to youthful samples, especially those containing delinquents and criminals (Rathus et al., 1980; Zager & Megargee, 1981), the MAC loses its discriminant validity specific to substance use. Analogous problems have been encountered with special heroin abuse scales (He; Cavior, Kurtzberg & Lipton, 1967) or drug abuse scales (DaS; Panton & Brisson, 1971). These scales, developed on correctional populations, work

fairly well in such settings but may not be capable of discriminating alcoholics from neurotics in a psychiatric population. Thus, it appears that a problem with such special scales is they are too "special."

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Is the "addictive personality" construct viable? Despite the serious conceptual and methodological problems characterizing most research in the area, the answer must certainly be that there is no single, unique personality entity that is a necessary and/or sufficient condition for substance use. Moreover, the claims of theorists like Spotts and Shontz (1980) notwithstanding, specific types of personalities have not been consistently linked to individuals' preferences for particular drugs. Part of the reason these conclusions are so evident is that such hypotheses are at least tacitly predicated on the assumption that the construct "personality" represents a set of discrete types rather than an aggregation of continuous variables. Such a conceptualization and the pursuit of related "personality type" main effects on behavior seems indefensible in light of what we know and are learning about person x situation interactions affecting human actions.

But, if we look at personality as a contributor, a predispositional component to or concurrent dimension of substance use and abuse, the picture appears to be somewhat different. Here, however, the complexities of operationally defining "addictive behavior" become critical. Different personality characteristics or styles may make different contributions, depending upon the type, frequency, time, consequences, and stage of substance involvement under consideration. The social psychologies of "moderate usage" and "abusive" substance involvement, e.g., seem very likely to be divergent. The need for a theoretical framework for dealing with these variables, thus seems obvious.

Substance use is a behavior which first of all demands availability and access to substances, and multiple sociocultural factors undoubtedly interact to determine the level of this variable. Beyond this, other aspects of the

environment are also important. A disengagement from proscriptions against substance use and/or some experience with a context which supports use (e.g., permissive parental models, high levels of peer involvement, drug subcultures, etc.) make a clear contribution. Finally, individual perceptions, attitudes and values, and personal traits or styles can explain why, given comparable environments, people vary in their substance use. What are some of the significant personality factors?

A high value on independence and nonconformity, concomitant with a weak commitment to societally-promoted achievement goals is common among both addiction-prone and addicted individuals. A sense of social alienation and a general tolerance for deviance have also frequently been identified in connection with substance use and, for obvious reasons, these attitudes appear to increase as substance use continues. Personal characteristics of impulsivity, difficulty delaying gratification and perhaps even an antisocial personality style have also been identified to varying degrees across alcohol, marijuana, and heroin use. Perhaps closely tied to these factors is a disposition toward sensation seeking which may be relatively independent of environmental conditions.

In the arena of psychopathology, there is some evidence to suggest that role strain or other forms of stress predispose one to substance use, at least acutely. Also, an earlier initiation to drugs seems to predict more severe substance use problems, perhaps indicating a greater general vulnerability to stress and/or that the substance use itself is stressful. These relations may, in part, explain why adolescent and other transitions are often associated with the most severe substance abuse problems, among other forms of "deviance" (cf. Jessor & Jessor, 1977). Beyond simple adjustments to life stresses, the

level of psychopathology observed in clinical addicts seems to increase with the dangerousness and level of involvement with the drug. Polydrug abusers and heroin addicts, e.g., showed much more psychopathology than marijuana users. The specific nature of psychopathology, however, is not consistent, and issues of causality and directionality of these correlations remain to be worked out. Finally, a potentially critical issue in the personality-addictive behavior nexus is the expected function of substance use for the individual. Use of drugs to escape or avoid problems, rather than increase sensations, would appear to be a more foreboding pattern.

Overall, the ideas and data reviewed in this paper would suggest that personality contributions to addictive behavior are not specific. They represent a potential for deviance which has many alternate forms whose expression can only be predicted through consideration of environmental variables in a relation that we know little about as yet. The optimal research strategies of the future must be multivariate and interactional, considering a variety of methods for personality assessment and clearer specification of the aspects of addictive behavior that are of interest.

REFERENCES

Allport, G. The functional autonomy of motives. American Journal of Psychology, 1937, 50, 141-156.

American Psychiatric Association. Diagnostic and statistical manual of mental disorders (3rd edition). Washington, D. C.: APA, 1980.

Apfeldorf, M. Alcoholism scales of the MMPI: Contributions and future directions. International Journal of Addictions, 1978, 13, 17-53.

Apfeldorf, M., & Hunley, P. Exclusion of subjects with F scores at or above 16 in MMPI research on alcoholism. Journal of Clinical Psychology, 1976, 32, 498-500.

Arnon, D., Kleinman, M., & Kissin, B. Psychological differentiation in heroin addicts. International Journal of the Addictions, 1974, 9, 151-159.

Atsaides, J., Nueringer, C., & Davis, K. Development of an institutional chronic alcoholic scale. Journal of Consulting and Clinical Psychology, 1977, 45, 609-611.

Bachman, J., & Jones, R. Personality correlates of cannabis dependence. Addictive Behaviors, 1979, 4, 361-371.

Barnes, G. E. The alcoholic personality: A reanalysis of the literature. Journal of Studies on Alcohol, 1979, 40, 571-634.

Becker, H. Marijuana: A sociological overview. In D. Solomon (Ed.), The marijuana papers. New York: Signet Books, 1968.

Bem. D., & Allen, A. On predicting some of the people some of the time: The search for cross situational consistencies in behavior. Psychological Review, 1974, 81, 506-520.

Bem, D., & Funder, D. Predicting more of the people more of the time: Assessing the personality of situations. Psychological Review, 1978, 85,

485-501.

Bentler, P., & Eichberg, R. A social psychological approach to substance abuse construct validity: Prediction of adolescent drug use from independent data sources. In D. Lettieri (Ed.), Predicting adolescent drug abuse. Rockville, MD: NIDA, 1975.

Berg, N. Effects of alcohol intoxication on self-concept: Studies of alcoholics and controls in laboratory conditions. Quarterly Journal of Studies on Alcohol, 1971, 32, 442-453.

Berzins, J., & Ross, W. Locus of control among opiate addicts. Journal of Consulting and Clinical Psychology, 1973, 40, 84-91.

Berzins, J., & Ross, W., English, G., & Haley, J. Subgroups among opiate addicts: A typology investigation. Journal of Abnormal Psychology, 1974, 83, 65-73.

Berzins, J., Ross, W., & Monroe, J. A multivariate study of the personality of hospitalized narcotic addicts on the MMPI. Journal of Clinical Psychology, 1971, 27, 174-181.

Blane, H. The personality of the alcoholic: Guises of dependency. New York: Harper, 1968.

Blane, H., & Chafetz, M. Dependency conflict and sex role identity in drinking delinquents. Quarterly Journal of Studies on Alcohol, 1971, 32, 1025-1039.

Blumberg, H., Cohen, S., Dronfield, B., Mordecai, E., Roberts, J., & Hawks, D. British opiate users: II Differences between those given an opiate script and those not given one. International Journal of the Addictions, 1974, 9, 205-220.

Blume, S., & Sheppard, C. The changing effects of drinking on the changing personalities of alcoholics. Quarterly Journal of Studies on Alcohol, 1967, 28, 436-443.

Boscarino, J. Alcohol abuse among veterans: The importance of demographic factors. Addictive Behaviors, 1979, 4, 323-330.

Braucht, G., Brakarsh, D., Follingstad, D., & Berry, K. Deviant drug use in adolescence: A review of psychosocial correlates. Psychological Bulletin, 1973, 79, 92-106.

Braucht, G. N., Kirby, M. W., & Berry, G. J. Psychosocial correlates of empirical types of multiple drug abusers. Journal of Consulting and Clinical Psychology, 1978, 46, 1463-1475.

Brill, N., & Christie, R. Marijuana use and psychosocial adaptation. Archives of General Psychiatry, 1974, 31, 713-719.

Brill, N., Crumpton, E., Grayson, H. Personality factors in marijuana use. Archives of General Psychiatry, 1971, 24, 163-165.

Brook, J. S., Lukoff, I. F., & Whiteman, M. Initiation into adolescent marijuana use. Journal of Genetic Psychology, 1980, 137, 133-142.

Brown, J., & Crowell, R. Alcohol and conflict resolution: A theoretical analysis. Quarterly Journal of Studies on Alcohol, 1974, 35, 66-85.

Burke, H., & Marcus, R. MacAndrew MMPI alcoholism scale: Alcoholism and drug addictiveness. Journal of Psychology, 1977, 96, 141-148.

Butcher, J., & Owen, P. Objective personality inventories. In B. Wolman (Ed.), Clinical diagnosis of mental disorders: A handbook. New York: Plenum, 1978.

Butts, S., & Chotlos, J. A comparison of alcoholics and nonalcoholics on perceived locus of control. Quarterly Journal of Studies on Alcohol, 1973, 34, 1327-1332.

Cahalan, D. Problem drinkers. San Francisco: Jossey-Bass, 1970.

Cahalan, D., & Cisin, I. Epidemiological and social problems associated with

drinking problems. In R. Tarter & A. Sugerman (Eds.), Alcoholism: Interdisciplinary approaches to an enduring problem. Reading, MA: Addison-Wesley, 1976.

Cahalan, D., & Room, R. Problem drinking among American men. New Brunswick, NJ: Rutgers University Center of Alcohol Studies, 1974.

Campbell, D., & Fiske, D. Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 1959, 56, 81-105.

Cappell, H., & Herman, C. Alcohol and tension reduction: A review. Quarterly Journal of Studies on Alcohol, 1972, 33, 33-64.

Carman, R. Internal-external locus of control, alcohol use, and adjustment among high school students in rural communities. Journal of Community Psychology, 1974, 2, 219-133.

Carroll, J. Similarities and differences of personality and psychopathology between alcoholics and addicts. American Journal of Drug and Alcohol Abuse, 1980, 7, 219-236.

Carroll, J., Klein, I., & Santo, Y. Comparison of the similarities and differences in the self-concepts of alcoholics and addicts. Journal of Consulting and Clinical Psychology, 1978, 46, 545-576.

Cavior, N., Kurtzburg, R., & Lipton, D. The development and validation of a heroin addiction scale with the MMPI. International Journal of the Addictions, 1967, 2, 129-137.

Chein, I., Gerard, D., Lee, R., & Rosenfeld, E. The road to H: Narcotics, delinquency and social policy. New York: Basic Books, 1964.

Clark, W., & Cahalan, D. Changes in problem drinking over a four year span. Addictive Behaviors, 1976, 1, 251-259.

Clopton, J. Alcoholism and the MMPI. Journal of Studies on Alcohol, 1978, 39,

1540-1558.

Conley, J. An MMPI typology of male alcoholics: Admission, discharge and outcome comparisons. Journal of Personality Assessment, 1981, 45, 33-39.

Connor, R. The self-concepts of alcoholics. In D. Pittman & C. Snyder (Eds.), Society, culture and drinking patterns. New York: Wiley, 1962.

Costello, R. M., Lawlis, G. F., Manders, K. R., & Celistino, J. F. Empirical derivation of a partial personality typology of alcoholics. Journal of Studies on Alcohol, 1978, 39, 1258-1266.

Costello, R., & Manders, K. Locus of control and alcoholism. British Journal of Addiction, 1974, 69, 11-17.

Cox, W. The alcoholic personality: A review of the evidence. Progress in Experimental Personality Research, 1979, 9, 89-148.

Craig, R. Personality characteristics of heroin addicts: A review of the empirical literature with critique-Part I. International Journal of the Addictions, 1979, 14, 513-532.

Craig, R. Personality characteristics of heroin addicts: A review of the empirical literature with critique-Part II. International Journal of the Addictions, 1979, 14, 607-626.

Cross, H., & Davis, G. College students' adjustment and frequency of marijuana use. Journal of Counseling Psychology, 1972, 19, 65-67.

Donovan, D., Chaney, E., & O'Leary, M. Alcoholic MMPI subtypes. Relationships to drinking styles, benefits, and consequences. Journal of Nervous and Mental Disorders, 1978, 166, 553-561.

Donovan, J., & Jessor, R. Adolecent problem drinking: Psychosocial correlates in a national sample study. Journal of Studies on Alcohol, 1978, 39, 1056-1524.

Dunette, M. Individual prediction as a strategy for discovering demographic and interpersonal/psychosocial correlates of drug resistance and abuse. In D. Lettieri (Ed.), Predicting adolescent dug abuse. Rockville, MD: NIDA, 1975.

Ekehammar, B. Interactionism in personality from a historical perspective. Psychological Bulletin, 1974, 81, 1026-1048.

Endler, N., & Magnusson, D. Toward an interactional psychology of personality. Psychological Bulletin, 1976, 83, 956-974.

Engel, G. The need for a new medical model: A challenge for biomedicine. Science, 1977, 196, 129-136.

Epstein, S. The stability of behavior I: On predicting most of the people much of the time. Journal of Personality and Social Psychology, 1979, 37, 1097-1126.

Epstein, S. The stability of behavior II: Implications for psychological research. American Psychologist, 1980, 35, 790-806.

Eshbaugh, D. M., Hoyt, C., & Tosi, D. J. Some personality patterns and dimensions of male alcholics: A multivariate description. Journal of Personality Assessment, 1978, 42, 409-417.

Fillmore, K. Relationships between specific drinking problems in early adulthood and middle age. Journal of Studies on Alcohol, 1975, 36, 882-907.

Finney, J., Smith, D., Skeeters, D., & Auvenshire, C. MMPI alcoholism scales: Factor structure and content analysis. Quarterly Journal of Studies on Alcohol, 1971, 32, 1055-1060.

Fisher, S. Nonspecific factors as determinants of behavioral responses to drugs. In A. DiMascio & R. Shoder (Eds.), Clinical handbook of psycho-

pharmacology. New York: Science House, 1970.

Fitzgerald, B., Pasewark, R., & Tanner, C. Use of the Edwards Personal preference Schedule with hospitalized alcoholics. Journal of Clinical Psychology, 1967, 2, 194-195.

Fitzgibbons, D., Berry, D., & Shearn, C. MMPI and diagnosis among hospitalized drug abusers. Journal of Community Psychology, 1973, 1, 79-81.

Foltz, R., Fentiman, A., & Foltz, R. GC/MS assays for abused drugs in body fluids. Rockville, MD: NIDA Research Monograph Series (No. 32), 1980.

Franks, C. The use of alcohol in the investigation of drug-personality postulates. In R. Fox (Ed.), Alcoholism: Behavioral research, therapeutic approaches. New York: Springer, 1967.

Freed, E. Drug abuse by alcoholics: A review. International Journal of the Addictions, 1973, 8, 451-473.

Freed, E. Alcoholism and the Rorschach test: A review. Journal of Studies on Alcohol, 1976, 37, 1163-1154.

Freed, E. An alcoholic personality? Thorofare, NJ: Charles B. Slack, 1979.

Gendreau, P., & Gendreau, L. The "addiction-prone" personality. A study of Canadian heroin addicts. Canadian Journal of Behavioral Science, 1970, 2, 18-25.

Gendreau, P., & Gendreau, L. A theoretical note on personality characteristics of heroin addicts. Journal of Abnormal Psychology, 1973, 82, 139-140.

Goldstein, G., & Chotlos, J. Dependency and brain damage in alcoholics. Perceptual and Motor Skills, 1965, 21, 136-150.

Goldstein, G., & Chotlos, J. Stability of field dependence in chronic alcoholic patients. Journal of Abnormal Psychology, 1966, 71, 420.

Goldstein, J. W., & Sappington, J. T. Personality characteristics of students

who become heavy drug users: An MMPI study of an avant-garde. American Journal of Drug and Alcohol Abuse, 1977, 4, 401-412.

Goodwin, D. Alcoholism and heredity: A review and hypothesis. Archives of General Psychiatry, 1979, 36, 57-61.

Gordon, L. Value correlates of student attitudes on social issues: A multination study. Journal of Applied Psychology, 1972, 56, 305-311.

Gordon, L. B. Preferential drug abuse: Defenses and behavioral correlates. Journal of Personality Assessment, 1980, 44, 345-350.

Gorsuch, R., & Butler, M. Initial drug use: A review of predisposing social psychological factors. Psychological Bulletin, 1976, 83, 120-137.

Goss, A., Morosko, T., & Sheldon, R. Use of the Edwards Personal Preference Schedule with alcohol in a vocational rehabilitation program. Journal of Psychology, 1968, 68, 287-289.

Grant, M. Drinking and creativity: A review of the alcoholism literature. Unpublished manuscript. Alcohol Education Centre, London, 1981.

Gulas, I., & King, F. On the question of pre-existing personality differences between users and nonusers of drugs. Journal of Psychology, 1976, 92, 65-69.

Haagen, C. Social and psychological characteristics associated with the use of marijuana by college men. Wesleyan University, 1970 (available in mimeo).

Haberman, P., Josephson, E., Zanes, H., & Elinson, J. High school drug behavior: A methodological report on pilot studies. In S. Einstein & S. Allen (Eds.), Proceedings of the first international conference on student drug surveys. Farmingdale, NY: Baywood, 1972.

Haertzen, C., Hill, H., & Monroe, J. MMPI scales for differentiating and predicting relapse in alcoholics, opiate addicts, and criminals. International Journal of The Addictions, 1968, 3, 91-106.

Hampton, P. A psychometric study of drinkers: The development of a personality

questionnaire for drinkers. Genetic Psychology Monograh, 1953, 48, 55-115.

Henriques, E., Arsenian, J. Cutter, H., & Samaraweera, A. Personality characteristics and drug of choice. International Journal of the Addictions, 1972, 9, 73-76.

Herzog, M. A., & Wilson, A. S. Personality characteristics of the female alcoholic. Journal of Clinical Psychology, 1978, 34, 1002-1004.

Higgins, R. Experimental investigations of tension reduction models of alcoholism. In G. Goldstein & C. Neuringer (Eds.), Empirical studies of alcoholism. Cambridge: Ballinger, 1976.

Hoffman, H., & Jackson, D. Differential personality inventory for male and female alcoholics. Psychological Reports, 1974, 34, 21-22.

Hoffman, H., Jansen, C., & Wefring, L. Relationships between admission variables and MMPI scale scores of hospitalized alcoholics. Psychological Reports, 1972, 31, 659-662.

Hoffman, H., Loper, R., & Kammeier, M. Identifying future alcoholics with MMPI alcoholism scales. Quarterly Journal of Studies on Alcohol, 1974, 35, 490-498.

Hoffman, H., & Nelson, J. Personality characteristics of alcoholics in relation to age and intelligence. Psychological Reports, 1971, 29, 143-146.

Hoffman, H., Nelson, P., & Jackson, D. The effects of detoxification on psychopathlogy for adults as measured by the Differential Personality Inventory (DPI). Journal of Clinical Psychology, 1974, 30, 89-93.

Holland, T. R. Multivariate analysis of personality correlates of alcohol and drug abuse in a prison population. Journal of Abnormal Psychology, 1977, 86, 644-650.

Hollinshead, W., Marlowe, D., & Rothberg, J. Defining drug involvement in an Army population. Unpublished paper, Department of Psychiatry, Walter Reed Army Institute of Research, 1974.

Holmes, W. The development of an empirical MMPI scale for alcoholism. Unpublished Masters Thesis, San Jose State College, 1953.

Horan, J., Westcott, T., Vetovich, C., & Swisher, J. Drug usage: An experimental comparison of three assessment conditions. Psychological Reports, 1974, 35, 211-215.

Hoyt, D., & Sedlacek, G. Differentiation of alcoholics, normals and abnormals with the MMPI. Journal of Clinical Psychology, 1958, 14, 59-74.

Huba, G., Segal, B., & Singer, J. Organization of needs in male and female drug and alcohol users. Journal of Consulting and Clinical Psychology, 1977, 45, 34-44.

Hunt, W., & Matarazzo, J. Three years later: Recent developments in the experimental modification of smoking behavior. Journal of Abnormal Psychology, 1973, 84, 107-114.

Hurst, P., Cook, R., & Ramsey, D. Assessing the prevalence of illicit drug use in the Army. U. S. Army Research Institute for the Behavioral and Social Sciences, Technical paper 264, 1975.

Irgens-Jensen, O. Problem drinking and personality: A study based on the Draw-A-Person Test. Oslo: Universitetsforlaget, 1971.

Jackson, D. Personality Research Form Manual. Goshen, NY: Research Psychologists Press, 1967.

Jessor, R. Predicting time of onset of marijuana use: A developmental study of high school youth. Journal of Consulting and Clinical Psychology, 1976, 44, 125-134.

Jessor, R. Psychosocial factors in the patterning of drinking behavior. In J. Fishman (Ed.), The bases of addiction. Berlin: Dahlem Konferenzen, 1978.

Jessor, R. Marijuana: A review of recent psychosocial research. In R. Dupont,

A. Goldstein & I. O'Donnell (Eds.), Handbook on drug abuse. Washington, DC: U. S. Govt Printing Office, 1979.

Jessor, R., Chase, J., & Donovan, J. Psychosocial correlates of marijuana use and problem drinking in a national sample of adolescents. American Journal of Public Health, 1980, 70, 604-613.

Jessor, R., Collins, M., & Jessor, S. On becoming a drinker: Social psychological aspects of an adolescent transition. Annals of the New York Academy of Science, 1972, 197, 199-213.

Jessor, R., & Jessor, S. Adolescent development and the onset of drinking. Journal of Studies on Alcohol, 1975, 36, 27-51.

Jessor, R., & Jessor, S. Problem behavior and psychosocial development: A longitudinal study. New York: Academic, 1977.

Jessor, R., & Jessor, S. Theory testing in longitudinal research on marijuana use. In D. Kandel (Ed.), Longitudinal research on drug use. Washington: Hemisphere, 1978.

Jessor, R., Jessor, S., & Finney, J. A social psychology of marijuana use: Longitudinal studies of high school and college youth. Journal of Personality and Social Psychology, 1973, 26, 1-15.

Jessor, R., Young, H., Young, E., & Tesi, G. Perceived opportunity, alienation, and drinking behavior among Italin and American youth. Journal of Personality and Social Psychology, 1970, 15, 215-222.

Johnson, B. Marijuana users and drug subcultures. New York: Wiley, 1973.

Johnston, L. Drugs and American youth. Ann Arbor, Michigan: Institute for Social Research, The University of Michigan, 1973.

Johnston, L., O'Malley, P., & Eveland, L. Drugs and delinquency: A search for causal connections. In D. Kandel (Ed.), Longitudinal research on drug use.

Washington: Hemisphere, 1978.

Jones, E., & Berglas, S. Control of attributions about the self through self-handicapping strategies: The appeal of alcohol and the role of under-achievement. Personality and Social Psychology Bulletin, 1978, 4, 200-206.

Jones, M. C. Personality correlates and antecedents of drinking, drinking patterns in adult males. Journal of Consulting and Clinical Psychology, 1968, 321, 2-12.

Jones, M. Personality antecedents and correlates of drinking patterns in women. Journal of Consulting and Clinical Psychology, 1971, 36, 61-69.

Kalin, R. Self-descriptions of college problem drinkers. In D. McClelland, W. David, R. Kalin, & E. Wanner (Eds.), The drinking man. New York: Free Press, 1972.

Kammeier, M., Hoffman, H., & Loper, R. Personality characteristics of alcoholics as college freshman and at time of treatment. Quarterly Journal of Studies on Alcohol, 1973, 34, 390-399.

Kandel, D. Interpersonal influences on adolescent illegal drug use. In E. Josephson & E. Carroll (Eds.), Drug use: Epidemiological and sociological approaches. Washington: Hemisphere, 1974.

Kandel, D. Stages of adolescent involvement in drug use. Science, 1975, 190, 912-914.

Kandel, D. (Ed.), Longitudinal research on drug use: Empirical findings and methodological issues. Washington, D. C.: Hemisphere Publishing Company (Halsted of Wiley), 1978.

Kandel, D., Kessler, R., & Margulies, R. Antecedents of adolescent initiation into stages of drug use: A developmental analysis. In D. Kandel (Ed.), Longitudinal research on drug use. Washington: Hemisphere, 1978.

Kaplan, H. Increase in self-rejection as an antecedent of deviant responses. Journal of Youth and Adolescence, 1975, 4, 281-292.

Kay, E., Lyons, A., Newman, W., Mankin, D., & Loeb, R. A longitudinal study of the personality correlates of marijuana use. Journal of Consulting and Clinical Psychology, 1978, 46(3), 470-477.

Keehn, J. Neuroticism and extroversion: Chronic alcoholics' reports on effects of drinking. Psychological Reports, 1970, 27, 767-770.

Kellam, S., Ensminger, M., & Simon, M. Mental health in the first grade and teenage drug, alcohol and cigarette use. Drug and Alcohol Dependence, 1980, 5, 273-304.

Keller, M. The oddities of alcoholics. Quarterly Journal of Studies on Alcohol, 1972, 33, 1143-1148.

Kenrick, D., & Stringfield, D. Personality traits and the eye of the beholder: Crossing some traditional philosophical boundaries in the search for consistency in all people. Psychological Review, 1980, 87, 88-104.

Key, J., Cutter, H., Rothstein, E., & Jones, W. Alcohol, power, and inhibition: A factor analytic evaluation of McClelland's hypothesis with a construct validation of the factors. Journal of Health and Social Behavior, 1972, 13, 337-346.

Kilpatrick, D. G. Sutker, P. B., & Smith, A. D. Deviant drug and alcohol use: The role of anxiety, sensation seeking, and other personality variables. In M. Zuckerman, & C. D. Speilberger (Eds.), Emotions and Anxiety: New concepts, methods, and applications. Hillsdale, NJ: Lawrence Erlbaum, 1976.

Kimlicka, T. M., & Cross, H. J. A comparison of chronic vs. casual marijuana users on personal values and behavioral orientations. International Journal of the Addictions, 1978, 13, 1145-1156.

Knecht, S., Cundick, B., Edwards, D., & Gunderson, E. The prediction of marijuana use from personality scales. Educational and Psychological Measurement, 1972, 32, 1111-1117.

Knox, W. Objective psychological measurement and alcoholism. A review of the literature 1971-1972. Psychological Reports, 1976, 1023, 1050.

Kovacs, M. A psychological approach toward the meanings of drug use. In D. Lettierei (Ed.), Predicting adolescent drug abuse. Rockville, MD: NIDA, 1975.

Kranitz, L. Alcoholics, heroin addicts and nonaddicts: Comparisons on the MacAndrew alcoholism scale of the MMPI. Quarterly Journal of Studies on Alcohol, 1972, 33, 807-809.

Kroger, R., & Turnbull, W. Invalidity of the validity scales: The case of the MMPI: Journal of Consulting and Clinical Psychology, 1975, 43, 48-55.

Kurtines, W., Ball, L., & Wood, G. Personality characteristics of long-term recovered alcoholics: A comparative analysis. Journal of Consulting and Clinical Psychology, 1978, 46, 971-977.

Lachar, D., Berman, W., Gisell, J., & Schoof, K. The MacAndrew alcoholism scale as a general measure of substance abuse. Journal of Studies on Alcohol, 1976, 37, 1069-1615.

Lachar, D., Gdowski, C. L., & Keegan, J. F. MMPI profiles of men alcoholics, drug addicts and psychiatric patients. Journal of Studies on Alcohol, 1979, 40, 45-56.

Lang, A. R., Searles, J., Lauerman, R., & Adesso, V. Expectancy, alcohol, and sex guilt as determinants of interest in and reaction to sexual stimuli. Journal of Abnormal Psychology, 1980, 89, 644-653.

Laskowitz, D. The adolescent drug addict: An Alderian view. Journal of Individual Psychology, 1961, 17, 68-79.

Lester, D., & Narkunski, A. Methodological problems in describing the addictive personality. Psychological Reports, 1978, 43, 134.

Lettieri, D., Sayers, M., & Pearson, H. Theories on drug abuse: Selected contemporary perspectives. NIDA Research Monographs #30, 1980.

Levine, J., & Zigler, E. The developmental approach to alcoholism: A further investigation. Addictive Behaviors, 1981, 6, 93-98.

Libb, J., & Taulbee, E. Psychotic-appearing MMPI profiles among alcoholics. Journal of Clinical Psychology, 1971, 27, 101-102.

Lind, C. 16 PF screening instrument for alcoholics. Journal of Clinical Psychology, 1972, 28, 548-549.

Loper, R., Kammeier, M., & Hoffman, H. MMPI characteristics of college freshman males who later became alcoholics. Journal of Abnormal Psychology, 1973, 82, 159-162.

Lucas, W. Predicting initial use of marijuana from correlates of marijuana use: Assessment of panel and cross-sectional data 1969-1976. International Journal of the Addictions, 1978, 13, 1035-1047.

Luetgert, M., & Armstrong, A. Methodological issues in drug usage surveys: Anonymity, recency, and frequency. International Journal of the Addictions, 1973, 8, 683-689.

MacAndrew, C. The differentiation of male alcoholic outpatients from nonalcoholic psychiatric outpatients. Quarterly Journal of Studies on Alcohol, 1965, 26, 238-246.

MacAndrew, C. Evidence for the presence of two fundamentally different age-independent characterological types within unselected runs of male alcohol and drug abusers. American Journal of Drug and Alcohol Abuse, 1979, 6, 207-221.

MacAndrew, C. On the possibility of the psychometric detection of persons who are prone to the abuse of alcohol and other subtances. Addictive Behaviors, 1979, 4, 11-20.

MacAndrew, C. What the MAC scale tells us about alcoholic men: An interpreta-

tive review. Journal of Studies on Alcohol, 1981, 42, 604-625. (a)

MacAndrew, C. Similarities in the self-depictions of men alcoholics and psychiatric outpatients: An explanation of Eysenck's dimension of emotionality. Journal of Studies on Alcohol, 1981, 42, 421-432. (b)

MacAndrew, C., & Garfinkel, H. A consideration of changes attributed to intoxication as common sense reasons for getting drunk. Quarterly Journal of Studies on Alcohol, 1962, 23, 252-266.

Maisto, S., & Caddy, G. Self-control and addictive behavior: Present status and prospects. International Journal of the Addictions, 1981, 16, 109-133.

Marlatt, G. Behavioral assessment of social drinking and alcoholism. In G. Marlatt & P. Nathan (Eds.), Behavioral approaches to alcoholism. New Brunswick, NJ: Journal of Studies on Alcohol Inc., 1978.

Marlatt, G. Relapse prevention: A self-control program for addictive behaviors. Unpublished manuscript, University of Washington, 1980.

Mayfield, D., & Allen, D. Alcohol and affect: A psychopharmacological study. American Journal of Psychiatry, 1967, 123, 1346-1351.

McArdle, J. Impression management by alcoholics. Quarterly Journal of Studies on Alcohol, 1974, 35, 911-916.

McClelland, D., Davis, W., Kalin, R., & Wanner, E. The drinking man. New York: Free Press, 1972.

McCord, J. Etiological factors in alcoholism: Family and personal characteristics. Quarterly Journal of Studies on Alcohol, 1972, 33, 1020-1027.

McCord, W., & McCord, J. Origins of alcoholism. Stanford, CA: Stanford University Press, 1960.

McCord, W., & McCord, J. A longitudinal study of the personality of alcoholics. In D. J. Pittman & C. Snyder (Eds.), Society, culture and drinking patterns. New York: John Wiley and Sons, 1962.

McGuire, J., & Megargee, E. Personality correlates of marijuana use among youthful offenders. Journal of Consulting and Clinical Psychology, 1974, 42, 124-133.

Megargee, E. Screening Army enlistees to identify individuals with potential substance abuse problems. Unpublished manuscript, National Academy of Sciences, 1982.

Mello, N. Behavioral studies of alcoholism. In B. Kissin & H. Begleiter (Eds.), Biology of alcoholism (Vol. 2). New York: Plenum, 1972.

Mello, N. Stimulus self-administration: Some implications for the prediction of drug use liability. In P. Thompson & K. Unna (Eds.), Predicting dependence liability of stimulant and depressant drugs. Baltimore: University Park Press, 1977.

Mendelson, J., & Mello, N. A disease as an organizer for biochemical research: Alcoholism. In A. Mandell & M. Mandell (Eds.), Psychochemical research in man. New York: Academic Press, 1969.

Miller, W. Alcoholism scales and objective assessment methods: A review. Psychological Bulletin, 1976, 83, 649-674.

Miller, W. The addictive behaviors. Oxford: Pergamon Press, 1980.

Miller, J., Sensenig, J., & Reed, T. Risky and cautious values among narcotic addicts. International Journal of the ADdictions, 1972, 7, 1-7.

Mischel, W. Personality and assessment. New York: Wiley, 1968.

Mischel, W. Toward a cognitive social learning reconceptualization of personality. Psychological Review, 1973, 80, 252-283.

Mischel, W. The interaction of person and situation. In D. Magnusson & N. Endler (Eds.), Personality at the crossroads. New York: Halstead, 1977.

Monroe, J., Ross, W., & Berzins, J. The decline of the addict as "psychopathy":

Implications for community care. International Journal of the Addictions, 1967, 2, 601-608.

Murray, H. Explorations in personality. New York: Oxford, 1938.

Naditch, M. Ego mechanisms and marijuana usage. In D. Lettieri (Eds.), Predicting adolescent drug abuse. Rockville, MD: NIDA, 1975.

Naditch, M. Locus of control and drinking behavior in a sample of men in Army basic training. Journal of Consulting and Clinical Psychology, 1975, 43, 96.

National commission on marijuana and drug use, Marijuana: A signal of misunderstanding, Appendix (Vol. 1). Washington, DC: U. S. Government Printing Office, 1972.

Nerviano, V. Common personality patterns among alcoholics. Journal of Consulting and Clinical Psychology, 1974, 44, 104-110.

Noel, N., & Lisman, S. Alcohol consumption by college women following exposure to unsolvable problems: Learned helplessness or stress-induced drinking? Behavior Research and Therapy, 1980, 18, 429-440.

Norem-Hebeisen, A. Self-esteem as a predictor of adolescent drug abuse. In D. Lettieri (Ed.), Predicting adolescent drug abuse. Rockville, MD: NIDA, 1975.

Nurco, D. Etiological aspects of drug abuse. In R. DuPont, A. Goldstein, & J. O'Donnell (Eds), Handbook on drug abuse. Rockville, MD: NIDA, 1979.

Ogborne, A. Two types of heroin reactions. British Journal of the Addictions, 1974, 69, 237-242.

O'Leary, D., O'Leary, M., & Donovan, D. Social skills acquisition and psychosocial development of alcoholics: A review. Addictive Behaviors, 1976, 1, 111-120.

O'Leary, M., Rohsenow, D., & Chaney, E. The use of multivariate personality strategies in predicting attrition from alcoholism treatment. Journal of Clinical Psychology, 1979, 40, 190-193.

O'Mally, P. Correlates and consequences of illicit drug use. Unpublished doctoral dissertation, University of Michigan, 1975.

Orford, J. A study of the personalities of excessive drinkers and their wives using approaches of Leary and Eysenck. Journal of Consulting and Clinical Psychology, 1976, 44, 534-545.

Orive, R., & Gerard, H. Personality, attitudinal and social correlates of drug use. International Journal of the Addictions, 1980, 15, 869-881.

Overall, J. MMPI personality patterns of alcoholics and narcotics addicts. Quarterly Journal of Studies on Alcohol, 1973, 34, 104-111.

Owen, P., & Butcher, J. Personality factors in problem drinking: A review of the evidence and some suggested directions. In R. Pickens & L. Heston (Eds.), Psychiatric factors in drug abuse. New York: Grune & Stratton, 1979.

Page, R., & Linden, J. "Reversible" organic brain syndrome in alcoholics: A psychometric evaluation. Quarterly Journal of Studies on Alcohol, 1974, 35, 98-107.

Panton, J., & Brisson, R. Characteristics associated with drug abuse within a state prison population. Corrective Psychiatry and Journal of Social Therapy, 1971, 17, 3-33.

Parry, H. Sample surveys of drug use. In R. DuPont, A. Goldstein & I. O'Donnell (Eds.), Handbook on drug abuse. Rockville, MD: NIDA, 1979.

Partington, J. Dr. Jekyll and Mr. High: Multidimensional scaling of alcoholics' self-evaluations. Journal of Abnormal Psychchology, 1970, 75,

131-138.

Paton, S., Kessler, R., & Kandel, D. Depressive mood and illegal drug use: A longitudinal analysis. Journal of Genetic Psychologhy, 1977, 131, 267-289.

Penk, W. E., Fudge, J. W., Robinowitz, R., & Neman, R. S. Personality characteristics of compulsive heroin, amphetamine, and barbiturate users. Journal of Consulting and Clinical Psychology, 1979, 47, 583-585.

Penk, W., & Robinowitz, R. Personality differences of volunteer and non-volunteer heroin and nonheroin drug users. Journal of Abnormal Psychology, 1976, 85, 91-100.

Penk, W., E., Woodward, W. A., Robinowitz, R., & Hess, J. L. Differences in MMPI scores of Black and White compulsive heroin users. Journal of Abnormal Psychology, 1978, 87, 505-153.

Penk, W., Woodward, W., Robinowitz, R., & Parr, W. An MMPI comparison of polydrug and heroin abusers. Journal of Abnormal Psychology, 1980, 89, 299-302.

Petrie, A. Individuality in pain and suffering. Chicago: University of Chicago Press, 1967.

Pihl, R., & Spiers, P. The etiology of drug abuse. In B. Maher (Ed.), Progress in expermental personality research (Vol. 8). New York: Academic Press, 1978.

Platt. J. "Addiction proneness" and personality in heroin addicts. Journal of Abnormal Psychology, 1975, 84, 303-306.

Platt, J., & Labate, C. Heroin addiction: Theory, research, and treatment. New York: Wiley, 1976.

Pliner, P., & Cappell, H. Modification of affective consequences of alcohol: A comparison of social and solitary drinking. Journal of Abnormal

Psychology, 1974, 83, 418-425.

Popham, R., & Schmidt, W. A decade of alcoholism research. A review of the research activities of the Alcoholism and Drug Addiction Foundation of Ontario, 1951-1961. Toronto: University Press, 1962.

Pryer, M., & Distefano, M. Further evaluation of the EPPS with hospitalized alcoholics. Journal of Clinical Psychology, 1970, 26, 205.

Rathus, S. A., Fox, V. A., & Ortins, V. B. The MacAndrew scale as a measure of substance abuse and delinquency among adolescents. Journal of Clinical Psychology, 1980, 36, 579-583.

Reid, J. Study of drinking in natural settings. In G. Marlatt & P. Nathan (Eds.), Behavioral approaches to alcoholism. New Brunswick, NJ: Rutgers Center of Alcohol Studies, 1978.

Reiter, H. Note on some personality differences between heavy and light drinkers. Perceptual and Motor Skills, 1970, 30, 762.

Replogle, W., H., & Hair, V. F. A multivariabe approach to profiling alcoholic typologies. Multivariate Experimental Clinical Research, 1977, 3, 157-164.

Rich, C., & Davis, H. Concurrent validity of MMPI alcoholism scales. Journal of Clinical Psychology, 1969, 25, 425-426.

Robins, L. A follow-up of Vietnam drug users. Washington, DC: U. S. Government Printing Office, 1973.

Robins, L., Bates, W., & O'Neal, P. Adult drinking patterns in former problem children. In D. Pittman & C. Snyder (Eds.), Society, culture and drinking patterns. New York: Wiley, 1962.

Rohsenow, D. J., & O'Leary, M. R. Locus of control research on alcoholic populations: A review. I. Development, scales,and treatment. International Journal of the Addictions, 1978, 13, 55-78.

Rohsenow, D. J., & O'Leary, M. R. Locus of control research on alcoholic populations: A review. II. Relationships to other measures. International Journal of Addictions, 1978, 13, 213-226.

Rosenberg, N. MMPI alcoholism scales. Journal of Clinical Psychology, 1972, 28, 515-522.

Rosenthal, R. Interpersonal expectations: Effects of the experimenter's hypothesis. In R. Rosenthal & R. Rosnow (Eds.), Artifact in Behavioral Research. New York: Academic Press, 1969.

Sadava, S. Research approaches in illicit drug use: A critical review. Genetic Psychology Monographs, 1975, 91, 3-59.

Sadava, S. W. Etiology, personality and alcoholism. Canadian Psychological Review, 1978, 19, 198-214.

Schiff, S. A self-theory investigation of drug addiction in relation to age of onset. Unpublished doctoral dissertation, New York Univesity, 1959.

Schuster, C., & Johansen, C. The use of animal models for studying drug abuse. In R. Gibbins et al. (Eds.), Research Advances in Alcohol and Drug Problems (Vol. 1). New York: Wiley, 1974.

Schwartz, D., & Karp, S. Field dependence in a geriatric population. Perceptual and Motor Skills, 1967, 24, 495-504.

Sechrest, L. Personality: In Annual Review of Psychology, 1976.

Seevers, M., & Deneau, G. Physiological aspects of tolerance and physical dependence. In W. Root & F. Hofmann (Eds.), Physiological Pharmacology. New York: Academic Press, 1963.

Segal, B. Personality factors related to drug and alcohol use. In D. Lettieri (Ed.), Predicting adolescent drug abuse. Rockville, MD: NIDA, 1975.

Segal, B. Reasons for marijuana use and personality: A cannoical analysis.

Journal of Alcohol and Drug Education, 1977, 22, 64-67.

Segal, B., Huba, G., & Singer, J. The prediction of college drug and alcohol use from personality and day dreaming tendencies. International Journal of the Addictions, 1978,

Selzer, M. The Michigan Alcoholism Screening Test: The quest for a new diagnostic instrument. American Journal of Psychiatry, 1971, 127, 1653-1658.

Shepphard, C., Ricca, E., Fracchia, J., & Merlis, S. Psychological needs of suburban male heroin addicts. Journal of Psychology, 1974, 87, 123-128.

Smart, R., & Jackson, D. A preliminary report on the attitudes and behavior of Toronto students in relation to drugs. Toronto: Addiction Rsearch Foundation, 1969.

Smith, G., & Fogg, C. Psychological predictors of early use, late use, and nonuse of marijuana among teenage students. In D. Kandel (Ed.), Longitudinal research on drug use. Washington: Hemisphere, 1978.

Spiegel, D., Hadley, A., & Hadley, R. Personality test patterns of rehabilitation center alcoholics, psychiatric inpatients, and normals. Journal of Clinical Psychology, 1970, 26, 366-371.

Spotts, J., & Shontz, F. A life theme theory of chronic drug abuse. In D. Lettieri, M. Sayers & H. Pearson (Eds.), Theories on drug abuse. Rockville, MD: NIDA, 1980.

Stein, K. Rozynko, V., & Pugh, L. The heterogeneity of personality among alcoholics. British Journal of Social and Clinical Psychology, 1971, 10, 253-259.

Sutherland, E. H., Schroeder, H. G., & Tordella, C. L. Personality traits and the alcoholic. Quarterly Journal of Studies on Alcohol, 1950, 11, 547-561.

Sutker, P. Personality differences and sociopathy in heroin addicts and nonaddict prisoners. Journal of Abnormal Psychology, 1971, 78, 247-251.

Sutker, P. B., Archer, R. P., & Allain, A. N. Drug abuse patterns, personality characteristics, and relationships with sex, race, and sensation seeking. Journal of Consulting and Clinical Psychology, 1978, 46, 1374-1378.

Sutker, P., Archer, R., Brantley, P., & Kilpatrick, D. Alcoholics and opiate addicts: A comparison of personality characteristics. Journal of Studies on Alcohol, 1979, 40, 635-644.

Teasdale, J., Segraves, R., & Zacune, J. "Psychoticism" in drug users. British Journal of Social and Clinical Psychology, 1971, 10, 160-171.

Trevithick, L., & Hosch, H. M. MMPI correlates of drug addiction based on drug of choice. Journal of Consulting and Clinical Psychology, 1978, 46, 180.

Valliant, G. A twelve year follow-up of New York narcotic addicts: Some social and psychiatric characteristics. Archives of General Psychiatry, 1966, 15, 599-609.

Wahl, C. Some antecedent factors in the family histories of 109 alcoholics. Quarterly Journal of Studies on Alcohol, 1956, 17, 643-654.

Wallace, D., & Hiner, D. Some descriptive measures of 100 consecutive VA hospital drug abuse admissions. International Journal of the Addictions, 1974, 9, 465-473.

Weckowitz, T., & Janssen, D. Cognitive functions, personality traits, and social values in heavy marijuana smokers and nonsmoker controls. Journal of Abnormal Psychology, 1973, 81, 264-269.

Weiss, L., & Masling, J. Further validation of a Rorschach measure of oral imagery: A study of six clinical groups. Journal of Abnormal Psychology, 1970, 76, 83-87.

Whitelock, P. Overall, J., & Patrick, J. Personality patterns and alcohol use in a state hospital population. Journal of Abnormal Psychology, 1971, 78, 9-16.

Wiggins, J. Personality and prediction: Principles of personality assessment. Reading, MA: Addison-Wesley, 1973.

Williams, A. The alcoholic personality. In B. Kissin & H. Begleiter (Eds.), The biology of alcoholism: Social aspects of alcoholism. New York: Plenum, 1976.

Williams, A., McCourt, W., & Schneider, L. Personality self-descriptions of alcoholics and heavy drinkers. Quaterly Journal of Studies on Alcohol, 1971, 32, 310-317.

Wilsnack, S. The effects of social drinking on women's fantasy. Journal of Personality, 1974, 42, 43-61.

Wingard, J. A., Huba, G. V., & Bentler, P. M. The relationship of personality structure to patterns of adolescent substance use. Multivariate Behavioral Research, 1979, 14, 131-143.

Witkin, H., Karp, S., & Goodenough. D. Dependence in alcoholics. Quarterly Journal of Studies on Alcohol, 1959, 20, 493-504.

Witkin, H., Lewis, H., Hertzman, M., Machover, K., Meissner, P., & Wapner, S. Personality through perception: An experimental and clinical study. New York: Harper, 1954.

Wittman, P. Developmental characteristics and personalities of chronic alcoholics. Journal of Abnormal and Social Psychology, 1939, 34, 361-377.

Yakichuk, A. J. A study of the self-concept evaluations of alcoholic's and nonalcoholics. Journal of Drug Education, 1978, 8, 41-49.

Zager, L., & Megargee, E. Seven MMPI Alcohol and Drug Abuse Scales: An empirical investigation of their interrelationships, convergent and discriminant validity, and degree of racial bias. Journal of Personality and Social Psychology, 1981, 40, 532-544.

Zinberg, N. Nonaddictive opiate use. In R. DuPont, A. Goldstein & J. O'Donnell (Eds.), Handbook on Drug Abuse. Rockville, MD: NIDA, 1979.

Zuckerman, M. Sensation seeking: Beyond the optimal level of arousal. Hillsdale, NJ: Erlbaum, 1979.

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