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THE RELATIONSHIP OF PSYCHIATRIC SEVERITY TO TREATMENT SERVICES AND OUTCOMES FOR CLIENTS IN SUBSTANCE ABUSE TREATMENT

October 2002



CSAT
Center for Substance
Abuse Treatment
SAMHSA

DeltaMetrics

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Prepared by

**John Cacciola
Karen Dugosh
Carol Foltz
Jack Durell**

**DeltaMetrics
600 Public Ledger Building
150 South Independence Mall West
Philadelphia, PA 19106-3475**

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TABLE OF CONTENTS

Page

FOREWORD

ACKNOWLEDGMENTS

ABSTRACT

EXECUTIVE SUMMARY..... i

I. INTRODUCTION..... 1

1. BACKGROUND..... 1

1.1 Co-morbidity of Psychopathology and Substance Use Disorders 1

1.2 Psychiatric Co-morbidity: Admission Severity and
Treatment Outcomes 2

2. THE PRESENT ANALYSIS 4

2.1 Purpose and Parameters of the Present Analysis 4

2.2 Analytic Questions 5

3. ORGANIZATION OF THE REPORT 5

II. METHODS 7

1. MEASURES 8

1.1 Addiction Severity Index 8

1.2 Treatment Services Review..... 8

2. CLIENT CHARACTERISTICS AND DEMOGRAPHICS AT INTAKE..... 8

3. PSYCHIATRIC SEVERITY AND PROBLEM SEVERITY AT INTAKE 10

4. PSYCHIATRIC SEVERITY AND TREATMENT SERVICES..... 12

4.1 Psychiatric Services..... 13

4.2 Non-psychiatric Services..... 14

TABLE OF CONTENTS (CONT.)

	<u>Page</u>
5. RELATIONSHIP BETWEEN TREATMENT SERVICES AND OUTCOMES IN PSYCHIATRICALY SEVERE CLIENTS	15
5.1 Psychiatric Services and Outcomes.....	15
5.2 Non-psychiatric Services and Outcomes.....	16
III. FINDINGS	18
1. CLIENT CHARACTERISTICS AND DEMOGRAPHICS AT INTAKE.....	18
2. PSYCHIATRIC SEVERITY AND PROBLEM SEVERITY AT INTAKE	18
3. PSYCHIATRIC SEVERITY AND THE RECEIPT OF TREATMENT SERVICES	23
3.1 Psychiatric Severity And Psychiatric Services.....	23
3.2 Psychiatric Severity And Non-Psychiatric Services	25
4. RELATIONSHIP BETWEEN TREATMENT SERVICES AND OUTCOMES IN PSYCHIATRICALY SEVERE CLIENTS	28
4.1 Psychiatric Treatment Services and Outcomes	28
4.2 Non-psychiatric Treatment Services and Outcomes	30
IV. SUMMARY AND IMPLICATIONS.....	33
1. SUMMARY OF ANALYTIC FINDINGS	33
1.1 Psychiatric Severity and Problem Severity in Other Areas.....	33
1.2 Psychiatric Severity and Treatment Service Provision	33
1.3 Treatment Service Provision and Outcomes for Psychiatrically Severe Clients	34
2. CONSTRAINTS	35
3. IMPLICATIONS.....	36
3.1 Implications for Treatment Providers	36
3.2 Implications for Policymakers	37
3.3 Implications for Researchers/Evaluators.....	37
3.4 Future Directions.....	38

TABLE OF CONTENTS (CONT.)

	<u>Page</u>
REFERENCES.....	40
APPENDIX A ADDITIONAL INFORMATION ABOUT THE ANALYSIS	
APPENDIX B INFORMATION ABOUT THE SAMPLE SIZE AND MISSING DATA	
APPENDIX C FURTHER DEMOGRAPHIC INFORMATION	

FOREWORD

The mission of the Center for Substance Abuse Treatment (CSAT), Substance Abuse and Mental Health Services Administration (SAMHSA), is to improve the lives of individuals and families affected by alcohol and drug abuse by ensuring access to clinically sound, cost-effective addiction treatment that reduces the health and social costs to our communities and the nation. As part of its mission, CSAT supports the development of innovative treatment approaches, based on sound data and state-of-the-art analyses, and disseminates information on treatment approaches shown to be effective for curbing addiction and related behaviors.

In 1997, CSAT established the National Evaluation Data Services (NEDS) contract to support the CSAT mission. In 2000, through a new contract (Contract No. 270-00-7078), CSAT continued and expanded the scope of NEDS. NEDS activities help to foster collaboration and partnering among the public and private sectors along the Federal-state-local community-based treatment continuum. The three major activities of NEDS, under the current contract, are to assist in developing data infrastructure vehicles and tools, to perform treatment services secondary analyses on existing data, and to support the Government Performance Results Act (GPRA) activities. NEDS, through its Secondary Analysis Technical Reports, provides evidence-based information on substance abuse treatment issues relevant to treatment needs, access, utilization, efficacy, effectiveness, and efficiency. NEDS analyses focus on treatment needs, services received, and populations of interest to the substance abuse treatment field in order to provide new information about which services yield the best outcomes for what types of clients, at what cost. This information helps address treatment issues such as the treatment gap, culturally competent treatment services, and recovery.

This analysis examines the relationships among psychiatric severity, problem severity in other functional areas, treatment service provision, and treatment outcomes for clients participating in six large-scale treatment outcomes studies included in the Treatment Research Institute Addiction Severity Index (ASI) registry. The results indicated that psychiatric severity was related to increased problems in a number of ASI domains, including substance use. Psychiatric severity was related to increased psychiatric service receipt, but generally not to service receipt in other areas. Intensity of treatment services was generally not related to outcomes. This analysis can alert the treatment field to the increased multidimensional problems of psychiatrically severe clients and to the risk of worse outcomes for such clients. The identification and appropriate provision of services to these clients remain uncertain, however.

These findings may assist treatment providers in identifying treatment needs and appropriate interventions for psychiatrically severe substance abusing clients and may provide policymakers with information necessary to enhance the substance abuse treatment system. Results from this more naturalistic analysis may assist researchers/evaluators in designing controlled studies to address specific questions more precisely than was possible here.

Patrick J. Coleman
Project Director
National Evaluation Data Services (NEDS)

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We wish to acknowledge A. Thomas McLellan of the Treatment Research Institute for the use of the national Addiction Severity Index (ASI) database. We also wish to thank Bruce Rounsaville, Yale University, for his valuable and insightful comments on an earlier draft of this paper. Thanks are also due to Substance Abuse and Mental Health Services Administration (SAMHSA) staff members who reviewed and commented on an earlier draft of this paper. Many individuals on the NEDS team contributed to this report through content and editorial reviews, and final document preparation. Special thanks go to Larry Greenfield, Jean Strohl, Sandra Pertica, Sharyn Berg, and Iris Mensing.

ABSTRACT

The extensive co-morbidity of non-substance use psychiatric disorders in substance abuse treatment clients is well documented. This analysis investigated the relationships among psychiatric severity, problem severity in other domains, treatment services, and treatment outcomes in clients with substance use disorders. Several issues were addressed: 1) the extent to which psychiatrically severe clients have problems in other domains, 2) whether psychiatrically severe clients receive more treatment services, and 3) the extent to which service provision relates to better outcomes for psychiatrically severe clients. Addiction Severity Index (ASI) registry data from six large-scale treatment outcomes studies were used to examine these issues. In the studies, both the ASI and the Treatment Services Review (TSR) were administered to clients. The overall sample included 2,782 outpatient and residential clients. Analyses of variance (ANOVAs), multivariate analyses of variance (MANOVAs), Chi-square analyses, and regression analyses were used to address the analytic questions. Results indicated that psychiatric severity was related to increased problems in a number of ASI domains (i.e., medical, family/social, alcohol, and drug) at admission to substance abuse treatment. At follow-up, psychiatric severity was related to poorer medical and alcohol use outcomes. Psychiatric severity was related to increased psychiatric service receipt, but generally not to service receipt in other problem areas. With few exceptions, service provision was not related to outcomes. This analysis can alert the treatment field to the increased multidimensional problems of psychiatrically severe clients and such clients' risk for worse outcomes. There remains a great need, however, to identify the most appropriate type and intensity of services for these clients.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This secondary analysis examined the relationships among psychiatric problem severity, problem severity in other life areas commonly affected by substance abuse, treatment service receipt, and treatment outcomes in substance abuse treatment clients.

1. INTRODUCTION

The extensive co-morbidity of non-substance use psychiatric disorders in clients entering substance abuse treatment has been well documented. The Epidemiologic Catchment Area (ECA) study, with more than 20,000 participants from communities and institutions in the United States, found that substantial percentages of individuals with alcohol disorders (37%) and other drug disorders (53%) had a history of non-substance use Axis I psychiatric disorders (i.e., clinical disorders, such as mood disorders) or an Axis II antisocial personality disorder (ASPD). In samples of substance abuse treatment clients, the reported rates of co-morbidity have varied widely from study to study but are generally higher than those in the ECA study.

This analysis was conducted to investigate the relationships among psychiatric severity, problem severity in areas commonly affected by substance abuse, treatment services, and treatment outcomes using a large and diverse sample of clients in substance abuse treatment. The specific questions addressed in the analysis are:

- Do clients in substance abuse treatment who display greater psychiatric severity also have more serious problems in other functional areas (i.e., medical, employment, alcohol, drugs, family/social, and legal)?
- Do clients who display greater psychiatric severity receive more psychiatric services?
- Do clients who display greater psychiatric severity receive more treatment services in other problem areas?
- Does the amount of psychiatric treatment services received relate to better outcomes or clients who display greater psychiatric severity?
- Does the amount of non-psychiatric treatment services received relate to better outcomes for clients who display greater psychiatric severity?

The data used to address this series of questions were collected from six large-scale substance abuse treatment outcome studies.

2. METHODS

The data sets for this analysis were selected from the Addiction Severity Index (ASI) registry (a data registry compiled by the Treatment Research Institute, Philadelphia, PA). The sample contained clients from both outpatient and residential substance abuse treatment. In all of these studies, ASIs were administered at treatment admission and at 6 through 9 months post-admission or post-discharge, and Treatment Service Reviews (TSRs) were collected during the first month of treatment.

The overall sample contained 2,782 clients, who were divided into three psychiatric severity groups [low severity (n = 906), moderate severity (n = 836), and high severity (n = 871)]. Psychiatric severity was operationalized using clients' pre-treatment ASI psychiatric composite scores. The relationship between pre-treatment psychiatric severity and the severity of problems in the other domains measured by the ASI was assessed using a multivariate analysis of variance (MANOVA). Chi-square analyses, logistic regression analyses, an analysis of variance and a MANOVA were used to assess the relationship between psychiatric severity level and receipt of psychiatric and non-psychiatric services as measured by the TSR. Regression analyses were used to assess the extent to which receipt of treatment services was related to treatment outcomes (i.e., problem severity at follow-up in the seven ASI domains).

3. FINDINGS

Overall, the findings indicated that there was a relationship between pre-treatment psychiatric severity and problem severity in all domains except employment and legal problems. Pre-treatment psychiatric severity was also related to treatment service receipt. Service receipt, however, was generally unrelated to post-treatment outcomes in the various functional domains. The results of the analyses pertaining to the various analytic questions are summarized below.

At treatment admission, clients with high and moderate levels of psychiatric severity displayed significantly higher problem severity in the medical, alcohol, drug, and family/social problem areas than clients with low levels of psychiatric severity. Clients with high levels of psychiatric severity displayed significantly higher levels of medical and family/social problem severity than clients with moderate levels of psychiatric severity. At follow-up, psychiatric severity was related to poorer medical and alcohol use outcomes.

There was some evidence that clients with greater psychiatric severity received more treatment services than clients with low psychiatric severity. Clients with high levels of psychiatric severity were more likely to be prescribed psychiatric medication and medication for

a medical problem than clients with low levels of psychiatric severity. Clients with high and moderate levels of psychiatric severity received more psychiatric sessions than clients with low levels of psychiatric severity.

Little relationship was found between the amount of psychiatric and non-psychiatric services received and treatment outcomes for psychiatrically severe clients. Clients who were prescribed psychiatric medication tended to be the most psychiatrically severe clients. While demonstrating improvement from admission to follow-up, clients who were prescribed psychiatric medication tended to have worse psychiatric outcomes than clients who were not prescribed psychiatric medication. Their overall level of psychiatric severity at follow-up was greater than that of their counterparts who did not receive psychiatric medication. No other treatment services (both psychiatric and non-psychiatric) were related to outcomes for psychiatrically severe clients.

Several important findings emerged relating to treatment type. Clients in outpatient and residential substance abuse treatment exhibited similar levels of psychiatric severity. Clients in residential treatment received more psychiatric services than clients in outpatient treatment. More psychiatrically severe clients in residential treatment than psychiatrically severe clients in outpatient treatment displayed better psychiatric outcomes.

4. SUMMARY AND IMPLICATIONS

The findings have important implications for treatment providers, policymakers, and researchers/evaluators. For treatment providers, psychiatric severity may be a marker of problems in other life areas and a potential indicator of multidimensional service needs. For this reason, enhanced service provision across multiple problem areas is worthy of consideration for clients who report psychological problems. The results indicate that psychiatrically severe clients may be best treated in a residential setting. For organizations that provide multiple levels of care, it may be worth instituting program evaluation initiatives to examine the differential effectiveness of these two treatment types.

For policymakers, the results support the conceptualization of substance use disorder as a multidimensional problem and suggest the need to design multi-focused treatment. Additionally, the consideration of psychiatric severity in determining the appropriate level of care appears warranted insofar as more services were provided and better outcomes were observed in residential treatment. Finally, policymakers may need to support the implementation of enhancements to treatment units, including staff training, part-time psychologists or psychiatrists, and community referral services.

This analysis revealed a number of preliminary results as well as analytic constraints. Because service receipt was likely to have been driven by severity of client problems and severity in a specific problem area was generally related to the corresponding outcome (i.e., a more severe admission problem predicted a worse outcome), this naturalistic analysis could not adequately disentangle severity and service intensity. Future randomized studies that control for these variables and use more refined measures can provide a more rigorous assessment of the validity and generalizability of the present findings.

I. INTRODUCTION

I. INTRODUCTION

This secondary analysis examined the relationships among psychiatric problem severity, treatment service receipt and intensity, and treatment outcomes in substance abuse treatment clients. This chapter describes pertinent literature relating to this issue and presents a description of the specific questions the analysis addresses.

1. BACKGROUND

A brief review of the literature indicates that co-occurring psychiatric disorders in clients entering substance abuse treatment is the rule, not the exception. Furthermore, co-occurring disorders are related to increased problems and worse outcomes. Finally, there is some evidence that enhanced service provision has a positive impact on outcomes.

1.1 Co-morbidity of Psychopathology and Substance Use Disorders

The extensive co-morbidity of non-substance use psychiatric disorders in clients entering substance abuse treatment has been well documented (Cacciola, Alterman, McKay, & Rutherford, 2001). Co-morbidity of non-substance use psychiatric disorders in clients who have substance use disorders has also been referred to as coexisting mental illness and other drug abuse, and clients with this constellation of disorders as dual diagnosis or dual disorder clients. The Center for Substance Abuse Treatment (CSAT), with the publication of this Treatment Improvement Protocol (TIP) dedicated to “Assessment and Treatment of Patients with Coexisting Mental Illness and Alcohol and Other Drug Abuse” has recognized the importance of this group of clients (SAMHSA, 1994).

The Epidemiologic Catchment Area (ECA) study, with more than 20,000 participants from communities and institutions in the United States, found that substantial percentages of individuals with alcohol disorders (37%) and other drug disorders (53%) had a history of non-substance use Axis I psychiatric disorders (i.e., clinical disorders, such as mood disorders) or an antisocial personality disorder (ASPD) (Regier et al., 1990). In samples of substance abuse treatment clients, the reported rates of co-morbidity have varied widely from study to study but are generally higher than those in the ECA study (e.g., Penick et al., 1994; Ross, Glaser, & Germanson, 1988; Rounsaville et al., 1994; Rounsaville et al., 2001). Earlier studies documented the prevalence of non-substance use Axis I disorders and ASPD, as did the ECA study. Mood and anxiety disorders were consistently the most predominant Axis I disorders, with psychotic disorders accounting for a very small proportion of co-morbidity (see Cacciola, Alterman, McKay, et al., 2001). Later studies, which included all of the personality disorders,

revealed even higher rates of co-morbidity because as many as two-thirds to three-quarters of clients in substance abuse treatment have a personality disorder (e.g., Cacciola, Alterman, Rutherford, McKay, & Mulvaney, 2001), with ASPD and borderline personality disorders typically the most prevalent (Cacciola, Alterman, McKay, et al., 2001).

Psychopathology in clients with substance use disorders has been assessed in a variety of ways (Cacciola, Alterman, McKay et al., 2001; Zimmerman, 1994), including the use of structured and unstructured diagnostic interviews and interviewer- or self-administered psychological symptom and functioning questionnaires. Although different assessment instruments and methods affect the prevalence rates of identified psychopathology, the relationships between psychopathology and problems in other life domains and between psychopathology and treatment outcomes have been rather consistent regardless of psychiatric assessment. One widely used approach to assessing psychopathology in clients with substance use disorders has been to use the Addiction Severity Index (ASI) (McLellan, Kushner, et al., 1992). The ASI has a psychiatric assessment section that can be summarized in a number of ways, the most widely accepted being the ASI psychiatric composite score. The ASI psychiatric composite score summarizes recent (past 30-day) psychiatric status by combining a variety of items that measure psychological symptoms, frequency of psychological problems (number of days), subjective distress, and need for treatment (McGahan, Griffith, Parante, & McLellan, 1990). Although the ASI composite score does not diagnose psychiatric disorders *per se*, the symptoms assessed include depression, anxiety, suicidality, and trouble controlling violence, all of which relate well to Axis I and Axis II (i.e., personality disorders, such as borderline personality disorder) pathology. Finally, ASI psychiatric summary scores have been shown to have predictive value that is as good as or better than that of psychiatric diagnoses (e.g., Rounsaville, Kosten, Weissman, Kleber, & Wilber, 1986).

1.2 Psychiatric Co-morbidity: Admission Severity and Treatment Outcomes

Concurrent assessment of psychopathology and problem severity in multiple life areas (typically at admission to substance abuse treatment) has yielded some interesting findings. Overall, when both Axis I and Axis II diagnoses have been considered, clients with substance use disorders and additional psychopathology have more problems in other life domains than do clients without significant psychopathology. In general, clients with Axis I and/or Axis II co-morbidity experience more psychological distress and more family and social problems than do clients without significant psychopathology. Axis I psychopathology, however, has not been consistently related to severity of substance use. The Axis II personality disorders have been related to admission and historical problems, and these problems tend to span alcohol and other drug use as well as other aspects of psychosocial functioning, including criminal activity (e.g.,

Brooner, King, Kidorf, Schmidt, & Bigelow, 1997; Nace, Davis, & Gaspari, 1991; Rutherford, Cacciola, & Alterman, 1994; also see Cacciola, Alterman, McKay, et al., 2001).

Naturalistic treatment studies and studies not focused specifically on treating psychopathology have generally demonstrated that clients in substance abuse treatment who have additional psychopathology have poorer biopsychosocial outcomes (i.e., medical, employment, legal, family/social, and psychiatric) than do clients who do not have significant psychopathology (Cacciola, Alterman, McKay, et al., 2001). These studies, however, have also found that psychopathology has not been consistently related to substance use outcomes (see Cacciola, Alterman, McKay, et al., 2001). For example, studies of the impact of major depression on alcohol use have found better alcohol treatment outcomes for women with co-morbid depression (Rounsaville, Dolinsky, Babor, & Meyer, 1987), worse alcohol use outcomes for men with depression (Rounsaville et al., 1987), and no difference in alcohol use outcomes for men with and without depression (Powell, Penick, Nickel, & Liskow, 1994). Similarly, McKay and colleagues (McKay et al., 1997) found no relationship of cocaine use outcomes to current depression or to anxiety disorders and found that lifetime major depression and anxiety disorders were actually associated with less cocaine use.

Well-designed, placebo-controlled medication studies have addressed the issue of treating co-morbid psychiatric disorders in clients with substance use disorders. In this regard, the treatment of depression is the most studied. At least three studies have consistently demonstrated positive effects of tricyclic agents on depression symptoms in clients with alcohol and/or other drug use disorders (Mason, Kocsis, Ritvo & Cutler, 1996; McGrath, et al., 1996; Nunes et al., 1998). These studies did not, however, generally show that antidepressant medication treatment affected client substance use.

1.3 Treatment Services and Treatment Outcomes

The provision of biopsychosocial services in addiction treatment has been proposed as a means of enhancing treatment of substance abuse clients (Gerstein & Harwood, 1990; Institute of Medicine, 1990). More recently, a number of empirical studies have demonstrated that the provision of these additional services can enhance client outcomes (McLellan et al., 1998; McLellan & Weisner, 1996). Going beyond the general provision of more and diverse services, there is also evidence for the effectiveness of targeting specific services to specific problems, or client-service matching (Hser, Polinsky, Maglione, & Anglin, 1999; McLellan et al., 1997).

An important yet under-examined issue concerning psychopathology and substance abuse treatment outcomes is the relationship of treatment services to the multidimensional outcomes of

clients who have both substance use disorders and psychopathology. Two studies are particularly relevant. In both of these studies, psychopathology was operationalized as psychiatric severity using the ASI psychiatric composite score, and treatment services were measured with the TSR. First, McLellan et al. (1994), in a heterogeneous sample of 649 clients in substance abuse treatment, found that 1) greater alcohol and drug use at treatment admission predicted worse substance use outcomes, 2) the amount of substance abuse services received was essentially unrelated to substance use outcomes, 3) receipt of other services (e.g., psychiatric, medical) was only modestly related to better substance use outcomes, 4) more biopsychosocial problems at admission predicted worse biopsychosocial outcomes, and 5) receipt of more biopsychosocial services was related to better biopsychosocial outcomes. In the second study, Alterman, McLellan, and Schiffman (1993) focused more specifically on 204 male veterans with psychopathology and cocaine and/or alcohol dependence. In this sample, Alterman and his colleagues found that clients with higher levels of psychopathology at treatment admission had more problems in a number of life areas (including alcohol use but not drug use) and received more treatment services in several problem areas (again, including alcohol use but not drug use). Furthermore, there was preliminary evidence that clients with psychopathology who received more treatment showed greater improvement at follow-up in the areas of alcohol use and medical problems. Although the first study did not find a relationship between treatment services and outcomes, the second study and others, including those by McLellan, do show a relationship between treatment services received and outcomes.

2. THE PRESENT ANALYSIS

In the analysis described in this report, data were pooled across six treatment outcomes studies to address five specific analytic questions relating to psychiatric severity, severity of problems in other life domains, treatment services, and treatment outcomes.

2.1 Purpose and Parameters of the Present Analysis

This project extends the work of previous studies in a number of important ways. In this analysis, the sample size is much larger than that used in earlier studies. Its inclusion of large numbers of women and minorities allows for a determination of effects of gender and race/ethnicity. The results of this analysis may further validate the use of the ASI psychiatric composite score as a brief assessment measure to identify psychopathology and treatment needs in clients with substance use disorders. Additionally, the results may assist substance abuse clinicians and treatment providers in targeting specific clients to appropriate levels of psychiatric and other treatment services.

2.2 Analytic Questions

The specific analytic questions this report are:

- Do clients in substance abuse treatment who display greater psychiatric severity also have more serious problems in other functional areas?
- Do clients who display greater psychiatric severity receive more psychiatric services?
- Do clients who display greater psychiatric severity receive more treatment services in other problem areas?
- Does the amount of psychiatric treatment services received relate to better outcomes (i.e., alcohol, drug, medical, employment, legal, family/social, and psychiatric) for clients who display greater psychiatric severity?
- Does the amount of non-psychiatric treatment services (e.g., employment services, legal services, AA/NA meetings) received relate to better outcomes (i.e., alcohol, drug, medical, employment, legal, family/social, and psychiatric) for clients who display greater psychiatric severity?

3. ORGANIZATION OF THE REPORT

This chapter has provided an overview of the relevant literature and an introduction to the analytic questions addressed in the report. Chapter II describes sample characteristics and the analytic methods by which the analytic questions were addressed. Chapter III describes the results of the analyses. Chapter IV presents a summary of the findings, along with a discussion of implications and recommendations. Three appendices are attached: Appendix A contains additional information regarding the six studies used in the secondary analyses, Appendix B includes detail on missing data for each analysis, and Appendix C presents the results of additional analyses relating demographic characteristics to level of psychiatric severity.

II. METHODS

II. METHODS

This chapter describes the samples used in the secondary analysis and the instruments that were administered to clients in the sample. Additionally, the analytic questions are presented, along with detailed descriptions of the analytic approaches that were used to address each question.

The data used in this analysis were collected from six large-scale substance abuse treatment outcomes studies. Five of the studies were federally funded, while one was state-funded. The sample includes data from both residential/inpatient and outpatient/intensive outpatient service delivery units (SDUs).¹ Data from these particular studies were selected for inclusion because they provide information collected using the Addiction Severity Index (ASI) (McLellan, Kushner, et al., 1992) and the Treatment Services Review (TSR) (McLellan, Alterman, Cacciola, Metzger, & O'Brien, 1992), recognized measures for use in assessing problems related to substance abuse and treatment services, respectively. The data sets were selected from the ASI registry (a data registry compiled by the Treatment Research Institute, Philadelphia, PA).

Criteria for inclusion in the analysis were as follows: 1) the ASI was administered both at admission and 6 to 9 months post-admission or post-discharge, 2) the TSR data were collected for the entire first month of treatment, 3) ASIs were administered by a trained interviewer, and 4) the data were collected during approximately the past five years. An overview of the baseline samples in each of these studies is presented in Exhibit II-1. See Appendix A for more detailed information pertaining to each analysis.

EXHIBIT II-1			
CHARACTERISTICS OF INCLUDED STUDIES*			
Study	Baseline Number of Clients Overall	Treatment Type	Baseline Number of Clients by Treatment Type**
Philadelphia Target Cities Project	441	Outpatient	297
CSAT Managed Care	1,135	Outpatient	808
		Residential	327
Illinois State I	659	Outpatient	446
		Residential	211
Washington CSAT TOPPS I	263	Outpatient	96
		Residential	167
Arkansas CSAT TOPPS I	154	Residential	154
Rhode Island CSAT TOPPS I	130	Outpatient	44
		Residential	84
Total	2,782	Outpatient	1691
		Residential	943

* Note: While there may be differences in both client characteristics and service provision among the six studies included in the analysis, the most important differences among clients and services are likely to occur at the SDU level. The database does not contain SDU information for all of the studies (i.e., Philadelphia Target Cities and Washington CSAT TOPPS I). Additionally, the sheer number of SDUs and small numbers of clients within some of them prohibit the inclusion of this variable in the analyses. For these reasons, SDU-level effects could not be examined in the secondary analysis.

**Note: For each study, the sum of number of clients in each type of treatment may not equal the overall number of clients because of missing data.

¹ CSAT defines a Service Delivery Unit (SDU) as a single geographical site offering a single level of care.

1. MEASURES

Two measures, the Addiction Severity Index (ASI) and the Treatment Services Review (TSR), are included in this analysis. The two measures are described below.

1.1 Addiction Severity Index

The Addiction Severity Index (ASI) (McLellan, Kushner, et al., 1992; McLellan, Luborsky, & O'Brien, 1980) is a 45- to 60-minute structured interview designed to evaluate problems in individuals who have substance use disorders. It provides information regarding seven areas of functioning commonly affected in clients with alcohol and drug use disorders: alcohol use, drug use, medical condition, employment, illegal activity, family/social relations, and psychiatric status. Key items in each section are used to generate composite scores that yield an assessment of overall problem severity in that area in the past 30 days. The ASI can also be used to measure the extent to which a client's problems have changed following participation in treatment. The ASI contains additional items in each problem area that assess the history and chronicity of problems in that area. Studies have consistently supported the reliability and validity of the ASI as a tool to assess problem severity in individuals with substance use disorders across the seven problem domains detailed above (Alterman, Brown, Zaballero, & McKay, 1994; McDermott et al., 1996; McLellan et al., 1985).

1.2 Treatment Services Review

The Treatment Services Review (TSR) (McLellan, Alterman et al., 1992) is a brief (5- to 10-minute) structured interview containing items that measure the extent of a client's participation in treatment. The TSR is designed to assess a number of factors related to the alcohol or drug treatment services the client has received, such as the amount, nature, and efficacy of the treatment received during a particular period. The types of services measured correspond to the domains of functioning assessed by the ASI (that is, alcohol, drugs, medical, employment, legal, family/social, and psychiatric). With the TSR, it is possible to differentiate the various types and the amount of treatment a client received and to assess the extent to which the problems presented at admission have been addressed through treatment. The original TSR (used in the Philadelphia Target Cities project) assesses services for a 1-week period, while a revised version (used in the remaining studies) assesses services for a 2-week period. Data exist that support the reliability and validity of the TSR (McLellan, Alterman et al., 1992).

2. CLIENT CHARACTERISTICS AND DEMOGRAPHICS AT INTAKE

The overall sample included in the analysis described in this report consisted of 2,782 clients. Clients were classified as high, moderate, and low in psychiatric severity on the basis of

their pre-treatment ASI psychiatric composite score. Ninety-four percent (n = 2,613) of clients received a psychiatric severity classification. Clients with a severity score of zero were classified as low in psychiatric severity (n = 906). The remaining clients were divided into two approximately equal groups using a median split procedure (median = 0.42). The moderate psychiatric severity group consisted of 836 clients, and the high psychiatric severity group consisted of 871 clients. Some clients (n= 169) could not be classified because missing data did not allow the calculation of a pre-treatment ASI psychiatric composite score. The average age of clients in the sample was 34.58 (SD = 8.72). One third of the sample was female, and 38 percent of the sample were white.

Because clients were not formally diagnosed, descriptive information pertaining to level of psychiatric severity is provided in Exhibit II-2. All clients in the psychiatrically severe groups (i.e., moderate or high) reported recent psychological problems, such as depression or anxiety, or more serious symptoms, such as suicidal ideation/behavior or hallucinations. The average number of days that clients in the three severity groups reported experiencing any psychiatric problems in the 30 days prior to treatment admission ranged from less than a day for clients in the low severity group to 21 days for clients in the high severity group. A total of 64 percent of high severity clients had been hospitalized for their psychiatric problems at some point in their lifetime, compared to 25 percent of moderate severity clients and 11 percent of low severity clients. A larger proportion of high psychiatric severity clients reported experiencing hallucinations at some point in their lifetime and in the past 30 days than moderate and low severity clients. Finally, a larger proportion of high psychiatric severity clients reported suicidal thoughts in their lifetime and in the past 30 days than moderate and low severity clients.

EXHIBIT II-2
PSYCHIATRIC PROBLEMS OF CLIENTS WITH
LOW, MODERATE, AND HIGH PSYCHIATRIC SEVERITY
(N=2,613)

Psychiatric Problems		Psychiatric Severity		
		Low (n=906)	Moderate (n=836)	High (n=871)
Mean number of days experiencing psychiatric problems in 30 days prior to admission	M SD	.21 .28	7.70 10.01	21.02 10.37
Hospitalized for psychiatric problems in lifetime		11%	25%	64%
Experienced hallucinations				
In lifetime		3%	12%	72%
In past 30 days		0%	2%	27%
Suicidal thoughts				
In lifetime		12%	32%	69%
In past 30 days		0%	4%	35%

M - mean, SD - standard deviation.

A series of analyses was performed to determine the extent to which clients' demographic characteristics [age, gender, and race (white vs. minority, i.e., African-American, Native American, Alaskan/Asian Pacific/Hispanic)] were related to their level of psychiatric severity (high, moderate, and low). For client age, a one-factor analysis of variance (ANOVA) was performed in which age was the dependent variable and level of psychiatric severity (high, moderate, and low) was the independent variable. Bonferroni post-hoc tests were used to identify pairwise differences. For gender and race, both categorical variables, Chi-square analyses were performed to determine if each demographic variable was related to psychiatric severity level. Finally, a Chi-square analysis was performed using type of treatment and psychiatric severity information to determine the extent to which a client's level of psychiatric severity was related to the type of treatment (residential vs. outpatient) he or she received. Sample size and missing data information for each analysis are presented in detail in Appendix B. A summary is provided in Exhibit II-3.

EXHIBIT II-3			
INFORMATION ON SAMPLE SIZE AND MISSING DATA			
ANALYSES OF CLIENT CHARACTERISTICS			
Characteristic	Sample size	Missing Information	
		Psychiatric Severity	Characteristic
Age	2,443	169	170
Gender	2,610	169	3
Race	2,584	169	29
Type of Treatment	2,468	169	145

3. PSYCHIATRIC SEVERITY AND PROBLEM SEVERITY AT INTAKE

The first analytic question examined the relationship between pre-treatment psychiatric problem severity (high, moderate, and low) and pre-treatment problem severity in the six non-psychiatric problem areas measured by the ASI (medical, employment, alcohol, drug, legal, and family/social) using a multivariate analysis of variance (MANOVA). Specifically, it examined whether clients with more psychological symptoms had more problems in other life areas. The MANOVA procedure allows for the comparison of the three psychiatric groups on multiple dependent variables simultaneously.

In addition to psychiatric severity, several other, independent variables were included in the analysis [race (white vs. minority), gender, and treatment type (outpatient vs. residential)], as well as a continuous covariate (age). Terms reflecting the interaction of psychiatric severity and the other independent variables were also included. Following the initial MANOVA, non-

significant interaction terms were removed, and the analysis was performed again, as recommended by statisticians (Hair, Anderson, Tatham, & Black, 1995). Significant multivariate effects were followed by univariate F-tests and Bonferroni pairwise comparisons to clarify between-group differences in each problem domain.

The analysis was performed on clients for whom there were complete data for all of the variables, resulting in a sample size of 1,834 clients, or 66 percent of the entire sample. An attrition analysis was performed comparing clients who were and were not included in the analysis on several key variables (age, gender, race, treatment type, and pre-treatment ASI composite scores).² T-tests were used to compare clients on continuous variables, while Chi-square tests were used to compare clients on categorical variables. In terms of gender, about 69 percent of the clients included in the analysis were male, while only 62 percent of the clients not included in the sample were male, $\chi^2(1) = 13.89, p < .001$. In addition, Exhibit II-4 shows that clients included in the analysis tended to have higher legal problem severity and lower psychiatric and medical problem than clients not included in the analysis.

EXHIBIT II-4				
PROBLEM SEVERITY OF CLIENTS IN THE ANALYSIS OF PSYCHIATRIC SEVERITY AND PROBLEM SEVERITY				
ASI Problem Severity		Clients Included in the Analysis (n=1,834)	Clients Not Included in the Analysis (n=948)	p
Legal	M	.16	.12	.001
	SD	.21	.19	
Psychiatric	M	.26	.31	.001
	SD	.27	.27	
Medical	M	.20	.28	.001
	SD	.32	.36	

M – mean, SD – standard deviation.

*This exhibit includes only those ASI domains in which a significant difference was found in the ASI composite scores of clients included and clients not included in the analysis.

² An attrition analysis of this nature was performed for all of the subsequent analyses discussed in this report. In these analyses, data may be missing for a variety of reasons, including incomplete baseline or follow-up ASI information resulting in missing demographic or composite score variables, lack of administrative data pertaining to treatment type, incomplete TSR service information, and/or lack of a follow-up ASI. See Appendix B for information on the sample size and missing data.

4. PSYCHIATRIC SEVERITY AND TREATMENT SERVICES

The second analytic question investigated the extent to which clients received differing amounts of treatment services, depending on their level of pre-treatment psychiatric problem severity (low, moderate, or high). Two sets of analyses were performed to answer this analytic question. The first set of analyses considered the extent to which psychiatric treatment services were received, while the second set of analyses considered the extent to which non-psychiatric treatment services were received. The treatment services were classified as follows:

- **Psychiatric services**
 - Prescribed psychiatric medication (dichotomous)
 - Received other psychiatric services/sessions (psychological testing; meditation, relaxation training, biofeedback, or behavior modification; psychiatric counseling/discussion).
- **Medical services**
 - Prescribed medication for medical problem (dichotomous)
 - Received other medical services (medical care visit, medical discussion).
- **Drug and alcohol services**
 - Received drug and alcohol testing (blood testing, urine testing)
 - Attended self-help/12-step meetings (e.g. AA, NA meetings)
 - Received other drug/alcohol services (drug/alcohol counseling sessions, relapse prevention sessions).
- **Legal services (contacts with the criminal justice system; discussion of criminal/civil charges or legal problems).**
- **Employment services (days in school or training; meetings focusing on employment opportunities, training, education, or benefits; discussion of employment/support problem).**
- **Family/social services (counseling sessions focusing on family problems).**

For each service that is not indicated as being dichotomous, the variable reflects the number of times the client received that specific type of service during the 28 days following admission to treatment (with the exception of school or training, in which cases the number of days is reflected). For the two dichotomous variables, the variable captures whether or not the client received the specific service at all during the 28 days following admission to treatment.

4.1 Psychiatric Services

An initial examination of the relationship between pre-treatment psychiatric severity (high, moderate, and low) and whether or not the client was prescribed psychiatric medication was conducted using a Chi-square analysis. Data from 1,100 clients (40% of the entire sample) were used in the analysis. Clients included in the analysis had lower psychiatric and problem severity than clients not included in the analysis (see Exhibit II-5). (For information on sample size and missing data for each analysis, see Appendix B.)

EXHIBIT II-5				
PROBLEM SEVERITY OF CLIENTS IN THE ANALYSIS OF				
PSYCHIATRIC SEVERITY AND PRESCRIPTION OF PSYCHIATRIC MEDICATION				
ASI Problem Severity		Clients Included in the Analysis (n=1,100)	Clients Not Included in the Analysis (n=1,682)	p
Psychiatric	M	.25	.29	.001
	SD	.26	.27	
Employment	M	.79	.82	.001
	SD	.26	.25	

M – mean, SD – standard deviation.

*This exhibit includes only those ASI domains in which a significant difference was found in the ASI composite scores of clients included and clients not included in the analysis.

Next, a logistic regression analysis in which psychiatric severity, a three-level categorical variable contrasting moderate and high against low, was used to predict whether the client was prescribed psychiatric medication. Other variables included in the regression model were gender, race (white vs. minority), age, and treatment type (residential vs. outpatient). A total of 992 clients (36% of the entire sample) were included in the logistic regression analysis. Clients included in the analysis were more likely to be male (73%) than clients not included in the analysis (63%), $\chi^2(1) = 30.60, p < .001$.

A Chi-square analysis was then performed to assess the extent to which any psychiatric services were received by clients in the three pre-treatment psychiatric severity groups. For this analysis, the variable representing the number of psychiatric services (excluding psychiatric medicine prescription) received was transformed into a dichotomous variable reflecting whether a client received any psychiatric service. The relationship between psychiatric severity (high, moderate, and low) and the receipt of any psychiatric services was assessed using a Chi-square analysis. Data from 1,129 clients (41% of the entire sample) were included in the analysis. Clients included in the analysis did not differ significantly from clients not included in the analysis on any key variables.

Finally, the relationship between pre-treatment psychiatric severity and the number of psychiatric services received (not including psychiatric medication) was further investigated using an analysis of variance (ANOVA). The independent variables included in the analysis were psychiatric severity (high, moderate, and low), gender, race (white vs. minority), treatment type (residential vs. outpatient), and age, which was included as a continuous covariate. Included in the analysis were the interactions of the independent variables and psychiatric severity. Non-significant interaction terms were excluded from the analysis, and the analysis was performed again with the terms excluded. A total of 1,019 clients (37% of the entire sample) were included in the ANOVA. Clients included in the analysis were more likely to be male (74%) than clients not included in the analysis (63%), $\chi^2(1) = 32.06, p < .001$.

4.2 Non-psychiatric Services

A series of analyses was performed initially to assess the extent to which the receipt of services in non-psychiatric problem domains was related to psychiatric problem severity. Because the variable relating to the receipt of medication for a medical problem is dichotomous rather than continuous, its relationship to psychiatric severity was analyzed separately from the other non-psychiatric service variables. First, a Chi-square analysis was performed to assess the extent to which clients were prescribed medication for medical problems as a function of pre-treatment psychiatric severity. Data from 1,127 clients (41% of the entire sample) were included in the analysis. Clients included in the analysis did not differ significantly from clients not included in the analysis on any key variables.

Next, a logistic regression analysis in which psychiatric severity, a three-level categorical variable contrasting moderate and high against low, predicted whether clients were prescribed medication for their medical problems. Gender, race (white vs. minority), age, and treatment type (residential vs. outpatient) were also included as predictors in the regression analysis. The regression analysis was performed using data from 1,018 clients (37% of the entire sample). Clients included in the analysis were more likely to be male (74%) than clients not included in the analysis (63%). In addition, clients included in the analysis ($M = 0.25, SD = 0.29$) displayed lower psychiatric severity than clients not included in the analysis ($M = 0.29, SD = 0.27$).

Next, a series of analyses was performed to determine the extent to which clients with varying levels of psychiatric severity received any of the seven non-psychiatric services: medical services (excluding medication prescription), employment services, legal services, family/social services, drug/alcohol testing, self-help attendance, and other drug/alcohol services. For each service item, the variable reflecting the number of times each service was received was transformed into a dichotomous variable indicating whether the client received the specific service at all during the first month of treatment. Seven Chi-square analyses were performed

using each dichotomous service item and psychiatric severity (high, moderate, and low) to determine whether receipt of any of the various services was related to a client's level of psychiatric severity. Sample sizes for the analyses ranged from 1,130 to 1,149 clients (about 41% of the entire sample). Clients included in the analysis did not differ significantly from clients not included in the analysis on any key variables.

Finally, a MANOVA was performed to examine further the extent to which psychiatric severity was related to receipt of the remaining non-psychiatric service items. In this analysis, the seven non-psychiatric service items [medical services (excluding medication prescription), employment services, legal services, family/social services, drug/alcohol testing, self-help attendance, other drug/alcohol services] were the dependent variables, and psychiatric severity (high, moderate, and low) was the main factor of interest. Gender, race (white vs. minority), and treatment type (residential vs. outpatient), as well as their interactions with psychiatric severity, were included as secondary factors. Age was included in the analysis as a continuous covariate. A total of 974 clients (35% of the entire sample) had complete data for all of the variables and were included in the analysis. Clients included and not included in the analysis differed in terms of gender composition, in that 74 percent of clients included in the analysis were male, while 63 percent of clients not included in the analysis were male, $\chi^2(1) = 32.06, p < .001$.

5. RELATIONSHIP BETWEEN TREATMENT SERVICES AND OUTCOMES IN PSYCHIATRICALY SEVERE CLIENTS

The final series of analytic questions assessed the extent to which service provision, both psychiatric and non-psychiatric, was related to psychiatric and non-psychiatric outcomes for clients with psychiatric problems. To address this analytic question, two sets of analyses were performed. The first set of analyses addressed the relationship between psychiatric service provision and treatment outcomes in each ASI problem domain, while the second set of analyses addressed the relationship between non-psychiatric service provision and the same outcomes. For both sets of analyses, treatment outcomes were defined as post-treatment ASI composite scores. Because this analytic question is concerned with treatment outcomes for psychiatrically severe clients, data for clients classified as low in psychiatric severity ($n = 906$) and for clients who were missing psychiatric severity information ($n = 169$) (collectively accounting for 36% of the entire sample) were not included in the analyses. Thus, the target sample for these analyses consisted of a maximum of 1,707 clients.

5.1 Psychiatric Services and Outcomes

The first set of analyses was designed to assess the relationship between psychiatric service provision and outcomes in the seven problem domains measured by the ASI. Seven regression analyses, one analysis corresponding to each ASI problem domain, were performed.

In the analyses, psychiatric services [prescribed psychiatric medication and number of psychiatric services received (excluding medication)] were predictors of post-treatment ASI composite scores. In addition, other variables [gender, race (white vs. minority), age, and treatment type (residential vs. outpatient)] were included in each model to assess the extent to which the variables were related to outcomes. The pre-treatment ASI composite score corresponding to the outcome domain was entered into each model to control statistically for baseline problem severity. Finally, psychiatric problem severity (moderate vs. high) and its interaction with the two treatment service items were included in each model. The number of clients included in these analyses ranged from 381 to 456 (22% to 27% of the target sample). Clients included in the analysis did not differ significantly from clients not included in the analysis on any key variables.

5.2 Non-psychiatric Services and Outcomes

The second set of analyses addressed the relationship between non-psychiatric service provision and treatment outcomes for clients with more severe psychiatric problems. Again, a series of seven regression analyses, one analysis pertaining to each ASI domain, was performed in which the non-psychiatric service provision items [medical services (excluding medication prescription), employment services, legal services, family/social services, drug/alcohol testing, self-help attendance, other drug/alcohol services] were predictors of treatment outcomes (post-treatment ASI composite scores). Key demographic variables [gender, age, and race (white vs. minority)] were included in the models, as was treatment type. To control for pre-treatment differences in problem severity, pre-treatment ASI composite scores corresponding to the outcome domain were also included in each model. The number of clients included in these analyses ranged from 376 to 451 (22% to 26% of the target sample). Clients included in the analyses did not differ significantly from clients not included in the analyses on any key variables.

II. FINDINGS

III. FINDINGS

The analytic findings are presented in this chapter. Information regarding the sample is presented in the first section. The results of the analyses pertaining to each analytic question are described in the remaining sections.

1. CLIENT CHARACTERISTICS AND DEMOGRAPHICS AT INTAKE

Client demographic characteristics were related to psychiatric severity level. The results of the one-factor (high, moderate, and low psychiatric severity) ANOVA that was performed to assess the relationship between a client's age and level of psychiatric severity indicated a significant effect of psychiatric severity, $F(2, 2440) = 9.11, p < .001$. Characteristics of the sample are presented in Exhibit III-1. Clients with high levels of psychiatric severity were older than clients with low levels of psychiatric severity. The Chi-square analysis assessing the relationship between psychiatric severity and gender indicated that the two variables were related to one another, $\chi^2(2) = 92.55, p < .001$. The proportion of males in the sample tended to decrease as psychiatric severity increased. A client's psychiatric severity level was not significantly related to his or her race, $\chi^2(2) = 11.45, n.s.$ Somewhat surprisingly, psychiatric severity level was not significantly related to treatment type, $\chi^2(2) = 4.04, n.s.$ See Appendix C for more detailed demographic and treatment type information as they relate to psychiatric severity.

EXHIBIT III-1					
CLIENT CHARACTERISTICS, TREATMENT TYPE, AND PSYCHIATRIC SEVERITY					
		Psychiatric Severity			p
		Low	Moderate	High	
Age* (n = 2,443)	M SE	33.76 ^a 0.30	34.47 0.31	35.57 ^b 0.31	0.000
Gender (n = 2,610)	Male	693 ^a (77%)	565 ^b (68%)	480 ^c (55%)	0.000
Race (n = 2,584)	White	338 (38%)	289 (35%)	368 (43%)	0.003
Treatment type (n = 2,468)	Residential	284 (32%)	280 (36%)	302 (37%)	0.133

*Means/frequencies with different letters are significantly different from one another, $p < .001$.

2. PSYCHIATRIC SEVERITY AND PROBLEM SEVERITY AT INTAKE

A four-factor MANOVA (psychiatric severity, gender, race, and treatment type) with age as a covariate was performed using pre-treatment problem severity in the six non-psychiatric ASI

problem areas as dependent variables. The results of the analysis indicated that four interaction terms (psychiatric severity x gender, psychiatric severity x race, psychiatric severity x gender x race, and psychiatric severity x treatment type x gender x race) could be excluded from the analysis.

The MANOVA that was calculated with these non-significant terms excluded revealed a main effect of age (the covariate), $F(6, 1810) = 26.73, p < .001$, psychiatric severity, $F(12, 3620) = 27.89, p < .001$, treatment type, $F(6, 1810) = 63.69, p \leq .001$, gender, $F(6, 1810) = 7.54, p < .001$, race, $F(6, 1810) = 26.55, p \leq .001$, psychiatric severity x treatment type $F(12, 3620) = 3.09, p < .001$, psychiatric severity x treatment type x gender, $F(30, 7242) = 2.26, p < .001$, and psychiatric severity x treatment type x gender, $F(30, 7242) = 2.18, p < .001$. The multivariate effects indicate that there is a significant effect of one of the factors for at least one of the dependent variables being considered. To determine specifically where the significant differences are, univariate analyses must be performed. Because all of the multivariate statistics in the current analysis were significant, four-factor ANOVAs and Bonferroni pairwise comparisons were calculated for each composite score. The ANOVAs included the significant interaction terms, and age was included as a covariate.

On the basis of these subsequent analyses, a significant main effect of psychiatric severity was found for the medical, $F(2, 1815) = 53.25, p < .001$, alcohol, $F(2, 1815) = 43.39, p < .001$, drug, $F(2, 1815) = 42.89, p < .001$, and family/social $F(2, 1815) = 76.16, p < .001$ pre-treatment ASI composite scores. Clients with moderate or high psychiatric severity displayed higher problem severity in these four domains than clients with low problem severity. Additionally, clients with high psychiatric severity displayed higher medical and family/social problem severity than clients with moderate psychiatric severity. The means and standard errors for this main effect are presented in Exhibit III-2. This finding provides support for the hypothesis that clients with higher levels of psychiatric severity have more severe problems in other domains as well, particularly in terms of medical, alcohol, drug, and family/social problems.

EXHIBIT III-2
BASELINE PROBLEM SEVERITY AS A FUNCTION
OF PSYCHIATRIC SEVERITY*
(N = 1,834)

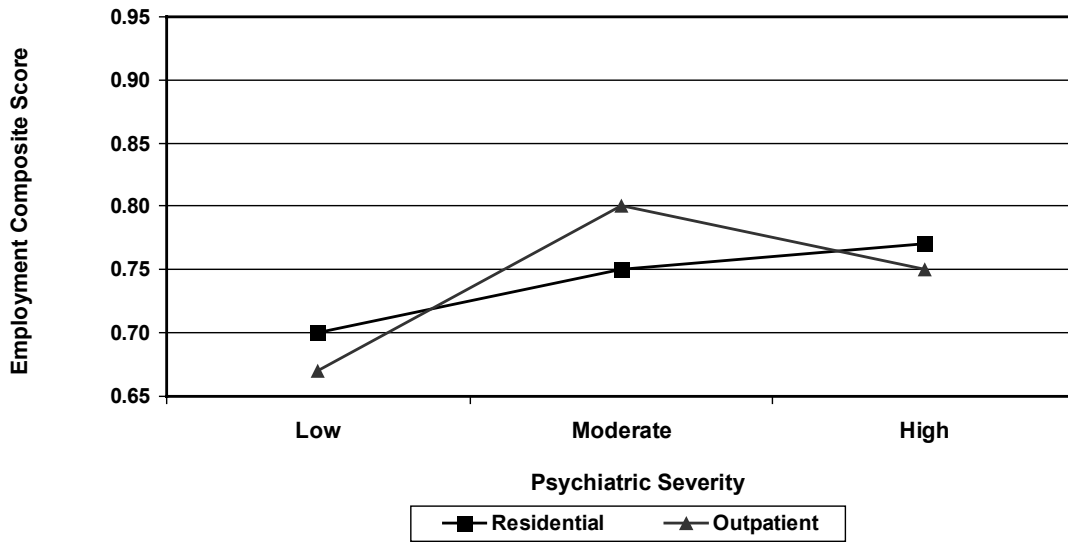
Baseline Composite Score	Psychiatric Severity					
	Low (n = 689)		Moderate (n = 569)		High (n = 576)	
	M	SE	M	SE	M	SE
Medical	0.11 ^a **	0.01	0.20 ^b	0.01	0.32 ^c	0.01
Employment	0.75	0.01	0.81	0.01	0.81	0.01
Alcohol	0.20 ^a	0.01	0.31 ^b	0.01	0.37 ^b	0.01
Drug	0.12 ^a	0.01	0.17 ^b	0.01	0.19 ^b	0.01
Legal	0.17	0.01	0.19	0.01	0.16	0.01
Family/social	0.19 ^a	0.01	0.28 ^b	0.01	0.36 ^c	0.01

* Estimated means are evaluated at covariate age = 34.24.

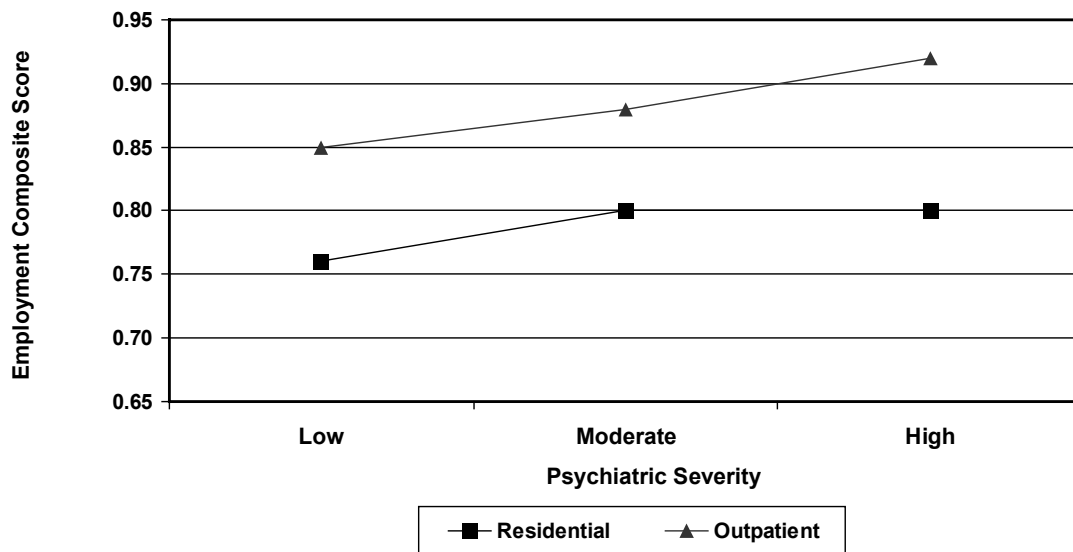
** For each composite score, estimated means with different letters are significantly different from one another.

Additionally, an interaction between psychiatric severity, treatment type, and race was found for employment problem severity, $F(5, 1815) = 4.66, p < .001$. Minority clients in residential treatment tended to display higher levels of employment problems than minority clients in outpatient treatment, and employment severity of minorities tended to increase as a function of psychiatric severity in both types of treatment. White clients in both types of treatment tended to display more similar levels of employment severity than minority clients. Employment problem severity tended to increase as a function of psychiatric severity, with the exception that white clients in outpatient treatment with high psychiatric severity tended to display lower employment problem severity than white clients in outpatient treatment with moderate psychiatric severity. This interaction is illustrated graphically in Exhibit III-3 and Exhibit III-4.

**EXHIBIT III-3
BASELINE EMPLOYMENT PROBLEM SEVERITY OF WHITE CLIENTS,
BY PSYCHIATRIC SEVERITY AND TREATMENT TYPE**



**EXHIBIT III-4
BASELINE EMPLOYMENT PROBLEM SEVERITY OF OTHER CLIENTS,
BY PSYCHIATRIC SEVERITY AND TREATMENT TYPE**



No other significant findings emerged in relation to psychiatric severity; however, several significant effects emerged with regard to the secondary variables in the analysis. A significant main effect of race was obtained for the pre-treatment employment, $F(1, 1815) = 52.39, p < .001$, drug $F(1, 1815) = 64.68, p < .001$, and legal $F(1, 1815) = 28.79, p < .001$ composite scores. The results of the pairwise comparisons indicated that minority clients displayed higher levels of pre-treatment employment ($M = 0.84, SE = 0.01$) and drug ($M = 0.19, SE = 0.01$) problem severity than white clients ($M = 0.75, SE = 0.010; M = 0.14, SE = 0.01$, respectively). White clients ($M = 0.20, SE = 0.01$) displayed higher pre-treatment legal problem severity, however, than minority clients ($M = 0.15, SE = 0.01$). A significant main effect of gender was obtained for family/social composite scores, $F(1, 1815) = 24.18, p < .001$. Women displayed greater pre-treatment family/social problem severity ($M = 0.30, SE = 0.01$) than men ($M = 0.25, SE = 0.01$). The analysis also indicated a significant main effect of treatment type for alcohol, $F(1, 1815) = 115.28, p < .001$, drug, $F(1, 1815) = 237.11, p < .001$, legal, $F(1, 1815) = 61.83, p < .001$, and family/social, $F(1, 1815) = 86.01, p < .001$ pre-treatment composite scores. In all cases, clients in residential programs [alcohol: ($M = 0.37, SE = 0.01$); drug: ($M = 0.21, SE = 0.01$); legal: ($M = 0.22, SE = 0.01$); and family/social: ($M = 0.33, SE = 0.01$)] displayed higher problem severity than clients in outpatient programs [alcohol: ($M = 0.21, SE = 0.01$); drug: ($M = 0.11, SE = 0.01$); legal: ($M = 0.13, SE = 0.01$); and family/social: ($M = 0.22, SE = 0.01$)].

The significant effects of psychiatric severity, race, gender, and treatment type are summarized for each ASI problem area in Exhibit III-5.

EXHIBIT III-5				
SIGNIFICANT EFFECTS OF PSYCHIATRIC SEVERITY, RACE, GENDER, AND TREATMENT TYPE ON PRE-TREATMENT PROBLEM SEVERITY*				
(N = 1,834)*				
Baseline composite score	Psychiatric severity	Race	Gender	Treatment type
Medical	L<M<H			
Employment		W<M		
Alcohol	L<M, H			OP<R
Drug	L<M, H	W<M		OP<R
Legal		M<W		OP<R
Family/social	L<M<H		M<F	OP<R

* Based on MANOVA, Univariate ANOVAs, and Bonferroni pairwise comparisons, $p < .001$

3. PSYCHIATRIC SEVERITY AND THE RECEIPT OF TREATMENT SERVICES

This section presents the results of two series of analyses relating psychiatric severity levels to the receipt of treatment services. The first section contains the results of analyses addressing the receipt of psychiatric services, while the second section contains the results of analyses addressing the receipt of non-psychiatric services.

3.1 Psychiatric Severity And Psychiatric Services

The first set of analyses in this series investigated the relationship between psychiatric severity and the prescription of psychiatric medication. The Chi-square analysis indicated a significant relationship between psychiatric severity (high, moderate, and low) and the prescription of psychiatric medication. Exhibit III-6 contains the rate at which psychiatric medication was prescribed at the three levels of psychiatric severity. As can be seen in the exhibit, the likelihood of a client's receiving psychiatric medication increased in a step-wise fashion as the client's level of psychiatric severity increased. A large minority, 36 percent, of clients with high levels of psychiatric severity received medication, and 13 percent of clients with moderate levels of psychiatric severity received medication, while only 4 percent of clients with low levels of psychiatric severity received medication.

EXHIBIT III-6			
RECEIPT OF PSYCHIATRIC MEDICATION AS A			
FUNCTION OF PSYCHIATRIC SEVERITY*			
(N = 1,100)			
Psychiatric Medication	Psychiatric Severity		
	Low (n = 428)	Moderate (n = 352)	High (n = 320)
Received medication	17 (4%)	45 (13%)	116 (36%)

* $X^2(2) = 145.06, p < .001$.

The next analysis explored this relationship further, while also taking into account other potentially important variables that may influence the prescription of psychiatric medication. The results of a logistic regression analysis indicated that psychiatric severity was a significant predictor of the receipt of psychiatric medication when demographic factors and treatment type were included in the analysis. Consistent with the results of the Chi-square analysis, clients with moderate and high levels of psychiatric severity were much more likely to be prescribed psychiatric medication than clients with low levels of psychiatric severity. None of the other variables included in the model were significant predictors of the prescription of psychiatric medication. The results of the logistic regression analysis are presented in Exhibit III-7. Thus,

both sets of analyses provide evidence that clients with higher levels of psychiatric severity are more likely to receive psychiatric medication than clients with lower levels of psychiatric severity.

EXHIBIT III-7						
LOGISTIC REGRESSION PREDICTING PRESCRIPTION						
OF PSYCHIATRIC MEDICATION						
(N = 992)						
	B	SE	Wald Statistic	df	p	Exp(B)
Psychiatric severity			92.66	2	0.000	
Moderate	1.66	0.35	22.14	1	0.000	5.28
High	2.93	0.33	76.48	1	0.000	18.75
Gender (male = 1)	-0.43	0.20	4.38	1	0.036	0.65
Race (white = 1)	0.60	0.20	9.02	1	0.003	1.82
Treatment type (residential = 1)	-0.44	0.21	4.38	1	0.046	0.64
Age	0.03	0.01	6.99	1	0.008	1.03
Constant	-4.44	0.56	63.78	1	0.000	0.12

The second set of analyses in this series investigated the relationship between psychiatric severity and the receipt of other psychiatric treatment services. The Chi-square analysis revealed a significant relationship between psychiatric severity (low, moderate, high) and the receipt of any other psychiatric treatment services. The proportion of clients with varying levels of psychiatric severity that received any psychiatric services (excluding the prescription of psychiatric medication) is presented in Exhibit III-8. The results of this analysis indicate that clients with high and moderate levels of psychiatric severity were more likely to receive psychiatric services than clients with low levels of psychiatric severity.

EXHIBIT III-8			
RECEIPT OF ANY OTHER PSYCHIATRIC SERVICES,			
AS A FUNCTION OF PSYCHIATRIC SEVERITY*			
(N = 1,129)			
	Psychiatric Severity		
	Low (n = 425)	Moderate (n = 361)	High (n = 343)
Received psychiatric services	175 (41%)	234 (65%)	257 (75%)

* $X^2(2) = 96.83, p < .001$.

The next analysis was performed to further clarify the nature of this relationship using a continuous measure of psychiatric services. A four-factor ANOVA (psychiatric severity x gender x race x treatment type) with age included as a covariate was performed to assess the

relationship between these factors and the number of psychiatric services received. The initial analysis included all interaction terms related to psychiatric severity, and the results of the analysis indicated that all interaction terms could be excluded from the analysis. The subsequent ANOVA revealed a main effect for psychiatric severity. Moderate and high psychiatrically severe clients received similar levels of psychiatric services, while both groups received more psychiatric services than low psychiatrically severe clients. Thus, not only was a client's level of psychiatric severity related to whether he or she received any psychiatric treatment services, but it was also related to the absolute number of psychiatric services that he or she received.

In addition to the psychiatric severity effect, a main effect for treatment type was indicated by the analysis. Clients in outpatient treatment ($M = 2.83$, $SE = 0.33$) received fewer psychiatric services than clients in residential treatment ($M = 7.84$, $SE = 0.44$). No other secondary effects were significant. Exhibit III-9 presents the mean number of psychiatric services received by clients as a function of psychiatric severity and treatment type.

EXHIBIT III-9						
PSYCHIATRIC SERVICES RECEIVED,						
AS A FUNCTION OF PSYCHIATRIC SEVERITY AND TREATMENT TYPE*						
(N = 1,019)						
Treatment type***	Psychiatric Severity**					
	Low (n = 388)		Moderate (n = 325)		High (n = 306)	
	M	SE	M	SE	M	SE
Outpatient (n=661)	1.46	0.46	3.13	0.50	3.90	0.48
Residential (n=368)	6.47	0.57	8.14	0.56	8.91	0.57

* Estimated means are evaluated at covariate age = 35.05.

** Main effect of psychiatric severity, $F(2, 1012) = 8.81$, $p < .001$; Low < Moderate, High.

*** Main effect of treatment type, $F(1, 1012) = 94.93$, $p < .001$; Outpatient < Residential.

3.2 Psychiatric Severity And Non-Psychiatric Services

The first set of analyses in this series dealt with the extent to which clients were prescribed medication for their medical problems. A Chi-square analysis assessing the relationship between psychiatric severity (high, moderate, and low) and the prescription of non-psychiatric medicine indicated a significant relationship between the two variables, $\chi^2(2) = 28.24$, $p < .001$. The rate of medical prescription for each level of psychiatric severity is presented in Exhibit III-10. Specific comparisons indicated that clients with high levels of psychiatric severity were more likely to have been prescribed non-psychiatric medication for a medical problem than clients with low levels of psychiatric severity, suggesting that psychiatric severity is, in fact, related to the receipt of non-psychiatric treatment services.

EXHIBIT III-10			
PRESCRIPTION OF NON-PSYCHIATRIC MEDICATION FOR MEDICAL PROBLEM,			
AS A FUNCTION OF PSYCHIATRIC SEVERITY*			
(N = 1,127)			
Non-psychiatric Medication	Psychiatric Severity		
	Low (n = 431)	Moderate (n = 358)	High (n = 338)
Received medication prescription	108 (25%)	124 (34%)	146 (43%)

* $X^2(2) = 28.24, p < .001$.

This analysis was followed by a logistic regression analysis to further clarify this relationship and identify and control for other factors that predicted whether clients were prescribed non-psychiatric medication for a medical problem. The results indicated that psychiatric severity was a significant predictor of medication prescription for non-psychiatric conditions. Consistent with the results of the previous analysis, clients with high levels of psychiatric severity were much more likely to have been prescribed non-psychiatric medication than clients with low levels of psychiatric severity, when other factors are controlled.

In addition to level of psychiatric severity, age was found to be a significant predictor of non-psychiatric medical prescription. As a client's age increased, he or she became more likely to have been prescribed non-psychiatric medication for a medical problem. The results of the logistic regression are presented in Exhibit III-11.

EXHIBIT III-11						
LOGISTIC REGRESSION PREDICTING RECEIPT OF						
NON-PSYCHIATRIC MEDICATION FOR MEDICAL PROBLEM						
(N = 1,018)						
	Beta	SE	Wald Statistic	df	p	Exp(B)
Psychiatric severity			18.52	2	0.000	
Moderate	0.49	0.17	8.28	1	0.004	1.63
High	0.72	0.17	17.81	1	0.000	2.06
Gender (male = 1)	-0.23	0.16	2.19	1	0.139	0.79
Race (white = 1)	-0.05	0.14	0.14	1	0.709	0.95
Treatment type (residential = 1)	0.36	0.14	6.40	1	0.011	1.44
Age	0.03	0.01	17.14	1	0.000	1.03
Constant	-2.25	0.34	43.91	1	0.000	0.11

Following the first set of analyses, which established that the prescription of medication for a medical problem was related to psychiatric severity level, the second set of analyses in this series examined the extent to which psychiatric severity level was related to the receipt of other types of non-psychiatric services. The initial Chi-square analyses were performed to determine whether the receipt of any level of service for each of the various types of non-psychiatric services was related to psychiatric severity. The analysis examining the relationship between receipt of medical services and level of psychiatric severity indicated a significant relationship between the two variables. The rates of non-psychiatric service receipt for clients at each level of psychiatric severity are presented in Exhibit III-12. Specific comparisons indicated that clients with high levels of psychiatric severity were more likely to have received any medical services (excluding medication) than clients with low levels of psychiatric severity. A client's level of psychiatric severity was not related to receipt of services for any of the other types of services.

EXHIBIT III-12			
NUMBER (%) OF CLIENTS RECEIVING ANY			
NON-PSYCHIATRIC SERVICES AS A FUNCTION OF PSYCHIATRIC SEVERITY			
Service type	Psychiatric severity		
	Low	Moderate	High
Medical * (n = 1,141)	224 (52%)	232 (64%)	241 (70%)
Employment (n = 1,130)	222 (52%)	217 (60%)	190 (55%)
D/A testing (n = 1,149)	205 (48%)	160 (44%)	150 (42%)
Self-help attendance (n = 1,149)	320 (75%)	306 (84%)	272 (77%)
D/A counseling (n = 1,148)	383 (89%)	338 (92%)	296 (84%)
Legal (n = 1,142)	125 (29%)	107 (29%)	68 (20%)
Family (n = 1,136)	182 (43%)	176 (49%)	192 (55%)

* $X^2(2) = 26.25, p < .001$.

Analyses were then performed to assess the relationship between psychiatric severity (and other secondary variables) to a continuous measure of the number of different types of non-psychiatric services received. The results of the initial four-factor (psychiatric severity x race x gender x treatment type) MANOVA using the number of non-psychiatric treatment services received as the dependent variables indicated that all interaction terms except the psychiatric severity x gender x treatment type term were not significant and could be excluded from the model. The MANOVA was performed again and included only the significant interaction term. The multivariate analysis indicated no psychiatric severity effects, again suggesting that a

client's level of psychiatric severity was not related to the number of non-psychiatric treatment services he or she received.

Despite the fact that psychiatric severity was not related to the quantity of non-psychiatric service provision, several interesting findings emerged pertaining to the secondary variables. The MANOVA revealed multivariate main effects of gender, $F(7, 954) = 7.78, p < .001$, and treatment type, $F(7, 954) = 28.59, p < .001$. This suggests that there are gender and treatment type effects for at least one of the dependent variables that is being assessed. To determine where these effects occurred, univariate ANOVA's and Bonferroni post-hoc tests were performed for each of the service items. The univariate ANOVA examining the receipt of family services indicated a main effect of gender, $F(1, 960) = 32.20, p < .001$. Females ($M = 4.64, SE = 0.36$) were more likely to receive family/social services than males ($M = 2.35, SE = 0.20$). In addition, three univariate ANOVA's revealed main effects for treatment type (AA/NA meeting attendance, $F(1, 960) = 68.36, p < .001$; other A/D services, $F(1, 960) = 140.80, p < .001$; and family services, $F(1, 960) = 59.07, p < .001$. For all three types of services, clients in residential programs (AA/NA attendance: $M = 17.31, SE = 0.78$; other A/D services: $M = 18.79, SE = 0.88$; family services: $M = 5.05, SE = 0.34$) received more services than clients in outpatient programs ($M = 9.58, SE = 0.52$; $M = 6.30, SE = 0.59$; $M = 1.94, SE = 0.23$, respectfully). No other effects were significant.

4. RELATIONSHIP BETWEEN TREATMENT SERVICES AND OUTCOMES IN PSYCHIATRICALY SEVERE CLIENTS

The following sections address the extent to which treatment service provision is related to treatment outcomes. The first section presents the results of analyses pertaining to psychiatric treatment services, and the second section presents the results of analyses pertaining to non-psychiatric treatment services. Because these analyses were concerned with service provision for clients with psychiatric problems, they included only clients with moderate and high levels of psychiatric severity.

4.1 Psychiatric Treatment Services and Outcomes

Seven regression analyses, one corresponding to each ASI problem domain, were performed to assess the relationship between psychiatric service provision and treatment outcomes in the ASI problem domains. The regression analysis pertaining to the psychiatric problem domain indicated that the prescription of psychiatric medication was a significant predictor of psychiatric outcomes. Clients who were prescribed psychiatric medication had worse psychiatric outcomes than clients who were not prescribed psychiatric medication.

Further investigation of this somewhat paradoxical finding indicated that both groups of clients displayed a significant decrease in psychiatric severity as measured by the ASI composite score from baseline to follow-up, $F(1, 452) = 142.71, p < .001$; the psychiatric composite scores were higher overall, however, for clients who received psychiatric medication than for clients who did not receive psychiatric medication, $F(1, 452) = 108.58, p > 0.001$. The higher psychiatric problem severity of clients who received psychiatric medication seems to account for the worse outcomes exhibited by this group of clients relative to clients who did not receive psychiatric medications.

The provision of other psychiatric services was not related to psychiatric outcomes. The results of the remaining six analyses indicated that psychiatric service provision (in terms of both psychiatric medication prescription and other psychiatric services) was not a predictor of treatment outcomes. That is, a client's treatment outcome was not related to the provision or amount of psychiatric services in the non-psychiatric problem domains.

Several important findings not related to psychiatric service provision did emerge. Pre-treatment problem severity in a particular problem area was a significant predictor of post-treatment problem severity in that problem area for all seven problem domains. Clients with more severe pre-treatment problems had more severe post-treatment outcomes. For the alcohol and medical problem domains, high (vs. moderate) psychiatric severity was predictive of worse outcomes (see Exhibit III-13 and Exhibit III-14). Thus, high psychiatrically severe clients tended to have worse alcohol and medical outcomes than moderate psychiatrically severe clients. Finally, clients in residential treatment displayed lower levels of psychiatric problem severity following treatment than clients in outpatient treatment (see Exhibit III-15).

EXHIBIT III-13				
PSYCHIATRIC SERVICES AND OUTCOMES IN				
MEDICAL PROBLEM AREA				
(N = 446)				
Variable	Beta	SE	t	p
Age	0.11	0.01	2.49	0.013
Race (white)	-0.01	0.03	-0.25	0.804
Gender (male)	-0.06	0.03	-1.148	0.138
Psychiatric severity (high)	0.21	0.04	3.67	0.000
Baseline composite score	0.33	0.04	7.41	0.000
Treatment type (residential)	-0.03	0.03	-0.64	0.524
Psychiatric medication (yes)	0.05	0.05	0.77	0.443
Other psychiatric services	0.06	0.01	0.95	0.343
Psychiatric medication x severity	0.03	0.07	0.41	0.680
Other psychiatric services x severity	-0.12	0.01	-1.87	0.063

EXHIBIT III-14
PSYCHIATRIC SERVICES AND OUTCOMES IN
ALCOHOL PROBLEM AREA
(N = 382)

Variable	Beta	SE	t	p
Age	0.08	0.01	1.54	0.123
Race (white)	0.03	0.02	0.65	0.514
Gender (male)	0.05	0.02	1.09	0.274
Psychiatric severity (high)	0.25	0.02	3.98	0.000
Baseline composite score	0.29	0.03	5.57	0.000
Treatment type (residential)	-0.09	0.02	-1.59	0.112
Psychiatric medication (yes)	0.15	0.03	1.83	0.068
Other psychiatric services	0.08	0.01	1.18	0.239
Psychiatric medication x severity	-0.13	0.04	-1.47	0.141
Other psychiatric services x severity	-0.17	0.01	-2.40	0.017

EXHIBIT III-15
PSYCHIATRIC SERVICES AND OUTCOMES IN
PSYCHIATRIC PROBLEM AREA
(N = 454)

Variable	Beta	SE	t	p
Age	0.06	0.01	1.56	0.119
Race (white)	0.08	0.02	1.87	0.062
Gender (male)	0.05	0.02	1.23	0.220
Baseline composite score	0.40	0.06	7.85	0.000
Treatment type (residential)	-0.17	0.02	-3.88	0.000
Psychiatric medication (yes)	0.30	0.04	4.51	0.000
Other psychiatric services	0.07	0.01	1.16	0.246
Psychiatric medication x severity	-0.14	0.05	-1.87	0.063
Other psychiatric services x severity	-0.03	0.01	-0.56	0.578

4.2 Non-psychiatric Treatment Services and Outcomes

Similar analyses were performed to assess the relationship between the receipt of non-psychiatric treatment services and treatment outcomes in each of the seven problem domains. The results of the analyses indicated that the receipt of non-psychiatric services was not predictive of outcomes for any of the problem domains. That is, the receipt of non-psychiatric treatment services was not related to a client's level of problem severity following treatment.

Several important findings emerged pertaining to the secondary variables in the analysis. As was the case in the previous set of analyses, pre-treatment problem severity predicted post-

treatment problem severity in each problem domain. The regression analysis also indicated that treatment type was predictive of psychiatric outcomes. Clients in residential treatment experienced better psychiatric outcomes than clients in outpatient treatment. This pattern of results is identical to the pattern that was found in the psychiatric service provision analysis for psychiatric problem severity. The results of the regression analysis for the psychiatric domain are presented in Exhibit III-16.

EXHIBIT III-16				
NON-PSYCHIATRIC SERVICES AND OUTCOMES IN				
PSYCHIATRIC PROBLEM AREA				
(N = 451)				
Variable	Beta	SE	t	p
Age	0.06	0.01	1.47	0.141
Race (white)	0.06	0.02	1.37	0.172
Gender (male)	0.06	0.02	1.44	0.152
Baseline composite score	0.39	0.05	9.19	0.000
Treatment type (residential)	-0.18	0.03	-3.85	0.000
Medication (yes)	0.08	0.02	1.81	0.071
Medical services	0.07	0.01	1.54	0.124
Employment services	0.02	0.01	0.39	0.696
D/A testing	-0.01	0.01	-0.05	0.963
Self-help attendance	-0.01	0.01	-0.21	0.836
D/A counseling	-0.09	0.01	-1.82	0.070
Legal services	-0.08	0.01	-1.83	0.068
Family/social services	0.07	0.01	1.49	0.138

IV. SUMMARY AND IMPLICATIONS

IV. SUMMARY AND IMPLICATIONS

This chapter outlines the results of the analyses relating to each analytic question. In addition, the implications of the findings for treatment providers, policymakers, and researchers/evaluators are discussed. Finally, ideas regarding future direction for research/evaluation are presented.

1. SUMMARY OF ANALYTIC FINDINGS

Several important findings emerged in this secondary analysis. The findings as they relate to each analytic question are outlined in the sections that follow.

1.1 Psychiatric Severity and Problem Severity in Other Areas

The client's level of psychiatric severity was related to his or her level of severity in other domains. Specifically, the significant differences were found among clients with varying levels of psychiatric severity in the following domains:

- Medical (low < moderate < high)
- Alcohol (low < moderate and high)
- Drug (low < moderate and high)
- Family/social (low < moderate < high).

The client's race, gender, and treatment type were related to problem severity in several domains. For employment problem severity specifically, the effects of psychiatric severity were dependent on a client's treatment type and race.

1.2 Psychiatric Severity and Treatment Service Provision

The results indicate that a client's level of psychiatric severity was related to the receipt of psychiatric treatment services. The following findings support such a conclusion:

- Clients with high levels of psychiatric severity were more likely than clients with low levels of psychiatric severity to be prescribed psychiatric medication.
- Clients with moderate and high levels of psychiatric severity received more psychiatric sessions than clients with low levels of psychiatric severity.

Additionally, two important findings emerged with regard to treatment setting and psychiatric severity:

- Psychiatric severity levels were not significantly different in residential and outpatient treatment.
- Clients in residential treatment received more psychiatric services than clients in outpatient treatment.

Psychiatric severity was also related to medical service provision. Specifically:

- Clients with high levels of psychiatric severity were more likely to be prescribed medication for a medical problem than clients with low levels of psychiatric severity.
- The proportion of clients who received other medical services increased as level of psychiatric severity increased.

Psychiatric severity was not related to the provision of the remaining non-psychiatric treatment services. However, the several important findings not related to psychiatric severity were obtained:

- Females received more family/social services than males.
- Clients in residential treatment attended more self-help meetings and received more family/social and other drug/alcohol services than clients in outpatient treatment.

1.3 Treatment Service Provision and Outcomes for Psychiatrically Severe Clients

Service provision was, for the most part, unrelated to outcomes for psychiatrically severe clients. Only one significant relationship between service provision and outcome emerged:

- Clients who were prescribed psychiatric medication tended to have worse psychiatric outcomes than clients who were not prescribed psychiatric medication.
- Although clients who were prescribed psychiatric medication experienced significant reductions in problem severity from admission to follow-up, they displayed greater overall severity than their less psychiatrically disturbed counterparts, which may account for this finding.

Several findings not related to service provision were obtained:

- Pre-treatment problem severity was a consistent predictor of post-treatment problem severity.

- Clients with high levels of psychiatric severity had worse medical and alcohol use outcomes than clients with moderate levels of psychiatric severity.
- Clients in residential treatment displayed better psychiatric outcomes than clients in outpatient treatment.

2. CONSTRAINTS

Several constraints of the current project warrant consideration in drawing conclusions from the results. First, the project was a secondary analysis of generally naturalistic treatment outcomes studies. Because service receipt was likely to be driven by severity of client problems and severity in a specific problem area was generally related to the corresponding outcome (i.e., more severe admission problem predicts worse outcome), this naturalistic analysis could not adequately disentangle problem severity and service intensity. Controlled or randomized studies designed specifically to disentangle the effect of these variables and to answer the specific analytic questions posed here are warranted. Thus, any conclusions drawn from the present analysis must be considered preliminary and subject to further investigation.

Second, for many of the analyses, the extent of missing data was noteworthy and resulted in the inclusion of less than half of the clients for some key analyses. The attrition analyses did not generally indicate numerous differences between the clients included and not included in the analyses. Nonetheless, the fact that there were some differences, coupled with the sometimes very low inclusion rates, may differentially limit the generalizability of specific findings.

Third, the analysis was based solely on self-reported data. All data were derived from information gathered by trained interviewers, as opposed to client self-administered questionnaire, and therefore presumably passed an initial level of quality. Furthermore, the Addiction Severity Index (ASI) and Treatment Services Review (TSR) have demonstrated reliability and validity in a number of studies. Nevertheless, there is mixed evidence regarding the veracity of self-reported follow-up data; the results of the current project could only be enhanced with more objective and external measures of outcome.

Fourth, services were assessed only for the first month of treatment. There is the possibility that the patterns of service provision and the relationships of services receipt to outcomes would be different if services had been assessed for the entire treatment episode.

Fifth, the TSR elicits information on the quantity of services. It does not address the quality of the services, which would almost certainly impact the results.

Finally, psychiatric co-morbidity was not specifically assessed in these clients. The results can be applied to dually diagnosed clients only with caution. The ASI psychiatric

composite score has been shown to assess psychological distress reliably and validly, but it can only be considered a rough proxy for psychiatric diagnoses arrived at through a clinical interview or use of a structured diagnostic assessment tool.

3. IMPLICATIONS

The results of this secondary analysis have important implications for the substance abuse treatment field. These implications are outlined in the sections that follow. Specifically, implications for treatment providers, policymakers, and researchers/evaluators are presented. Finally, future directions are proposed.

3.1 Implications for Treatment Providers

Moderate and high levels of psychiatric severity may indicate problems in other important life areas (i.e., drug, alcohol, family/social, and medical). Thus, psychiatric severity may serve as a marker to identify clients who have multiple problems. Not surprisingly, this result parallels those found when co-occurring disorders are formally diagnosed in clients with substance use disorders. Therefore, psychiatric severity based on the ASI psychiatric composite score or a DSM diagnosis can alert the provider to the likely existence of problems in other important life domains. Our finding that psychiatric severity was not significantly different across treatment types (i.e., residential and outpatient) was somewhat surprising, especially since psychiatric severity was related to more problematic status in multiple areas. Furthermore, clients in residential treatment received more psychiatric services (at all levels of severity), and psychiatric outcomes were better for clients who were treated in residential versus outpatient settings. These findings support using “emotional and behavioral complications” as a dimension on which to assess clients' placement needs and to determine an appropriate level of care. Nevertheless, the level of service provision in residential treatment did not explain the better psychiatric outcomes. It may be that the overall structure and milieu of the residential setting is responsible for its beneficial effect relative to outpatient care.

The findings that clients with higher levels of psychiatric severity were more likely to receive psychiatric medication and psychological counseling or other sessions are encouraging insofar as one can infer that clinicians are identifying clients in need of these specialized services. On the other hand, there is little evidence that psychiatrically severe clients are receiving more services in other areas even though they manifest multiple problems. Enhanced service provision across multiple problem areas may be worthy of consideration for clients who report psychological problems. It must be kept in mind, however, that the results of this analysis indicated (rather unexpectedly) that increased service provision generally was not related to

improved outcomes. Until successful service patterns for psychiatrically severe clients are identified, it nevertheless makes sense to use clinical judgment and provide services matched to problems.

3.2 Implications for Policymakers

Nearly two-thirds of the sample experienced recent psychological problems, and at both the moderate and high levels of psychiatric severity these problems were associated with increased problems in other life areas. These findings reinforce the conceptualization of a substance use disorder as a multidimensional problem requiring multidimensional treatment. Treatment designed solely to treat substance use may well be inadequate to address the presenting problems of most of the clients such treatment is designed to serve.

Although in this analysis service provision generally was not related to outcomes, residential treatment was related to better psychiatric outcomes. This finding indicates the importance of psychiatric severity as a potential marker of a need for the higher levels of care. Residential treatment is under scrutiny because of its higher cost, and identifying those for whom it is most appropriate remains a challenge. The results of this analysis suggest that psychiatric severity may be one such indicator.

3.3 Implications for Researchers/Evaluators

The stated constraints of the analysis suggest a road map for researchers/evaluators to address the questions posed by this analysis more precisely. Most importantly, random assignment of clients with co-morbid non-substance use disorders to appropriate and matched services would provide more definitive answers to the key questions about outcomes. A number of additional directions can be inferred from the constraints of the analysis. Because the ASI is so widely used in substance abuse treatment, determining the relationship between summary scores for the ASI psychiatric section (e.g., the ASI psychiatric composite score) and the presence of a non-substance use psychiatric disorder would be valuable. An answer to this question would assist treatment providers who use the ASI as a screen for psychological problems. Finally, measuring the quality as well as the quantity of treatment services would most likely enhance our understanding of the relationship between treatment and outcomes. An assessment tool that could provide such a measure is a difficult task that nonetheless warrants a developmental effort.

3.4 Future Directions

Current psychological problems were identified in two-thirds of the overall sample using the ASI psychiatric composite score. This proportion roughly corresponds to the proportion of clients in substance abuse treatment who have a non-substance use psychiatric diagnosis. Thus, either definitional approach indicates that co-occurring psychological disorders are the rule rather than the exception. Treatment intake procedures can be sensitive to this reality by routinely screening/diagnosing for psychological problems in a standard manner and offering treatment plans formulated to address identified psychiatric needs. For some treatment units, these procedures may require enhancements such as staff training, part-time psychologists or psychiatrists, and community referral sources. These procedures seem warranted nevertheless, not only because of the high rates of psychiatric problems in substance abuse treatment clients, but also because these psychiatric problems often indicate other medical or social problems. Enhancements typically have costs associated with them, and policymakers may need to support them for implementation to occur. Because clients in residential treatment received more psychiatric services and psychiatric outcomes were better for clients who were treated in residential versus outpatient settings, outpatient sites may require more enhancements than residential settings. Nevertheless, the level of service provision in residential treatment could not explain the better psychiatric outcomes. For organizations that provide multiple levels of care, it may be worth instituting program evaluation initiatives to examine the differential effectiveness of residential care and enhanced outpatient care for psychiatrically severe clients.

Our overall results indicated that increased service provision was not related to improved outcomes. Standard assessment practices, clinical judgment, and providing services matched to problems are reasonable guidelines for providers until future clinical research identifies optimal service patterns.

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APPENDIX A
ADDITIONAL INFORMATION ABOUT THE ANALYSIS

APPENDIX A

ADDITIONAL INFORMATION ABOUT THE ANALYSIS

This appendix contains information pertaining to each of the six studies used in this secondary analysis. For each analysis, the goals/purpose of the project are presented along with information regarding the number of facilities and SDUs within each study. Finally, the dates at which data collection began are provided.

- The Philadelphia Target Cities Project examined the effects of service enhancements (i.e., case management services, the development of a Management Information System, the integration of centralized intake/admission units, the provision of intensive staff training, and the provision of a wide range of client-level support services) to drug and alcohol treatment systems in various cities across the U.S. Data included in this study were obtained during Wave 3 of data collection. Data were obtained from multiple facilities, and all Wave 3 clients included in this series of analyses received outpatient services. Specific SDU information was not available for this study. Data collection for Wave 3 began November 1995.
- The CSAT Managed Care Project compared fee-for-service, private managed care and public managed care arrangements for the treatment of public substance dependent clients. The study included clients from 7 facilities, representing 7 outpatient and 3 residential SDUs. Data collection for this study began March 1997.
- The Illinois State I study compared multidimensional outcomes (i.e., alcohol, drug, family/social, legal, employment) of clients in inpatient, intensive outpatient, and outpatient treatment and assessed the extent to which treatment saved money for the state and community. A total of 8 treatment facilities participated in the study, representing 10 outpatient and 3 residential SDUs. Data collection for this study began June 1997.
- The Washington State TOPPS I study compared the effectiveness of full continuum of care (inpatient treatment followed by intensive outpatient and aftercare) and partial continuum of care (intensive outpatient treatment followed by aftercare) in terms of both overall effectiveness and cost. The study included less than 10 SDUs, approximately half of which represented initial inpatient treatment SDUs and half of which represented initial intensive outpatient treatment SDUs. Data collection for this study began October 1997.
- The Arkansas CSAT TOPPS I study examined treatment outcomes for pregnant and parenting women in 12 state-funded residential treatment programs in the state of Arkansas. A total of 14 SDUs were included in the study. Data collection for this study began December 1997.

- The Rhode Island CSAT TOPPS I study examined treatment outcomes for pregnant and parenting women receiving state-funded treatment in the state of Rhode Island in residential and outpatient programs. A total of 10 facilities participated in the study, representing 12 outpatient and 4 residential SDUs. Data collection for this study began January 1998.

APPENDIX B
INFORMATION ABOUT THE SAMPLE SIZE AND MISSING DATA

APPENDIX B

INFORMATION ABOUT THE SAMPLE SIZE AND MISSING DATA

This appendix contains information regarding the sample sizes and missing data information pertaining to each main analysis.

1. ANALYSIS OF DIFFERENCES IN DEMOGRAPHIC CHARACTERISTICS AS A FUNCTION OF PSYCHIATRIC SEVERITY

Analyses were conducted to assess the extent to which demographic variables differed among clients in the three psychiatric severity groups. Information pertaining to sample sizes and missing data sources is presented in Exhibit B-1.

EXHIBIT B-1			
SAMPLE SIZE AND MISSING DATA INFORMATION FOR			
ANALYSES OF CLIENT CHARACTERISTICS			
Characteristic	Sample Size	Missing Information	
		Psychiatric Severity	Characteristic
Age	2443	169	170
Gender	2610	169	3
Race	2584	169	29
Treatment type	2468	169	145

2. ANALYSIS OF PRE-TREATMENT PSYCHIATRIC SEVERITY AND PROBLEM SEVERITY IN OTHER DOMAINS

The analysis examining the relationship between pre-treatment psychiatric problem severity and pre-treatment problem severity in the six non-psychiatric domains was performed using data from clients with complete data for all of the variables, resulting in a sample size of 1,834 clients (66% of the entire sample). Two hundred six clients were excluded from the analysis because of missing demographic data, 621 clients were excluded because of missing baseline ASI composite scores, and 121 clients were excluded because of missing treatment type information.

3. ANALYSIS OF PRETREATMENT PSYCHIATRIC SEVERITY AND RECEIPT OF PSYCHIATRIC SERVICES

In a series of analyses, level of pre-treatment psychiatric severity was related to psychiatric service receipt. Psychiatric service items included psychiatric medication and other psychiatric service receipt. Information regarding sample sizes and missing data for each analysis is provided in the text that follows.

3.1 Psychiatric Medication

Data from 1100 clients (40% of the entire sample) was used in the Chi-square analysis examining of the relationship between pre-treatment psychiatric severity (high, moderate, and low) and whether or not the client was prescribed psychiatric medication. Clients were excluded from the analysis due to missing psychiatric severity information (n = 169) and missing psychiatric service information (n = 1, 513).

The subsequent logistic regression analysis in which psychiatric severity, gender, race (white vs. minority), age, and treatment type (residential vs. outpatient) was used to predict whether or not a client was prescribed psychiatric medication included data from 992 clients (36% of the entire sample). Clients were excluded from the analysis due to missing demographic information (n = 206), missing psychiatric severity information (n = 163), missing treatment type information (n = 141), missing psychiatric service information (n = 1280).

3.2 Other Psychiatric Services

The Chi-square analysis assessing the relationship between psychiatric severity (high, moderate, and low) and the receipt of any psychiatric services was assessed using a Chi-square analysis included data from 1,129 clients (41% of the entire sample). Clients were excluded from the analysis because of missing psychiatric severity information (n = 169) and missing psychiatric service information (n = 1,484).

A total of 1,019 clients (37% of the entire sample) were included in the ANOVA assessing relationship between pre-treatment psychiatric severity and the number of psychiatric services received (not including psychiatric medication). Clients were excluded from the analysis due to missing demographic information (n = 206), missing psychiatric severity information (n = 163), missing treatment type information (n = 141), and missing psychiatric service information (n = 1,253).

4. ANALYSIS OF PRETREATMENT PSYCHIATRIC SEVERITY AND RECEIPT OF NON-PSYCHIATRIC SERVICES

The next series of analyses were performed to assess the relationship between a client's level of psychiatric severity and the provision of non-psychiatric services. Non-psychiatric services included medication, employment, legal, family, and drug and alcohol services in addition to drug and alcohol testing and self-help attendance. Information pertaining sample sizes and missing data for each analysis is presented in the text that follows.

4.1 Medication

Data from 1,127 clients (41% of the entire sample) was included in the Chi-square analysis assessing the extent to which clients were prescribed medication for medical problems as a function of pre-treatment psychiatric severity. One hundred sixty nine clients were excluded from the analysis due to missing psychiatric severity information, and 1,486 were excluded due to missing medical service information.

The logistic regression analysis in which psychiatric severity, gender, race (white vs. minority), age, and treatment type (residential vs. outpatient) predicted whether or not clients were prescribed medication for their medical problems was performed using data from 1,018 clients (37% of the entire sample). Clients were excluded from the analysis due to missing baseline demographic information (n = 206), missing psychiatric severity information (n = 163), missing treatment type information (n = 141), and missing treatment service information (n = 1,254).

4.2 Other Services

A series of seven Chi-square analyses were performed using each dichotomous service item and psychiatric severity (high, moderate, and low) in order to determine if the receipt of any of the various services [medical services (excluding medication prescription), employment services, legal services, family/social services, drug/alcohol testing, self-help attendance, other drug/alcohol services] was related to a client's level of psychiatric severity. Sample sizes for the analyses ranged from 1,130 – 1,149 clients (about 41% of the entire sample). Detailed sample size and missing data information is presented in Exhibit B-2 below.

EXHIBIT B-2			
SAMPLE SIZE AND MISSING DATA INFORMATION			
IN ANALYSIS OF PSYCHIATRIC SEVERITY AND NON-PSYCHIATRIC SERVICES			
Type of Non-Psychiatric Service	Total Number of Clients in Analysis (% of Entire Sample)	Number of Clients Missing Psychiatric Severity Information	Number of Clients Missing Treatment Service Information
Medical	1,141 (41%)	169	1,472
Employment	1,130 (41%)	169	1,483
D/A testing	1,149 (41%)	169	1,464
Self-help attendance	1,149 (41%)	169	1,464
Other D/A services	1,148 (41%)	169	1,465
Legal	1,142 (41%)	169	1,471
Family	1,136 (41%)	169	1,477

About one third (n = 974) of the client sample (35% of the entire sample) was included in the MANOVA assessing the relationship between the seven non-psychiatric service items [medical services (excluding medication prescription), employment services, legal services, family/social services, drug/alcohol testing, self-help attendance, other drug/alcohol services] and psychiatric severity. Clients were excluded from the analysis because of missing demographic information (n = 206), missing psychiatric severity information (n = 163), missing treatment type information (n = 141), and missing treatment service information (n = 1,298).

5. ANALYSIS OF PSYCHATRIC SERVICES AND OUTCOMES

The number of clients in each analysis and missing data information for the regression analyses relating psychiatric service receipt to outcomes is presented in Exhibit B-3 that follows. As indicated, the number of clients included in these analyses ranged from 381 to 456 (22% to 27% of the target sample).

EXHIBIT B-3						
SAMPLE SIZE AND MISSING DATA INFORMATION						
FOR ANALYSIS OF PSYCHIATRIC SERVICES AND OUTCOMES						
ASI Problem Domain	Number of Clients	Missing data information				
		Demographics	Baseline ASI CS	Treatment Type	Service Provision	Follow-up ASI CS
Medical	446	143	36	106	845	131
Employment	456	143	30	101	850	127
Alcohol	382	143	50	106	849	177
Drug	381	143	82	105	824	172
Family/social	405	143	179	105	770	105
Legal	455	143	40	108	837	124
Psychiatric	454	143	0	109	866	135

6. ANALYSIS OF NON-PSYCHIATRIC SERVICES AND OUTCOMES

The number of clients in each analysis and missing data information for the regression analyses relating non-psychiatric service receipt to outcomes is presented in Exhibit B-4. As indicated, the number of clients included in these analyses ranged from 376 to 451 (22% to 26% of the target sample).

EXHIBIT B-4						
SAMPLE SIZE AND MISSING DATA INFORMATION						
FOR ANALYSIS OF NON-PSYCHIATRIC SERVICES AND OUTCOMES						
ASI Problem Domain	Number of Clients	Missing data information				
		Demographics	Baseline ASI CS	Treatment Type	Service Provision	Follow-up ASI CS
Medical	440	143	36	106	848	134
Employment	451	143	30	101	853	129
Alcohol	379	143	50	106	852	177
Drug	376	143	82	105	824	177
Family/social	400	143	179	105	772	108
Legal	451	143	40	108	840	125
Psychiatric	451	143	0	109	869	135

APPENDIX C
FURTHER DEMOGRAPHIC INFORMATION

APPENDIX C

FURTHER DEMOGRAPHIC INFORMATION

This appendix contains a series of tables that provide more specific information pertaining to the demographic characteristics (and treatment modality) of the sample as a function of level of psychiatric severity. Only significant results ($p < .001$) are discussed.

EXHIBIT C-1						
DEMOGRAPHIC VARIABLES AS A FUNCTION OF PSYCHIATRIC SEVERITY FOR OUTPATIENT AND RESIDENTIAL CLIENTS*						
Treatment Type	Demographic Variable		Psychiatric Severity			p
			Low	Moderate	High	
Outpatient	Age (n = 1542)	M SD	33.42a 9.91	35.09 8.49	36.27 b 8.56	0.000
	Gender (n = 1600)	Male	461 a (78%)	331 b (37%)	278c (54%)	0.000
	Race (n = 1588)	White	210 (36%)	161 (33%)	203 (40%)	0.100
Residential	Age (n = 760)	M SD	34.62 8.04	33.30 8.27	34.06 7.11	0.017
	Gender (n = 865)	Male	204 a (72%)	183 (65%)	165 b (55%)	0.000
	Race (n = 851)	White	118 (42%)	113 (41%)	150 (51%)	0.046

*Note: For each row, values with different letters are significantly different from one another, $p < .001$.

As indicated in Exhibit C-1, high psychiatrically severe clients in outpatient treatment are significantly older than low psychiatrically severe clients in outpatient treatment. In outpatient treatment, the low psychiatrically severe clients are more likely to be male than moderate or high psychiatrically severe clients. Likewise, high psychiatrically severe outpatient clients are more likely to be male than moderate psychiatrically severe outpatient clients. Finally, low psychiatrically severe clients are more likely to be male than high psychiatrically severe clients.

EXHIBIT C-2						
DEMOGRAPHIC VARIABLES AS A FUNCTION OF PSYCHIATRIC SEVERITY FOR MINORITY AND WHITE CLIENTS*						
Race	Demographic Variable		Psychiatric Severity			p
			Low	Moderate	High	
Minority	Age (n = 1523)	M SD	34.52 a 9.46	35.33 8.13	36.54 b 7.64	0.001
	Gender (n = 1588)	Male	444 a (79%)	377 b (70.2%)	284 c (58%)	0.000
	Treatment type (n = 1484)	Residential	161 (30%)	162 (33%)	147 (32%)	0.500
White	Age (n = 892)	M SD	32.49 9.23	32.73 8.56	34.16 8.70	0.039
	Gender (n = 994)	Male	245 a (73%)	179 (62%)	187 b (51%)	0.000
	Treatment type (n = 955)	Residential	118 (36%)	113 (41%)	150 (43%)	0.192

*Note: For each row, values with different letters are significantly different from one another, $p < .001$.

As indicated in Exhibit C-2, minority clients with high levels of psychiatric severity are significantly older than minority clients with low levels of severity. For both white and minority clients, the proportion of males within each group decreases as a function of psychiatric severity.

EXHIBIT C-3						
DEMOGRAPHIC VARIABLES AS A FUNCTION OF PSYCHIATRIC SEVERITY FOR MALE AND FEMALE CLIENTS*						
Gender	Demographic Variable		Psychiatric Severity			p
			Low	Moderate	High	
Female	Age (n = 727)	M SD	34.55 7.58	33.26 7.33	34.86 8.06	0.052
	Race (n = 866)	White	92 (44%)	110 (41%)	181 (47%)	0.309
	Treatment type (n = 843)	Residential	79 (38%)	97 (38%)	137 (36%)	0.884
Male	Age (n = 1713)	M SD	33.54 a 9.81	34.95 8.73	36.08 b 8.21	0.000
	Race (n = 1716)	White	245 (36%)	179 (32%)	187 (40%)	0.043
	Treatment type (n = 1622)	Residential	204 (31%)	183 (36%)	165 (37%)	0.051

*Note: For each row, values with different letters are significantly different from one another, $p < .001$.

As indicated in Exhibit C-3, males with high levels of psychiatric severity are significantly older than males with low levels of psychiatric severity.

EXHIBIT C-4						
DEMOGRAPHIC VARIABLES AS A FUNCTION OF PSYCHIATRIC SEVERITY FOR CLIENTS IN FOUR AGE GROUPS*						
Age	Demographic Variable		Psychiatric Severity			p
			Low	Moderate	High	
18-25	Gender (n = 387)	Male	154 a (86%)	87 (72%)	51 b (59%)	0.000
	Race (n = 383)	White	85 (48%)	59 (50%)	57 (66%)	0.014
	Treatment type (n = 371)	Residential	34 a (20%)	46 b (40%)	28 (33%)	0.000
26-35	Gender (n = 982)	Male	268 a (80%)	218 b (67%)	175 c (54%)	0.000
	Race (n = 969)	White	122 (37%)	110 (34%)	121 (38%)	0.567
	Treatment type (n = 920)	Residential	112 (35%)	106 (36%)	125 (41%)	0.237
36-45	Gender (n = 805)	Male	191 a (74%)	182 a (73%)	182 b (61%)	0.001
	Race (n = 800)	White	83 (32%)	67 (27%)	110 (37%)	0.049
	Treatment type (n = 759)	Residential	93 (37%)	74 (33%)	88 (31%)	0.366
46 +	Gender (n = 265)	Male	69 (83%)	70 (82%)	65 (67%)	0.014
	Race (n = 262)	White	25 (30%)	21 (25%)	32 (34%)	0.446
	Treatment type (n = 251)	Residential	20 (25%)	17 (19%)	17 (19%)	0.634

*Note: For each row, values with different letters are significantly different from one another, $p < .001$.

As indicated in Exhibit C-4, a larger proportion of clients in the 18-25 age group were male in the low psychiatrically severe group than in the high psychiatrically severe group. In addition, a larger proportion of moderate psychiatrically severe clients in this age group were in residential treatment than low psychiatrically severe clients. For the 26-35 age group, the proportion of males in each group decreased as a function of psychiatric severity. Finally, a larger proportion of low and moderate psychiatrically severe clients in the oldest age group were male than in the high psychiatrically severe clients in the oldest age group.