VOCATIONAL REHABILITATION FOR PERSONS WITH DUAL DIAGNOSES:
SPECIFIC SERVICE PATTERNS THAT ENHANCE EARNINGS AT THE
TIME OF CASE CLOSURE

Presented in Partial Fulfillment of the Requirements for the Degree of Doctor of
Philosophy in the Graduate School of the Ohio State University

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* * * * *
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ABSTRACT

In spite of the growing interest in vocational rehabilitation (VR) services for those with psychiatric disabilities, there still remains a large group of individuals, those with a dual diagnosis (D\(^2\)) of a psychiatric disability and comorbid substance abuse problem, whose needs are not being met within the VR community. VR professionals are not prepared to treat the special needs of this group. Consequently, unemployment figures are likely to be even higher for those diagnosed with a D\(^2\). D\(^2\) is a large problem that appears to be growing, as approximately 6 out of every 100 persons in the United States are believed to suffer with comorbid issues. As a result of inequities in treatment, individuals with a dual diagnosis are unable to maintain employment and continue to drain economic resources.

This study asserts that the large and growing population of persons with dual diagnoses will greatly benefit from increased awareness by the VR community. This is the first study of its kind to examine which of the existing 13 rehabilitation services best provide the opportunity for positive VR outcomes (i.e., increase in earnings) in the treatment of persons with dual diagnoses. In addition, this study examines whether change in income at the time of closure of a VR case reflects a significant relationship
between specific classifications of someone’s dual diagnosis and the services that person has received. Similarly, the relationship between race and services provided is evaluated based on change in income.

Five of the possible 13 VR services listed in the 1998 RSA-911 database were identified as significant predictors of enhanced income at VR case closure. They were College Training, Business Training, Job Finding, Counseling, and Transportation services. While a few isolated instances indicated that race or diagnosis classifications with services provided predict increased income, overall, their effects in this study were minimal.

Our understanding of how to better meet the employment objectives of persons with a D² can reduce the drain on public resources, as well as to enable individuals with a D² to enjoy happy and productive lives.
Thanks Lauren.
Without you this would not have been possible.
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It has been twelve years since President George H. Bush signed the Americans with Disabilities Act (ADA) into law (1990). Perceived as a breakthrough in civil rights for persons with disabilities, the ADA was designed to eradicate discrimination for this segment of the population in areas such as public accommodations, telecommunications and transportation (Szymanski & Parker, 1996; Rubin & Roessler, 1995). Crafted to improve the quality of life for those whom it protects, this piece of legislation has drawn both favorable and unfavorable reviews, particularly in the area of employment. Some say it has achieved what it originally set out to do by increasing employer awareness, while others have said it was only marginally effective in changing discriminatory patterns in the workplace setting (Price & Gerber, 2001; Schaller, Parker & Garcia, 1998). While its merits are open to debate, few deny the impact the ADA has had on the field of vocational rehabilitation (VR). Since the inception of ADA, in spite of judicial rulings to restrict its parameters, the breadth and scope of VR has dramatically increased.

While the vocational rehabilitation of persons with disabilities today is seen as an important occupational and social endeavor, VR was not always considered to have an essential function. Rubin & Roessler (1995) describe how VR had a humanitarian and
religious background and therefore received almost no federal aid at the start. At the beginning of the twentieth century the only persons receiving vocational assistance were the blind, the deaf, or veterans disabled in combat. Slowly, the movement expanded to the degree that today, under the auspices of ADA and other federal enactments, vocational rehabilitation serves those with a host of physical and mental impairments. The profession of VR not only expanded its breadth and scope, but its knowledge base as well, with a significant increase in the study of VR for persons with many different disabilities. Mowbray and colleagues (1995) among others assert that one area in VR that should be understood better is the vocational outcome studies for those with psychiatric disabilities.

Estimated at four to five million eligible Americans by the end of the 1990’s alone, individuals with serious mental illnesses had hardly sought VR services and were rarely considered by professionals as viable candidates for rehabilitation services, until approximately fifteen years ago (Tsang et al., 2000; Finch & Wheaton, 1999). Despite the recent surge in interest in the methods of treatment for this population, statistics show that the actual rates of vocational assistance and competitive employment remain quite meager (Drake et al., 1996). At this time there is no clear understanding why VR success for those with psychiatric disabilities are not better. Some experts believe the social stigma surrounding this disorder discourages appropriate amounts of research from the VR community, while others assume the symptoms of the disabilities made it virtually impossible to match them with employment possibilities (Tsang et al., 2000; Diksa & Rogers, 1996). These myths, however did not deter occupational therapists from seeing
the need to improve treatment through enhancing their knowledge and by the mid-1980’s interest and research on improving the VR process for those with psychiatric disabilities had begun.

The research produced by this increasing interest produced more information about this population and allowed individuals in the field to better serve the clients with psychiatric limitations and their special needs. For example there is growing support for the need to foster a close connection between vocational rehabilitation and psychotherapy within a supported employment model (Lysaker & France, 1999). Along this same line of thought, others have explored how psychotropic intervention might positively correlate with rehabilitation outcome (Bond & Meyer, 1999; Littrell, 1995). There is even a growing body of work pertaining to employer concerns about hiring persons with these disorders. At this point the returns on the investment have been modest, as an estimated 80-90% of individuals with psychiatric disabilities remain unemployed (Bond & Meyer, 1999; Drake et al., 1996; Jacobs et al., 1992). Nonetheless, as the numbers of persons continue to swell, research and attention to this matter must improve to meet the growing demands.

In spite of the growing interest there remains a large group of individuals, within this group, whose needs are clearly not being met within the VR community. Vocational professionals are not prepared to treat their special needs and as a result unemployment figures are likely to be even higher for them than they are for those with serious mental illnesses (Sengupta, Drake & McHugo, 1998; Brown & Saura, 1996). This population has been so neglected that researchers attempting to better understand this disorder first discover the dearth of any research and in particular longitudinal data (Brown et al.,
1989). Clearly though, this is not a problem confined to the VR field. Social scientists in many disciplines are ill equipped to address this issue, and as a result these persons ‘suffer in silence’ (Ortman, 2001). The problem, that until recently was overlooked the entire research community has had many labels, but now has come to be known as a dual diagnosis.

The concept of the dual diagnosis is one that has been around for years. The basic idea is that of a person suffering with a psychiatric and comorbid substance abuse disorder. Over time different labels for this condition have evolved including dual disorder, chemically addicted mentally ill (CAMI), and mentally ill chemically addicted (MICA). Professionals unfamiliar with this population have also confused it with persons that have a psychiatric disability and coexisting mental retardation. For the purpose of clarity, this study will address those persons with psychiatric and substance abuse disorders as dually diagnosed.

While the concept has been around, professional awareness of it has not. By and large practitioners in psychiatric facilities, substance abuse recovery centers and VR resources are untrained to diagnose and treat persons with this disability (Doyle-Pita, 2001; Ortman, 2001). Individuals with dual disorders require a disproportionate amount of service expenditures and make excessive demands on staff and administrative time (Watkins, Lewellen & Barrett, 2001). As a result of these and other complications, this segment of the disabled population has poor prognosis in treatment.

The professional apathy and indifference is particularly pronounced in the field of vocational rehabilitation. There exists almost no data on this subject and precious few recommendations with which a treatment plan can be developed. Many outdated and
misguided beliefs continue to factor into the formulation of treatment plans and serve to
stymie the efforts of well-intentioned and hard-working rehabilitation case managers.
One such erroneous belief maintains that VR will be unsuccessful for those with dual
diagnoses and discourages that treatment even proceed. This myth asserts that the
unstable nature of their disability make it virtually impossible to assist them. In fact,
many employment centers exclude people with mental illness who have comorbid
substance abuse problems (Sengupta, Drake & McHugo, 1998). These negative
predispositions ultimately reduce the precious few opportunities of employment that exist
for those with a D² (Brown & Saura, 1996).

Another ill-fated idea that has diminished the impact of VR for those with dual
disorders pertains to the demand for sobriety. Many VR programs across the country
require that participants be clean and sober for a specified period of time, before
obtaining services. While it may be an effective deterrent for substance abuse with the
general population, it eliminates the possibilities of occupational rehabilitation for the
dually diagnosed consumer. These services are eliminated instead of implemented,
which is disappointing, because the stable environment of work and VR is needed and
highly conducive to symptom reduction (Blankertz, McKay & Robinson, 2001; Brown &
Saura, 1996).

The combination of these and other ill-fated decisions has led to a paucity of
research and recommendations for individuals with dual disorders. Service providers
however can no longer ignore the needs of this diverse and rapidly expanding population
of clients with mental illness and coexisting substance abuse problems. Estimates
suggest the prevalence of substance abuse/dependence for those with psychiatric
disabilities are at or above 50 percent (Hodgson, Lloyd & Schmid, 2001; Miller & Fine, 1997; Brown et al., 1989). Vocational rehabilitation clearly needs to examine current practices and better understand what it will take to implement an effective treatment plan for persons with dual disorders.

Significance of the Problem

Just how pervasive is the problem of mental illness compounded by substance abuse? This is a difficult question to answer for many reasons, but primarily is due to the problem of improper diagnosis of those who present with mental illness and substance abuse at the same time. A big reason why these patients go through a treatment module undetected is the lack of appropriate training for rehabilitation- and other service providers (Guy, 1997; Lett, 1988). The nature of the disorder itself also poses another challenge to diagnosis (Doyle-Pita, 2001). For example, symptoms of an anxiety disorder and the effects of using stimulants like cocaine can mimic one another and create an invalid diagnosis, especially when the practitioner is well-versed in assessing one, but not the other disorder. As a result, accurate assessments give way to amorphous estimates of the scope of dual disorders and drastically impair the efficaciousness of an Individualized Written Rehabilitation Plan (IWRP).

In spite of the problems with inaccurate diagnoses, most studies indicate that persons with dual disorders constitute a large percentage of the population with psychiatric disabilities (Poland, 1997; Guy, 1997). Miller and Fine (1997) conclude that the lifetime prevalence among alcoholics with a psychiatric disorder was 55%, and among addicts, 64%. For psychiatric patients, most of the literature suggests prevalence rates of substance abuse around 50% (Miller & Fine, 1997; Davenport, 1996; Brown et
al., 1989). These are startling numbers, especially considering that around four to five million individuals in the United States have serious mental illness alone, and they represent the largest disability category served by the vocational rehabilitation system (Rutman, 1994). $D^2$ is a large problem that appears to be growing, as approximately 6 out of every 100 persons in the United States are believed to suffer with comorbid issues (Ortman, 2001).

The size of the problem that $D^2$ poses to the rehabilitative community is quite alarming. What is even more alarming is that subjects with $D^2$ have a low success rate in finding employment after treatment, compared to most other subjects with mental illness (Brown & Saura, 1996). This poor prognosis is theorized from the subjective impressions of clients’ perceived inability to meet the requirements of the VR programs, in addition to satisfying their basic living needs and support networks (Doughty & Hunt, 1999). The cumulative effect of a psychiatric and coexisting substance abuse disorder would suggest that these persons have poorer VR outcomes than those with mental illness alone, who, as studies have shown, already have worse outcomes than other disability groups (Rimmerman, Botuck & Levy, 1995). Consequently, the large and growing population of persons with dual diagnoses will greatly benefit from increased awareness by the VR community.

Need for the Study

While the urgency for closer attention to the vocational rehabilitation needs of those with dual diagnoses may be great, so far the response within VR can be best described as apathetic. The only information available to practitioners at present is hypotheses on effective treatment modalities. Brown and Saura (1996) explored both the
challenges and barriers to service delivery and argued that providers are unprepared to assess a client for substance abuse, which creates a seriously flawed Rehabilitation Plan. A further problem is the stigma attached to psychiatric patients with substance abuse problems, which often causes providers to discourage them subtly, if not outright, based on institutional policies regarding detoxification.

To overcome these and other deficiencies in the treatment of persons with a D², Brown and Saura (1996) advocated for improved assessment techniques, altered eligibility requirements, and interagency cooperation within the entire VR community. Many experts on the matter (Doyle-Pita, 2001; Sengupta, Drake & McHugo, 1998; Brown & Saura, 1996) agree that these actions will be critical features of an improved model of VR treatment for those with a D². However, while the objectives that Brown and Saura have proposed are understandable, it is not clear how they can be achieved. Clarity of purpose is needed, as treatment for dual disorders requires specific treatment planning, not a haphazard delivery of services (Guy, 1997).

Doyle-Pita (2001) outlined what may be the most specific model for the vocational rehabilitation of persons with dual diagnoses. She described how one must first establish a therapeutic alliance with the client. After establishing this alliance, the case manager must persuade the client to reexamine his or her pattern of substance abuse, and then assist the client to either abstain from, or reduce the drug abuse. Following the persuasion phase is what Doyle-Pita labeled the active treatment phase. Clients at this stage are taught to establish healthier social networks, social skills training and cognitive-behavioral strategies. It is at this stage that she felt the vocational rehabilitation and mental health/substance abuse treatment centers can be most helpful to each other and
interagency cooperation should be at its greatest, then. In other words, VR will positively influence clinical outcomes, and vice-versa. The final stage, relapse prevention, seeks to maintain awareness of vulnerability and expanding recovery to other areas.

While Doyle-Pita’s (2001) model may be useful in delineating the stages of recovery, it still does not identify the most useful services in planning a VR program for the dually diagnosed. The current dissertation will be the first to examine which services best provide the opportunity for positive VR outcomes in the treatment of persons with dual diagnoses.

Research Questions and Variables

The research questions to be answered by this study are:

**Question 1:** Which particular services, among the 13 services listed in the 1998 federal/state RSA-911 database, better predict an increase in earnings at the time of case closure for those listed with a dual diagnosis?

The independent variables were the 13 services identified by the 1998 case service reports (RSA-911) as being potentially provided to individuals with disabilities. The dependent variable was the difference between wages earned at the time of application and wages earned at the time of closure.

**Question 2:** To what extent and how accurately can the person’s dual diagnosis (out of the six possible pairs of diagnoses) and the services provided for a client with that diagnosis predict values for his or her change in income from the time of application for VR services to closure of a VR case.

The first set of independent variables in this question is the groups of individuals within the spectrum of dual diagnoses who had identical disabling conditions. Three
mental and emotional conditions are identified by the RSA 911 (500-psychotic disorder, 510-neurotic disorder and 522-mental and emotional disorders, not elsewhere classified), along with two substance abuse/dependence conditions (520-alcohol abuse or dependence, and 521-other drug abuse or dependence). Together, these conditions yield six possible pairs of mental illness and coexisting substance abuse diagnoses. The second set of independent variables in this question is the 13 services identified by the 1998 case service reports (RSA-911) as being available to individuals with disabilities. The dependent variable is the difference in wages earned at the time of application to VR services and the wages earned at the time of closure of a VR case.

**Question 3**: To what extent and how accurately can the race of a client with D$^2$ and the VR services he or she has received predict the values for the change in his/her income from the time of his/her application for VR services to the closure of his/her VR case?

The first set of independent variables in this question is the 13 services identified by the 1998 case service reports (RSA-911) as being available to individuals with disabilities. The second set of independent variables in this question is the client’s race. The dependent variable is the difference in wages earned from the time of application to the time of closure.

**Hypotheses**

The hypotheses to be examined in this project are as follows:

**H$_0$**: There are no significant differences in vocational rehabilitation services utilized and difference in wages earned at the time of VR application and closure for those with dual diagnoses.
$H_1$: There are significant differences in vocational rehabilitation services used and difference in wages earned at the time of VR application and closure.

$H_0$: Vocational rehabilitation services and the six possible combinations of dual diagnoses have no significant effect on the difference in wages earned at the time of VR application and case closure.

$H_2$: Vocational rehabilitation services and the six possible combinations of dual diagnoses have a significant and varied effect on the difference in wages earned at the time of VR application and case closure.

$H_0$: Vocational rehabilitation services and race have no significant effect on the difference in wages earned at the time of VR application and case closure.

$H_3$: Vocational rehabilitation services and race have a significant and variable effect on the difference in wages earned at the time of VR application and case closure.

**Basic Assumptions**

First it should be noted that findings from this study will make no assumptions regarding causality and only will attempt to describe relationships between the variables. The data collected by the 1998 federal RSA-911 is assumed to be an accurate documentation by rehabilitation counselors presiding over relevant cases. This study also assumes that the 1998 federal RSA-911 database is a reliable and valid measure. Another assumption regards individuals who had a primary diagnosis of either a psychiatric or substance abuse disorder, with a secondary diagnosis of the opposite. This assumption suggests that subjects met the criteria as having a dual disorder and as a result, data from
the summary of their rehabilitation experience could be potentially assigned to the study. Finally, this study assumes that federal rehabilitation services would grant permission to complete this investigation.

Limitations of the Study

Some limitations of this study include the national sample of individuals with dual disorders who utilized rehabilitation services and had their cases documented by the RSA-911. These individuals were the group of clients with a D² who sought out rehabilitation services during the 1998 fiscal year and did not represent a true random sampling of persons with dual diagnoses. This study was further limited by the referring agencies or the skill of particular case managers in properly diagnosing a dual disorder. Health professionals in general are improperly trained and often unable to diagnose the coexistence of mental illness and substance abuse (Guy, 1997; Poland, 1997). Consequently, this study was limited by the lack of a true identifiable measure of the current number of persons with comorbid disturbances in the United States who receive federal VR services.

Another limitation of this study was in the inability to detect the quality and characteristics of the providers or services provided. Differences in the delivery of services such as counseling or job-finding may provide some explanations for the variation in the level of earnings from the time of VR application to the time of case closure.

It should also be noted that this was a quasi-experimental study that lacked a control group. As a result, there exists the possibility of plausible hypotheses that rival the hypotheses advanced by the current research design (Campbell & Stanley, 1963).
Finally, it should be noted that while the empirical analysis used by this study can identify hypothetical relationships, it cannot describe a direct and proximate cause of the study’s outcome.

**Definition of Terms**

**Competitive Employment**: Work for wages, salary, commissions, tips, or piece-rates, but not including work in extended employment such as workshops.

**Dual Diagnosis**: Persons with this condition have coexisting disorders of mental illness and substance abuse. This disorder has also been known by other names such as dual disorder, CAMI (chemically addicted mentally ill), or SAMI (substance abuse mentally ill).

**Major Disabling Condition**: The federal RSA-911 defines it as the physical or mental condition, impairment or disease most responsible for the client’s work limitation.

**Secondary Disabling Condition**: The federal RSA-911 defines it as the physical or mental condition impairment or disease that contributes to, but is not the major basis of the work disability.

**RSA-911 Code 500-Psychotic Disorder**: (Taken from the DSM-IV) Those documented with this condition include diagnoses of schizophrenia, delusional disorders and psychotic disorders, not elsewhere classified.

**RSA-911 Code 510-Neurotic Disorder**: (Taken from the DSM-IV) Those documented with this condition include diagnoses of anxiety disorders, somatoform disorders, dissociative disorders, delirium, dementia, and amnestic and other cognitive disorders.
RSA-911 Code 520—Alcohol Abuse or Dependence Disorder: (Taken from the DSM-IV) Those documented with this condition include substance-related disorders (abuse of and dependence on alcohol) and organic mental disorders, as induced by alcohol.

RSA-911 Code 521—Other Drug Abuse or Dependence: (Taken from the DSM-IV) Those documented with this condition include substance-related disorders (abuse of and dependence on drugs other than alcohol) and organic mental disorders, as induced by drugs other than alcohol.

RSA-911 Code 522—Other Mental and Emotional Disorders: (Taken from the DSM-IV) Those documented with this condition include personality disorders, attention-deficit and disruptive behavior disorders of childhood and adolescence, adjustment disorders, sexual and gender identity disorders, eating disorders, sleep disorders, factitious disorders, impulse control disorders, not elsewhere classified and other conditions that may be a focus of clinical attention.

Vocational Rehabilitation Services: Categories of services offered by federally funded vocational rehabilitation agencies include: assessment, restoration, training, college/university training, adjustment training, on-the-job training, miscellaneous training, counseling and guidance-substantial, job-finding services, job placement, transportation, maintenance and other services.

Wages Earned Before Application: The amount of money (to the nearest dollar) earned in the week prior to application for vocational rehabilitation services. Earnings here include total wages, salaries, tips and commissions received as regular income
before payroll deductions. It should be noted that the RSA-911 case service reports excluded any monthly public assistance stipends like the Federal program of Supplemental Social Security Income (SSI).

**Wages Earned at Closure:** The amount of money earned in the week prior to the date of case closure in status 26 (rehabilitated). Earnings here include total wages, salaries, tips and commissions received as regular income before payroll deductions.

**Wage Difference:** The raw difference between wages earned at time of application for vocational rehabilitation services and wages earned at time of case closure.

**Summary**

This chapter began with a brief review of the significance of dual diagnoses in the United States today. In spite of this fact, there currently exists a dearth of available research regarding the problem that persons with dual diagnoses pose to multiple service providers, particularly those within the field of vocational rehabilitation. Utilizing the 1998 Federal Rehabilitation Services Administration-911 database, this study will be the first of its kind to explore which of the existing 13 rehabilitation services or program components are most efficacious in producing positive occupational changes for persons with dual diagnoses. Individuals with a D² are heterogeneous and can have vast differences from other individuals with a D² in many areas, such as onset- severity- and symptomatology- of illness, and service needs (Davenport, 1996). It is these differences among those with a D² that prompted the current researcher to further examine how
vocational rehabilitation will best serve such an eclectic collection of individuals who can significantly vary according to mental health and coexisting substance abuse issues, as well as potential differences based on ethnicity.

It should be noted that potential differences based on what was considered to be primary and secondary disorders (e.g., substance abuse documented as a primary disorder and mental illness as secondary), were not deemed useful knowledge for this study. One reason for discounting this categorization is the difficulty in determining which symptoms to attribute to a particular disorder. For example, clients’ substance abuse often gives rise to pharmacologically-induced psychosocial consequences, but are associated with psychiatric issues if the person’s intake interview is conducted by a professional with mental health training (Lett, 1988). In addition, it is unclear whether the association of substance abuse/dependence and psychiatric conditions is one of cause and effect, or whether the order in which the disabilities occur affects treatment outcome (Brown & Saura, 1996). For the purpose of this exploration, differences in primary versus secondary diagnoses will not be recognized as important measures.

Persons with dual disorders are a large and expanding population. Yet, in spite of this growth in demand, vocational rehabilitation has paid scant attention to this growing epidemic. As a result of this and other inequities in treatment, individuals with a dual diagnosis continue to drain economic resources and are more unable to maintain employment (Guy, 1997). It is of vital economic and social importance to equip VR professionals with knowledge on how to effectively deliver their service and therefore reduce the drain on public resources, as well as to enable individuals with a D² to enjoy happy and productive lives. With this purpose in mind, it was the intent of this first
chapter to outline a research paradigm to be used in increasing the understanding of how to better serve persons with these very special needs, in order to meet their employment objectives.
CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

The purpose of this study was to examine the relationship between services offered by state/federal vocational rehabilitation programs and employment outcomes for those with dual diagnoses. It is the goal of this research project to identify specific treatment paradigms that better suit the needs of this largely ignored subgroup within the disabled community. The aim of this next section will be to provide pertinent background information in three important areas.

The first area will offer a better understanding of the concept of and treatment for those with dual diagnoses. Included in this section will be a description of the prominence of dual diagnosis, the disruptive nature of the disorder, and the diverse population that presents these comorbid features.

Following this description, the next section of the review will examine the Rehabilitation Services Commission (RSC), the mechanism that hopes to instigate positive vocational changes within the large, underserved group of consumers with dual diagnoses. Organized and run by state agencies, but financed primarily by federal funds, the RSC provides VR services to individuals with disabilities. This section will outline a
brief history of the RSC, the services offered by this agency, a description of the
treatment models, and some outcome studies about the RSC’s efficacy. Additional
information will be provided on the utility of vocational rehabilitation for racial/ethnic
minorities.

The final section will integrate the main topics of these previous two sections.
Literature will be provided on therapeutic issues, considerations and hypothesized
treatment models for VR professionals who assist individuals with psychiatric disorders,
as well as those with coexisting substance abuse diagnoses. As the reader will soon
understand, the history and progress of VR intervention for those with a D² can be
characterized as a recent exercise in futility.

Background Information on Dual Diagnoses

Epidemiology

There are conflicting reports as to the prevalence of individuals with dual
diagnoses, but even the most conservative estimates will surprise many within the field.
The findings of the National Comorbidity Study concluded that 30 percent of all
Americans between the ages of 14 and 54 with a psychiatric disability also have a
substance abuse disorder (Ryglewicz & Pepper, 1996). Ortman (2001) asserts that
around 6 out of 100 Americans have diagnosable disorders in both areas. Both findings
suggest the presence of a large and highly representative portion of all Americans with
diagnosable dual disorders.

Among those patients being treated for psychiatric disorders, anywhere from 40-
60 percent also met criteria for a lifetime addictive disorder (Watkins, Lewellen &
Barrett, 2001 & Gomez et al., 2000). Overall, individuals with a mental health disorder
had more than a twofold increased odds of an alcohol or drug use diagnosis relative to those without mental disorders (Gomez et al., 2000). For those receiving treatment for recovery from substance abuse, the percentages of comorbidity climb even higher (Compton et al., 2000; Bleyker, 1999; Poland, 1997). In a pilot study on adolescents with substance abuse disorders (n = 226), Stowell and Estroff (1992) found that 82 percent also met criteria for another Axis I disorder. While these figures are only estimates, they give clear indications that the magnitude of the problem is greater than was first reported.

**Etiology**

The cause of dual diagnoses is unknown but many theories have been advanced. One idea that has attained support is the role of family and genetics in the onset of coexisting dual disorders. Research has demonstrated a moderate correlation between particular familial characteristics and dually diagnosed members (Sheils & Rolfe, 2000; Silver, 1999). Merikangas, Risch and Weissman (1994) divided families into three groups and studied the rates of alcoholism and depression. The results of their evaluation found that children in families with a history of primary diagnosis of depression had an increased likelihood of depression. Furthermore, the presence of alcoholism also increased the risk of depression in families. Various adoption studies also have examined the co-occurrence of dual disorders and found a significant relationship of mood disorders/substance abuse with biological relatives of 71 adoptees (Bierut & Dinwiddie, 1997).

Another hypothesis sought to establish a relationship between the symptoms and onset of one disorder with the onset of the other. Should psychiatric disorders be considered *primary* or *secondary* to drug dependence? Practitioners are often accused of
establishing primacy in subject disturbance to justify treatment discourse (Poland, 1997), but the data on this matter are mixed. Compton and associates (2000) investigated the relationship between substance abuse disorders and comorbid psychiatric conditions among 425 persons in drug treatment programs. Among the more noteworthy findings was that antisocial personality disorder and phobias had onsets prior to the onset of drug dependence. On the other hand, the majority of drug dependent persons with a generalized anxiety disorder reported an onset of the disorder after they began abusing their drug(s) of choice. While Compton et al.’s (2000) study is consistent with the rest of the literature, in that it confirms a relationship does exist between the disorders, it was clearly hesitant to assign either disorder as being primary or secondary.

Another train of thought suggests that it is the environment that most plays a part in the development of a dual diagnosis. Within particular groups of people, the risk of developing comorbid disorders is much greater than it is for the general population. An adoption study of genetic and environmental factors revealed that environmental factors, divorce, and psychiatric disturbance were associated with increased drug abuse (Miller & Fine, 1997). Results like this demonstrate the need to not just be aware of the genetics and primary disturbance, but also the subject’s continued exposure to particular events that raise the possibility of developing dual disorders.

Finally, a growing body of literature is accumulating that supports the role neurotransmitters play in the onset of addictions (Pandey, Davis & Pandey, 1997; Gold, 1997). One such hypothesis related to this theory is the reinforcing role that dopamine plays in reinforcing the effects of cocaine addiction (Gold, 1997). This same elevated level of dopamine is the neurotransmitter that also produces hallucinogenic reactions.
observed in schizophrenia. Psychopharmacology owes a great deal of its success to the theories that were advanced by hypotheses like these. Much like the other ideas, while this hypothesis has received some empirical support, it in no way purports to describe a causal relationship. Each of the four ideas has some merit, but the origins of D² need to be assessed on a case-by-case basis.

**Diagnosis**

Over the years, many professionals have identified dual diagnoses within a subsection of the target groups they are serving. For example, those serving individuals with mental retardation identify dual diagnosis as people with both a psychiatric disability and mental retardation (Dudley, Ahlgrim-Delzell & Calhoun, 1999). Educators look upon a dual diagnosis as those with developmental delays and behavior-modification needs. For the purpose of this study, D² will refer to the coexistence of substance abuse and psychiatric disabilities. In the RSA-911 manual, the domain of substance abuse was split into two disorders: (1) Alcohol Abuse or Dependence Disorder (520) and; (2) Other Drug Abuse or Dependence Disorder (521). In the DSM-IV (1994) the term “substance” can refer to any of the 11 classes of drugs: alcohol; amphetamine or similarly acting sympathomimetics; caffeine; cannabis; cocaine; hallucinogens, inhalants; nicotine; opioids; phencyclidine (PCP); or similarly acting arylcyclohexylamines; and sedatives, hypnotics, and anxiolytics.

Being identified with a substance-related disorder is further demarcated by the differences between substance abuse and dependence. The criteria for substance abuse is defined in the DSM-IV as having one or more of the following symptoms in the same twelve-month period: recurrent substance use resulting in a failure to fulfill major
obligations at work, home or school; recurrent substance use in situations that are physically hazardous; recurrent substance-related legal problems; and continued substance use despite persistent or recurrent social or interpersonal problems.

On the other hand, the criteria for substance dependence is defined in the DSM-IV as having three or more of the following symptoms in the same twelve-month period: tolerance; withdrawal from the substance; substance taken longer in larger amounts and for longer than intended; persistent desire or unsuccessful efforts to cut down; great deal of time spent obtaining the substance; reduction in other social activities in favor of substance abuse; and continued substance abuse in spite of knowledge of its deleterious effects. In this study both disorders will be referred to as “substance abuse,” but there are clear differences between the two that may be useful points of reference in future research.

The psychiatric disorders in the RSA-911 database are split into three categories: Psychotic (500); Neurotic (510); and Other Mental and Emotional Disorders (522). Taken from the DSM-IV the conceptual definition of “psychotic” is a loss of ego boundaries or a gross impairment in reality testing. The diagnoses in this definition include schizophrenia, delusional disorders and psychotic disorders, not elsewhere classified. The terms “neurotic” or “neurosis” are no longer used in the latest versions of the DSM publications, but “neurosis” has been characterized as a chronic or recurrent nonpsychotic disorder that often manifests itself in anxiety (Kaplan & Sadock, 1998). Those documented with this disorder in the RSA-911 database have diagnoses that include anxiety disorders, somatoform disorders, delirium, dementia, and amnestic and other cognitive disorders.
The final code, Other Mental and Emotional Disorders (522), includes those with personality disorders, attention-deficit and disruptive behavior disorders of childhood and adolescence, adjustment disorders, sexual and gender identity disorders, eating disorders, sleep disorders, factitious disorders, impulse control disorders not elsewhere classified and other conditions that may be a focus of clinical attention.

Regarding the disorder of dual diagnosis, one should note the view of many experts, in that the combination of the two disorders creates a disturbance that is much greater than either one alone (Watkins, Lewellen & Barrett, 2001; Ortman, 2001; Doughty & Hunt, 1999). Treating persons with a dual diagnosis therefore requires a treatment plan that is altogether different from one designed for a person with a single disorder. The next section on course and prognosis will further identify the unique challenges to the dually diagnosed.

**Course and Prognosis**

Individuals with dual diagnoses are heterogeneous as to their psychiatric diagnoses, as well as the various length and severity of substances they abuse (Watkins, Lewellen & Barrett, 2001; Davenport, 1996). Given the significant differences among subjects, poor complicity with treatment regiments, and the high mobility of this population, particular patient patterns and prognoses are best described as volatile and uncertain (Daley & Zuckoff, 1998; Davenport, 1996; Brown et al., 1989). Ortman (2001), however, in his book *The Dual Diagnosis Recovery Sourcebook*, identifies a three-stage progression of this disorder.

Ortman (2001) characterizes the early stage as a time when the person uses alcohol or drugs occasionally. In this stage, the mental or emotional problems are
beginning to be linked to the drug use, and the individual is seeing drugs as a way to soothe the cognitive turmoil. In the middle stage of D², the drinking and the drug use increase, while the toll taken becomes more evident. Severe bouts with depression or anxiety increase in frequency due in large part to the physiological effects of the constant abuse, as the user’s world begins to spin completely out of control. Ortman (2001) characterizes the final stage as a house collapsing. The addiction has become chronic and the mental/emotional illness has taken possession of the user. Addiction is a fatal disease that ultimately takes one’s life either through suicide or the physical toll from the constant and/or toxic ingestions of drugs or alcohol. For many, there simply is no escape from the grip of mental illness and substance abuse.

With a progression like the one described above, it is no wonder that the prognosis is poor for patients with psychiatric and comorbid substance abuse disorders. One reason for this is because they do not comply with treatment requests. Daley and Zuckoff (1998) compared compliance with treatment between individuals with a diagnosis of major depression, and those with the same psychiatric diagnosis and a coexisting substance abuse disorder. They found significant differences in the rates of compliance between the two groups after just the initial session (86% for persons with major depression versus 43% for those with a dual diagnosis). Daley and Zuckoff (1998) go on to assert that a high level of transience contributes to the poor prognosis.

Guy (1997) reports that an estimated 56% of individuals with a D² are involved in the legal system. She states that in a study of persons with dual diagnoses only 12% were employed. This was consistent with other studies that confirmed the low rates of employment for those with comorbid disorders (Sengupta, Drake & McHugo, 1998).
Estimates of low levels of family satisfaction and high levels of homelessness are also discouraging signs for an already improperly served population (Guy, 1997). The next section will look at treatment strategies being employed in a wide range of treatment centers to help reverse this disturbing trend.

Treatment for Persons with a D²

D² is a disorder that has afflicted American society for generations, but treatment plans have only developed to combat this problem recently. The consequence of this is a dearth of longitudinal data documenting the potential benefits of particular therapeutic interventions (Watkins, Lewellen & Barrett, 2001; Brown et al., 1989). Interest has increased, but at this time the demand outweighs the supply of information on efficacious paradigms.

One thing is for certain, and that is those with dual diagnoses are a diverse collection of patients who require unique services. An effective intervention for a person with a diagnosis of major depression disorder and episodic alcohol abuse is likely to be different from one who has a diagnosis of paranoid schizophrenia and opioid dependence. No specific therapy has been shown to be superior in helping those with dual diagnoses recover fully from their disturbances. However, a few patterns of services are accumulating empirical support and beginning to emerge as viable aids in the healing process. The first part of this section will examine the possible benefits of psychopharmacology for those with D².

Psychopharmacological Therapy

It appears almost paradoxical to use medications in assisting one with a dual diagnosis. After all, how can one encourage abstinence from drugs or alcohol when one
achieves this by prescribing a mind-altering drug? To this end, Ries (1993) states that psychotropic intervention of the dually diagnosed is most useful when the psychiatrist is attentive to three issues:

1. What is the abuse potential of the medication?
2. What characteristics of the medication may help sobriety or recovery?
3. What characteristics of the medication may hinder sobriety or recovery?

Provided these questions are carefully considered case-by-case, many in the mental health community believe that psychopharmacological treatment is a useful treatment for a D² (Davis et al., 1997; Brady & Roberts, 1995; Klerman et al., 1994). Some possible treatment alternatives like antipsychotics (Mellaril, Zyprexa & Risperdal) are effective treatments for schizophrenics and have a low potential for abuse (Ortman, 2001). They pose a minimal risk in being a counterproductive agent of change. Davis and colleagues (1997) describe how another class of medications, Monamine Oxidase Inhibitors (MAOIs), shows promise in the pharmacotherapy of persons with Borderline Personality Disorders. They further report that the advantage of MAOIs is particularly useful for D² as it also prevents the spread of alcoholism.

One final medication that deserves mention is the use of Selective Serotonin Reuptake Inhibitors (SSRIs). These medications are being used for a variety of psychiatric disturbances such as mood disorders, problems with anxiety and even a few personality disorders (Ortman, 2001; Davis et al., 1997). The benefit for individuals with mood disorders is particularly pronounced as it stabilizes the mood without causing the euphoric state that those with chemical dependencies seek (Ortman, 2001).
Individuals with even a minimal knowledge of medications would have noted one class of medications was conspicuously absent from this brief overview, benzodiazepines (BZP). BZPs are primarily indicated as treatment of anxiety and sleep disturbances (Kaplan & Sadock, 1998). They also are among the more sought-after medications by drug abusers for their euphoric effects. Most experts would agree that BZPs should be avoided in the treatment of those with dual diagnoses, except in the case of detoxification (Murray & Ries, 1997).

There are many more medications not mentioned in this brief discourse, like methadone and tricyclic, antidepressants (TCAs) that are potentially efficacious adjuncts to treating the dually diagnosed. Litten and associates (1997) describe how naltrexone and 5HT agonists like gepirone also are showing promise as medications in reducing alcohol consumption. While this strategy has many potential benefits, pharmacotherapy is not the only source of treatment for those with chemical addictions and mental illness. Other modalities should be examined as well.

The next section will look at family therapy for D².

**Family Therapy**

Perhaps no other group suffers more than the family members, when one of their own has a dual diagnosis. Unfortunately, families are often among the most neglected segment of the recovery process. They face huge burdens and receive little in the way of support from outside resources when a family member is diagnosed with both a psychiatric disorder and a substance abuse problem (Ortman, 2001; Silver, 2001; Sciacca, 1996). In spite of this lack of support, family members remain central figures in the
treatment and recovery of persons with comorbid disorders (Sheils & Rolfe, 1998). The following discussion looks at ways that the family can be incorporated into the recovery process.

Sheils and Rolfe (1998) describe in their analysis on family therapy that those with dually diagnosed members are often treated using psychiatric or substance abuse models, which naturally lends itself to trivializing the impact of the other disturbance. They have suggested an integrated framework that delivers services to the family in a slow and methodical manner. The first stage involves psycho-education concerning substance abuse, and should be done in such a manner as to avoid confrontation. The middle stage requires families to acquire skills to deal better with substance abuse and its effects. The success of this stage hinges on family members supporting and encouraging the individual to engage in healthier activities without increasing the stress level. One support network is MICAA-NON, a group for the families of mentally ill/drug addicted and alcoholic persons (Sciacca & Hatfield, 1995). In the final stage, after some time to try out new methods of handling the stressors caused by dual disorders, family members are brought back to review their actions and modify individual actions.

In the Sheils and Rolfe (1998) model, therapy was done as a unit, but in Ortman’s (2001) model, the disabled individual initiates family therapy. Participants are taught to empathize with their problems caused by the disabled individual’s abuse. Following this, amends are made and an apology is written. It is the desire of this paradigm to educate the patient’s family about the disability, and enlist the family’s participation in the recovery of the person with the disability. Family support is the goal for all involved, but
this onus is on the person with the disability. Family therapy has certainly carved out its
niche in treating those with dual disabilities (Kavanagh et al., 1999; Silver, 1999), but
individual therapy is the most widely used alternative.

The final section will examine essential components and plans for treatment on an
individualized basis.

Individual Therapy

While treatment for individuals with either disorder dates back many centuries,
Sciacca (1996) reports that the first treatment modules for dually diagnosed patients that
were adapted to fit the special needs of mentally ill/chemical abusers began at a New
York Psychiatric hospital in 1984. The governor at the time, Mario Cuomo, provided
support for a program that developed unique techniques of non-confrontation to denial
and resistance, employed treatment groups and explored topics from the mentally
ill/chemical abusers’ own perspective. In 1985, the state of Michigan implemented the
first interagency program that sought to combine treatment from different bureaus. From
these humble and recent beginnings, the treatment for the dually diagnosed was born.

While progress has been made, at present service systems for this disorder are not
well configured to meet the specialized needs of the mentally ill/chemical abusers
(Willenbring, 2001; Poland; 1997; Brown et al., 1989). Nonetheless, there have been
some insights gained on treatment considerations and service models that will serve being
reviewed in this section. One should begin with the concerns relating to assessment.

One of the biggest problems in treating persons with dual disorders has long been
the problem with a proper diagnosis (Lett, 1988). As mentioned previously, most
individuals arrive in treatment and are diagnosed with either a mental illness or substance
abuse diagnosis, depending on the agency conducting the interview. Providers are ill-equipped to correctly identify an opposing disturbance, which is compounded by the problem of symptoms overlapping one another (Lett, 1988). Better screening procedures are needed to correctly identify those consumers who will need these services (Hattenshwiler, Reush & Modestin, 2001; Kavanagh et al., 2000).

Another treatment concern identified is the need to design specialized treatment programs for those with different diagnoses. One of the few quantitative analyses performed in this area by Hattenschwiler, Reush and Modestin (2001) made comparisons among four groups of dual patients with different features. What they found was that while there were little differences in variables such as demographics, there were significant differences among variables like adherence to treatment, global outcome, and psychopathology. This examination underscores the documented need for practitioners to be aware of the differing diagnoses, as they are likely to have significant impact on treatment efficacy (Watkins, Lewellen & Barrett, 2001; Davenport, 1996).

Some final considerations one should be aware of when developing a program for those with dual disorders are the issues of compliance, autonomy and problem-solving capabilities. While considered as three distinct features, effective programs will simultaneously address all three concerns. Poor compliance is an issue that is markedly high for those with dual disorders (Daley & Zuckoff, 1998). Planning must include strategies incorporated throughout the life of a program for those who are dually diagnosed (Daley & Zuckoff, 1998).

Effective programs should seek as well to maximize patient autonomy and problem solving capabilities. Herrick and Elliott (2001) incorporated a problem-
orientation component to a group of 117 patients with personality impairments and comorbid substance abuse concerns. By incorporating this treatment plan, exit studies showed the patients had a decrease in depressive behavior, distress and substance-use relapses. Improving patient autonomy is also a goal to focus on in therapy. Various studies have used focus groups and collateral patient reports and found that they have had a positive impact on treatment outcome (Ouimette et al., 2001; Maisto et al., 1999; Stasiewicz & Stalker, 1999). The myth is that persons with dual diagnoses are untrustworthy and incapable of making decisions regarding their treatment; the reality, however, is that they are more often than not capable and willing to provide honest and insightful feedback about treatment effectiveness.

The next part of this discussion will focus on the two models that are the basis of many treatment plans for those with dual diagnoses. The first model is the Transtheoretical Model (TTM). Founded on the treatment of substance abuse disorders, this paradigm is frequently mentioned in the therapeutic annals for individuals with a D² (Watkins, Lewellen & Barrett, 2001). Prochaska and DiClemente (1984) identify that there are ten core processes related to therapeutic change. These are: consciousness raising, self-liberation, social liberation, counter-conditioning, stimulus control, self-reevaluation, environmental reevaluation, contingency management, dramatic relief, and helping relationships. The therapeutic process may not use all of these steps, but some are essential if changes in behavior are to occur.

Prochaska and DiClemente (1984) go on to identify that change occurs in the following stages:

Precontemplative – not aware of or not acknowledging having a problem.
Contemplative – recognizing something is wrong but not yet committed to doing anything about it.

Decision – accepting the existence of the problem and committing to doing something about it.

Action – actively seeking solutions that may include ‘home remedies,’ 12-step programs and formal therapy.

Maintenance – relapse prevention.

Change can be initiated at five different levels: symptom/situational, maladaptive cognitions, interpersonal problems, family conflicts, and interpersonal conflicts. While its original intent was for those with substance abuse disorders, incorporating an individualized model for those with dual diagnoses receives some empirical support as a useful framework to address this problem (Velasquez, Carbonari & DiClemente, 1999).

Many other experts have also sought to formulate an integrated model of therapy that better treats both disorders (Doyle-Pita, 2001; Jerrell, Wilson & Hiller, 2000; Minkoff, 1997). Minkoff (1997) conceptualizes this idea as a simultaneous individual treatment module for both psychiatric and substance abuse disorders throughout the individual planning in areas such as case management, stabilization, and support systems. In this treatment, one provider oversees the therapy for both disorders. The four stages of this model are engagement, persuasion, active treatment and relapse prevention (Doyle-Pita, 2001). Depending on which stage the client is at, the service provider incorporates an individualized plan to assist them to get better. Much like the transtheoretical model, this model has also received some empirical support as an effective alternative (Velasquez, Carbonari & DiClemente, 1999; Sengupta, Drake & McHugo, 1998). While
other treatment modalities like dialectical behavioral therapy or motivational interviewing exist (Van Horn & Bux, 2001; Linehan et al., 1999), TTM and integrated therapy are the two models that have received the most attention as effective service models in producing positive change in those with dual diagnoses.

Before concluding this section, a description will be provided of an actual treatment program serving those with mental illness and coexisting substance abuse. A program developed by Kathleen Sciacca in 1984 for the Harlem Valley Psychiatric Center was perhaps the beginning of treatment for persons with comorbid disorders (Gigliotti, 1986). Gigliotti (1986) reported that the original pioneers for a treatment center identified issues for both client and consumer had to be addressed. The approach was non-confrontational because of the fragility of the patients and was tailored to their individual needs. Therapists educated and deferred credit for success in order to build self-esteem as well as acceptance for issues and individuals. Again, much like the models described above, patients were identified as going through phases in the process. The end result of this initiative was improved insight by the consumer on their issues, increased education and awareness, decreased hospitalization, and longer periods of abstinence. There are notable differences from the two paradigms above, but clearly this program developed by Kathleen Sciacca borrowed elements from both paradigms and integrated them into its structure.

State/Federal Rehabilitation Programs

Vocational rehabilitation in the United States has seen remarkable changes in its breadth and scope over the past 100 years. The profession has grown from a mere 143 workers in 1930 to over 20,000 counselors in the field today (Rubin & Roessler, 1995;
Garner, 1993). Dollars spent also skyrocketed from one million by the federal
government in 1918, to over 142 million dollars spent by the State of Ohio in the year
2000 alone (Ohio Rehabilitation Services Commission, 2001; Rubin & Roessler, 1995).
With a clientele of 600,000, this type of staggering growth is enough to make most
Fortune 500 companies green with envy. How did a movement with such humble
beginnings grow into such a political force equipped to change the way society views
those with disabilities? The purpose of the next section will be to trace the evolution of
this billion-dollar program from its rudimentary beginnings and to describe mechanisms
or models that most influence the delivery of services for those seeking vocational
assistance. Of particular influence to the reader will be a discussion at the end of the
section on how vocational rehabilitation has answered the call (or not) of service to
minorities. Essentially, this section will explore the period of unprecedented growth in
the last 100 years and how VR is structured to meet the challenges for the next 100 years
to come.

The History of VR

Prior to the turn of the twentieth century, vocational rehabilitation was not
considered to be an important agenda in the political arenas that shaped public opinion.
Laissez-faire attitudes pervaded which effectively wrested the responsibility of
rehabilitation squarely onto the persons with the disabilities (Rubin & Roessler, 1995).
At this time, those with psychiatric disorders suffered the additional indemnity of not
even being recognized as being disabled. Ideas like demon possession, laziness or
phrenology better explained the cause of their disorder and signaled internal weaknesses
as disabilities that were not in line with compensation or services.
Rubin and Roessler (1995) stated that a shift in public attitude regarding
disabilities began with the onset of Industrialism and World War I. Spurred on by the
efforts of the then-President Theodore Roosevelt, the Federal government passed
legislation in 1917 setting up the Federal Board of Vocational Education and made
monies available to states to match and develop VR education programs. The Soldier’s
Rehabilitation Act of 1918 set aside one million dollars for the states in order to create
these programs for World War I veterans with disabilities. After heated debate, Congress
finally passed the Smith-Fess Act of 1921, which was the first to set up civilian
rehabilitation programs. In spite of the available money, many states were slow to adopt
these programs. However, money continued to be funneled in from the federal
government to establish state programs for vocational rehabilitation.

Legislative change for vocational rehabilitation then stagnated in the thirties and
did not provide much in the way of landmark legislation for those with dual diagnoses
until 1943, when the Barden-Lafollette Act extended and expanded federal-state
rehabilitation services to persons with mental retardation and psychiatric disabilities. For
the first time, individuals with mental illness could participate in rehabilitative services
along with those with physical ailments. In the late 1940s through 1990, VR underwent
dramatic changes that broadened the breadth of its influence as well as expanding the
resources available to consumers. These changes culminated in the passage of the
Americans with Disabilities Act (ADA) of 1990. The ADA created changes that forever
altered the delivery of services within the state/federal VR system. Discussing and
describing the laws for disabled citizens will be provided in the next section, as well as
exploring the effects of this for those with substance abuse and psychiatric disabilities.
While the Rehabilitation Services Commission (RSC) has no power to enforce compliance, the original crafter of this bill sought to create a mandate for those who are protected by ADA, provide clear enforceable rules, ensure the role of the government in enforcing those rules, and regulate commerce so as to eliminate discrimination. The ADA defines disability and has five titles, seeking to prohibit discrimination for those classified as having a disability. These five titles are as follows:

- **Title I**: The Prohibition of Discrimination in Employment Practices
- **Title II**: Nondiscrimination on the Basis of Disability in State and Local Government Services
- **Title III**: Nondiscrimination in Public Accommodations and Commercial Facilities
- **Title IV**: Increased Access to Telecommunication
- **Title V**: Miscellaneous Provisions.

The American Disabilities Act of 1990 is consistent with the 1974 revisions that define disability as a physical or mental impairment that substantially limits one or more major life activities of such individual, who has a record of such an impairment, or is regarded as having such an impairment (Szymanski & Parker, 1996). While the American Disabilities Act has been the focus of a great deal of litigation and debate, it clarified and strengthened the role of the rehabilitation movement, and in particular emphasized the importance of federal and state rehabilitation programs (Cava, 2002; Gearan, 2002; Kopelman, 1996). One question pertinent to this study is how this law has affected the treatment of those with psychiatric disabilities, who also suffer from substance abuse.
The Ohio Rehabilitation Services Commission (2001) addressed these two issues within the context of the ADA, albeit separately in their sourcebook. They note that those who have alcoholism past or present are considered to have a disability under the law, while those with only previous drug addictions are considered disabled. Those currently using drugs are not entitled to the same protections (such as workplace accommodations) as those with a history of alcoholism, regardless of whether they are addicted, or have a disability. Clearly, this is something to consider as this exploration proceeds.

The ADA however recognizes the needs of those with mental illness. Such provisions protected under the ADA include giving employees time off to meet with therapists, tolerating the presence of a job coach, and allowing them the access of a phone in order to receive support. Clearly, this legislation has been the benchmark in shaping the goals, services, and treatment models for state-run rehabilitation programs that contributed to the data collected for this study.

State/Federal Rehabilitation Programs

States are free to design their own vocational rehabilitation programs but they must meet federal regulations if they are to receive the three dollars provided by the federal government for every dollar they invest. As a result, while each program boasts unique and unprecedented mechanisms of service delivery, there is great deal of generalization in rehabilitation programs. Those eligible for VR programs are: (1) persons who have a physical or mental disability which results in a substantial impediment to employment; (2) persons who can benefit in terms of an employment
outcome from vocational services provided; and (3) persons who require VR services to prepare for, secure, retain and regain employment (Ohio Rehabilitation Services Commission, 2000).

Ideally, central offices usually handle administrative and coordinative functions, while smaller agencies spread throughout the region guide applicants through the rehabilitation process. This process is developed in collaboration between client and VR counselor that typically follows four steps:

1. Decide on an employment goal. The customer selects a job goal that matches his or her aptitudes and interests. The counselor may help to obtain the necessary information so the customer can make the best choices. Sometimes this will require gathering information from other people or programs, or getting assessments. Assessments may include medical exams, vocational testing, work evaluations, and job tryouts.

2. Develop a plan. The customer can choose to work with a counselor to develop a plan for employment. The plan will clearly identify the services that will be needed. It will also state who will provide the services and how to determine if they are beneficial. Some services will be provided directly by the counselor or other MRS staff. Other services may be purchased or provided by other agencies.

3. Follow the plan. The customer receives the services outlined in his or her plan. See some examples of services below. The plan is reviewed annually and changed as necessary.

   - Job-seeking skills training

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• Job-placement assistance
• Accommodations/assistive technology
• Job coaches
• Tools, equipment, and licenses
• Job training
• Prostheses and other medical services
• Support services such as interpreters, readers, and transportation

4. Reach the goal. The counselor—and sometimes other MRS staff—works with the customer to reach the final goal: finding the right job. Once the customer is on the job, the counselor follows up for at least 90 days to make sure both the employer and new employee are satisfied. Sometimes additional services are needed. When this happens, MRS can begin working with the customer again to make sure he or she is able to stay on the job.

(Michigan Rehabilitation Services: Services for People with Disabilities, 2002, Available at: http://www.mrs.mjc.state.mi.us/cs/intojobs/eligible.html)

While there exist some differences in the application of this program among different states, overall, the VR programs are administered in an analogous fashion (Ohio Rehabilitation Services Commission, 2000; Hasenoehrl, 1993; McAlister, 1989).

Basic information on the elements involved in the rehabilitation process for those consumers participating is recorded by each state and forwarded to the federal government. All the data is collected and included in the reporting manual for the
Rehabilitation Services Administration-911 (RSA-911) case service report published annually. Elements of each case included in this report include among other information collected:

- Sex
- Race
- Hispanic origin
- Previous closure status
- Type of public support during VR
- Major disabling condition
- Secondary disabling condition
- Listing of disability codes
- Work status at application
- Weekly earnings at application
- Monthly public assistance amount at application
- Previous employment status
- Services provided
- Work status at closure
- Weekly earnings at closure
- Type of closure
- Counseling/guidance services (substantial).

For the most part, the elements listed above are self-explanatory, but as this analysis unfolds, particular information on the RSA-911 database should be provided regarding
the elements related to the particular disabling conditions examined in this research, services provided, type of closure, and listed income from earnings or otherwise.

There are several different disabling conditions currently being treated by state-run, federally funded rehabilitation centers across the United States. RSC centers have served many different types of disabilities such as blindness, heart/lung conditions, epilepsy, and traumatic brain injuries. For the current study, the subjects will have a major disabling condition as a psychiatric disability and secondary condition of substance abuse/dependence. The five categories of disabling conditions identified as potential subjects for this study are as follows:

(Crosswalk between RSA-911 codes for mental and emotional conditions and the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders- DSM-IV)

- Code 500-Psychotic Disorder: Includes schizophrenia; delusional disorders; and psychotic disorders, not elsewhere classified.
- Code 510 – Neurotic Disorder: Includes anxiety disorders; somatoform disorders; dissociative disorders; delirium, dementia, and amnestic and other cognitive disorders; and mood disorders including depressive and bipolar disorders.
- Code 520 – Alcohol Abuse or Dependence: Substance-related disorders—abuse and dependence on alcohol; and organic mental disorders, as induced by alcohol.
- Code 521 – Other Drug Abuse or Dependence: Substance related disorders—abuse of and dependence drugs other than alcohol; and organic mental disorders, as induced by drugs other than alcohol.

- Code 522 – Other Mental and Emotional Disorders: Personality disorders; attention deficit and disruptive behavioral disorders of childhood or adolescence; adjustment disorders; sexual and gender identity disorders; eating disorders; sleep disorders; factitious disorders; impulse control disorders, not elsewhere classified; and other conditions that may be a focus of clinical attention.

Clearly, while there are few categories, these categories encompass a vast number of potential disabilities within both substance and mental illness realms.

The next area of information recorded that is pertinent to this study has to do with the types of services offered. The variance in types of services available for consumption has grown exponentially in recent years. Among those used have been counseling and assessment to assistive technology devices. In some cases, consumers receive financial aid to start up businesses (Creating opportunity, 2002). While the type of assistance is highly variable, the federal documentation of services received is limited to one of thirteen categories. These types of services have been listed and described in the order they were displayed in the 1998 RSA-911 database:

- Assessment – This complex of services is designed to enable the rehabilitation agency to determine the applicant’s eligibility for vocational rehabilitation services, and/or to determine the nature and scope of services to be provided.
Assessment involves diagnosis and evaluation and can be medical, psychological, social or vocational in scope.

- **Restoration (Physical and Mental)** – This category includes those medical and medically related services that are necessary to correct or substantially modify physical or mental conditions. Examples of restoration services are surgery, therapy, treatment and hospitalization. Devices provided to improve or maintain the individual’s ability to function would be recorded under **Assistive Technology Devices**.

- **College/University Training**—Included is all academic training, on a level beyond secondary schooling. Persons attending full- or part-time or evening courses conducted by a university, college, junior college, or a college-level extension school would be recorded as receiving this training. Academic training in an elementary or high school is to be recorded under miscellaneous training.

- **Business and Vocational Training**—This is a non-collegiate post-secondary education. Included is training in (a) a business/commercial school or college and (b) a vocational/trade school. Training in the business/commercial school or college would prepare the individual for work in areas of office practice, typing, word processing, bookkeeping, accounting, data processing, etc. Training in the vocational/trade school would typically prepare the persons for occupations such as welding, woodworking, TV repair, electrical wiring, auto and aviation mechanics, drafting, cosmetology, barbering, etc.
• Adjustment training—This is training which will help the individual adjust to a particular situation hindering his or her ability to work. Included would be work conditioning, developing work tolerance, mobility training, remedial training, literacy training, lip reading, Braille, etc.

• On-the-Job Training—This is training by a prospective employer in which the individual usually works for wages while learning the skills of a job. There should be an understanding that if the training is successful, the person will remain on the same or a similar job.

• Miscellaneous Training—This category is provided to allow classification of types of training that do not readily fit into the previous groupings. Included would be academic training on a secondary education level or lower as well as specialized schools for persons who are blind or deaf which are academic in nature.

• Counseling and Guidance/Substantial—Record Code 1 only when Counseling and Guidance services are provided to the individual to a substantial degree. This means that Counseling and Guidance services were of overriding importance in the totality of rehabilitation services delivered to the individual, as determined by a large amount of time and effort expended to provide such services.

• Job-Finding Services—A job-finding service is provided when enough information has been imparted to permit the individual to arrange for a job interview with a possible employer on his or her own. Such information, provided singly or in groups, would include instruction in how to read the
want ads and other sources of employment opportunities, prepare job resumes, write cover letters, and prepare for job interviews. A job-finding service is also rendered when the State agency directly refers or arranges for the direct referral of the individual to a prospective employer.

- **Job Placement**—A job placement service is rendered when the individual is referred to and is hired by an employer. This service may be provided by the State rehabilitation agency, the State employment service, or any other job-finding source such as a private employment agency. Excludes instances in which (a) the individual found his or her own job without training in job-finding skills that were provided or arranged for by the State agency, and (b) an employer at the time of application for rehabilitation services retained the individual in employment. A key feature of this service is that the individual became employed as a result of the job referral. However, the employment need not have been successful. Closures into homemaking and unpaid family work are not to be reported as job placement services. It is possible, however, that the homemaker or unpaid family worker was previously referred to and hired by an employer, but the employment did not succeed. In these instances, a placement service was rendered.

- **Transportation**—Transportation is any a service provided or arranged for by the State agency to enable the individual to arrive at appointments for assessment, medical services, training, or any other rehabilitation service, as well as to permit the individual to get to work.
- Maintenance—Included under this category are services provided to cover the additional costs incurred by the individual while he or she is undergoing rehabilitation services.

- Other Services—This category allows the classification of rehabilitation services that cannot be recorded elsewhere. Included are occupational tools and equipment, initial stocks and licenses, and services to family members for the benefit of the individual. Medical care for acute conditions arising during rehabilitation and constituting a hazard to the determination of potential or to the achievement of the vocational objective is also to be included in this category.

In addition to the documentation of services, one should also make note of the differences in the ways that one’s income is listed at the time of application and the time of closure. A potential concern for this study was identifying the source of income for the person with a dual diagnosis using VR services. Often, persons engaged in VR have some degree of assistance prior to receiving help. This can come from sources like Aid to Families with Dependent Children (AFDC) and Supplemental Security Income (SSI). Sources of income outside of the person’s work could confound the results if they are factored into the earnings at the time of application or closure. However, the RSA-911 database lists incomes like public assistance separate from weekly earnings during the week before application or closure. The earnings at closure and the week before application include total wages, salaries, tips and commissions received as regular income before payroll deductions such as state and federal income taxes. Incomes at or over 999 dollars are coded only as $999.
There has been some heated debate over the definitions of employment. How does “competitively employed” differ from “non-competitive” and “supported” employment? Given the purpose of the exploration—to identify services that correlate with better vocational outcomes for individuals with dual diagnoses and not argue the merits of the classification used in the RSA-911—the conclusion was to specifically not use this information. However, one should be aware that case closures were divided into one of six categories:

1. (Status 08 from Status 02) Closed, not accepted for VR services, from the applicant status.
2. (Status 08 from Status 06) Closed, not accepted for VR services, from extended evaluation.
3. (Status 26) Closed, rehabilitated.
4. (Status 28) Closed, not rehabilitated, after individualized written rehabilitation program initiated.
5. (Status 30) Closed, not rehabilitated, before individualized written rehabilitation program initiated.
6. (Status 38 from Status 04) Closed from the pre-service listing.

The average case processing time in Ohio alone was 22.6 months from referral to rehabilitation (Ohio Rehabilitation Services Commission, 2001). If these figures are indicative of national figures, Status 26 closures can therefore be expected to take approximately two years.

Clearly, the state/federal VR program has grown considerably since its inception in 1918. However, is it effective at helping those with disabilities become self-sufficient
and employed, as well as increasing for employers the workforce pool? Based on recent reports, the answer appears to be a resounding yes. Michigan Rehabilitation Services (2002) placed 7,590 individuals with disabilities into jobs during the fiscal year of 2000. They also estimated a savings of 9.5 million dollars in public assistance funds as a result of rehabilitation efforts. For those receiving services, earnings after treatment constituted a jump of almost 150%. The Texas Rehabilitation Commission’s annual report for the fiscal year of 2001 also demonstrated positive VR outcomes for consumers. Of the 142,000 served in that year, over 24,000 were successfully rehabilitated (Texas Rehabilitation Commission, 2002). Consistent with mandates to serve those with the most serious disorders, 81% of those served had significant disabilities (Texas Rehabilitation Commission, 2002). The income of those who were rehabilitated was 3.5 times greater. A case can be made that state and federal programs have been successful in the vocational rehabilitation of those with disabilities.

However, not everyone has been so effusive in their praise of the VR system. The following discussion will examine the literature that analyzes the differences in VR service patterns and outcomes for those with disabilities.

Vocational Rehabilitation for Minorities

Until the mid 1960s, VR and all forms of counseling demonstrated little interest or concern for the status of racial, ethnic, or other minority groups (Atkinson, Morten & Sue, 1979). All issues and concerns were conceptualized using one perspective, predominantly that of the White Anglo-Saxon male. Through a combination of factors, such as demographics, economic and social changes, this perspective was forced to change. More emphasis is being placed on multicultural issues in VR training programs
now than ever before, but is that enough? There are many critics of rehabilitation programs who believe that the system has let down persons with disabilities who are of different racial/ethnic descent (Alston & Bell, 1996; Leung, 1993). The purpose of this section will be to examine service accessibility, delivery and outcomes for minorities in VR programs. While but a few doubt that vocational rehabilitation has made inroads on this subject, many believe there still is much work to be done, if VR is to aspire to level the playing field of service delivery for those with variable racial or ethnic backgrounds.

Racial and ethnic minorities are among the fastest growing populations in the United States. In 1990 almost one in four Americans had African-, Asian-, Latino-, or Native American ancestry in contrast to one in five in 1980 (Leung, 1993). Latinos who are the fastest growing population group in the U.S. will become the largest non-white population by the year 2010 (Quiñones-Mayo, Wilson & McGuire, 2000). It should follow then that with these radical changes in demographics, one would see a corresponding change in who receives the services as well as who is delivering them. In fact, the impact of economic inequalities and other pressures leads to even greater than average rates of disabilities within minority populations (Quiñones-Mayo, Wilson & McGuire, 2000; Alston & Bell, 1996).

In spite of this, the VR service rates of minority populations remain disproportionately lower than those of non-minority status (Schaller, Parker & García, 1998; Dziekan & Okocha, 1993). Alston and Bell (1996) report the rates of rehabilitation provisions to African Americans can be two to three times lower than that for White Americans. Minorities overall were more likely to be ruled ineligible for services in comparison to White Americans (Feist-Price, 1995). It should be noted also that those
providing the services are predominantly white. Schaller, Parker, and Garcia (1998) noted that ideally, staffing for any program would reflect the makeup of those who use the program. There remain however, shortages of rehabilitation counselors from diverse backgrounds. It would not be a reach to conclude that the relatively homogenous characteristics of the Anglo-Saxon rehabilitation counselors negatively affect the acceptance rates of those minorities seeking services. The unfamiliarity and mistrust of the two parties feed on one another and lead to this reduction in services.

Assuming though the consumer is found eligible for services, the next question about differences in state/federal services between minority and non-minority populations would be the nature of the services rendered. Are there unique patterns of services based upon differences in race, sex or ethnicity?

A study by Wheaton and associates (1997) examined data from a large Midwestern state during the 1995 fiscal year to assess whether differences existed in service to VR consumers based on race, sex and closure status. Researchers used a combination of a cluster analysis and three-factor ANOVA, and found that there was no effect for sex. However, there was an effect for race, closure status and the interaction between the two. African Americans and persons whose cases were closed successfully received more services. In effect, the presence of a disability and minority status may necessitate the need for more services to produce a successful closure.

Wilson (1997), in combination with the above study, delineates further the service differences with European and African Americans. Results from statistical analyses indicated a significant correlation between race and the number of services received. The most common services for African Americans were adjustment training, transportation
and maintenance, while for European Americans the most common services were restoration, college, and diagnosis. Not only was there a relationship among services received, but also for those whose services were withheld. Wilson found a correlation between race and reasons for closure. African Americans were more likely to have services terminated due to: (a) cannot locate, and (b) failure to cooperate, while for European Americans it was: (a) handicap too severe, (b) no vocational handicap, or (c) other. Certainly the connotations are much different among the reasons for closure.

Much more has been written about the inequity in VR treatment based on race, ethnicity and gender than can be described in this section (Schaller, Parker & Garcia, 1998; Sheppard et al., 1995; Atkinson, Morten & Sue, 1979). Clearly, differences are seen throughout the life of a rehabilitation plan, from identification and acceptance to closure. It is the hope of those intricately involved in serving persons with a D^2 that the rehabilitation movement continues to find ways to include everyone seeking vocational assistance.

Before proceeding to the next chapter, the purpose of the final section within the literature review will be to examine research and opinions regarding the vocational rehabilitation of those with dual diagnoses.

**VR Treatment for Those with Dual Diagnoses**

While there appears to be an increasing understanding of the need to serve those with dual diagnoses, at this time there is a scarcity of research on the subject. To date, what little research there is, centers around comparisons of VR outcomes for the dually diagnosed and those with psychiatric disorders (Sengupta, Drake & McHugo, 1998; Drake et al., 1996). The focus here will be to synthesize and describe the available
information on vocational rehabilitation of persons with D². The goal of this section will be to provide an overview of research on VR for the dually diagnosed in five key areas: (a) Issues and problems in VR for those with D²; (b) Benefits of VR for the dually diagnosed; (c) Possible effects of differential diagnoses; (d) Proposed treatment models; and (e) Research on services used. Much of the information provided in this section was based on inferences from the authors and anecdotal evidence. Research is clearly needed to ensure better outcomes.

**Issues and Problems Facing the VR of Persons with a D²**

The problems facing those with a dual diagnosis seeking rehabilitation begin at the initial intake interview. In treating those with D², the greatest problem is that the coexistence of chronic mental illness and substance abuse often goes undetected (Lett, 1988). Brown and Saura (1996) believe that this problem is a reflection of the specialization in the rehabilitation-counseling field. Counselors in this area specialize in returning individuals to work, but they are ignorant of substance abuse and dependence issues. Brown and Saura (1996) go on to hypothesize that rehabilitation counselors are too apprehensive to discuss with consumers issues of recovery of those with dual diagnosis, which leads to an incomplete IWRP.

Another problem is that referring agencies often specialize in either mental illness or substance abuse, but not both (Guy, 1997; Poland; 1997). As a result, the diagnosis fails to include comorbid issues, which causes an under-representation of the numbers of true dual diagnoses. Treatment planning requires knowledge of the client’s total rehabilitation needs. Unfortunately without the proper diagnosis, these needs will likely go unmet.
The needs of patients who have been dually diagnosed can go unmet for other reasons, as well. Brown and Saura (1996) postulate that the issue of relapse has become a major impediment for those with dual diagnoses who are seeking competent rehabilitation services. Vocational rehabilitation patterns often follow sequentially and do not allow failure at any point. This ideology is especially pronounced in the area of substance abuse or relapse. The 1998 Amendments to the Rehabilitation Act of 1973 actually excluded individuals from VR programs who engage in the illegal use of drugs (Hitchen, 2001). Substance abuse and relapse must be addressed prior to VR. Brown and Saura (1996) go on to say that substance abuse is thought of only as a peripheral concern. For those dually diagnosed, recovery and relapse are issues that can occur at any time. However, treatment programs for drug and alcohol abuse see relapse as a common occurrence in therapy that must be factored into the plan. Unfortunately for those seeking vocational rehabilitation, relapse is an essential feature of the disability, but is never accounted for and rather subjects the individual to immediate removal from many VR programs.

Pressure comes from the other side of treatment, as well. Rehabilitation counselors often demand that their clients not work until they have successfully abstained (Blankertz, McKay & Robinson, 1998). The belief here is that the excessive pressure caused by venturing into a work environment may cause relapse. In the end, it appears as if there is pressure from both the VR and chemical dependency treatment programs to prevent individuals from seeking to simultaneously obtain both services.

Returning to the issue of chemically addicted, mentally ill individuals, procuring VR services is further disrupted by the lack of treatment for their specialized needs.
Davenport (1996) describes how two competing systems currently exist for these clients. This competition has created rival camps that regularly come into conflict. Instead of complementing one another, each system undermines the other’s utility. The dually diagnosed as a result fall between the cracks, getting treated only by the symptomatology that is considered to be the primary, presenting problem. Whereas there exist specific professional agencies for individuals with other disabilities, that seek to rehabilitate their consumers in addition to securing VR services for them, such an integrated program is not available for persons with a D². In its present state, treatment for persons with dual disorders lacks essential components to treat both disorders, which ultimately will reduce the possibility for successful integration into a work environment.

Disabilities often affect individuals on many levels. Not only must the consumer address the issue of his or her actual disability, but there are also likely to be additional aspects that cannot be ignored. These aspects can include tangible issues like transportation or workplace accommodations, or intangible ones like self-esteem, social skills, or stamina. One of the most challenging considerations of all is dealing with stigmas. The effect of stigma is even worse for the dually diagnosed, as substance abuse and mental illness are two of the most stigmatized disabilities in social services (Goodyear, 1983; Furnham & Pendred, 1983).

Brown and Saura (1996) describe how stigma affects the rehabilitative process on three levels: Employer bias, service provider bias and personal bias. While legislation has been enacted to eliminate unfair labor practices for those with disabilities, many employers continue to harbor these biases. While 90% in a study of 127 employers
indicated that they would hire an ex-psychiatric patient if they were properly trained, only one in six (17%) had actually done so (Rubin & Roessler, 1995). This bias even extends into the rehabilitation process. Those with a dual diagnosis are especially prone to RC biases due to co-occurring circumstances like a patient’s lack of peer support, adequate clinical exposure or specific skill training. Counselors with these negative attitudes have been shown to adversely affect outcome (Cook, 1992).

One such study by Dunston-McLee (2002) examining the effect of the rehabilitation counselors’ attitude toward those with dual diagnoses concludes that VR professionals possess positive attitudes toward those with dual diagnoses, but lack an understanding of the importance of the recovery process. The positive attitude but prevailing ignorance toward those with comorbid disorders can probably impair the success of VR for those with a dual diagnosis as much as negative attitudes and stereotypes.

Perhaps most important is one’s own bias toward him or herself. Patients with comorbid disorders can frequently have a fundamental negative bias toward themselves and their future outcomes (Nunn, 1999). This negative bias can create low self-efficacy that deleteriously affects the outcome of a rehabilitation plan in a number of ways. Ferris (1999) in her analysis of self-empowerment in vocational rehabilitation describes the benefits and consequences of those with high or low self-efficacy. People with low self-efficacy tend to avoid activities and situations that exceed their capabilities and increase their self-doubt about task performance, which in turn raises subjective distress. Inevitably, the increase in self-doubt will lead to fewer successful case closures. Internal negative bias is more tenuous in this society as well, because physical disabilities are
more accepted than psychological, emotional, or substance abuse. The dually diagnosed have many external prejudices to overcome in their quest to acclimate themselves into the work environment, but perhaps the greatest prejudice is the one that resides within.

The most recognizable and perhaps greatest obstacle in vocational rehabilitation for those with dual disorders is the ignorance within the professional ranks. In spite of the growing prevalence of this problem, many professionals in vocational rehabilitation are not trained in this area, which strongly contributes to a high frequency of poor outcomes (Doughty & Hunt, 1999; Kelley & Benshoff, 1997). Kelley and Benshoff (1997) postulate that rehabilitation counseling needs to move beyond present treatment paradigms that are incapable of serving the needs and complex problems of individuals with a D². From intake interview to case closure, VR professionals are in need of a better understanding to better serve the increasing numbers of individuals with dual diagnoses.

Benefits of VR Treatment for Persons with a D²

While there are pitfalls in the current process that the rehabilitation community must confront, there remains the potential for benefits to those with dual diagnoses in numerous areas. Blankertz, McKay and Robinson (1998) state that for the patient, work is a positive alternative to spending time securing their drugs of choice. Part of the recovery process they describe is the increase in structured activities, and most work environments follow a sequential pattern on a continuous schedule, which cuts into their drug-seeking behavior. Another benefit of work is the socialization of persons with a D² to the non-substance abusing community. Persons with psychiatric and substance abuse disorders have no greater difficulty than in forming relationships (Hodgson, Lloyd & Schmid, 2001). By entering healthy relationships with more secure individuals, persons
with a D² can overcome this limitation. In one study on subjects with a dual diagnosis, this inability to build a positive social network is something that clients requested more help for than with any other skill (Caan, Rutherford & Holloway, 1996).

A third payoff of VR in the case of dually diagnosed persons is the enhancement of self-esteem. Blankertz, McKay & Robinson (1998) conclude that through work, one increases one’s sense of mastery and self-efficacy, as work provides a feeling of self-accomplishment and pride in functions completed. This is essential for those with a comorbid disturbance because of the need to counteract the feelings of shame, guilt and weakness. Competent VR services will instill in the client an enhanced sense of self worth that not only improves their employability, but recovery as well.

Additional parts of the VR program that are conducive to individuals with a D² include the holistic nature of the program. A good VR counselor can integrate many different specialty services into helping their client achieve a positive employment outcome. They are used to coordinating multiple facets of a plan, such as physical therapy, job coaching and business training into one coherent whole. Like the VR counselor, experts on D² stress the need to integrate services if one is to be successful in therapy (Jerrell, Wilson & Hiller, 2000; Drake & Mueser, 2000; Minkoff, 1997). VR counselors are thus ideally suited to provide a balance of services, which predisposes them to intervene on multiple levels.

Another prerequisite to rehabilitation counseling that fits the needs of the dually diagnosed is the Individualized Written Rehabilitation Program (IWRP). Another problem facing these clients is their lack of planning. Particularly with substance abuse/dependence, short- and long-term goals are bypassed in favor of impulsive
proclivities. A well-established and maintained IWRP, which is the cornerstone to a successful intervention, will aid in short-circuiting these self-destructive behaviors.

The nature of vocational rehabilitation is also ideally suited to the needs of substance-abusing, mentally ill patients for one final reason, the priority of services. Individuals with dual disorders are more likely to be considered as having more severe symptomatology than those with only one disorder (Watkins, Lewellen & Barrett, 2001; Ryglewicz & Pepper, 1996). Unlike many professions which would tend to focus efforts on less disturbed patients in order to enhance productivity, rehabilitation counseling actually has clear directives to serve those with severe disabilities. The first article of the Rehabilitation Act of 1973 mandates state/federal rehabilitation programs to serve those with severe disabilities. Therefore, instead of discouraging individuals with comorbid substance abuse and mental illness issues, rehabilitation counselors should more actively recruit the dually diagnosed population into VR programs.

Sengupta, Drake and McHugo (1998) also summarized studies that support the need to extend services for those with dual diagnoses. In three studies comparing employment outcomes between those with serious mental illness and dual disorders, the authors concluded that substance abuse disorder does not impair one’s work capacity beyond already significant impairments due to mental illness. This is important, because while vocational rehabilitation has put extensive emphasis on treating those with mental illness, it has done little for those with problems with substance abuse or both. From the available research, Sengupta, Drake and McHugo (1998) therefore concluded that substance abuse issues should not be used as reasons for excluding people with mental illness from vocational services or employment opportunities.
While concerns about certain aspects of VR service delivery for those with dual diagnoses must be addressed, this topic clearly needs to be further researched and developed.

**The Effect of Differential Diagnoses**

Persons with dual diagnoses cover almost the entire spectrum of psychiatric and substance abuse disturbances (Blankertz, McKay & Robinson, 1998; Davenport, 1996). Within one diagnosis exists a plethora of individuals with unique and challenging demands, unbeknownst to the vast majority of trained rehabilitation professionals. In order to successfully treat those with a D², programs must be designed to accommodate particular needs, and VR services will likely be no different (Guy, 1997).

Doughty and Hunt (1999) describe the prevalence and some of the special considerations rehabilitation counselors must be aware of in serving those who have been dually diagnosed. Research showed that a large number (19%) of subjects with a D² had a diagnosis of an anxiety disorder. When counseling individuals with comorbid disturbances, rehabilitation counselors must concern themselves with the client’s withdrawal patterns in addition to other reported sympomatology, in order to determine the duration of the disabling emotional condition.

For another large group of the dually diagnosed, those with a diagnosis of depression and substance abuse, it has been concluded that 98% of persons with issues of dependence have symptom complaints of depression. It is recommended that abstinence of the drug be achieved for a period of time before concluding that a diagnosis of depression is warranted. Withdrawal should be especially guarded against in the case of a diagnosis of depression and substance abuse, because lapses can undermine goals for
recovery and employment. Of the personality disorders, an estimated 20-40% in one study also met the criteria for antisocial personality disorder, while borderline personality disorders affect an estimated 13-43% of persons with chemical dependence. Genetic bases were hypothesized as having the strongest correlation with the development of these behavior disturbances.

Finally, there are issues of schizophrenia and substance abuse/dependence. Doughty and Hunt (1999) found that an estimated 40-60% of individuals with a diagnosis of schizophrenia suffer from problems with chemical addiction. Counselors must understand here that many of the observed symptoms can also be attributed to the abuse of substances. To gain a better appreciation of the impact of each disorder, counselors should encourage clients to abstain for a specified period of time, so as to distinguish between the symptoms related to the psychosis and those due to abuse/dependency.

These and many more variations of differential diagnoses are considered to be a dual disorder for clients. In order to be more effective as rehabilitation counselors, RCs must account for the differing frequency and types of needs that this collection of consumers will demand.

Treatment Models

While awareness of dual diagnoses has increased over the past decade, persons with psychiatric and comorbid substance abuse/dependence disorder continue to go undiagnosed and neglected in treatment and rehabilitation (Doyle-Pita, 2001; Kelley & Benshoff, 1999). One of the consequences of this dereliction in duty is that VR professionals, when working with a client who presents with both disorders, lack a clear direction with which to construct the IWRP. To date, there are no treatment models
specifically designed for individuals with dual diagnoses. Two models have been hypothesized to be effective intervention paradigms for this population: (1) the Supported Employment Model, which has received empirical support for those with serious mental illness, and (2) the Empowerment Model, that has garnered similar accolades for those with chemical dependency issues.

In order to accommodate the wide variety of dysfunctional behaviors that persons with psychiatric disabilities may present, the field of VR has tried a few different paradigms to aid clients in their quest for employment. Job clubs, transitional employment, and job banks are but a few of the more promising models receiving support for persons with psychiatric disabilities. One approach that many feel has the maximum potential of applying to all types of individuals with mental illness is the supported employment (SE) paradigm (Lysaker & France, 1999; Drake et al., 1996; Wallace, 1993).

This supported employment model places clients in competitive employment as quickly as possible, and then provides all of the support services necessary to help clients succeed. Instead of a comprehensive training program in classrooms or sheltered workshops, the learning takes place on the job with intensive follow-up services (Rubin & Roessler, 1995). It is important to note that there are no prescribed sets of services; they are administered as needed to the individual over an indefinite period of time. There are a number of variations in this model such as train-place-train-follow-up and place-train-follow-up. In spite of the differences in alternative approaches, all models recognize the importance of delivering services that are neither time-limited nor delivered
on a fixed schedule. Job conditions can change rapidly along with the client’s needs, and advocates of this treatment intervention assert its superiority in providing services that are both flexible and appropriate (Rubin & Roessler, 1995).

In spite of the growing support for the use of supported employment for those with psychiatric disabilities and even additional diagnoses of substance abuse/dependence (Sengupta, Drake & McHugo, 1998; Gervy & Bedell, 1994; Anthony & Blanch, 1987), there are distinct differences of opinion on which variation of the model to use. To this end, R. E. Drake and associates (1996) set out to compare the efficacy of two distinct types of SE services: Group Skills Training (GST) and Individual Placement and Services (IPS) models. Researchers hypothesized that the GST model, in which an independent rehabilitation agency would provide pre-employment skills training and support in obtaining and maintaining jobs would be superior to the IPS model, that integrated vocational and mental health services under one treatment team. With a sample of 143 subjects, results from the pre-analysis evaluations showed that the clients who made positive assumptions prior to entering the IPS program increased their likelihood of being competitively employed during most of the 18-month follow-up period. These results demonstrate startling similarities to D² treatment programs that encourage the delivery of services for both psychiatric and substance abuse disturbances from one distinct program, rather than two autonomous sites (Jerrell, Wilson & Hiller, 2000; Drake & Meuser, 2000).

The Sengupta, Drake and McHugo article (1998) described the potential utility of this SE model for those with dual diagnoses. After evaluating data from five studies, using both cross-sectional and longitudinal analyses, they found that substance abuse
disorders did not have a strong effect on competitive employment outcomes for persons with serious mental disorders. Their final conclusion was that those with dual diagnoses should not be excluded from supported employment programs. The benefits of SE for those with serious mental illness would not be compromised if the client had additional issues of chemical abuse/dependence.

Another notable treatment program, the Self-Empowerment Program (SEP), was created in response to a lack of cooperation between chemical dependency recovery centers and VR professionals. Recapitulated by Hitchen (2001), originally developed by the University of Arizona and started in the state of Oregon in 1995, the SEP was a way to encourage increased participation in VR programs by American Indians with chemical dependency issues.

The SEP was comprised of four full-day sessions that explored participants’ perceptions, behaviors, and emotions related to their interactions with the world. It also sought to help them understand that each action or inaction was a consciously made choice and is therefore something they could control. By identifying ‘old behaviors’ before they were presented, they would be better equipped to lead a healthier and drug-free life. SEP involvement was also expected to help participants feel more comfortable in accessing VR services, and therefore could help participants to transition to the VR process with more ease.

The SEP was implemented into many areas in the state of Oregon in 1995. Prior to its onset, VR programs only served about 2% of the 13,934 Oregonians with disabilities who used these services. Of those served, 42% of those American Indian clients who applied would successfully complete the VR process. By 2001, however,
these numbers would significantly rise. SEP helped Oregon VR services average 235 new American Indian applicants per year and successful completion percentages rose to 46%. While not all of these applicants were in recovery, the author surmised that there was a direct correlation between SEP and vocational services.

Three parallels can be drawn between this study and the one described in the following chapters, suggesting that SEP is a viable alternative for those with dual diagnoses. The first is SEP emphasis on increasing the target populations’ participation. Of primary importance in all treatment plans pertaining to D² is the patients’ failure to enter, comply with, or complete treatment (Daley & Zuckoff, 1998; Lehman et al., 1993). Any VR treatment plan must address client reluctance to participate and comply with interventions, and SEP does.

The second need addressed by SEP for those with dual diagnoses is in aiding the integration of recovery and vocational rehabilitation treatment. Most experts agree that these two entities, which frequently have little to do with the other, would actually complement one another if interagency cooperation were to increase (Sheils & Rolfe, 2000; Squyres & Ososkie, 1998; Blankertz, McCay & Robinson, 1998; Brown & Saura, 1996). A sense of mutual support and teamwork grew out of the Oregon VR project, something sorely missing from current VR treatment for those with dual disorders.

The final need that makes SEP a program ideally suited in the treatment of those with dual diagnoses is the commitment to aftercare. Those with chemical dependency issues will not benefit from time-limited services. Maintaining sobriety, and sound mental health for that matter, is a life-long challenge, and those committed to enhancing vocational outcomes must use that time-line as well. Individual needs wax and wane, but
the help should always be readily available. The foundation of the Self-Empowerment Program in Oregon is the longstanding commitment to improve VR services to individuals in the American Indian community. Experts agree that any such program seeking to work with those large cross-sections of individuals with mental illness and substance abuse disabilities would be advised to emphasize the component of aftercare treatment (Ouimette et al., 2001; Kelley & Benshoff, 1999).

One of the keys to each of these programs’ potential for success within this population is in their flexible nature. As such, services included in individual IWRPs will not be uniform, but instead vary from case to case. Will there be particular services that can be more often linked to successful VR outcomes for those seeking vocational rehabilitation? That, of course, is the question this study seeks to answer. However, there was a similar exploration performed on those with serious mental illness (SMI) that may provide some clues.

This final study conducted by Finch and Wheaton (1999) sought to identify types of rehabilitation services received and employment outcomes for recipients with SMI who are receiving state vocational rehabilitation services during the federal fiscal year 1995. Using a cluster analysis of the 13 possible services defined by the RSA, researchers first determined the best cluster configuration of services to the target population. They found five primary clusters and named them according to their predominant characteristics: (1) Counseling-only cluster; (2) Minimalist cluster; (3) Direct placement cluster; (4) The total job assistance cluster; and (5) The comprehensive cluster. They found that from cluster constellations 3, 4, and 5, counseling was one service that had a significant impact on wages. Researchers also hypothesized that if
counseling had been used more extensively in cluster 2, there would have been a significant positive effect on wages as well. Adjustment training, on the other hand, was a service included only in one of the five clusters. From this, one could infer that its utility was only of marginal significance in the VR training for those with SMI.

Researchers also wondered whether the type of illness classified could be correlated to the particular services the clients used during treatment. They used a chi-square test of independence between cluster membership and type of mental illness, to determine whether there was a significant relationship and find out whether severity would equate to services rendered and occupations entered. Test results were not significant and thus showed little relationship between gross classification of mental illnesses and occupational category.

Summary

This chapter presented a review of the literature analyzed in three major areas: (a) Understanding the concept and treatment issues for those with dual diagnoses; (b) Providing a description of state/federal vocational rehabilitation programs and the mechanisms implemented to promote positive outcomes; and (c) Describing the current literature on VR for those with dual diagnoses. The next chapter (III) will furnish a description of the methodology used to conduct this study.
CHAPTER 3

METHOD

At present, there exists a dearth of literature pertaining to treatment options in vocational rehabilitation for individuals with a D². To better serve the growing numbers of dually diagnosed consumers, this study sought to identify those services that enhance rehabilitation outcome when utilized in an IWRP with this population. Increased knowledge will aid rehabilitation professionals and social service agencies alike in designing plans that optimally affect VR outcome.

The connection between low employment rates and income are common for those with serious mental illness (Finch & Wheaton, 1999), and the probability is high that the rates decline even further for those who have a coexisting substance abuse disorder. This model assumes that effective service interventions will not only correlate with higher wages for those with dual diagnoses, but also with more positive outcomes in all areas. Subsequently, the outcome variable used in this study was the difference between earnings at the time of application and the earnings at the time of case closure for those with a D² who sought treatment during the 1998 fiscal year.

The key predictor or independent variable in this study was the list of services provided by the state and federal rehabilitation agencies for those with dual diagnoses
throughout the life of the individualized program. Differential diagnoses and race were two additional predictor variables included in this study that may provide some increased understanding of the factors that influence effective treatment interventions for this population.

A correlational design was employed as the primary means with which to extract potentially meaningful relationships between the predictors (services rendered, differential diagnoses and race) and outcome (earnings differences) variables. Correlational analysis has many benefits, but of most importance to this research was its flexibility and capacity to mirror the complexity of relationships that often characterize research in the behavioral sciences (Cohen & Cohen, 1983). This type of analysis inevitably leads to a greater ability to make predictions on multiple influences, and this is key, given the relationships this research is attempting to describe. Examining the complexities of rehabilitating individuals with dual diagnoses demand a model that accounts for any number of potential correlational factors. The correlational design used in the current study helped this researcher better understand the problems that practitioners face in treating persons with a D².

The research design for this study was selected as a suitable method of extracting the secondary data from the 1998 RSA-911. There were a few advantages and one primary concern the researcher considered when using secondary data provided by the 1998 RSA-911. Michel (1999) posited that the primary advantage in using this set is that instead of committing time to methodological problems of collecting the data, researchers can devote more time to the theoretical aims and substantive issues of the study. Another reason for widespread support for using secondary data is that by using the data from an
existing database, these studies can be generalized and replicated by similar groups. Future research in this area can easily review the indicator variables in another context and draw out other important ideas on the service and treatment of those with dual diagnoses.

In spite of the benefits, there remains one limitation that research using secondary analysis must account for or risk confounding the results. Concerns about validity increase as the data is being used again for a different purpose. In order to reduce the risk of error, one must carefully reconsider validity and reliability issues from the data collection before developing rational hypotheses on relationships with the preexisting variables.

Subjects

Information was taken from case service reports on persons who used state/federal rehabilitation services during the 1998 fiscal year. The main criteria for inclusion in the study was a primary diagnosis of a mental condition: psychotic disorder (500), neurotic disorder (510), mental and emotional disorders not elsewhere classified (522), and a secondary diagnosis of a substance abuse/dependence condition: alcohol abuse or dependence (520), other drug abuse or dependence (521). Given the inconclusive findings concerning the link between these two disorders, it was determined that primary and secondary labels were of little significance, but for the sake of consistency, mental illness diagnoses were assigned to the primary disorder and substance abuse/dependence diagnoses were assigned to the secondary condition (Compton et al., 2000).
The other element necessary for subject inclusion in this study was to have an earnings amount at the time of application and earnings amount at the time of closure. Persons with dual diagnoses traditionally have poor compliance rates in many types of treatment programs (Daley & Zuckoff, 1998; Poland, 1997). Vocational rehabilitation will likely provide no exception, as completion rates for this population are expected to be far below the norm. With the definition of competitive employment being openly challenged in many VR circles, it was important to include subjects with earnings at time of closure, because that best exemplified those who achieved successful case completion.

To further acquaint the reader to the background design and methodology, the next section will describe the instruments and materials used in this area of research.

Instrument/Data Collection

The following section will describe to the reader the instrument or database from which the necessary information was obtained. In addition to describing the database, a summary of the assumptions and considerations about the collection of the data used in the final analysis will close this portion of the methodology.

Instrument

The federal Rehabilitation Services Commission, which is housed within the U.S. Department of Education, Office of Special Education and Rehabilitative Services, maintains the RSA-911 database. It is published yearly and is available for public use. The particular database selected for this research was based on national case service reports to state and local rehabilitation agencies during the 1998 fiscal year. Information during this time frame was gathered from a total of 599,372 completed case reports. The information contained within this case service report listed 51 articles of information
about the demographics and characteristics of the cases. Personal identifying information however was omitted. See the Appendix (Reporting Manual Table of Contents for the RSA-911) for a copy of the table of contents to the RSA-911.

Various elements were used to devise the demographics of the subjects studied in this research, but the following seven were utilized in the final analysis:

Race
Hispanic origin
Major disabling condition
Secondary disabling condition
Weekly earnings at application
Weekly earnings at closure
Services provided.

It should be of particular interest to those who review the Table of Contents (Appendix) that while element 51 is Counseling/guidance services (substantial) and appears separate from the element labeled Services provided, this element was listed among the 13 services that were offered. Further exploration by this researcher revealed that this element was included in the special crosschecks section and later relabeled to include information on the rehabilitation technology services provided.

The federal agency, Office of Management and Budget, presides over the collection of this data with its stated goal of ensuring the quality and integrity of the information being gathered.
Data Collection

The national RSA-911 database and text was initially reformatted and exported onto a Microsoft Excel 2000 program. From there, the variables of interest for both demographic information and data analysis were extracted and used later in a Statistical Package for the Social Sciences (SPSS) program. While this description of the physical process appeared simple and straightforward, there were two theoretical concerns about the data collection that should be discussed.

One of the first concerns to be addressed was the use of statistical power. Often used in statistical tests of significance, power analysis can also be considered here as the null hypothesis to be tested in all three questions was that \( r = 0 \). Using a statistical test of power is often done as a means of deciding on the sample size of a population that would be both of practical and theoretical significance. This is done to minimize the cost or time associated with an actual field study collection. In this case, however, data was obtained from a secondary source and at minimal cost. Given this and the large sample size (\( n = 5127 \)) of those with dual diagnoses (Primary-mental illness, secondary-substance abuse/dependence) who had earnings at the time of application and the time of closure, it was both feasible and more informative to run the data analysis using the entire population.

Another question was the problem with missing data. Of the 16,696 persons with a primary disorder of mental illness and secondary disorder of substance abuse, only 5,127 had earnings at the time of application (earnings/app) and at the time of closure (earnings/close). This created the question of what to do with this missing data. 11,569 subjects had missing data from the earnings/close column (69.3%). Serious ramifications
can cloud the results of the analysis if there is not a sound theoretical judgment used to answer this concern. There is a great deal of literature out there that would suggest that persons with dual diagnoses have exceptionally poor prognoses and are difficult to treat (Blankertz, McKay & Robinson, 1998; Doughty & Hunt, 1999). In addition, the types of closure with this population (only 5,127 had enhanced earnings at closure) suggested that those who did not have increased earnings at closure did not complete the program. This model therefore concluded that a significant proportion of those who had missing data in this section did not complete program requirements and therefore this data was not necessary.

Procedure

The primary vehicle used to conduct the statistical analysis of the research data was the SPSS program. SPSS has been touted as a flexible, omnibus applications program that enables researchers to analyze quantitative data very quickly and in many different ways (Bryman & Cramer, 2001). In addition to the research and analysis conducted to respond to the three hypotheses, descriptive statistics were generated and comparisons were made on three groups of individuals who used RSC services in the 1998 fiscal year: (1) Dually diagnosed individuals who obtained earnings at the time of closure; (2) Dually diagnosed individuals who did not obtain earnings at the time of closure; and (3) Samples drawn from the entire population of individuals who received rehabilitation services during the 1998 fiscal year. The elements to be included in the descriptive tables and group comparisons included the following:
Age
Sex
Race
Highest grade completed
Work status at application
Marital status
Weekly earnings at application
Hours worked at application
Monthly public assistance amount at application
Primary source of support at application
Previous employment status
Year last employed
Cost of case services
Work Status at closure
Weekly earnings at closure
Hours worked at closure
Primary source of support at closure
Type of closure
Reason for closure
Veteran status.

**Independent Variables**

Given the nature of this study, one of the more important aspects of the process that would have reverberating effects throughout the analysis was the selection of the
independent variables. There were a number of ways to examine the issues that surround the current VR response to clients with a D² using the federal database. After an exhaustive literature review, it was concluded that while many experts openly advocate for VR intervention (Sengupta, Drake & McHugo, 1998; Lett, 1988), very few have a concept of the mechanisms it will take to help achieve employment. Davenport (1996) points out that there is a complete lack of outcome data concerning this population. It was concluded that from this research, the most basic of tenets should be explored so as to provide some foundation on the factors affecting the treatment.

The most basic tenets of vocational rehabilitation are the very services provided to those with disabilities. Therefore the primary predictor variable in this study was the element from the RSA-911 data that listed the 13 services that could be provided to the individual. This categorical variable listed the following services: Assessment, Restoration, College/University training, Business and vocational training, Adjustment training, On-the-job training, Miscellaneous training, Counseling and guidance (substantial), Job-finding services, Job placement, Transportation, Maintenance, and Other services.

Two other demographic and categorical elements were also used as independent variables. The first was the diagnosis of the dually diagnosed subject. In the RSA-911 database, there were three different types of mental illness and two types of chemical abuse, which meant that six combinations of diagnoses were possible. Given the vast disparity in symptom complaints among those with substance abuse/mental illness persons, Doughty and Hunt (1999) asserted that rehabilitation counselors must be aware of the symptomatology and adjust their plans accordingly. Consequently, potential
differences among separate diagnoses should be examined in order to help VR counselors identify best services fitted for each diagnosis. The third and final variable, race, mentioned in previous research by Wilson (1997), was a variable that may also have a significant impact on the outcome of the results. For this reason, race was chosen as the final predictor variable to be studied in this exploration.

**Dependent Variable**

The outcome or dependent variable chosen for this study was the difference between earnings at the time of closure and earnings at the time of application. Both elements were continuous variables that could range from $0-999. Anything above $999 was listed as 999. There was concern that while it is a continuous variable, this restriction of parameters might lead to an increase in error. After reviewing the data, though, it was found that from a sample of those with a D², 0 of the 238 individuals with a dual diagnosis had earnings at the time of application or closure of $999. It is therefore likely that this dollar amount will not confound the results from this analysis.

**Data Analysis for Question One**

**Research Question 1.** Which particular services, among the 13 services listed in the 1998 federal/state database, better predict an increase in earnings at the time of case closure for those listed with a dual diagnosis?

**Data Analysis.** The predictor variables in this question are the 13 services listed in the RSA-911 database potentially available to persons with a dual diagnosis using vocational rehabilitation. These variables are dichotomous and checked as 0 for having not been received, or 1 for having been received. The outcome variable for this question was the raw difference between income at the time of closure and income at the time of
application. The raw difference between the two was chosen for the dependent variable over the use of a residual difference. The reason for this was the relative insignificance of the difference in earnings among subjects and the uniformity of the earnings at the time of application (206 out of 238 individuals in the random sample of those with a D² had earnings at the time of application of $0).

By reason of the small group of subjects with earnings at the time of application and closure (n = 5127), the analysis was performed using the entire population of individuals with dual diagnoses who received VR services during the 1998 fiscal year. Because the data was already collected and available, a power analysis to limit the sample size was determined to be unnecessary as well.

In order to provide some benefit to professionals in the field, this researcher sought information concerning the correlation of services to enhanced outcome for persons with dual diagnoses. Regression analysis was employed to test the hypothesis for question number one, because of its potential to more accurately predict which service or services will most improve the client’s outcome. At this time, however, studies on the subject area are nonexistent and lack any substance with which to form an educable guess about the relationship between dependent and independent variables. Lacking the knowledge to assign overlapping variance to particular variables, the backward elimination procedure of stepwise regression was used as the primary analytical tool in this procedure.

In backward elimination, all predictor variables start out in the regression equation. The t-statistic of significance for each coefficient is calculated and the regression coefficient of the variable with the minimum absolute t-value is deleted.
(Freund & Minton, 1979). One regression analysis is then performed at each stage until the final model is selected after all remaining coefficients are statistically significant at some pre-determined level (Gunst & Mason, 1980; Freund & Minton, 1979).

This procedure is not without criticism. Cohen and Cohen (1983) state that problems with this method of regression analysis include problems with replication of findings to other samples and an increased possibility of significance by chance. However, they also conclude that the findings can have utility, provided the goal is primarily predictive, the size of the sample is large, and the number of predictors are small (Gunst & Mason, 1980). All three of the above conditions are valid in the current study, suggesting that backward elimination will have some utility.

It should be noted that while the study sought to better understand the relationships between services provided and improved monetary outcome, no assumptions about causality were made.

Data Analysis for Question Two

Research Question 2. To what extent and how accurately can the person’s dual diagnosis (out of the six possible pairs of diagnoses) and the services provided for a client with that diagnosis predict values for his or her change in income from the time of application for VR services to closure of a VR case?

Data Analysis. Two predictor variables were used to examine this question. The first was the 13 services that were listed in the RSA-911 database as potentially available to consumers of federally funded VR programs. The second independent variable was differences in the two diagnoses that determined a dual diagnosis. Recall that mental health disorders were limited to three differential diagnoses and substance abuse
disorders could be classified into two groups. From this, one can calculate six different combinations, though “primary” and “secondary” were ruled insignificant measures, and extracted from the final analysis. The outcome variable for this question was the difference in earnings from the time of application to the time of closure.

With the goal of this study being to better understand and predict the course of treatment in vocational rehabilitation for those with dual diagnoses, regression analysis was again chosen as the most preferable data analysis technique. The backward elimination model was also chosen to meticulously eliminate variables that provide the ‘least’ significant coefficients. This method was repeated until all remaining services were significant at the $\alpha = .01$ level. Provided there was a lack of multicolinearity, a regression model can then be fitted, which best predicts the relationship between services offered and differential diagnoses with difference in income.

Data Analysis for Question Three

Research Question 3. To what extent and how accurately can the race of a client with $D^2$ and the VR services he or she has received predict the values for the change in his/her income from the time of his/her application for VR services to the closure of his/her VR case?

Data Analysis. Again, two predictor variables were used to examine this question. The first was the 13 services listed in the RSA-911 as being offered by state vocational rehabilitation agencies. The second criterion variable was the race of the dually diagnosed individuals having received services and obtained income at the time of closure. Race here was broken down into four categories: White, Black, American Indian
or Alaskan Native, and Asian or Pacific Islander. The outcome variable for this question
was again the difference in income from the time of application to the time of closure.

Regression analysis was again the primary data analysis technique employed in
better understanding the relationship between these variables. Again, since this is an
exploratory study, the backward elimination procedure was used as the primary tool in
this regression analysis. It is the goal of this study to better understand the dynamics of
the interrelationships between these variables in order to develop inferences about future
treatment plans for those with a dual diagnosis. This study makes no attempt to assign
causality among these relationships.
CHAPTER 4

RESULTS

This chapter describes the results of the statistical analysis on the population of individuals diagnosed with a dual diagnosis who participated in state/federal rehabilitation programs for the 1998 fiscal year. Data analysis on these individuals examined the ability of three factors (services implemented, race, and separate classifications among those with dual diagnoses) to predict enhanced treatment outcomes. For this study, enhanced treatment outcomes were operationally defined as the difference between the subject’s earnings at the time of closure and at the time of application.

Given the paucity of available information for the growing segment of the disabled population with a D², the first section of this chapter will provide descriptive statistics of the persons who used VR services in 1998. Included in this will be comparisons of the 5,127 dually diagnosed subjects (with a primary disorder of mental illness and secondary disorder of substance abuse/dependence) who completed the VR program, to those who did not complete the program (n = 11569). Further comparisons will be made to a random sample of 5,127 subjects from the entire population of individuals who were documented to have received services from state/federal VR programs during the 1998 fiscal year (N = 599372).
Following the descriptive analysis will be sections directed at responding to the three research questions. The three questions sought to better understand the dynamics of the vocational rehabilitation process for those with a dual diagnosis were as follows:

1. Which particular services, among the 13 services listed in the 1998 federal/state database, better predict an increase in earnings at the time of case closure for those listed with a dual diagnosis?

2. To what extent and how accurately can the person’s dual diagnosis (out of the six possible pairs of diagnoses) and the services provided for a client with that diagnosis predict values for his or her change in income from the time of application for VR services to closure of a VR case?

3. To what extent and how accurately can the race of a client with D$^2$ and the VR services he or she has received predict the values for the change in his/her income from the time of his/her application for VR services to the closure of his/her VR case?

In a majority of studies in the social sciences, including this one, relationships are not established between two mutually exclusive events but are better explained by relationships among multiple events. As such, researchers must examine the main effects and the conditional changes or interactions when other variables are introduced. In order to better chronicle the analysis of VR for those with a dual diagnosis, the final section of this chapter will describe an exploratory analysis using two-, three-, and four-way interactions among the three independent variables (services rendered, race, and separate classifications for those with dual diagnoses) and a dependent variable (change in earned income from the time of application to closure).
Review of Methodology

To begin with, a series of descriptive analyses were performed on key elements of the 1998 RSA-911 database, comparing three groups of subjects. The first was a random sample (n = 5127) of persons with a D² (mental illness-primary disorder, substance abuse/dependence-secondary disorder) who received services from federally funded VR programs in the 1998 fiscal year. They were compared with individuals with a dual diagnosis listed in the RSA-911 who completed the intake interview at the time of application, but who did not have an earned income at the time of closure (n = 11569). The next series of comparisons contrasted the entire group of individuals with a dual diagnosis (Primary diagnosis of mental illness and secondary diagnosis of substance abuse/dependence), to a random sample of 16,696 subjects from the entire RSA-911 database. The final comparisons analysis compared those individuals diagnosed with a D² who had earnings both at the time of application and the time of closure (n = 5127) to another random sample of those from the general RSA population. Following the introductory exploration, the researcher will utilize a backward elimination method of regression analysis to answer all three research questions.

This particular form of regression analysis was employed in this exploratory study on the vocational rehabilitation of persons with dual diagnoses. The backward elimination procedure, a variation of the stepwise selection methods, was chosen to identify which VR services best predict an increase in earnings from the time of application to the time of closure. In this type of analysis, all of the predictor variables (services provided to VR consumers; k = 13) were initially included in the regression analysis, with the change in earnings from the time of application to the time of closure.
serving as the dependent variable. The predictor variable then with the least significant 
coefficient was deleted from the equation, and the regression analysis was performed 
again, but with one less variable. This method continued until all remaining independent 
variables exceeded the alpha = .01 level of significance.

Given the large sample of individuals (n = 5127), an additional measure was taken 
to further disseminate practical significance from statistical significance. The Social 
Security Administration (SSA) eligibility requirements set $65 (which would equal $15 
per week) as the maximum amount of money that recipients can receive each month 
without having their full benefits withheld. This study borrowed from SSA’s numbers 
and used $15 dollars as the amount that would constitute practical significance. Only 
those services predicting changes of greater than $15 per week are to be included in the 
final model.

Additional stepwise regression for each of the two other independent variables 
were analyzed in order to better understand the effect that a person’s race and differential 
diagnosis may have on the types of services that optimally enhance VR treatment 
outcome. While not included in the original design of the study, interaction effects of the 
three predictor variables were also examined to discern the possible joint effects of the 
these independent variables chosen for the study.

Presentation of the Results

This chapter will be divided into three sections. The first section will contain 
information that provides demographic characteristics of the population of interest to this 
research project. Characteristics of those with dual diagnoses in the 1998 database will 
be provided, as well as comparisons to two other groups: (1) Those from the same
database and the same diagnosed features that did not have listed earnings at the time of closure; and (2) Random samples from the entire population of subjects obtained in the 1998 RSA-911 database.

The results of the data analysis pertaining to the three research questions will be provided in the next section. In the last section, data will be provided on the results of other exploratory data analyses, such as ANOVA and multiple regression with two-way interactions, and synthesized with the initial procedures to provide for the reader alternative ways to view the outcome of the three hypotheses called into question. This integration of information will also form the basis of the interpretation of the findings to follow in Chapter 5.

Demographic Characteristics of the Population

In spite of the increasing prevalence, there remains a lack of available data describing the features of individuals with a D$. Given this lack of existing information, the descriptive analysis, which will summarize, organize and display important data elements from the 1998 RSA-911 database may provide some of the most important analyses for future research in this area. Included in this analysis will be comparisons on three levels to better inform the reader of the relationships that exist within and among different populations.

A total of 599,372 documentations were collected from individuals who participated in state and federal vocational rehabilitation programs during the 1998 fiscal year. From that number, a total of 171,991 (29%) individuals had a primary and/or secondary diagnosis of a psychological disorder. Additionally, 82,202 (14%) of the RSA-911 population had a primary and/or secondary diagnosis of a substance abuse
disorder. From these numbers, a total of 27,874 (5%) individuals had a mental illness and substance abuse that constituted the working definition of a D² in this research. This study analyzed data from the sample of 16,696 or 60% of the total number of individuals with dual diagnoses who had a primary diagnosis of psychological disturbances and a secondary diagnosis of substance abuse. It should be noted that from this sample, 5,127 participants successfully completed their program and had income at the time of closure. Of the remaining 11,178 subjects with dual diagnoses who had a primary diagnosis of substance abuse and secondary diagnosis of mental illness, 4,052 or 36% had nonmissing income values at closure.

In the literature review, issues arose concerning the level of significance in limitations that a particular disability presents. For those dual diagnosis cases studied in this research, where successful completion of VR programs was indicated, over 91% (or 4,677) were listed as severely disabled. By contrast, the percentage of those from the total sample of dual diagnoses was 84%. For those with mental health or substance abuse disturbances only, the percentages were even smaller (81% and 67%).

Before continuing with the demographics comparisons, two points of interest on closure status and number of services should be discussed. While 31% of the sample of 16,696 participants had income at closure, 34% of the subjects with a mental-health-only diagnosis had enhanced income at closure. Of the 5,127 cases of persons with a dual disorder who had increased income at closure, almost 87% reported having used three or more services through the course of the rehabilitation plan.

The next topic pertinent to the discussion was the series of comparative analyses performed in three stages. The first stage was a descriptive analysis between the
population of individuals in the RSA-911 database diagnosed with a D² who had earnings both at the time of application and at the time of closure (n = 5127) and the entire set of persons with a D² (n = 16696) with the same sequence of diagnoses (mental illness-primary, substance abuse/dependence-secondary). The second set of comparisons contrasted those with a dual diagnosis in the RSA-911 (n = 16696) and a random sample of individuals from the RSA-911 database (N = 599372) with the same subject size. Finally, a comparative analysis was performed on the descriptive statistics between the dually diagnosed who had earnings at the time of application and closure (n = 5127), to a same-size random sample of persons from the general population of individuals who were receiving services from the 1998 RSA-911 database. These three comparisons will serve as the background with which to better understand the information provided on persons with dual diagnoses obtained from the 1998 RSA-911 database.

**D² Subjects with Earnings at Closure/D² Subjects without Earnings at Closure**

The total size of the population in 1998 receiving state/federal VR services and diagnosed with a D² (mental illness-primary, substance abuse/dependence-secondary) was 16,696. They made up 3% of the entire population of individuals receiving vocational rehabilitation services (N = 599372) during the 1998 fiscal year. Of the 16,696 participants, 5,127 (or 31%) had earnings both at the time of application and closure. The first analysis examined the differences between the dually diagnosed subjects with income at the time of closure (D²w$), and those who did not have income listed at the time of closure (D²w/o$).

Among the interval or ratio elements pertinent to this study and included in the analysis were age, level of education, weekly earnings at the time of application, hours
worked at the time of application, hours worked at the time of closure, monthly public assistance, and the cost of case services between these two groups. Statistical analysis when the alpha is set at .05 or .01 noted significant differences between the two samples in age (T-Value = -4.37, P-Value = 0.00, DF = 10548), level of education (T-Value = -6.59, P-Value = 0.00, DF = 16292), weekly earnings at application (T-Value = -8.32, P-Value = 0.00, DF = 8663), hours worked at application (T-Value = -9.63, P-Value = 0.00, DF = 7582), monthly public assistance (T-Value = 12.00, P-Value = 0.00, DF = 11,387), and the cost of case services (T-Value = -33.99, P-Value = 0.00, DF = 6481).
Table 4.1: Means and Standard Deviations of Demographics and Case Service Characteristics for Dually Diagnosed Participants in 1998 VR Programs

<table>
<thead>
<tr>
<th>Data Elements</th>
<th>VR Participants with a D²</th>
<th></th>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>D²w$</td>
<td>SD</td>
<td>D²w/o$</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>Age*</td>
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<td>36.78</td>
<td>9.57</td>
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<td></td>
</tr>
<tr>
<td>Level of Education*</td>
<td>11.72</td>
<td>2.06</td>
<td>11.95</td>
<td>2.02</td>
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<td></td>
</tr>
<tr>
<td>Weekly Earnings at Application*</td>
<td>26.15</td>
<td>77.88</td>
<td>15.68</td>
<td>62.31</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hours Worked at Application*</td>
<td>4.72</td>
<td>11.54</td>
<td>2.81</td>
<td>9.09</td>
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<td></td>
</tr>
<tr>
<td>Hours Worked at Closure**</td>
<td>33.43</td>
<td>10.62</td>
<td>**</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly Public Assistance*</td>
<td>132.31</td>
<td>229.50</td>
<td>181.71</td>
<td>253.85</td>
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<td>Cost of Case Services*</td>
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<td>4011.93</td>
<td>875.74</td>
<td>2156.37</td>
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</table>

*Note.  P<.01

**Note. Could not compare two groups for the hours worked at closure, because there was no data available for the missing group.
The next set of variables examined in this comparison analysis were categorical by nature and utilized the chi-square test statistic to determine whether the observed proportions from the different categories differed significantly. Dichotomous or multichotomous data elements obtained from the 1998 RSA-911 database for this round of analysis included sex, race, marital status, veteran status, work status at application, previous employment status, work status at closure, and type of closure. It should be noted that the data analysis could not be conducted on three of the aforementioned categories (previous employment status, work status at closure and type of closure) due to the large numbers of data points missing from the group of individuals with dual diagnoses who did not have earnings at the time of case closure. Figures 4.1 through 4.5 contain the percentages for each of the remaining five data elements.
Female 31%  n=4349
Male  69%  n=7220

Female 31%  n=1947
Male  69%  n=3180

Figure 4.1: 1a. Gender Percentages/Proportions
Figure 4.2: 1b. Race Percentages/Proportions
Married 10%, n=1202
Separated 9%, n=1088
Widowed 2%, n=182

Divorced 24%
n=2806

Never Married 55%
n=6291

* on bottom of figure

Figure 4.3: 1c. Marital Status Percentages/Proportions
Figure 4.4: 1d. Veteran Status Percentages/Proportions

**D² w/o Earnings**

- Served: 7%, n=808
- Not Served: 93%, n=10761

**D² with Earnings**

- Served: 6%, n=318
- Not Served: 94%, n=4809
Figure 4.5: 1e. Work Status at Application Percentages/Proportions

**D² w/o Earnings**

- Competitive Emp. 9%, n=847
- Not Working: Other 87%, n=8384

* bottom of figure

**D² with Earnings**

- Competitive Emp. 14%, n=740
- Not Working: Other 80%, n=4089

* bottom of figure

- Not Working: Stud. 3%, n=275
- Not Working: Train. 1%, n=111
- Extended Emp. 0%, n=41
- Homemaker 0%, n=35
- Self-Emp. 0%, n=19
- Unpaid Fam. Worker 0%, n=6
- State-Mged Business Ent. 0%, n=1

Missing n's=1889
It should be noted that no significant differences existed between the two groups of VR participants with dual diagnoses in the areas of sex (P-Value = 0.64, DF = 1), race (P-Value = 0.62, DF = 3), and veteran status (P-Value = 0.06, DF = 1). Significant differences, did however exist between the two groups in their work status at application (P-Value = 0.00, DF = 1) and marital status (P-Value = 0.00, DF = 4).

D² Total/Sample RSA-911 Population (16696 Subjects)

The next set of demographic comparisons sought to better understand the similarities and differences between the population of persons with dual diagnoses to those from a representative sample of all participants receiving VR services. To do so, this study used data from participants identified with dual diagnoses (primary diagnosis-mental illness, secondary diagnosis-substance abuse/dependence) that received VR services in 1998 (n = 16696) and compared it to a same size random sample (n = 16696) of individuals who obtained VR services from the same RSA-911 database.

These comparisons were drawn from elements included in the RSA-911 1998 database. The same seven interval or ratio elements (age, level of education, weekly earnings at the time of application, hours worked at the time of closure, monthly public assistance, and the cost of case services) were the variables viewed in the first set of comparisons analysis. Means and standard deviations for these seven sets of variables between the two groups are listed in table 4.2. Statistical analysis using t-tests, when alpha was set at .05, noted significant differences between the two groups of subjects in their age (T-Value = 3.33, P-Value = 0.00, DF = 30441), level of education (T-Value = 0.95, P-Value = 0.34, DF = 30141), weekly earnings at application (T-Value = 14.59, P-Value = 0.00, DF = 22455), hours worked at application (T-Value = 14.73, P-Value =
0.00, DF = 22026), hours worked at closure (P-Value = 6.94, T-Value 0.00, DF = 11284),
monthly public assistance at application (T-Value = 13.16, P-Value = 0.00, DF = 28018),
cost of case services (T-Value = 12.34, P-Value = 0.00, DF = 27090). All variables
entered suggested statistically significant differences between those with dual diagnoses
and the representatives of individuals, who received VR services in the 1998 fiscal
year.
<table>
<thead>
<tr>
<th>Data Elements</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age*</td>
<td>36.99</td>
<td>12.91</td>
<td>36.57</td>
<td>9.36</td>
</tr>
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<td>Level of Education*</td>
<td>11.79</td>
<td>2.05</td>
<td>11.77</td>
<td>2.23</td>
</tr>
<tr>
<td>Weekly Earnings at Application*</td>
<td>19.31</td>
<td>68.29</td>
<td>34.80</td>
<td>103.80</td>
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<td>Hours Worked at Application*</td>
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<td>10.06</td>
<td>5.65</td>
<td>12.64</td>
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<td>Weekly Earnings at Closure*</td>
<td>258.92</td>
<td>149.64</td>
<td>246.38</td>
<td>168.33</td>
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<tr>
<td>Hours Worked at Closure*</td>
<td>33.43</td>
<td>10.62</td>
<td>31.93</td>
<td>12.32</td>
</tr>
<tr>
<td>Monthly Public Assistance*</td>
<td>164.60</td>
<td>246.80</td>
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<tr>
<td>Cost of Case Services*</td>
<td>1498.98</td>
<td>3007.95</td>
<td>2059.765</td>
<td>2023.51</td>
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</table>

*Note.  P<.01

Table 4.2: Means and Standard Deviations for Interval/Ratio Data Elements in the RSA-911 1998 Database Between those with Dual Diagnoses and a Random Sample from the RSA Population
Consistent with the last set of comparisons, the other set of variables studied were categorical and used the chi-square test statistic to determine if significant differences existed between groups. Data elements from the 1998 RSA-911 included sex, race, marital status, veteran status, work status at application, work status at closure, primary source of support at closure, and type of closure. The previous employment status element was again missing too much data to be included in this part of the study. Figures 4.6 through 4.14 contain the percentages and frequencies on these eight different dichotomous and multichotomous data elements.
Figure 4.6: 2a. Gender Percentages/Proportions

Total $D^2$

- Female: 45%  
  - $n = 7551$
- Male: 55%  
  - $n = 9139$

Random Sample RSA-911

- Female: 38%  
  - $n = 6296$
- Male: 62%  
  - $n = 10400$
Total $D^2$

White 74%
n=12315

Black 24%
n=3990

* bottom of figure

Random Sample RSA-911

White 76%
n=12693

Black 21%
n=3570

* bottom of figure

* Am. Indian/Ala. Native 1%, n=247
Asian/Pac. Islander 1%, n=144

* Am. Indian/Ala. Native 2%, n=267
Asian/Pac. Islander 1%, n=166

Figure 4.7: 2b. Race Percentages/Proportions
Figure 4.8: 2c. Marital Status Percentages/Proportions

**Total D^2**

- Never Married: 54%, n=8991
- Divorced: 24%, n=4030
- Married: 23%, n=3825

**Random Sample RSA-911**

- Never Married: 51%, n=8742
- Married: 23%, n=3825
- Divorced: 16%, n=2720
- Separated: 9%, n=1547
- Widowed: 2%, n=412

* bottom of figure
Figure 4.9: 2d. Veteran Status Percentages/Proportions
Total $D^2$  

- Competitive Emp. 11% $n=1587$  
- Not Working: Other 84% $n=12434$

Random Sample RSA-911  

- Competitive Emp. 16% $n=2100$  
- Not Working: Other 66% $n=8706$

*Not Working: Stud. 3%, $n=419$  
Not Working: Train. 1%, $n=177$  
Extended Emp. 1%, $n=82$  
Homemaker 0%, $n=61$  
Self-Emp. 0%, $n=36$  
Unpaid Fam. Worker 0%, $n=10$  
State Mged Business Ent. 0%, $n=1$

Missing n's = 1899

*Not Working: Stud. 13%, $n=1766$  
Homemaker 2%, $n=227$  
Extended Emp. 1%, $n=186$  
Not Working: Train. 1%, $n=146$  
Self-Emp. 1%, $n=93$  
Unpaid Fam. Worker 0%, $n=15$  
State mged business Ent. 0%, $n=2$

Mising n's = 3455

Figure 4.10: 2e. Work Status at Application Percentages/Proportions
Figure 4.11: 2f. Primary Source of Support at Application Percentages/Proportions
Figure 4.12: 2g. Work Status at Closure

**Total D2**

- Competitive Emp. 94%
  - n=4822

- Extended Emp. 3%
  - n=149

  * bottom of figure

- Self-Emp. 2%, n=60
- Homemaker 1%, n=60
- Unpaid Fam. Worker 0%, n=5

- Missing n's = 11569

**Random Sample RSA-911**

- Competitive Emp. 88%
  - n=5443

- Homemaker 6%
  - n=345

  * bottom of figure

- Extended Emp. 3%, n=208
- Self-Emp. 3%, n=173
- Unpaid Fam. Worker 0%, n=26
- State-Mged Business Ent. 0%, n=12

- Missing n's = 10489
Figure 4.13: 2h. Primary Source of Support at Closure Percentages/Proportions

* Family and Friends 7%, n=336
  Public Asst., AFDC 6%, n=307
  Public Instit-Tax Supported 1%, n=74
  All Other Sources/Support 1%, n=40
  All Other Public Sources 1%, n=29
  Public Asst. w/o Fed Funds 1%, n=28
  Private Relief Agency 0%, n=9
  Workers Compensation 0%, n=2
  Annuity/Other Non-Dis Ins. 0%, n=1

Missing n's = 11569

* Public Asst., AFDC 7%, n=421
  SSDI 6%, n=359
  All Other Public Sources 2%, n=75
  All Other Sources/Support 1%, n=75
  Public Instit-Tax Supported 0%, n=20
  Annuity/Other Non-Dis. Ins. 0%, n=17
  Workers Compensation 0%, n=14
  Public Asst. w/o Fed. Funds 0%, n=10
  Private Relief Agency 0%, n=4

Missing n's = 10490
Figure 4.14: 2i. Type of Closure Percentages/Proportions
Significant statistical differences existed in the area of sex (chi-square = 196.17, P-Value = 0.00, DF = 1), race (chi-square = 77.56, P-Value = 0.00, DF = 3), marital status (chi-square = 1083.80, P-Value = 0.00, DF = 4), veteran status (chi-square = 134.06, P-Value = 0.00, DF = 1), work status at application (chi-square = 2183.63, P-Value = 0.00, DF = 9), work status at closure (chi-square = 280.82, P-Value = 0.00, DF = 2), primary source of support at closure (chi-square = 154.49, P-Value = 0.00, DF = 8), and type of closure (chi-square = 981.49, P-Value = 0.00, DF = 3).

D² with Earnings/Sample 1998 RSA-911 Population (5127 Subjects)

The final set of demographics comparisons sought to bring the analysis full circle with a summary between the subjects diagnosed with a D² who had earnings at closure (n = 5127) and a random sample of the same size (n = 5127) from the 1998 RSA-911 state/federal database.

Initially, the eight interval or ratio data elements from this 1998 database that were included in this exploratory analysis were: Age; Highest grade completed; Weekly earnings at application; Hours worked at application; Monthly public assistance at application; Cost of case services; Weekly earnings at closure; and Hours worked at closure. The means and standard deviations of the interval/ratio elements for each of these two groups can be found in Table 4.3. The statistical analysis using t-tests, when alpha was set at .01, noted significant differences between the two groups in the areas of age (T-Value 3.50, P-Value = 0.00, DF = 9081), highest grade completed (T-Value = 4.89, P-Value = 0.00, DF = 9082), cost of case services (T-Value = 11.67, P-Value = 0.00, DF = 10144), hours worked at closure (T-Value = 3.67, P-Value = 0.00, DF = 3002).
No significant difference was found in the areas of weekly earnings at application (T-Value = -2.57, P-Value = 0.01, DF = 7687), hours worked at application (T-Value = -1.68, P-Value = 0.09, DF = 8062), monthly public assistance at application (T-Value = -0.33, P-Value = 0.74, DF = 9179) and, weekly earnings at closure (T-Value = 2.26, P-Value = 0.02, DF = 6985). One should also note the numbers of missing data from participants in the random sample of all the 1998 RSA-911 cases in weekly earnings at closure and hours worked at closure. 3267 (64%) subjects were missing data from the weekly earnings at closure, and 3279 (64%) were missing data from the hours worked at closure.
Table 4.3: Means and Standard Deviations of Interval/Ratio Data Between the Dually Diagnosed with Earnings at Closure and a Random Sample from the 1998 RSA-911, 1998 Federal/State Database

<table>
<thead>
<tr>
<th>Data Elements</th>
<th>D²w$ M  SD</th>
<th>Random RSA M  SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age*</td>
<td>37.45 8.86</td>
<td>36.68 12.89</td>
</tr>
<tr>
<td>Highest Grade Completed*</td>
<td>11.95 2.02</td>
<td>11.73 2.29</td>
</tr>
<tr>
<td>Weekly Earnings at Application</td>
<td>26.15 77.88</td>
<td>30.95 96.59</td>
</tr>
<tr>
<td>Hours Worked at Application</td>
<td>4.72 11.54</td>
<td>5.17 12.11</td>
</tr>
<tr>
<td>Monthly Public Asst. at App.</td>
<td>132.31 229.50</td>
<td>133.94 230.35</td>
</tr>
<tr>
<td>Cost of Case Services*</td>
<td>2898.74 4011.93</td>
<td>1936.37 4311.89</td>
</tr>
<tr>
<td>Weekly Earnings at Closure</td>
<td>258.92 149.64</td>
<td>249.45<strong>167.73</strong></td>
</tr>
<tr>
<td>Hours Worked at Closure*</td>
<td>33.43 10.62</td>
<td>32.29** 11.81**</td>
</tr>
</tbody>
</table>

*Note. P<.01

**Note. Data elements had missing values exceeding 3000 of the 5127 random subjects.
The final sets of elements examined in this comparison analysis were again categorical variables. Important data elements studied included sex, race, work status at application, marital status, primary source of support, year last employed, work status at closure, primary source of support at closure, type of closure, reason for closure and veteran status. One should note that three elements were unable to be compared due to excessive missing values. These three data elements were; year last employed, type of closure, and reason for closure. Figures 4.15 through 4.20 contain the percentages and proportions for each of the remaining nine categorical data elements.
Figure 4.15: 3a. Gender Percentages/Proportions
Figure 4.16: 3b. Race Percentages/Proportions
**D^2 with Earnings**

- Competitive Emp. 14%, n=740
- Not Working: Other 80%, n=4089

**Random Sample RSA-911**

- Competive Emp. 12%, n=613
- Not Working: Other 53%, n=2696

* Not Working: Stud. 3%, n=144
* Not Working: Train. 1%, n=66
* Extended Emp. 1%, n=41
* Homemaker 1%, n=26
* Self-Emp. 0%, n=17
* Unpaid Fam. Worker 0%, n=4

* Not Working: Stud. 10%, n=557
* Homemaker 1%, n=71
* Extended Emp. 1%, n=60
* Not Working: Train 1%, n=54
* Self-Emp. 0%, n=18
* Unpaid Fam. Worker 0%, n=5
* State -Mged Business Ent. 0%, n=2

Missing n's = 1071

Figure 4.17: 3c. Work Status at Application Percentages/Proportions
Figure 4.18: 3d. Marital Status Percentages/Proportions
Figure 4.19: 3e. Veteran Status Percentages/Proportions

D² with Earnings

- Served: 6% (n=318)
- Did Not Serve: 94% (n=4809)

Random Sample RSA-911

- Served: 4% (n=209)
- Did Not Serve: 96% (n=4918)
Figure 4.20: 3f. Primary Source of Support at Application
It should be noted that chi-square tests were run, significant differences existed between the two groups [dually diagnosed individuals with earnings at case closure and the random sample of persons (n = 5127) from the 1998 state/federal RSA-911 database] in the areas of sex (P-Value = 0.00, DF = 1), race (P-Value = 0.007, DF = 3), work status at application (P-Value = 0.00, DF = 9), marital status (P-Value = 0.00, DF = 4), primary source of support (P-Value = 0.00, DF = 7), work status at closure (P-Value = 0.00, DF = 7), primary source of support at closure (P-Value = 0.00, DF = 6), and veteran status (P-Value = 0.00, DF = 1). For all comparisons run using the chi-square test, significant statistical differences were noted for the nine elements available for analysis.

Results for the Research Hypotheses

In this section of the findings, results will be provided on the statistical analysis for each of the three research questions. Recall that the three research questions explored were: 1) Of the thirteen services listed in the RSA-911 database, which services better predicted an increase in earnings at the time of case closure?; 2) Would the service or set of services that best predicts enhanced earnings at closure change, if information were also provided on participants differential diagnosis?; 3) Would these services also change if additional information were provided on a subject’s race? Of the 16696 participants in state/federal VR programs, 5127 with a primary diagnosis of mental illness and secondary diagnosis of substance abuse/dependence had earnings at the time of application and the time of closure. It was the information, or more specifically the differences in earnings from application to closure, from these 5127 that provided dependent variables for this research.
Multiple regression was performed using SPSS to better understand the relationships between dependent and independent (services rendered, differential diagnosis, race) variables. Additional analysis was performed examining the interactions that may take place between the variables. As one looks further into issues like dual diagnosis, the relationships are dynamic and require a better understanding of complex interactions than can be provided a single dependent and independent variable. The use of multiple regression and two-, three- and four-way interactions, thus will give the reader a better understanding of the factors that will influence this VR process. Additional information comparing the results of this regression analysis to an ANOVA will also be provided to the reader as a ways of establishing some degree of reliability to the aforementioned examination.

Optimum Services for an Individual with a D²

This section concerned the data analysis relevant to responding to the hypothesis on which services optimally enhance VR outcome for individuals with a D². Given the large sample size (n = 5127), it was hypothesized that statistical significance may include services, which contribute little to the change in earnings for those with dual diagnoses. To account for this, 15.00 was chosen for this study as a cutoff score. Only those services that predicted a change in weekly earnings of greater than ($) 15.00 were included in the final regression model, while the services below this score were not included. Negatively signed relationships between the services and change in income were also not included in the final model, as they suggest a decrease in earnings outcome
for participants that used this service. For example, the parameter estimate for on-the-job training is negatively signed and could be interpreted as inversely affecting earnings at the time of case closure.

Preliminary analysis using the ANOVA was first performed to determine if existing differences among service means were significant. At alpha = .01, significant differences did indeed exist among the thirteen services and the change in earnings from application to closure (see Table 4.4). Using multiple regression however this study set out to predict which services would best predict increased earnings.

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</table>

Table 4.4: ANOVA of Change in Earnings from Application to Closure by Selected Services Provided in the VR Treatment Plan

The next step was to utilize the backward elimination procedure for regression analysis in order to determine which services best predicted enhanced earnings for those with dual diagnoses. Recall that in this procedure an initial analysis was performed using all thirteen variables, which in this case was the thirteen services listed as potentially
being offered to VR consumers during the 1998 fiscal year. The least significant coefficient was then eliminated and a new regression analysis was performed again. This step was repeated until the final model contained only those coefficients that are statistically significant.

The final model consisted of eight services: 1) College/university training, 2) Business/vocational training, 3) Adjustment training, 4) On-the-job training, 5) Counseling and guidance-substantial, 6) Job-finding services, 7) Job placement, and 8) Transportation (see Table 4.5). From the final regression model, three services were also eliminated (Adjustment training, On-the-job training and Job placement) because they held negatively signed relationships and would have predicted decreased earnings if utilized. One should note that the proposed cutoff score was not used as the remaining five services (College/university training, Business/vocational training, Counseling and guidance-substantial, Job-finding services and Transportation) predicted increases of more than $15.00.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Standard Error</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>195.39</td>
<td>5.70</td>
<td>1173.38</td>
<td>.00</td>
</tr>
<tr>
<td>College</td>
<td>59.25</td>
<td>5.95</td>
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<tr>
<td>Business</td>
<td>45.46</td>
<td>5.92</td>
<td>58.93</td>
<td>.00</td>
</tr>
<tr>
<td>Adjust. Training</td>
<td>-13.84</td>
<td>5.14</td>
<td>7.24</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>On-the-Job</td>
<td>-31.84</td>
<td>8.01</td>
<td>15.79</td>
<td>.00</td>
</tr>
<tr>
<td>Counseling</td>
<td>19.76</td>
<td>5.33</td>
<td>13.74</td>
<td>.00</td>
</tr>
<tr>
<td>Job-Finding</td>
<td>28.69</td>
<td>7.11</td>
<td>16.29</td>
<td>.00</td>
</tr>
<tr>
<td>Job-Placement</td>
<td>-26.91</td>
<td>7.20</td>
<td>13.98</td>
<td>.00</td>
</tr>
<tr>
<td>Transportation</td>
<td>18.11</td>
<td>4.41</td>
<td>16.88</td>
<td>.00</td>
</tr>
<tr>
<td>*Phys./Men. Restore.</td>
<td>-</td>
<td>-</td>
<td>.07</td>
<td>.79</td>
</tr>
<tr>
<td>*Other Services</td>
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<td>-</td>
<td>.25</td>
<td>.62</td>
</tr>
<tr>
<td>*Assessment</td>
<td>-</td>
<td>-</td>
<td>3.59</td>
<td>.06</td>
</tr>
<tr>
<td>*Miscellaneous</td>
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<td>-</td>
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<td>.04</td>
</tr>
<tr>
<td>*Inc. Maintenance</td>
<td>-</td>
<td>-</td>
<td>4.28</td>
<td>.04</td>
</tr>
</tbody>
</table>

R² = .051, F = (8,5092) <.0001

*Note. The variables removed from the final model.

Table 4.5: Backward Selection for the 13 Services
The model summary showed a modest correlation coefficient (0.23) and subsequent adjusted $R^2$ (0.0514). This would mean that 5.14% of all of the change in earned income from application to closure for individuals with dual diagnoses seeking state/federal VR services during the 1998 fiscal year can be explained by use of particular services.

In the world of behavioral research, very few relationships are characterized by one independent variable acting on a dependent variable. For example, an individual’s intelligence score influences school performance, but not in a causative manner. Many other variables including socioeconomic background, geography, and health also plays a part in determining just how well a child does in school. Given already that the $R^2$ for the original regression equation only accounts for 5.1% of the variance, it is clear to see that other factors similarly play a role in the change in income from application to closure. Given that the research already is looking at the effect race and differential diagnosis plays on outcome, this study opted to examine the effects the interactions between the three variables played on the outcome. Backward selection was used from a three-way interaction to identify if there are more complex relationships between dependent and independent variables. Perhaps the increasing complexity would identify relationships between the independent variables and better explain how an individual with a D² would enhance their income at the time of closure.

One can see however, that the only significant variables are the original service variables or main effects from the original regression equation and a few interactions between the three variables (see Table 4.6). In the backward procedure model,
interactions between variables did not have a significant effect on income when the alpha level was set at .01. R² also remained unchanged at .0514. The better model and simplest in this instance was the multiple regression model exploring only the main effects. The next task or question to be analyzed will be the effect race alone may have on the services used in the VR of an individual with a dual diagnosis.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Standard Error</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>195.39</td>
<td>5.70</td>
<td>1173.88</td>
<td>.00</td>
</tr>
<tr>
<td>College</td>
<td>59.25</td>
<td>5.95</td>
<td>99.19</td>
<td>.00</td>
</tr>
<tr>
<td>Business</td>
<td>45.46</td>
<td>5.92</td>
<td>58.93</td>
<td>.00</td>
</tr>
<tr>
<td>Adjust. Training</td>
<td>-13.84</td>
<td>5.14</td>
<td>7.84</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>On-the-Job</td>
<td>-31.84</td>
<td>8.01</td>
<td>15.79</td>
<td>.00</td>
</tr>
<tr>
<td>Counseling</td>
<td>19.76</td>
<td>5.33</td>
<td>13.74</td>
<td>.00</td>
</tr>
<tr>
<td>Job Finding</td>
<td>28.69</td>
<td>7.11</td>
<td>16.29</td>
<td>.00</td>
</tr>
<tr>
<td>Job Placement</td>
<td>-26.29</td>
<td>7.20</td>
<td>13.98</td>
<td>.00</td>
</tr>
<tr>
<td>Transportation</td>
<td>18.11</td>
<td>4.41</td>
<td>16.88</td>
<td>.00</td>
</tr>
<tr>
<td>*Job Place./Black</td>
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<td>-</td>
<td>.00</td>
<td>.97</td>
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<tr>
<td>*Job Place./Asian</td>
<td>-</td>
<td>-</td>
<td>.01</td>
<td>.94</td>
</tr>
<tr>
<td>*Job Find./Am. Indian</td>
<td>-</td>
<td>-</td>
<td>.05</td>
<td>.83</td>
</tr>
<tr>
<td>*College/Asian</td>
<td>-</td>
<td>-</td>
<td>.07</td>
<td>.79</td>
</tr>
<tr>
<td>*Adjust. Train./Black</td>
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<td>-</td>
<td>2.30</td>
<td>.13</td>
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</tbody>
</table>

R² = .051, F = (8, 5092) <.0001

*Note. A sample of the variables removed from the final model.

Table 4.6: Backward Selection from 4-Way Interactions between Services Provided, Race and Differential Diagnosis on the Change in Income from Application to Closure
The Effect Race and Services on Dually-Diagnosed Clients

The hypothesis explored how race affects the set of services that maximize the change in income for those with dual diagnoses seeking VR assistance. After dummy scoring the variables, the researcher used a series of single, two, three, or four-way interactions to determine which one have the most predictive ability. SAS began by using a single group, backward-elimination procedure. With race being the only variable, backward elimination was performed but did not appear to significantly affect earned income at closure.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Standard Error</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>195.39</td>
<td>5.70</td>
<td>1173.88</td>
<td>.00</td>
</tr>
<tr>
<td>College</td>
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<td>5.95</td>
<td>99.19</td>
<td>.00</td>
</tr>
<tr>
<td>Business</td>
<td>45.46</td>
<td>5.92</td>
<td>58.93</td>
<td>.00</td>
</tr>
<tr>
<td>Adjust. Training</td>
<td>-13.84</td>
<td>5.14</td>
<td>7.24</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>On-the-Job</td>
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<td>8.01</td>
<td>15.79</td>
<td>.00</td>
</tr>
<tr>
<td>Counseling</td>
<td>19.76</td>
<td>5.33</td>
<td>13.74</td>
<td>.00</td>
</tr>
<tr>
<td>Job Finding</td>
<td>28.69</td>
<td>7.11</td>
<td>16.29</td>
<td>.00</td>
</tr>
<tr>
<td>Job Placement</td>
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<td>7.20</td>
<td>13.98</td>
<td>.00</td>
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<tr>
<td>Transportation</td>
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<td>.00</td>
</tr>
<tr>
<td>*Black</td>
<td>-</td>
<td>-</td>
<td>.17</td>
<td>.68</td>
</tr>
<tr>
<td>*Am. Indian/Ala. Nat.-</td>
<td>-</td>
<td>-</td>
<td>.62</td>
<td>.43</td>
</tr>
<tr>
<td>*Asian/ Pac. Islander</td>
<td>-</td>
<td>-</td>
<td>4.03</td>
<td>.04</td>
</tr>
</tbody>
</table>

$R^2 = .051, F = (8, 5092) < .0001$

*Note. A sample of the variables removed from the final model.

Table 4.7: Backward Selection and a One-Way Interaction of the Services Provided and Race for Dually Diagnosed Individuals Receiving VR Services
To obtain the correct and most succinct model, researchers performed two, three and four-way interactions. There were no significant three and four-way interactions though indicating the backward elimination procedure for multiple regression be used for the two-way interaction. While the effect of race on services used was negligible, the ability to interpret results was much easier (see Table 4.8).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Standard Error</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>195.39</td>
<td>5.70</td>
<td>1173.38</td>
<td>.00</td>
</tr>
<tr>
<td>College</td>
<td>59.25</td>
<td>5.95</td>
<td>99.19</td>
<td>.00</td>
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<td>Business</td>
<td>45.46</td>
<td>5.92</td>
<td>58.93</td>
<td>.00</td>
</tr>
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<td>Adjust. Training</td>
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<td>7.84</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>On-the-Job</td>
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<td>8.01</td>
<td>15.79</td>
<td>.00</td>
</tr>
<tr>
<td>Counseling</td>
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<td>5.33</td>
<td>13.74</td>
<td>.00</td>
</tr>
<tr>
<td>Job Finding</td>
<td>28.69</td>
<td>7.11</td>
<td>16.29</td>
<td>.00</td>
</tr>
<tr>
<td>Job Placement</td>
<td>-26.29</td>
<td>7.20</td>
<td>13.98</td>
<td>.00</td>
</tr>
<tr>
<td>Transportation</td>
<td>18.11</td>
<td>4.41</td>
<td>16.88</td>
<td>.00</td>
</tr>
<tr>
<td>*Counseling/Black</td>
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<td>-</td>
<td>2.70</td>
<td>.10</td>
</tr>
<tr>
<td>*Business/Asian.</td>
<td>-</td>
<td>-</td>
<td>.88</td>
<td>.35</td>
</tr>
<tr>
<td>*Adjust./Am. Indian</td>
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<td>-</td>
<td>3.13</td>
<td>.08</td>
</tr>
<tr>
<td>*Transport./Asian</td>
<td>-</td>
<td>-</td>
<td>.64</td>
<td>.42</td>
</tr>
</tbody>
</table>

R² = .05, F = (8, 5092) <.0001

*Note. A sample of the variables removed from the final model.

Table 4.8: Backward Selection from Two-Way Interactions Examining the Effect of Race and Services Provided on the Change in Income at Closure
Finally, this study examined how an individual’s differential diagnoses might affect the set of services which best predict change in income.

The Effect of Differential Diagnosis on VR Services that Enhance Earnings

Individuals with a D² come from diverse backgrounds and have heterogeneous symptom complaints. The impact of this disorder can affect the individual, and subsequently the VR treatment plan, in a number of ways. Due to this stark reality, this research also set out to better understand the relationship between differential diagnosis and the services they utilize that best enhance the earnings at closure outcome. To better understand this relationship, the study dummy coded the six-possible alternative diagnosis and used multiple regression, backward selection from two-way, three-way, and main-effect interactions to determine which services best predict enhanced monetary gain at case closure.

Predictive ability in all three remained the same in all three models (R² = .0862). The elimination procedure again eliminated most but not all interactions (see Table 4.9 and 4.10). Three significant relationships between services and differential diagnosis were negatively signed and therefore suggests that if they were paired together, they would in fact predict a decrease in earnings: 1. College training paired with a diagnosis of mental and emotional disorders, not elsewhere classified-522 (Beta = -48.15, F-value = 13.56, P-value < .0002), 2. Business training paired with a diagnosis of neurotic disorder-
510 (Beta = -56.50, F-value = 13.25, P-value < .0001), and 3. Business training paired with a diagnosis of mental and emotional disorders, not elsewhere classified-522 (Beta = -50.89, F-value = 14.96, P-value < .0007).

In addition persons diagnosed with three specific conditions predicted statistically significant improvements in earnings at closure and they were: Primary diagnosis of neurotic disorder (Beta = 49.29, F-value = 64.96, P-value = .00), Primary diagnosis of mental/emotional disorders NEC (Beta = 66.73, F-value = 119.86, P-value = .00), and Secondary diagnosis of drug abuse/dependence (Beta = 19.13, F-value = 19.81, P-value = .00).

Some other notable interactions occurred as well. Dually-diagnosed Black subjects with a diagnosis of mental/emotional disorders NEC using adjustment training predicted significant increases in earned income at closure (Beta = 39.15, F-value = 7.43, P-value = <.01). Those with neurotic disorders using adjustment training also had significantly greater income at case closure (Beta = 31.15, F-value = 7.73, P-value = <.01). A final significant interaction found those with dual diagnoses who had a primary diagnosis of mental/emotional disorders NEC, secondary diagnosis of drug abuse/dependence using On-the-job training had greater earnings at case closure (Beta = 53.33, F-value = 6.97, P-value = <.01).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Standard Error</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
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<td>583.59</td>
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</tr>
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<td>6.83</td>
<td>102.55</td>
<td>.00</td>
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<tr>
<td>Business</td>
<td>76.85</td>
<td>9.19</td>
<td>70.00</td>
<td>.00</td>
</tr>
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<td>7.13</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>On-the-Job</td>
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<td>7.89</td>
<td>10.92</td>
<td>.00</td>
</tr>
<tr>
<td>Counseling</td>
<td>16.95</td>
<td>5.25</td>
<td>10.43</td>
<td>.00</td>
</tr>
<tr>
<td>Job Finding</td>
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<td>.00</td>
</tr>
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<td>Job Placement</td>
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<tr>
<td>Transportation</td>
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<td>11.89</td>
<td>.00</td>
</tr>
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</tr>
<tr>
<td>*College/Sec. Drug A/D</td>
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<td>.97</td>
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</tbody>
</table>

Table 4.9: Backward Selection from Main Effects Examining the Effect of Differential Diagnosis and Services Provided on the Change in Income at Case Closure

continued
Table 4.9 continued

*Trans./Pr. Mental NEC - - .24 .63
*Job Find./S. Drug A/D- - 1.08 .30

$R^2 = .086, F = (14, 5086) < .0001$

*Note.  A sample of the variables removed from the final model.

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<tr>
<th>Variable</th>
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<th>F</th>
<th>p</th>
</tr>
</thead>
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<td>593.99</td>
<td>.00</td>
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<td>College</td>
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<td>6.24</td>
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<td>.00</td>
</tr>
<tr>
<td>Business</td>
<td>74.63</td>
<td>9.18</td>
<td>66.01</td>
<td>.00</td>
</tr>
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<td>.00</td>
</tr>
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<td>17.01</td>
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<td>6.99</td>
<td>14.89</td>
<td>.00</td>
</tr>
<tr>
<td>Job Placement</td>
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<td>.00</td>
</tr>
<tr>
<td>Transportation</td>
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<td>13.60</td>
<td>.00</td>
</tr>
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</table>

Table 4.10: Backward Selection from Three-Way Interactions Examining the Effect of Differential Diagnosis and Services Provided on the Change in Income at Case Closure

continued
Table 4.10 continued

<table>
<thead>
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<th>SD</th>
<th>Median</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
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</tr>
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<td>.00</td>
</tr>
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<td>7.73</td>
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<td>6.97</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>* Bus./Black/ Pr. M.NEC</td>
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<td>-</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>*Asian/ Pr. M.NEC</td>
<td>-</td>
<td>-</td>
<td>.06</td>
<td>.81</td>
</tr>
<tr>
<td>*O-T-J/Am. Ind.</td>
<td>-</td>
<td>-</td>
<td>.14</td>
<td>.71</td>
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R² = .090, F = (17, 5083), <.0001

*Note. A sample of the variables removed from the final model.
Summary

The purpose of this study was to better understand the impact vocational services have on the earnings of individuals with a D² at case closure. The specific research questions answered in this research exercise were:

1. Were there particular services, among the 13 services listed in the 1998 federal/state RSA-911 database, which better predict an increase in the earnings at the time of case closure?

2. To what extent and how accurately can values for the change in income from application to closure for a person with a D², be predicted with knowledge about the services received and their race?

3. To what extent and how accurately can values for the change in income from time of application to closure for a person with a D², be predicted by the services received and their differential diagnosis?

5127 cases were extracted from the 1998 federal RSA-911 database of individuals with a dual diagnosis and used in this study. Initially basic comparisons were made between three groups as a way to gauge the external validity of the extracted sample. Then the backward selection procedure of multiple regression was used to identify services that had a significant positive effect on the subjects’ earnings at the time of case closure. Five services best predicted positive change in earnings outcome and they were: College training, Business training, Counseling and guidance services, Job placement services, and Transportation. Backward elimination found one significant relationship between services, race and differential diagnosis on the earned income at the time of closure for those with a dual diagnoses. Two other conditions predicted
interactions between particular diagnoses and services would also greatly improve income at case closure. Overall the multiple regression analysis provided modest adjusted correlation coefficients meaning that a small proportion of the variance in changed income can be explained by the services provided, race and differential diagnosis.
CHAPTER 5

DISCUSSION

The potential benefits of better understanding how to improve rehabilitation outcomes for those with dual diagnoses are great. It is the hope of this research that the findings in some small way will contribute to the development of a base of knowledge in vocational rehabilitation that enables professionals in the field to serve the needs of this ever-expanding population more effectively. To accomplish this task, three research questions were examined in the course of this study:

(1) Which particular services, among the 13 services listed in the 1998 federal/state database, better predict an increase in earnings at the time of case closure for those listed with a dual diagnosis?

(2) To what extent and how accurately can the person’s dual diagnosis (out of the six possible pairs of diagnoses) and the services provided for a client with that diagnosis predict values for his or her change in income from the time of application for VR services to closure of a VR case?

(3) To what extent and how accurately can the race of a client with D\(^2\) and the VR services he or she has received predict the values for the change in
his/her income from the time of his/her application for VR services to the closure of his/her VR case?

This study used data from the 1998 federal database to better understand and predict positive changes in earnings from application for VR services to case closure for those with dual diagnoses.

Included in this final chapter will be: (1) a discussion of the results as they pertain to the general knowledge about VR for those with a D² and the three primary research questions; (2) a review of the theoretical implications of these results; and (3) suggestions or recommendation for future research in this area.

Review of the Results

Demographic Characteristics

The three background comparison analyses between groups: (a) D² with earnings at closure/D² without earnings at closure; (b) Total D² cases with mental health listed as a primary disorder and substance abuse listed as a secondary/random sample (n = 16696) of the entire RSA-911 database; (c) D² with earnings at closure/random sample (n = 5127) of the entire RSA-911 database, yielded many statistically significant-, but few practical differences. Regrettably and unwittingly, most cases yielded unsuccessful Status 28 VR outcomes. Consequently, it was impossible to make closure comparisons. All comparisons of data elements such as race, gender, level of education and veteran status were similar. The only differences of practical significance involved information about consumer closure comparisons between the group of D² with earnings at closure and those groups opposing these subjects in comparison analyses of both (a) and (c). In essence, precipitating features and characteristics of closure were similar between D²
samples and the general population. It is also important to note that there were no known
differences from the data among background characteristics for D² subjects who
completed the VR plan and those who did not, further enforcing the possibility that
particular VR services do play a significant role in treatment outcome.

VR Outcomes for Those with a D²

The first research question involved identifying which of the 13 services best
predict enhanced earnings outcome at the time of case closure. Of the 13 services
available to the 1998 consumers of state/federal VR services, 5 were identified as
substantially having their income increase at the time of closure. These 5 services were
in order of highest beta coefficient from the multiple regression analysis: College
training, Business training, Job finding, Counseling-substantial and, Transportation.
Among these 5 services, it was not possible to identify any particular clusters of services
from the existing statistical paradigm as significantly influencing the variance. At the
same time, 87% of the successful case closures implied that in fact, 3 or more services
were incorporated at some point into the IWRP. Even though the current study focused
on each service individually, future research of the added benefit of clusters of services
would be warranted.

The second research question involved the large diversity within those afflicted
with D² and led to the conclusion that it would be useful to better understand the
influence traits of each of the separate classifications within the dual diagnosis spectrum,
because each may have a different effect on service outcome in VR. For instance, if one
were diagnosed with a neurotic disorder compounded by alcohol dependence, it was
important to identify which services would best suit that person’s vocational
rehabilitation needs. The statistical analysis of the current study indicated that adjustment training and on-the-job training showed especially significant positive effect on client income when the diagnoses were (1) neurotic- and drug abuse/dependence disorder, or (2) mental/emotional NEC- and drug abuse/dependence- disorder. When one of these two combinations of disorders presented in the 1998 RSA-911 database, practitioners who administered adjustment training and on-the-job training procured higher income for their clients at the time of case closure.

The final research question asked, if race were also to be considered, what services would significantly enhance the likely the success of a VR plan and ultimately increase the client’s income? Would, for example, the services that best predicted income improvement change if the group were restricted to D² patients who were Black or Native American? Research on the general population pertaining to this area of concern suggests that indeed there are particular services linked to race that would improve rehabilitation results. In this particular study, however, there was no significant relationship between the client’s race and services offered. Perhaps if a greater number of independent variables were included in future studies, it may be possible to obtain more information about the effect that race plays on VR treatment planning.

There were, however, some unexpected results obtained through the course of this original exploration that should be described. It was found that three particular diagnoses from the RSA-911 database predicted better income for D² patients. They are listed below in order from highest to lowest beta coefficient: (a) Primary diagnosis of other mental and emotional disorder; (b) Primary diagnosis of neurotic disorder; and (c)
Secondary diagnosis of other drug abuse or dependence. From this data analysis, one could predict that any subject with one or both of these listed disorders would have a significantly better chance for higher wages.

In addition, it should be noted that three interactions among services and differential diagnoses predict decreased earnings at closure. This simply implies that these different diagnoses would predict decreased earnings. They were: (a) College training/D² primary disorder of other mental or emotional disorder and secondary diagnosis of other drug abuse or dependence; (b) Business training with a primary diagnosis of psychotic disorder and; (c) Business training with a primary diagnosis of other mental or emotional disorder. This leads to the conclusion that while one is no closer to better understanding of the interrelationship between successful VR service intervention and particular mental or substance abuse disorder, one can make inferences as to which services and diagnoses practitioners should avoid in making out an IWRP.

Discussion

Background Information

More than a third of the entire population of vocational rehabilitation consumers from the 1998 RSA-911 database were persons who had a mental illness and/or chemical addiction. This segment of the total population seeking rehabilitation services was by far the largest, and accentuates the need to improve the service delivery to this oft-ignored collection of patients suffering with these disorders. Chief among the concerns with this large group, however, is the need to better understand and treat those with dual diagnoses. To do so, one must first accurately identify those with these issues, and in this study the findings again suggested that dual diagnoses cases were not correctly identified.
A mere twelve percent of those with mental health or chemical dependency problems had a coinciding diagnosis of the other, far below estimates from other studies that assert the percentages of those with comorbid disorders at fifty percent and beyond (Doyle-Pita, 2001; Blankertz, McKay & Robinson, 1998; Sengupta, Drake & McHugo, 1998).

Results from the demographics analysis shed a great deal of insight into the background and characteristics of those with dual diagnoses. First, one should be aware that the percentage of those labeled as severely disabled with either mental illness or substance abuse was roughly equal to the percentage of those who were labeled as severely disabled with both mental illness and chemical addiction. The equal numbers of cases in either group was not consistent with hypotheses that assumed that the combination of mental illness and chemical addiction would create symptomatology far worse than those with a single disorder (Doughty & Hunt, 1999; Davenport, 1996). It would be useful for rehabilitation professionals to be more informed about the course and nature of dual diagnosis, so that they may hold more optimistic views in their case plans for the dually diagnosed.

When examining the comparisons in background information between the dually diagnosed participants who had earnings at closure (n = 5127) to those who did not (n = 11569), it was obvious that obtained data at closure would be different. One group obtained employment and was enjoying increases in income, while the other was not. Not only were their earnings better, but they also enjoyed significantly higher rates of competitive employment, hours worked, and differences in work status. It should also be noted that participants with income at closure averaged almost $1,500 dollars more spent
in the cost of case services per person than their less successful counterparts. This
difference suggests that those who had no earnings at closure used far fewer services and
most likely, they terminated their VR plan prematurely.

Many would have surmised that the RSA-911 data might yield an alternative
explanation for the differences in income at closure, possibly related to background
characteristics that predispose a person to a successful VR incursion. However, the data
extracted dispels the possibility of this alternative explanation: it was surprising that there
existed almost no practical significant differences between the background characteristics
of these two groups. From the data available, mean equivalents such as age, gender, hours
worked at application, earnings at application, and education were essentially the same.
In the planning phase of this project, one particular data element, level of education, was
originally thought to be highly variable among groups. However, comparison analyses
found that all six groups had relatively close approximations of level of education.
Results from this introductory analysis increased the possibility that particular services
implemented into a treatment plan may significantly increase the income at case closure
and possibly improve the numbers of status 26 (successfully rehabilitated) outcomes.

The other two comparisons explored the differences between subjects with a D²
and random samples from the population of persons using state/federal services during
the same year. This was done as a way to test preconceived notions that individuals with
dual diagnoses are radically different and more challenging than those with other
disabilities (Sheils & Rolfe, 2000; Guy, 1997). Daley & Zuckoff (1998) discuss one of
these preconceived notions, that dual diagnosis patients have much poorer compliance
rates and thus are more likely to experience clinical deterioration of their psychiatric
condition. Such notions would certainly not bode well for those VR professionals who are unprepared to treat patients with D² and suggest the need for highly specialized treatment plans.

Different comparisons within the RSA-911 1998 database between the dually diagnosed consumers and a random sample from the general population point to many similarities. Background data elements such as age, sex, race, marital status, and education levels are similar. Their vocational history at application (earnings, hours worked and primary source of support) likewise was approximately the same. Even their closure rates were similar, which suggests both parties were equally amenable to occupational assistance. The only significant difference between patients with D² and the random samples was in the cost of case services. On average, the cost of case services for those with a dual diagnosis was $1,500 more than for those from the general population. This indicates the need for enhanced services and is consistent with assertions that call for additional assistance to aid in the vocational rehabilitation of patients with a dual diagnosis (Doyle-Pita, 2001; Guy, 1997). One possible additional expense many believe is the need to cover aftercare and follow-up guidance to reduce relapse and extend employment (Hitchen, 2001; Kelley & Benshoff, 1997). Whatever this additional cost may be, it is still less costly than the undesirable alternatives such as incarceration or hospitalization.

“It is not an act of intellect that makes people change themselves for the better, not a matter of insight, but an act of the will for intelligence without courage is as static as courage without intelligence is rash”-- Sidney J. Harris (Excerpted from Nightingale, 1991).
Researchers have identified the importance of expectations and beliefs by VR providers on the rehabilitation outcomes of their clients (Beck, 1999). In order to have a positive impact on their clients’ confidence in their employability, as Harris alludes to it, the counselor would be best served to instill in their clients a combination of personal intelligence and courage. Too often in VR when treating individuals with dual diagnoses, the practitioner is readily discouraged about the prospects of a successful outcome due to his/her own lack of understanding of his/her clients’ needs and his/her own ability to facilitate positive change in his/her clients’ occupational outlook. This error in rehabilitation counselors’ judgment is common and can deleteriously alter the outcome for the growing segment of the disabled population. Increasing practitioners’ knowledge about the true realities of case planning for those with dual diagnoses will in effect challenge common misconceptions, increase practitioners’ willingness to take therapeutic risks and positively enhance treatment results.

Implementation of Services

The results from the analysis of the services that best enhance earnings and outcome for a person with a D² appear to be inconsistent with conventional wisdom. Conventional wisdom would say that, given the usual seriousness of a dual diagnosis, a slow, methodical approach is the prudent way to structure the treatment plan. Individuals with significant psychiatric disabilities also are not likely to benefit from less-structured and more-complex interventions such as college or business training. Many of the results of this study, however, contradict these prevailing notions about which specific vocational rehabilitation services to offer to those who are mentally ill and chemically addicted at the same time.
College and business training topped the list of services that predict higher wages at the close of treatment. Many surmise that college and business training would require the most discipline and cognitive capacity and would therefore be unsuited for dually diagnosed patients. However, the findings of the current study strongly suggest that dually diagnosed patients do in fact have the most successful outcomes when they use these services. Therefore, it is imperative that the professional VR community consider college and business training as a viable treatment alternative for those with dual diagnoses. One of the reasons that people believe college and business training would not be a viable option for those with D² is that their education levels are inadequate for them to benefit from college and business training, when in fact, the findings of this study showed that the education levels of those with D² were not any different than those diagnosed with other disabilities. Therefore, VR professionals should not exclude college and business training from the pool of service options available to those with dual diagnoses.

Extensive counseling was also indicated as a service that predicts a significant increase in income for those with a D². This finding was corroborated by earlier studies that concluded that counseling was beneficial for those with serious mental illness and had a positive effect on VR outcomes (Finch & Wheaton, 1999). One area that negatively affects the quality of life for individuals enduring mental health disorders is in their ability to form relationships. One’s inability to cultivate meaningful interpersonal attachments also increases one’s potential for relapse due to the lack of an adequate social network, and subsequently reduces one’s employability. An effective way to address
issues of social attachment and its influence on one’s employability is through counseling, and VR professionals should be urged to incorporate counseling into their IWRPs for those with substance abuse and comorbid mental illness.

The final two services that significantly enhance earnings outcome (job-finding and transportation) emphasize the importance of more traditional rehabilitation counseling functions. The often-chronic nature of a D² is such that it precludes many from employment for extended periods of time, especially at a young age. A lack of experience leaves the consumer ill-prepared to arrange for a job interview on his or her own. Job-finding services can circumvent the chronic problems that a diagnosis of D² often presents, so that the individual programs can proceed. In the same manner, addressing transportation issues would also be an essential ingredient in the treatment plan, as so many lack the means to get from their residence to their place of employment. Previous research has asserted transportation as a major hurdle to overcome and a constant reason for ongoing unemployment (Sengupta, Drake & McHugo, 1998).

The small measures of variance suggest only a modest relationship between services and earnings outcome. Nonetheless, these five services in some order are likely to improve the VR outlook for those with dual diagnoses.

The Effect of Race

Many studies have noted the discrepancy in outcome measures on the utilization of public vocational rehabilitation services between White and Non-White populations (Alston & Bell, 1996; Leung, 1993; Herbert & Martinez, 1992). In fact, the 1992 amendments to the Rehabilitation Act of 1973 asserted that patterns of inequitable treatment to minorities have been documented at all junctures of the VR process. The
key for any success in this profession is to adopt VR plans to the needs of persons from all walks of life, and the bigger issue is to discover the particular services custom tailored to the needs of different minorities.

The primary purpose of inquiring into the connection of race and VR services was to understand the special needs of the Non-White, dually diagnosed VR recipients. The precedent was already set when a prior published report by Wheaton, Finch, Wilson and Granello (1997) identified that certain patterns of service appeared to be highly related to success for Non-White consumers. The current study however, did not find any significant relationships between race and VR service on earnings outcome. Services such as college training or job placement did not positively influence the earnings outcome for the dually diagnosed individual of minority descent.

It should be noted that an additional analysis incorporating all three variables into a multiple regression equation showed that for Black consumers with a primary diagnosis of mental/emotional disorders NEC, adjustment training predicted positive increases in earnings outcome at the time of case closure. The main study indicated, however, that race did not provide much in the way of insight on the tools that improve VR success.

The Effect of Differential Diagnosis

While the effect of race was not shown to have an impact on the delivery of services in successful VR interventions, differential diagnoses did affect delivery and outcomes. The particular diagnosis that a person presents with can enhance that person’s earnings at the time of case closure. Three listed diagnoses alone predicted significantly
higher wages and successful outcomes at case closure: (1) Primary diagnosis of neurotic disorder-510; (2) Primary diagnosis of other mental and emotional disorders-522; and (3) Secondary diagnosis of other drug abuse or dependence-521.

The first two psychiatric disorders understandably present fewer obstacles to overcome in VR planning than would be expected if someone had a primary diagnosis of a psychotic disorder. While all can be considered disabling, the issues presented by anxiety, mood, or personality disorders are thought to be more manageable than a person with schizophrenia or another psychotic disorder. The latter often has an earlier onset, which in turn reduces the opportunity for the patient to develop a work history with acceptable work skills. Tsang and colleagues (2000), in their meta-analysis showed that diagnosis plus the functioning levels prior to onset of illness were consistent predictors of better employment outcomes. This postulate was further reinforced by an earlier study that concluded that those with job histories and non-psychotic disorders will be most likely to benefit from VR services (Jacobs et al., 1992).

The more interesting finding from this particular regression analysis was that a secondary diagnosis of substance abuse/dependence also significantly predicted superior vocational outcomes with higher wages. The prevailing notion was that alcohol abuse and dependence would be the less severe disability, and therefore more capable of achieving higher earnings at case closure. This may not be the case, however, if one were to take a closer look. In American society there is much more tolerance for the abuse of alcohol, even at the workplace. In some occupational settings this behavior may even be encouraged. Those with dual diagnoses working within an environment like this will suffer and be prone to higher than normal relapse rates. On the other hand, all
workplace settings discourage the use and abuse of drugs. It is common for coworkers to go out for a few drinks after work, but not so to do a ‘couple of lines’ (though it does happen, as well). The end result is a society that tacitly accepts the use of alcohol, but not drugs. Therefore, it is easier to maintain a drug-free work environment, while sobriety in the workplace is harder to maintain.

The current study found that a secondary diagnosis of drug abuse/dependence would predict higher earnings at case closure than for those with a secondary diagnosis of alcohol abuse/dependence. This finding corroborates earlier conclusions that Arella and colleagues (1990) reached, that heavy alcohol abusers reported a greater need for services than drug users. It is likely that persons abusing drugs who take part in vocational rehabilitation are more able to find employment with fewer services than are alcoholics using the same VR services. This suggests that those with diagnosis of substance abuse linked to VR services were closer to employment prior to receiving VR assistance than were alcohol abusers.

A final hypothesis that may explain why the secondary disorder of drug abuse was a significant predictor of occupational success had to do with the labeling of the condition. Alcohol abuse tended to be listed as a “secondary disorder” in the 1998 RSA-911 database, and rehabilitation professionals were likely to have referred to it as a descriptor of their condition rather than a condition that requires special attention. On the other hand, drug abuse would probably invoke major concern and attention. It is imperative that VR professionals consider all forms of chemical addiction as serious impediments to recovery that need to be addressed with equal attention in an IWRP.
Those with neurotic and mental/emotional disorders NEC, however, were predicted to have substantially better outcomes if their curriculum included adjustment- or on-the-job training. Hands-on assistance while participants are on the job site likely did more to quell the insecurities of the patient and the company, not to mention mediate, between prospective employee and employer. Unlike those with psychotic disorders, who may need extensive training just to participate adequately in a group setting such as the work environment, those classified with mental/emotional disorders will respond better to adjustment or on-the-job training.

Serious consideration should be given to adjustment training when treating dually diagnosed clients with (1) neurotic- plus drug abuse/dependence disorder, or (2) mental/emotional NEC- plus drug abuse/dependence- disorder, so that they are not hindered in their ability to work. Training on the job while learning to meet the demands of work also predicts more success for these particular classifications of dually diagnosed subjects, bringing about increased earnings. In direct opposition to models emphasizing train-then-place, it would appear that, in the case of these particular classifications, a place-then-train model would be more effective. These findings parallel the New Hampshire study by Drake and colleagues (1996) who espoused that clients in individual placement and support programs were more likely to be working competitively than similar groups using group-skills training models. Paradigms emphasizing the place-then-train models appear to have more fortuitous results for dually diagnosed clients with (1) neurotic- plus drug abuse/dependence disorder, or (2) mental/emotional NEC- plus drug abuse/dependence disorder.
Recommendations

As the numbers of persons with a dual diagnosis grow, there is an urgent need to provide VR professionals with adequate resources with which they can improve their Individualized Written Rehabilitation Plans. Securing adequate resources requires more research in the VR field, since information on this subject matter still lags far behind.

The focus of this particular investigation was to identify which services categorized by the 1998 RSA-911 database most enhanced the vocational outcome for individuals with a D² who use state/federal VR programs. From this single premise used in this study, several modifications can be made to also produce meaningful analyses in the future. For the sake of brevity, this final section will examine three propositions that can expand the knowledge that currently exists on VR services for the dually diagnosed.

The subject pool in this study was limited to those obtaining state/federal VR services in the United States during the 1998 fiscal year. While this may be a good starting point, there are certainly more individuals with dual diagnoses who will benefit from occupational assistance. This author’s first recommendation is to draw data from a different pool of dually diagnosed subjects in VR, since a different subject profile may emerge when data is drawn from private VR facilities or when outreach programs are initiated for those who would otherwise not seek out help. The added perspective can only improve the practitioner’s knowledge pertaining to those with a D² and enable them to deliver a successful rehabilitation intervention.

Another recommendation that can build upon this current research would be to look at the clusters of services that are most effective. An earlier study by Finch and Wheaton (1999) found five service patterns for those with serious mental illness (SMI)
who successfully used state/federal programs. It should be noted that in conjunction with this study, of the 5,127 cases researched for this analysis, 87% used three or more services, and probably there were particular clusters of service patterns that correlated with successful outcomes from this database as well. It would therefore be prudent to similarly examine the effect of sets of services on treatment intervention outcomes for those with dual diagnoses.

One final recommendation encouraged by this present study will be to identify other factors that contribute to VR success. As was previously reported, only a modest amount of variance was explained by the available services. This study looked at two additional factors, race and different classifications of dual diagnosis, to see if they may also influence in some way the outcome; but clearly, there are more factors that influence the outcome. A series of well-documented case studies may provide the most comprehensive method of better understanding the mechanisms that enhance employment outcome for those with a D².

At present, the options are limitless as to the research possibilities on VR for those with dual diagnoses. The recommendations for future research are but three of a multitude of possibilities. Even replication studies would prove to be useful strategies in giving more detail on the kinds of services that improve rehabilitation success. One might even want to examine the concept of VR success. Some studies have sought to identify vocational and nonvocational change during the VR intervention, contending that both are mutually exclusive, but equally important predictors of client success (Growick, 1979). Whatever the choices may be in designing a logical research paradigm, it is imperative that research begin to address the scarcity of knowledge in this area.
Conclusion

Work is an activity that holds great promise as a method to stabilize the symptoms of mental illness and coexisting chemical addictions. There are many reasons why incorporating VR into a treatment regiment benefits everyone, including the large and growing population of persons with dual diagnoses. Progress has been noted in the development of integrated treatment approaches, but there is still a glaring need to arm VR professionals with the information they need to carry out effective interventions. The mounting evidence, however, beckons to practitioners and researchers alike to eradicate their old outdated methodologies (which fail to properly address the needs of persons with dual diagnoses) and adopt more flexible styles that are likely to improve rehabilitation outcomes. If the goal is to positively promote change and increase vocational opportunities to this underserved population, then the resolution to this problem will require flexibility and willingness to change, in addition to the maximum effort by each practitioner. For a profession that has been an agent of healthy change in this society for so long, that should not be too much to ask.
## APPENDIX

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