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THE RELATIONSHIP AMONG INDIVIDUALS WITH SERIOUS MENTAL ILLNESS, VOCATIONAL REHABILITATION SERVICES AND OUTCOMES

DISTRIBUTION

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

By

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* * * * *

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The purpose of this study was to investigate the types of vocational rehabilitation services provided through the federal/state vocational rehabilitation (VR) system to individuals with serious mental illness and the relationship of these services to employment outcomes. A sample of 658 individuals with serious mental illness who received vocational rehabilitation services during Federal Fiscal Year 1995 from the Ohio Rehabilitation Services Commission were chosen. A cluster analysis of both individuals who were successful and unsuccessful in employment outcomes resulted in five service groupings ranging from minimal to more comprehensive services. Results from a chi-square analysis indicated a relationship between an employment outcome and the comprehensiveness of services. A second cluster analysis on a subsample of those individuals who attained employment (n = 309) also resulted in five similar clusters. A chi-square analysis with a Cramer's V as a measure of association demonstrated a significant but moderate relationship between service clusters and occupational categories. Individuals in more skilled occupations such as professional, technical/management and
machine trades were provided more counseling services than expected with lesser skilled occupations such as processing provided minimal vocational rehabilitation services. A one-way analysis of variance (ANOVA) indicated a statistically significant relationship between service groups and wages. Post hoc planned contrasts resulted in service groups with more comprehensive service having significant differences in mean weekly wages. This study was limited by a lack of a control group and the self-selection of individuals with serious mental illness who were determined eligible and able to receive services through the federal/state VR program. Future studies should be directed toward comparison of service models of vocational rehabilitation and their employment outcomes.
This dissertation is dedicated to
my wife and best friend, Wanda.
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CHAPTER 1

INTRODUCTION

There is a growing national consensus among consumers and professionals that individuals with serious mental illness (SMI) can work. Nevertheless, 86 percent of such individuals, despite their skills and desires for work, remain unemployed (Rutman, 1994). Becker and Drake (1992) hold that persons with psychiatric disabilities want to lead normal lives and view work as one of the principal signifiers of adult life. Anthony and Blanch (1987) extensively studied the employment rates of persons with SMI and found that less than 15 percent were employed. An analysis of federal/state vocational rehabilitation (VR) closures for 1984-1988 of persons with serious mental illness compared with clients with hearing impairments, mental retardation, or circulatory problems showed that those individuals in the mental illness group averaged about 57 percent successful closures, while the other three groups averaged 76 percent, 63 percent, and 61 percent, respectively (Rutman, 1992). Unemployment rates of between 93-97 percent for persons with serious mental illness are
evidenced for 1988 in Ohio (Ohio Rehabilitation Services Commission & Ohio Department of Mental Health, 1988).

Over the past 40 years a variety of models of vocational rehabilitation programs and techniques have emerged to facilitate employment. It is generally agreed that some of these programs have been effective, but evaluation remains too incomplete to draw firm conclusions about effectiveness across a variety of locations and client groups (McGurrin, 1994). Moreover, there is little adequate research that examines the relationship between specific rehabilitation services and vocational success (Bond & Boyer, 1988). However, there is growing evidence to suggest that various components of the psychiatric rehabilitation approach can significantly affect vocational outcome for the psychiatrically disabled (Anthony, Danley & Howell, 1984; Anthony & Dion, 1986). Typical vocational rehabilitation programs for individuals with serious mental illness include transitional employment, supported employment, job clubs, and the federal/state vocational rehabilitation service system.

Transitional employment (TE) was developed by the Fountain House in 1957 to reverse the traditional "train and place" approach. Transitional employment consists of time-limited placement at entry level competitive jobs.
In the supported employment (SE) model, the client receives services as long as necessary to achieve placement and competitive employment (Wehman & Moon, 1988). The job club model developed by Azrin and associates places responsibility for finding a job on the client, with assistance from the rehabilitation staff (Azrin & Besalel, 1980).

The federal/state vocational rehabilitation system is the model with the longest history and serving the largest number of individuals with SMI. Established in 1920, the program initially targeted individuals with physical disabilities. It was not until the Barden-Lafollette Amendments of 1943 that the program was authorized to provide services to individuals with mental illness. In 1954, PL 83-565 provided services for large numbers of persons with mental illness. The 1973 Rehabilitation Act emphasized services to persons with the most severe handicaps, which made services more available to individuals with SMI (Rubin & Roessler, 1978). Although there are state service differences, the overall system is defined by federal regulations. Each state vocational rehabilitation agency provides central administrative support to field offices staffed by rehabilitation counselors and administrative personnel.
All vocational rehabilitation (VR) agencies provide individualized services driven by eligibility guidelines leading toward the development of an individualized written rehabilitation plan (IWRP). The IWRP specifies the vocational goals and services to be provided either directly by the VR agency or through purchased services. The Rehabilitation Act describes an open menu of possible services, including but not limited to, training, restoration, counseling and guidance, transportation, and maintenance. A consumer is "rehabilitated" if he or she maintains a vocational placement for at least 60 days. Vocational settings include competitive employment, sheltered employment, supported employment and self-employment. Within the SMI population, some states have made efforts to better co-ordinate and provide services to meet this population's unique needs (Savenu & Roth, 1989). To date, the effectiveness of these efforts has been mixed.

Purpose of the Study

The purpose of this study was to investigate the types of vocational rehabilitation services provided through the federal/state vocational rehabilitation (VR) program in Ohio to individuals with serious mental illness (SMI) and the relationship of these services to employment outcomes.

The following sections address the significance of the problem, the problem statement, the variables which were
considered, the need for the study, and the research questions and objectives. It then proceeds to address the basic assumptions of the study, the limitations of the study and provides a definition of terms.

Significance of the Problem

Although estimates vary according to sampling and employment criteria, base rates of competitive employment for persons with SMI have been reported to be less than 20 percent (Rogers, Anthony, & Jansen, 1988). The National Mental Health Association estimates that some 42 million persons have psychiatric impairments that limit one or more major functional areas. The National Institute of Mental Health (NIMH) indicates that the annual prevalence of all mental illness in the United States is approximately 45 million individuals, of whom an estimated 4 to 5 million adults are considered seriously mentally ill (Rutman, 1994). Recent estimates of the number of individuals with serious mental illness who are unemployed range from 70 percent to 90 percent (Anthony, Duell, Sharrott & Althoff, 1972; Anthony and Menec, 1983; Anthony, Howell & Danley, 1984), with only a few recent studies providing findings that the situation may be improving. Anthony and Dion (1986), in their review of rehabilitation research, found a fairly consistent full-time competitive employment rate of 20-25 percent for all persons discharged from psychiatric
hospitals. If only persons with serious mental illness are considered, the full-time competitive employment rate drops below 15 percent.

Within the federal/state vocational rehabilitation program, individuals with serious mental illness have averaged fewer successful employment closures than other disability groups (Rutman, 1992). Findings that positive outcomes were achieved at a better than 2:1 rate for those with physical disabilities than for clients with mental illness were reported by Marshak, Bostic and Turton (1990). The Ohio Rehabilitation Services Commission and the Ohio Department of Mental Health, in a critical framework for achieving employment outcomes, stated (1993):

Both research results and client feedback strongly indicate that unemployment and a lack of target vocational rehabilitation are the most pervasive problems confronting adults with serious mental illness in Ohio. (p. 1)

Clearly, for individuals with SMI successful employment is a significant issue, as are the efforts needed to facilitate such.

Need for the Study

There is evidence to suggest tentatively that many forms of vocational rehabilitation contribute to at least partial vocational restoration of persons disabled by serious and persistent mental illness (McGurrin, 1994).
Dion and Anthony (1987), for example, reviewed 35 experimental and quasi-experimental studies that attempted to change the skills and/or environmental supports of persons with SMI. Within the limitations of the measurement and research design, their review suggests that vocational rehabilitation interventions positively affect rehabilitation outcome on measures such as recidivism, time spent in the community, employment and productivity, skill development, and client satisfactions.

Bond and Boyer (1988) have reviewed research on vocational programming for persons with SMI. Four studies reported positive results, two found marginally significant results, and thirteen found no difference between the experimental and control groups. When examining sheltered or transitional employment, seven of eight studies favored the experimental group. Bond and Boyer (1988) also concluded that there is little adequate research that examines relationships between rehabilitation services and vocational success. They emphasized the long-term support needed for consumers to retain jobs and existence of programs that accommodate relapses and slow progress.

Bond and McConel (1990) point out the lack of research in vocational rehabilitation for individuals with SMI mirrors the low priority given to vocational issues in mental health programs and to psychiatric disability in
rehabilitation programs. They recommend research efforts that identify what approaches and services work with specific kinds of clients. McGurrin (1994) points out that it is not known which types of vocational rehabilitation models and services are most beneficial for which types of clients and at what stages of the recovery process. He also noted that not enough is known about the relative costs and benefits of the various program model/client mix combinations in order to most efficiently invest scarce program resources.

It is clear that a dearth of information exists about the vocational rehabilitation outcomes of individuals with SMI and the correlates to those outcomes. A need exists to explore the relationship between vocational rehabilitation services provided and employment outcomes for persons with SMI. Specifically, there exists a need to examine the relationship between services and outcomes of models of vocational rehabilitation, such as the federal/state VR system.

Research Questions and Variables

The research questions to be answered by this study were:

Question 1a: Are there identifiable patterns of vocational rehabilitation (VR) service for persons with SMI that can be empirically defined?
Question 1b: Is there an association between VR service patterns and rehabilitation outcomes?

The pattern of service groups were independent variables of undetermined levels. The independent variable was type of vocational rehabilitation services. The operational definition is the coded vocational rehabilitation service provided on the standard RSC-001 form by the Ohio Rehabilitation Services Commission (ORSC).

The dependent variable was constitutively defined as rehabilitation employment outcome. This is operationally defined as Status 26 (working after receiving services) or Status 28 (case closed, not working, after services received), as coded by the Ohio Rehabilitation Services Commission.

Question 2: The research questions concerning the quality of outcomes for persons with SMI who have received VR services and have become employed (Status 26) were:

2a. Is there an association between the service patterns received and types of occupations at closure?

2b. Is there a significant difference between the service patterns and wages earned?

The independent variable was service patterns, a categorical variable with undetermined levels.

The dependent variables were wages and type of occupation as operationally defined on the RSC-001 form in
weekly earnings and occupation group by the first digit of
the Dictionary of Occupational Titles code.

Hypotheses

The following hypotheses were used for this study:

$H_0$: Vocational rehabilitation services and successful
rehabilitation outcome are independent.

$H_1$: Vocational rehabilitation services and
rehabilitation outcome are not independent.

$H_0$: There is no significant difference between
vocational rehabilitation services received and earnings at
case closure.

$H_2$: There is a significant difference between
rehabilitation services received and earnings at case
closure.

$H_0$: Vocational rehabilitation services and
rehabilitation outcome as measured by type of occupation
received are independent.

$H_3$: There is a relationship between vocational
rehabilitation services and rehabilitation outcome as
measured by type of occupation received.

Basic Assumptions

This study assumed that completed RSC-0001 data sheets
were accurately completed by RSC counselors and that the
subsequent compilation of this data by RSC was valid and reliable. It was also assumed that individuals with SMI have met the required criteria by Rehabilitation Services Administration standards to qualify for such coding. This study made no assumptions as to causality and attempted only to describe relationships between variables. Finally, this study assumed that research permission would be granted through the Ohio Rehabilitation Services Commission.

Limitations of the Study

The limitations of this study were the self-selected sample of individuals with SMI who voluntarily sought vocational rehabilitation services through the Ohio Rehabilitation Services Commission. This study did not consider the skill level of the counselors, local employment opportunities, or quality of service providers. This study's focus was on employment outcomes (Status 26) and does not allow for other measures of consumers' improvement outside of employment status as defined by Ohio the Rehabilitation Services Commission. This study is further limited by the accuracy of those individuals completing the data form. Some data may be omitted, or wrongly coded.

From a methodological standpoint, this study was lacking a control group and the ability to measure the
results of certain types of services in an experimental design. Conclusions drawn must be tentative explanations and are not to be interpreted as causes.

Definition of Terms

The following terms were determined to need further clarification:

Individuals with serious mental illness (SMI): An individual who has serious mental illness is considered severely handicapped if he or she meets the following criteria: the client's disability seriously limits one or more functional capabilities in terms of employability, such as: communication, interpersonal skills, mobility, self-care, self-direction, work skills or work tolerance; and the client is expected to need multiple VR services over an extended period of time; and the client has one or more disabilities that cause substantial functional limitations resulting from any condition, including mental illness (Ohio Rehabilitation Services Commission, 1995). The federal/state system divides individuals with mental illness into one of three categories, based on diagnosis: psychotic, neurotic, and other mental/emotional disorders.

Status 26: When an individual has completed 60 days of employment successfully, his or her case is closed by ORSC, Status 26.
Status 28: When an individual fails to complete VR services by achieving employment after rehabilitation services have been provided, his or her case is closed by ORSC, Status 28.

Type of occupation: Occupation is recorded on the RSC-0001 closure by entering the six-digit Dictionary of Occupational Titles (DOT) code. For the purpose of this study the first digit of each occupation was used, the Occupational Category. There are nine Occupational Categories: professional, technical/management; clerical and sales; service; agriculture; processing; machine trades; benchwork; structural; and miscellaneous occupations.

Wages earned: At closure of RSC case, hourly earnings based on gross earnings for a week are recorded.

Vocational rehabilitation services: Categories of vocational rehabilitation services rendered by RSC include: diagnostic, restoration, college, business/vocational training, adjustment training, on-the-job training, miscellaneous training, counseling, job referral, job placement, transportation, income maintenance, and other services.

Summary
This chapter briefly describes the incidence of unemployment among individuals with serious mental illness.
(SMI). It also points out the variety of vocational rehabilitation programs that have developed over the past 40-50 years to facilitate employment for individuals with SMI. The federal/state vocational rehabilitation (VR) program has taken the lead in financial and programmatic support for individuals with psychiatric disabilities. While there is some evidence to suggest success in achieving employment outcomes within the vocational rehabilitation system, there exists a lack of data and research on specific rehabilitation program effectiveness. Given the fact that successful closure rates are low for the SMI population while service costs continue to rise, it is time to re-examine the relationship between VR services and outcomes including nonsuccessful and successful closure, and among those employed, their types of occupations and wages.
CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

The purpose of this study was to investigate the types of vocational rehabilitation services provided through the federal/state vocational rehabilitation system to individuals with serious mental illness (SMI) and the relationship of these services to employment outcomes. From this research, VR service effectiveness related to employment outcomes will be identified and program development will be recommended.

This chapter presents a review of the literature arranged in three major areas: (a) literature related to the extent, characteristics and employment barriers for individuals with serious mental illness and employment; (b) literature related to vocational rehabilitation and individuals with SMI; and, (c) literature on the federal/state vocational rehabilitation system and the effectiveness of their services for individuals with SMI.
Individuals with Severe Mental Illness

Severely or chronically mentally ill is the label originally used for individuals who were diagnosed with schizophrenia or psychosis and who had a long history of psychiatric hospitalization. Changes in treatment modality, initiated by a policy of deinstitutionalization of individuals with SMI into the community, has increased the number of individuals in the population living outside the hospital setting (Mechanic, 1989). More recent conceptualizations of the severely mentally ill population include a range of psychiatric diagnoses with special emphasis placed on the individual's level of resulting disability and the duration of the impairment (Bachrach, 1988).

Using this three-criteria definition, the National Plan for the Chronically Mentally Ill describes this population as follows:

The chronically mentally ill population encompasses persons who suffer certain mental or emotional disorders (organic brain syndrome, schizophrenia, recurrent depressive and manic-depressive disorders, paranoid and other psychoses, plus other disorders that may become chronic) that erode or prevent the development of their functional capacities in relation to (three or more of) such primary aspects of daily life as personal hygiene and self-care, self-direction, interpersonal relationships, social transactions, learning and recreation, and that erode or prevent the development of their economic self-sufficiency. Most such individuals have required institutional care of
extended duration, including intermediate-term hospitalization (90 days to one year in a single year), long-term hospitalization (one year or longer in the preceding five years), nursing home placement on account of a diagnosed mental condition or diagnosis of senility without psychosis. Some such individuals have required treatment from a medical or mental health professional solely on an outpatient basis, or despite their needs have received no treatment in the professional-care service system. Thus, included in the target population are persons who are or were formerly "residents" of institutions (public and private psychiatric hospitals and nursing homes), and persons who are at risk of institutionalization because of persistent mental disability. (U.S. Department of Health and Human Services, 1980, pp. 2-11)

In Ohio individuals who are certified by the State Department of Mental Health as having a severe mental illness must meet the following criteria:

SSDI/SSI. An individual is a recipient of Social Security Disability Income or Supplemental Security Insurance. If so, the adult qualifies for certification, and the next three criteria do not have to be addressed. (Awarded 1987 or thereafter.)

If the adult is not an SSDI/SSI recipient for a mental illness, the adult qualifies under two of the three following criteria:

Diagnosis. Axis I lists the specific eligibility DSM-IV diagnosis.

Duration. Axis II specifies the qualifying range for hospital or nursing home length of stay with a category recognizing major functional impairment lasting more than two years, resulting in continuous intermittent use of out-patient service (ranging from A - D).

Level of Functioning. Axis III measures level of functioning on three levels: basic living skills, social activity, and behavior.

The criteria above can be combined in five separate combinations that can result in certification:
1. SSDI/SSI for mental impairment;
2. Diagnosis plus Duration A or B or C;
3. Diagnosis plus Duration D plus Functioning Levels;
4. Duration A or B or C or D plus Functioning Levels;
5. Diagnosis plus Functioning Levels.

(Ohio Department of Mental Health, 1994, p. 10)

Goldman, Gattozzi and Taube (1982) estimated that between 1.7 and 2.4 million Americans have severe mental illness. The National Institute of Mental Health (NIMH) indicates that the annual prevalence of all mental illness in the United States is in the order of 45 million individuals, of whom an estimated 4-5 million adults are considered seriously mentally ill. A 1994 study for the Ohio Rehabilitation Services Commission estimates 318,773 persons (≤ 3.4 percent of the working age disabled) have problems with emotional state; about 68.2 percent are reported to be severely disabled or most severely disabled (Glazier, 1994).

An analysis of vocational rehabilitation closures from the federal/state system from 1984-1988 of persons with psychiatrically disabilities—compared with clients disabled by hearing impairments, mental retardation or circulatory problems—showed that the mentally ill group averaged about 57 percent successful closures, while the other three groups averaged 76 percent, 63 percent and 61 percent, respectively (Rutman, 1992). Findings that positive outcomes were achieved at a better than 2:1 ratio for physically disabled
clients are reported by Marshak, Bostic and Turton (1990). Data from a Harris survey indicate that only 60 percent of all disabled individuals were familiar with the federal/state vocational rehabilitation system; of these, only about 10 percent used its services; and of this number only about half were successfully rehabilitated (Harris, 1986).

The base rates of competitive employment for persons with SMI have been reported to be less than 20 percent (Rogers, Anthony & Jansen, 1988). Research findings, however, confirm the ability of many adults with chronic mental illness to function at varying levels of independence during periods of their illness, given adequate treatment, rehabilitation and support (U.S. Department of Health and Human Services, 1984; Harding et al., 1984; Stein & Test, 1980; Tessler & Goldman, 1982). Yet despite, and even during, these periods of higher social functioning, persons with chronic mental illness are unable to engage in competitive employment (Anthony & Jansen, 1984; Tessler & Goldman, 1982). Interestingly, some studies have demonstrated that diagnostic category was not a predictor of vocational outcome with this population (Rogers et al., 1995; Anthony & Jansen, 1984). A recent client self-report study in Ohio showed significant difference between employed persons with mental illness in their perception of decreased symptoms of anxiety, depression, and psychoses (Ohio
Department of Mental Health, 1996) when compared to unemployed individuals.

Anthony and Jansen (1984) enumerate nine significant research findings which are critical to the accurate determination of vocational functioning for adults with chronic mental illness. These findings, listed below, are quite relevant to conceptualization and definition of persons with chronic and severe mental illness.

1. Psychiatric symptomatology is a poor predictor of future work performance.
2. Diagnostic category is a poor predictor of future work performance.
3. Intelligence, aptitude and personality tests are poor predictors of future work performance.
4. A person's ability to function in one environment (e.g., a community setting) is not predictive of a person's ability to function in a different type of environment (e.g., a work setting).
5. There is little or no correlation between a person's symptomatology and most measures of functional skills.
6. The best clinical predictors of future work performance are ratings of a person's work adjustment skills made in a workshop setting or sheltered job site.
7. The best demographic predictor of future work performance is the person's prior employment history.
8. A significant predictor of future work performance is a person's ability to get along or function socially with others.
9. The best paper and pencil predictions of future vocational performance are tests that measure a
Mental illness and its effects are difficult to define and categorize. Because of this, a unique challenge exists in the vocational rehabilitation of individuals with serious mental illness. Much is known, however, about the barriers that persons with SMI face when seeking vocational rehabilitation. Rutman (1994) has listed nine barriers:

1. Persons with psychiatric disabilities often exhibit cognitive, perceptual, affective, and interpersonal deficits intrinsic to or resulting from mental illness. As a result, persons with psychiatric disabilities interested in employment opportunities frequently require a broader range of services and supports than do persons with other disabilities. These can include health and mental health services, social or behavioral support services, personal support, educational services, housing, and help with family relationships.

2. Most types of serious mental illness are episodic and unpredictable in nature. Most mental illnesses do not follow an orderly path of onset, course, and outcome. Rather, the disorder comes and goes with periods of recurrences which affect personal and social relationships and work capabilities.

3. Various treatment interventions can produce iatrogenic effects on persons with serious mental illness. Both pharmacological and psychological treatments are used for persons with SMI, but can produce negative as well as positive results. Medications may produce a variety of side effects including tremor, shuffling gait, drooling, restlessness, stiffness in facial muscles, lightheadedness, blurred vision, low blood pressure, facial twitches and grimacing, loss of co-ordination and swelling of limbs (Lehman, 1992). Psychologically oriented interventions can allow
clients to develop feelings of dependency on programs and/or practitioners and inhibit forward movement in the rehabilitation process.

4. Psychiatric disabilities may create within the individual inappropriate values, attitudes, and aspirations regarding work. Anthony and Blanch (1987) emphasize the "vocational immaturity" of persons with SMI due to a lack of many normal life experiences. As a result, self-knowledge, including their skills, interests, and work values, is limited for many persons with SMI. Vocational goals may be distorted—either too low or too high.

5. Conflicting definitions and taxonomies regarding psychiatric rehabilitation interfere with successful outcomes. Differences exist in classifications regarding psychiatric disability across systems and disciplines. The medical classification system emphasizes symptoms and pathologies, diagnosis and treatment; the vocational classification is concerned with functional capacities and skill enhancement.

6. There are significant tensions and discontinuities between the major service systems who work with psychiatric disabilities. While there is agreement that the needs of persons with SMI are great, the task of developing truly effective relationships among health, vocational and welfare agencies has been a long standing problem. A basic conflict has existed between mental health and VR systems. Mental health goals tend to be more all encompassing while VR direction clearly is toward independent employment. These sometimes conflicting goals can lead to inconsistent planning for the client and agency lack of coordination.

7. Work disincentives are created by Social Security Administration provisions governing financial support and medical insurance. Many recipients of Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) fear planning for employment due to a lack of information on work incentive programs created by SSA. Full-time permanent employment can lead to a cessation of benefits, although the current structure allows for extended periods of trial work and savings of funds for work related expenditures.
8. Significant difficulties exist in assessing clients' work readiness and predicting vocational outcomes. As cited previously there is little consensus about the most effective evaluation methods for VR success. Anthony and Jansen (1984) concluded that work adjustment ratings; the individual's ability to function well with others; paper-pencil tests on ego strength or self concept in the role of the worker; and the person's prior work experience are the best predictors of success.

9. Stigma toward persons with mental illness is present at many levels in our society and adversely affects opportunities for employment for persons with mental illness. Berven and Driscoll (1981) found that employer bias against persons with psychiatric disabilities is stronger for persons with mental illness than any other disability group. Continued myths and stigma by employers impact employment opportunities, despite legislation barring discrimination.

To better understand some of these nine concrete barriers to rehabilitation and employment, vocational psychologists have attempted to apply vocational theory to persons with chronic mental illness. In Super's (1957) theory of career development he organizes vocational development into life stages: exploration stage (ages 15-25); establishment stage (ages 52-45); maintenance stage (ages 45-65) and the disengagement stage. During the exploration stage, vocational interests become clear, aptitudes mature, skills are acquired and tested through school work and part-time employment, and compromises are made between aspirations and opportunities. In the establishment stage, careers tend to stabilize or stagnate. In the maintenance stage consolidation of status and
planning for and anticipating retirement consume progressively larger proportions of the individual's attention, and modifications of self-perceptions and expectations are similarly directed. The disengagement stage is usually marked by abrupt and formal withdrawal from paid employment.

John Holland's (1973) theory of careers has four key underlying assumptions: (a) most persons can be characterized by one of six personality types (realistic, investigative, aesthetic, social, enterprising or conventional); (b) environments can be characterized in parallel terms; (c) people seek out environments which permit them to exercise their personal attributes, fill compatible roles, and work on agreeable problems; and, (d) behavior is determined by the interaction of the person and the environment. Through the course of typical development, interactions among personal and cultural factors lead people through a process of acquiring preferences, interests and competencies which dispose them to think and act in particular ways. Knowing something about the interaction between the individual and the environment permits prediction of important outcomes, such as adjustment, success and satisfaction.

Individuals with serious mental illness, however, have not had such life experiences that allow for progressive
development and increased self-understanding. Addressing developmental needs first in vocational planning is important because most people with chronic mental illness probably have not developed beyond the growth or the exploration stage. Often there have been limited work opportunities, if any. Other individuals may have worked but had difficult experiences, while some individuals may have vocational experiences coupled with setbacks associated with the episodic nature of serious mental illness. Clients with chronic mental illness often give the impression that work is not important in their lives. Such a perception is understandable, because of the disruptions caused by poor functioning are almost certain to be felt more keenly at work than in other roles. At work, an individual's performance is usually observed carefully and evaluated regularly, so that compared to other roles, poor performance is more visible and has more immediate consequences (Bingham, 1991). The challenge in vocational rehabilitation of individuals with serious mental illness, then, is to facilitate the client's growth through structured work activities that match their current developmental stage. This requires sensitivity to all phases of the vocational rehabilitation process: assessment, plan development and placement.
Vocational Rehabilitation and Individuals with Serious Mental Illness

Marshak and her associates concluded that the success rate for persons with serious mental illness who seek vocational rehabilitation services is still the lowest of any population served. The authors cite a 14 percent successful closure rate at 18 months after application for services for persons with psychiatric disability, as compared to a 32 percent successful closure rate for people with physical disabilities (Marshak, Bostick & Turton, 1990). These authors also state that positive rehabilitation occurred for 500 clients with physical disabilities at a better than 2:1 ratio, as compared to those for 500 clients with serious mental illness (p. 292). Unemployment and underemployment clearly continue to be major problems for people who have mental illness. According to one comprehensive literature review, average employment rates for this population are less than 20 percent (Dion & Anthony, 1987), with the employment rate of the most severely mentally ill between 0 and 15 percent. Other studies indicate that people with serious mental illness experience an unemployment rate of 70 to 85 percent, although a majority have graduated from high school and many have at least some post-secondary education (Anthony, Cohen & Farhas, 1990; Spaniol & Zipple, 1987). Hence, there is
clearly a need for effective vocational rehabilitation efforts for individuals with severe mental illness.

It was not until about the mid 20th century that vocational rehabilitation with persons with SMI began. Although the federal/state vocational rehabilitation (VR) program was established in 1920, it was in 1943 that the Borden-Lafollette Amendments authorized vocational rehabilitation services to mentally ill persons (Tashjian, Hayward, Stoddard & Kraus, 1989). In 1954, PL 83-565 provided for services to large numbers of mentally ill persons, offered incentives for states to target services, and authorized funds for training programs designed to improve the capacity of the mental health and VR system to cooperate. During the 1950s and 1960s, in many states VR counselors who specialized in mental illness were located in state hospitals (Rubin & Roessler, 1978).

Since that time a number of rehabilitation program models have been developed, mostly by private nonprofit agencies such as Fountain House, Horizon House, et al. These include work therapy, research centers for hospitalized mentally ill persons (Gellman, 1967), provision of VR services in a comprehensive psychiatric care program (Jarell, 1964), replications of the Fountain House model of transitional employment (Bean & Beard, 1975), the development of supported employment programs (Revell, Wehman
& Arnold, 1984), the use of long-term sheltered workshops (Wilder, 1981), and post-employment services intended to improve the vocational success of mentally ill persons (Sands & Radin, 1978).

In 1977, the Community Support Program (CSP) initiatives were undertaken. CSP strongly supports the voluntary integration of services for individuals with SMI and full treatment status of vocational rehabilitation programs. Other changes included reducing work disincentives for SSI recipients, and extending transitional and supported employment programs to individuals with SMI (McGurrin, 1994).

Major Vocational Rehabilitation Models

There are currently a variety of vocational rehabilitation models used with individuals with serious mental illness. Many of these programs have demonstrated effectiveness but much remains to be studied on effectiveness across a variety of locations and client groups (McGurrin, 1994). There exists a profound lack of data needed to evaluate the differential impact of VR programs and services for different age, diagnostic, disability status, treatment history, and other relevant groupings of persons with severe mental illness (Bond & McConel, 1991). The following is a review of these major vocational rehabilitation models.
Transitional Employment

Transitional employment (TE) was developed by Fountain House Clubhouse in 1957 as an alternative to the more traditional "train and place" approach. TE consists of essentially time-limited placements, usually six months in length at entry level competitive jobs. Job coaching is gradually decreased as work hours increase. Upon completion of a placement a consumer seeks another TE, returns to the Clubhouse, or locates permanent employment. Fountain House has 50 percent of their daily census of 400 currently performing TE (personal communication, Ralph Bilbo, 1995). The TE model specifically focuses on the development of general work skills by placing participants in temporary entry level jobs with staff supervision only to evaluate employability skills and to provide the participant with an experience that is successful and breaks the pattern of repeated failures (Bond, et. al, 1988). One study by Laird and Krown (1991) reported a 20 percent competitive employment rate for TE participants over a 22-month period.

Supported Employment

The major goal of supported employment (SE) is permanent competitive employment (Wehman & Moon, 1988). The individual receives services as long as necessary to achieve
and maintain placement. SE provides specific training on the job site by a job coach. Although the job coach may actually do significant parts of the client's work initially, the role of the job coach gradually decreases as the client masters the job requirements (Wehman & Melia, 1985; Vandergoot, 1986). Since one of the major impediments to vocational success for persons with severe mental illness is a lack of interpersonal skills, job coaches focus on interpersonal skill development, including modeling appropriate social interactions with co-workers and supervisors (Anthony & Jansen, 1984). One study by Fabian and Wiedefeid (1989) demonstrated a 47 percent six-month job retention rate in an SE program. Between 1986 and 1988, nationwide participation in SE grew from 9,876 to 32,342 persons, according to reports for state rehabilitation agencies (Wehman & Melia, 1990). In the survey 16 percent were diagnosed with long-term mental illness. However, a 1988 survey of rehabilitation facilities in Indiana found that out of over 16,000 clients with SMI, only 135 were found to be in supported or competitive employment (Hornyak, 1987). Unfortunately, for these relatively few individuals who are employed through SE, the types of jobs available are usually entry level, dead-end jobs which lack interest, variety and challenge (Anthony, Cohen & Parkas, 1990; Mausner, 1993; NIIRR, 1992).
Job Clubs

The job club approach was originally developed by Azrin and Besabel (1979). This model places responsibility for finding a job on the individual, with the assistance of the rehabilitation staff. The job club approach utilizes group techniques, which include 32 strategies that the participant is expected to use in pursuing a job. These strategies range from contacting friends and relatives for job leads to developing interview skills and maintaining progress charts. The premise of the club approach is that activity and persistence result in employment (Simmons, Sellech, Steele, Sepetanc, 1993). Most job club reports show 65 percent to 85 percent of all participants enter employment, vastly superior to the 10 to 30 percent placement rates reported for traditional psychiatric work restoration programs (Jacobs, 1988). Limitations of the job club approach include (a) no emphasis on job maintenance, (b) heavy pressure on individual participants, and (c) employment retention rates have not been demonstrated to be long term (Bond, 1991).

PACT Vocational Model

The Program of Assertive Community Treatment (PACT) in Madison, Wisconsin is a comprehensive community level program which integrates both clinical and rehabilitation services within a team approach. Treatment and services
include direct assistance with symptom management, 24-hour crisis availability and facilitation of a supportive environment. Improved vocational functioning is an important component of the PACT model. PACT views work as treatment and outcome with a variety of options including competitive, supportive and work adjustment activities (Russet & Frey, 1991). Ongoing evaluation suggests the PACT model has proven to be effective: PACT clients demonstrated 40 to 50 percent employment at any given time with 80 percent engaged in vocational interventions (Test, Knoedler, Allness & Senn-Binke, 1985).

Post-Employment Support

Post-Employment Support is a facet of supported employment that provides counselling on the job. Multivariate regression analysis of data from six-month follow up interviews conducted with 192 former Threshold clients, a comprehensive rehabilitation facility in Chicago, showed that the only variable significantly related to length of employment was contact with an agency caseworker after leaving the agency (Cook, Jusko & Diakin, 1985).

Sheltered Workshop Programs

Shelter workshop programs have been used historically as a vocational setting for individuals with SMI (Gray, 1980; Roomey, 1984). In the sheltered workshop model,
unskilled work is used to develop employment related skills. Work is performed in a segregated setting with wages usually at a sub-minimum level. There appear to be significant problems with this model, as it does not focus on community job placement and reinforces a low pay level (Whitehead, 1977),

**Consumer Operated Business**

In consumer operated businesses, individuals with SMI establish and operate their own small business—typically yardwork crews, janitorial services and stores. Usually the business is connected with a local rehabilitation agency. While the consumer operated business does show some promise, the operation of the business and the need for business sense seem to limit this model being able to meet the needs of a large portion of persons with SMI (Bond, 1991).

**Rehabilitation Counseling**

Anthony's skill training model has been examined in the context of training rehabilitation counselors (Anthony, 1980). His assumption is that counselors cannot help clients achieve a higher skill level than the counselors themselves exhibit. Some rehabilitation counseling models are based on theories of rehabilitation originally developed for other disability populations. The assumption that rehabilitation concepts developed for the
physically disabled can be adapted to psychiatrically
disabled (Anthony, Cohen & Danley, 1988) has not been
empirically validated (Anthony et al., 1988).

Choose-Get-Keep Model

Another popular model of supported employment for
persons with SMI has been developed by what Anthony (1988)
has called the "Choose-Get-Keep" approach. This model
emphasizes greater involvement of the participant in
selection, acquisition and maintenance of employment.
During the "choose" phase, job or career interests and the
employment goal are selected through a collaborative effort
of the professional staff and participants. The "get" phase
stresses job search activities, job seeking skills, and the
development of individualized training needs, which allow
for the participant to become employed in his or her chosen
job. The final phase of "keeping" the job involves the
delineation of skill deficits, individual supports,
environmental modifications, and service coordination needs
in order to maintain the individual on the job (Flexer &
Solomon, 1993). Concurrent with "choose-get-keep" is a
concern for the development and enhancement of specific
skills needed to ensure successful vocational outcomes.
Danley (1995) states that skill development interventions
include those needed to enable the client to acquire missing
skills (i.e., those the client cannot perform in any
setting) and use existing skills when and where they are needed. Danley summarizes that an effective vocational rehabilitation program using this model includes:
(a) a mission which focuses the resources of the program on increasing client functioning in a vocational environment of choice, while decreasing the amount of long-term professional support; (b) opportunities for developing vocational maturity and enhancing self-esteem;
(c) a structure which constructively and deliberately involves clients in rehabilitation diagnosis, rehabilitation planning and rehabilitation interventions; (d) a network of environments which allows the client to select work or training environments compatible with abilities and preferences; and, (e) the option for intensified support during periods of increased stress during environmental transitions.

Summary—Vocational Rehabilitation Models
Since mid-century, a variety of psychiatric vocational rehabilitation models have evolved. Beginning with hospital based work programs and sheltered workshops, which essentially kept consumers in protected environments, programs have now emerged that offer more community integration with supports as needed (transitional employment, supported employment, choose-get-keep). Not all vocational models, however, have produced equally in terms
of long-term outcomes for persons with SMI (Bond, et al., 1988). Research is needed to better analyze and understand program effectiveness of the models (Simmons et al., 1993).

Many of these models have emerged from non-profit, community based facilities with financial and programmatic support through the federal/state vocational rehabilitation program. As noted, the federal/state vocational rehabilitation program by the mid-1950s was providing vocational rehabilitation services to individuals with SMI and has served the greatest number of persons with psychiatric disabilities. The VR system is in and of itself a unique program model, while within its structure offering some of the previously reviewed programs. The next section provides an overview of the federal/state VR model in relationship to services for individuals with serious mental illness.

**Federal/State Vocational Rehabilitation Model**

The vocational rehabilitation model with the longest history and serving the largest number of persons with severe mental illness is the federal/state VR system. The 1973 Rehabilitation Act emphasized services for the most severely handicapped persons. Prior to this, many persons with severe mental illness were actually declared ineligible for services by the federal/state VR system, because such clients seemed unlikely to benefit from VR services.
While there are differences in state services, the system is overall defined by federal regulations. In most states, VR is located within a department of education, welfare, labor or health. Central office functions include administration, funds management, research, evaluation, and quality control. All direct services to clients are provided in field offices staffed by rehabilitation counselors. The counselor's role involves a combination of clinical skills and brokering (McGurrin, 1994). Funds are available for purchasing services for clients. In addition, counselors are encouraged to arrange for services from other agencies to provide counseling and guidance.

Eligibility for VR services, according to federal regulations, means that a person (a) has a physical or mental impairment which constitutes or results in a substantial impediment to employment; (b) can benefit from VR services in terms of an employment outcome; and, (c) requires VR services to prepare for, enter, or engage in, or retain gainful employment. "Employment outcome" means entering or retaining full-time or part-time competitive employment in the integrated labor market in one of the following areas, as appropriate: the competitive labor market (including the practice of a profession), self-employment, or supported employment (Ohio Rehabilitation Services Commission, 1995).
When a client is determined eligible for services, an Individualized Written Rehabilitation Program (IWRP) must be developed in partnership between the client and the counselor. The IWRP is developed through an assessment of the individual's needs and must be designed to focus on employment goals of the person. Because services are individualized, the type and quality of service varies with each case. Across all state agencies the system is defined in terms of "statuses," or steps in the service process. Status numbers and their meaning for the process are as follows:

00 Referral
02 Application acknowledged
04 Extended evaluation (six months)
06 Extended evaluation (eighteen months)
08 Ineligible (from status 02, 04, or 06)
10 Eligible (for status 02, 04 or 06)
12 Rehabilitation plan completed
30 Unsuccessful closure (from status 12)
14 Counselling
16 Restoration
18 Vocational training
20 Services completed
22 Trial employment
24 Services interrupted
26 Successful closure

28 Unsuccessful closure after receiving some help (from status 20, 22 or 24)

32 Post-employment services

These statuses, in addition to providing structure for the VR process, are convenient for data input, processing and report generation.

The Rehabilitation Act describes an open menu of possible services including:

1. Evaluation of vocational rehabilitation potential, including diagnostic and related services incidental to the determination of eligibility for, and the nature and scope of services to be provided;

2. Counseling and guidance, including personal adjustment counseling, to maintain a counseling relationship throughout the program of services for an individual with handicaps, referral necessary to help individuals with handicaps secure needed services from other agencies, and advising clients and client applicants about client assistance programs;

3. Physical and mental restoration services, necessary to correct or substantially modify a physical or mental condition which is stable or slowly progressive;

4. Vocational and other training services, including personal and vocational adjustment, books, tools, and other training materials except that no training or training services in institutions of higher education (universities, colleges, community/junior colleges, vocational schools, technical institutes, or hospital schools of nursing) may be paid for with funds under this part unless maximum efforts have been made by the State unit to secure grant assistance in whole or in part from other sources;
5. Maintenance, including payments, not exceeding the estimated cost of subsistence and provided at any time after vocational rehabilitation services have begun through the time when postemployment services are being provided. Maintenance covers that individual's basic living expenses, such as food, shelter, clothing, and other subsistence expenses which are necessary to support and derive the full benefit of the other vocational rehabilitation services being provided;

6. Transportation, including necessary travel and related expenses including subsistence during travel (or per diem payments in lieu of subsistence) in connection with transporting individuals with handicaps and their attendants or escorts for the purpose of supporting and deriving the full benefit of the other vocational rehabilitation services being provided. Transportation may include relocation and moving expenses necessary for achieving a vocational rehabilitation objective;

7. Services to members of an individual with handicap's family when necessary to the vocational rehabilitation of the individual with handicaps;

8. Interpreter services and note-taking services for the deaf, including tactile interpreting for deaf-blind individuals;

9. Reader services, rehabilitation teaching services, note-taking services and orientation and mobility services for the blind;

10. Telecommunications, sensory and other technological aids and devices;

11. Recruitment and training services to provide new employment opportunities in the fields of rehabilitation, health, welfare, public safety, law enforcement and other appropriate public service employment;

12. Placement in suitable employment;

13. Post-employment services necessary to maintain or regain other suitable employment;

14. Occupational licenses, including any license, permit or other written authority required by a
State, city or other governmental unit to be obtained in order to enter an occupation or enter a small business, tools, equipment, initial stocks (including livestock) and supplies;

15. Rehabilitation engineering services; and

16. Other goods and services that can reasonably be expected to benefit an individual with handicaps in terms of employability.

(Office of Special Education and Rehabilitation Services, 1990, p. 287)

An individual is rehabilitated (Status 26) if he or she has maintained a vocational placement for at least 60 days. In VR the number of vocational placements, or rehabilitated clients (Status 26), is an important measure of success. The rehabilitation rate, or ratio of successful to unsuccessful clients, is another commonly used indicator of program performance. A nationwide data set on federal/state VR program clients was analyzed by Matrix Research Institute in Philadelphia. The data set covered the period 1984 through 1988 and included both clients with physical and mental health disabilities. Results of the analysis show that about 53 percent of the clients with serious mental illness were classified as vocationally rehabilitated at closure (Status 26). This result may be compared with a higher ratio of approximately 61 percent rehabilitated at closure for clients with physical disabilities (Matrix Research Institute, 1992). In recent years, there has been limited research on the types of
services within the federal/state system that yields employment outcomes for clients. A study by Wheaton et al., however, suggests that more comprehensive rehabilitation programs within the VR system may lead to better employment successes (Wheaton et al., 1996).

A 1989 study by Policy Studies Association, prepared for the Rehabilitation Services Administration, focused on the best practices of VR in providing services to individuals with severe mental illness (Tashjian, Hayward, Stoddard & Kraus, 1989). Some of the most significant findings of this study include:

Thirty-seven state VR agencies use specialized caseloads to some extent in serving SMI clients.

Seventy-three percent of the surveyed VR counselors identified situational assessment, vocational evaluation, psychiatric evaluation and personal interviews as the four most useful sources of information in planning client services.

Work adjustment training was the service most frequently received by the sampled clients (41 percent). According to PSA data, work adjustment and maintenance are the two services psychiatric clients are most likely to receive.

One-half of all sampled clients who obtained employment received no placement service from the VR agency.

Fifty-seven percent of sampled clients were closed rehabilitated. Eighty-nine percent of these clients were independently employed in the competitive labor market, six percent were employed in sheltered workshops, and three percent were closed in either supported or transitional employment.

Only five percent of the sampled clients who were closed rehabilitated received post-employment services.
The report concluded with recommendations for extension of the role of the job coach for clients with serious mental illness, expansion of psychosocial rehabilitation programs, greater emphasis on post-employment services, and expansion of VR and mental health collaboration.

Recent research by Drake et al. points out barriers in the brokered model of vocational rehabilitation provided by the federal/state system when applied to individuals with mental illness. Rather than providing VR services from multiple sources, leading to part- or full-time jobs, it is suggested that clients be allowed to move in and out of jobs according to their illness (Drake et al., 1995). More individualized programs, greater collaboration between mental health and VR agencies, and comprehensiveness of services are needed for this population. In a literature review, Lehman recognizes the need for vocational rehabilitation intervention with individuals diagnosed with schizophrenia but raises issues about the lack of effectiveness studies of vocational rehabilitation models. He calls for a better definition of vocational outcome, comparison of alternative models, and the impact of federal income entitlements on incentives to work (Lehman, 1995).

A study that compared integrated vocational rehabilitation services within a mental health center to a stand-alone rehabilitation agency service found individuals
with more work hours and better wages on follow-up after receiving the more integrated and comprehensive services (Drake et al., 1996). A review of cost-benefit evaluations of VR programs for persons with mental illness suggests that participation in supported employment can boost wages and decrease use of alternative services, but what is needed is more comparison among vocational programs for effectiveness (Rogers, 1995).

The federal/state VR program is in transition. Consideration is now being given to modification of the basic structure of the program to return major control to the states. Much of the controversy surrounding VR has been its inability to serve in a comprehensive basis a great portion of individuals with severe disabilities (GAO Report, 1993). Included in this group are individuals with severe mental illness. Unfortunately, there has been limited research on VR effectiveness, especially with persons with SMI. Lacking data, policy decisions are often made with limited information.

Summary

This chapter has presented a review of the literature analyzed in three major areas: (a) literature related to the extent of, characteristics of, and barriers to employment for individuals with severe mental illness; (b) literature
related to vocational rehabilitation models of individuals with SMI; and, (c) literature about the federal/state vocational rehabilitation system and its effectiveness for persons with severe mental illness. Chapter III provides a description of the methodology used to conduct this study.
CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to investigate the types of vocational rehabilitation (VR) services provided through the federal/state vocational rehabilitation system to individuals with serious mental illness (SMI) and the relationship of these services to employment outcome. Clients in this study participated in vocational rehabilitation services in Ohio during federal fiscal year 1995 (FFY95).

Research questions related to vocational rehabilitation service patterns were:

1a. Are there identifiable patterns of VR services for persons with SMI that can be empirically defined?

1b. Is there a relationship between VR service patterns and rehabilitation outcomes?

2. The research questions concerning the quality of outcomes for persons with SMI who have received VR services and have become employed (Status 26) were:
2a. Is there a significant difference between the service patterns and types of occupations?

2b. Is there an association between the service patterns and the wages earned?

Variables

The dependent variables in this study are: rehabilitation outcomes, a categorical variable with two levels (Status 26 and Status 28); type of occupation (first digit of the Dictionary of Occupational Titles' code, the Occupational Category), a categorical variable with nine levels; and wages at closure, a continuous variable with interval scaling. Independent variables were service groups, a categorical variable with undetermined levels.

Subjects

The subjects in this study were clients in the Ohio Rehabilitation Services Commission (ORSC) who received vocational rehabilitation services during FFY95 through an Individualized Written Rehabilitation Plan (IWRP). Subjects were obtained through examination of 1995 client data through the RSA-911 reporting system. All clients were classified as individuals with serious mental illness. All persons in the sample were identified on the RSA 911 as having a mental illness and had been closed either successfully (Status 26) or unsuccessfully (Status 28). Mental illness includes persons with psychotic disorders,
neurotic disorders, and other mental/emotional disorders. Successful closure is defined as remaining employed for at least 60 days. An unsuccessful closure is defined as an individual receiving at least one service but not being employed. A sample of 658 individuals was chosen from 2198 cases of individuals with serious mental illness who received VR services; and a subsample of 309 cases of individuals who received VR services and were closed successfully employed for at least 60 days (Status 26) was chosen. Permission to use data for this study was granted by the Administrator of the Ohio Rehabilitation Services Commission.

Instrument

The instrument used to collect the data was the RSC-0001 coding form, included in every Ohio Rehabilitation Services Commission client case and collected through the ORSC central data base. The instrument is completed by vocational rehabilitation staff upon the opening and closing of each case. There are 141 data elements, although this study will use only the following:

Primary Disabling Condition
Type Services:
  Diagnostic
  Restoration
  College Training
  Business/Vocational School
  Adjustment Training
  On-the-Job Training
  Miscellaneous Training
Counseling
Job Referral Services
Job Placement Services
Transportation
Income Maintenance
Other Services

Work Status At Closure (Occupational Category, 1st Digit of DOT Code)
Weekly Earnings at Closure

(Ohio Rehabilitation Services Commission, 1995)

The RSA-911 follows federal guidelines established by the Rehabilitation Services Administration (Rehabilitation Services Administration, 1995) and is used in each state. Although RSA has devised cross checks of the data, there is an unknown element of miscoding or lack of coding that exists with collection and analysis of this type of archival data. In the data analysis when this was suspected, based on past analysis and current knowledge of VR operations, this data was excluded to improve both validity and reliability. At the time of data entry, 18 comparison checks were utilized to promote consistency, coherence, and utility of RSA-911 data elements, and the validity of measurements derived from these data elements (Rehabilitation Services Administration, 1995).

Data Collection Procedure

Archival data collected by the Ohio Rehabilitation Services Commission during federal fiscal year 1995 (FFY95) was used for this study. The data was recorded on the RSC-0001 form by VR staff at all statewide ORSC field offices.
and entered into the central computer system by staff. This data was coded into the resulting statewide database, the RSA-911.

Analysis of Data

This study utilized the Statistical Package for Social Science for the Mainframe (SPSS; Norusis, 1993). SPSS has the capacity to calculate both descriptive and inferential statistics. Descriptive statistics were generated on all variables under study.

Research Question 1

Research question 1a. Are there identifiable patterns of VR service for persons with SMI that can be empirically defined? A cluster analysis was used to identify patterns of vocational rehabilitation services. The purpose of this analysis was to ascertain if patterns of VR service could be identified to aid in hypothesis generation about the unique service groups individuals with SMI are being provided and subsequent association with employment.

Clustering method. Within groups average linkage method was used as the clustering method. The within groups average linkage method was used for two reasons: (a) it is a compromise between the single link and the complete link methods which tend to be more restrictive when combining cases, and (b) the clustering results are the most
interpretable (i.e., in size and configuration) (Aldenderfer & Blashfield, 1984; Romesburg, 1990).

Within groups average linkage begins with each subject in his or her own "cluster" and progresses to the level where all subjects are merged into one all-inclusive cluster. At each level in the hierarchy, two existing clusters are merged to form the next level of the hierarchy; the merger that is effected is the one that will result in the smallest increase in the variance within the cluster relative to all other possible mergers at that level (Aldenderfer & Blashfield, 1984; Romesburg, 1990).

**Choice of similarity measure.** When variables are binary, special distance and similarity measures are required (Norusis, 1990). Many are based on measures of association for contingency tables. In this study, the resemblance coefficient used was the "simple matching" (SM) measure. The SM measure was used to define the total number of matches over the 13 service variables. The SM measure was chosen as positive and negative matches are treated equally (Aldenderfer & Blashfield, 1984). This allows for consideration of the lack of a variable's existence as well as its occurrences. A proximity matrix was then created and a cluster analysis was run.

**Computer program used.** This study utilized the Statistical Package for Social Science for the Mainframe (SPSS; Norusis, 1990). The CLUSTER program was used.
Method of determining number of clusters. Specifying SCHEDULE in SPSS CLUSTER program "displays the order in which and distances at which items and clusters combine to form new clusters" (Norusis, 1990, p. 365). Using this list, one looks for a "jump" in the value of these distances. A jump indicates that two relatively dissimilar clusters have been joined; "...thus the number of clusters prior to the merger is the most probable solution" (Aldenderfer & Blashfield, 1984, p. 57). This analysis began with no a priori assumptions about the number of clusters that would be found. Clusters were chosen based on analysis of the agglomeration schedule generated by SPSS.

Research question 1b. Is there a relationship between VR service patterns and rehabilitation outcomes? Service patterns (a categorical variable with undetermined levels) and rehabilitation outcomes (a categorical variable with two levels, Status 26 and Status 28) were analyzed using a chi-square analysis with the Pearson test statistic and the Cramer's V as a measure of association (Ary, Jacobs, & Razavich, 1990).

Research Question 2

The research questions concerning the quality of outcomes for persons with serious mental illness who have received VR services and have become employed were:

52
(2a) Is there a relationship between service patterns and type of occupation? The service patterns identified by the cluster analysis from Research Question 1 were used to define the service groups used in Research Question 2. A chi-square was used with service group (a categorical variable with undetermined levels) and type of occupation (a categorical variable with nine levels). Cramer's V was the measure of association. Standardized residuals were examined to determine which cells in the cross tabulation table added most to the chi-square statistic.

(2b) Is there a relationship between the service patterns and wages earned? A one-way analysis of variance (ANOVA) was used to determine if a difference exists among the service groups defined by the cluster analysis (a categorical variable) and weekly income at case closure (continuous variable). An F statistic was used to test differences. Eta was used as a measure of association between cluster membership and wages. If the omnibus F test was significant, contrasts were conducted post hoc.

Basic Assumptions

This study assumed that the instrument used for data collection was valid and reliable. The study made no assumptions of causality.
Summary

This chapter has described the procedures used to conduct this study. Chapter IV reports the findings of the study as they relate to the questions in the statement of the problem.
CHAPTER 4

FINDINGS

Introduction

This chapter presents the results from the analysis of the data. The purpose of this study was to investigate the types of vocational rehabilitation services provided through the federal/state vocational rehabilitation system to individuals with serious mental illness (SMI) and the relationship of these services to employment outcome. Clients in this study participated in vocational rehabilitation services in Ohio during federal fiscal year 1995 (FFY95).

Research questions related to vocational rehabilitation service patterns were:

1a. Are there identifiable patterns of VR services for persons with SMI that can be empirically defined?

1b. Is there a relationship between VR services patterns and rehabilitation outcomes?

2. The research questions concerning the quality of outcomes for persons with SMI who have received VR services and have been employed were:
2a. Is there a significant difference between the service patterns and types of occupations?

2b. Is there an association between the service patterns and the wages earned?

Review of Methodology

A cluster analysis was performed using the average linking within groups clustering method and the simple matching measure of distance and similarity. The cluster analysis was used to define clusters of service groups based on the 13 vocational rehabilitation services that SMI clients received (n = 658). Association between type of cluster and case outcome was analyzed by a chi-square. After clusters were defined, analyses were performed on those successfully employed clients to establish the quality of their outcome based on wages and type of occupations using a one-way analysis of variance (ANOVA) and a chi-square, respectively. The sample population was 658 cases of individuals with serious mental illness who received VR services and were closed successfully or unsuccessfully. This sample was drawn from 2198 cases of individuals who received VR services; 309 of the 658 cases were closed successfully employed and served as a further subsample.

Presentation of Results

This chapter is divided into three sections. The first section contains certain demographic factors related to the
population under study, including diagnoses and closure status.

The findings from the analysis of the data for the first research question are reviewed in Section 2. Demographic variables are reviewed first. The cluster analysis is presented with an analysis of service groups. Relationship of service groups to outcome will then be noted.

In the third section data are presented related to quality of vocational outcomes. Demographic variables are reviewed first. Specifically, differences existing between service groups and type of occupations and wages at closure will be shown.

Section 1 of the Findings

Demographic Variables

Prior to an examination of the data related to answering the research questions, certain demographic factors related to the population under study are reviewed, including diagnosis, closure status, and rehabilitation services.

Diagnosis. Demographic information relevant to diagnosis (type of serious mental illness) is listed in Table 1. The Rehabilitation Services Commission codes serious mental illness in three categories on the RSA-911:
psychotic disorders, neurotic disorders, and other mental/emotional disorders.

Table 1 presents the percentage distribution of individuals with serious mental illness who received VR services. The findings are summarized in Table 1. The results are as follows: psychotic disorder (n = 297, 45%), neurotic disorder (n = 219, 33%), and other mental/emotional disorders (n = 142, 22%).
<table>
<thead>
<tr>
<th>Type of mental illness</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychotic disorder</td>
<td>297</td>
<td>45</td>
</tr>
<tr>
<td>Neurotic disorder</td>
<td>219</td>
<td>33</td>
</tr>
<tr>
<td>Other mental/emotional disorders</td>
<td>142</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>658</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1

Percentage Distribution of Individuals with Serious Mental Illness Who Received VR Services
Closure status. Table 2 lists the frequency and percentage of closure status for individuals with serious mental illness who received VR services. In the federal/state rehabilitation system a movement of cases are categorized in 32 different statuses, numbered 00 to 32 (see Chapter 2). Status 26 closures are those cases who received VR services that were closed successfully employed for 60 days. Status 28 closures are those cases that received VR services but were closed not employed. The findings are summarized in Table 2. Table 2 presents the distribution of closure status for individuals with serious mental illness who received VR services.
<table>
<thead>
<tr>
<th>Type of closure status</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status 26</td>
<td>309</td>
<td>47</td>
</tr>
<tr>
<td>Status 28</td>
<td>349</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>658</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2

Sample Distribution of Closure Status for Individuals (n = 658) with Serious Mental Illness Who Received VR Services
Rehabilitation services. Table 3 presents the sample distribution of rehabilitation services for individuals with serious mental illness. The percentages do not sum to 100% because an individual can receive more than one service. The two most common services were diagnostic service (81.1%) and physical or mental restoration services (76.8%). The three least common services were: on-the-job training (5%), college training (12.4%), and business/vocational training (12.9%).

Table 3 presents the sample distribution of rehabilitation services for individuals with serious mental illness. The findings are summarized in Table 3.
<table>
<thead>
<tr>
<th>Type of service</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>534</td>
<td>81.1</td>
</tr>
<tr>
<td>Physical and mental restoration</td>
<td>506</td>
<td>76.8</td>
</tr>
<tr>
<td>College training</td>
<td>82</td>
<td>12.4</td>
</tr>
<tr>
<td>Business/vocational training</td>
<td>85</td>
<td>12.9</td>
</tr>
<tr>
<td>Adjustment training</td>
<td>211</td>
<td>32.0</td>
</tr>
<tr>
<td>On-the-job training</td>
<td>35</td>
<td>5.0</td>
</tr>
<tr>
<td>Miscellaneous training</td>
<td>169</td>
<td>25.6</td>
</tr>
<tr>
<td>Counseling</td>
<td>215</td>
<td>32.6</td>
</tr>
<tr>
<td>Job referral</td>
<td>223</td>
<td>33.8</td>
</tr>
<tr>
<td>Job placement</td>
<td>311</td>
<td>47.3</td>
</tr>
<tr>
<td>Transportation</td>
<td>253</td>
<td>38.4</td>
</tr>
<tr>
<td>Income maintenance</td>
<td>126</td>
<td>19.1</td>
</tr>
<tr>
<td>Other service</td>
<td>194</td>
<td>29.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>658</td>
<td></td>
</tr>
</tbody>
</table>

Note. The individual cell counts do not sum to the column total, and percentages do not sum to 100%, because a person could appear in more than one cell.

Table 3

Sample Distribution of Rehabilitation Services for Individuals (n = 658) with Serious Mental Illness
Comparison of Type of Mental Illness and Closure Status

Crosstabulation tables were constructed, and type of serious mental illness was compared with closure status. This question arose after data on Status 26 and 28 closures were run on individuals with mental illness prior to the cluster analysis.

Table 4 presents the types of mental illness by closure status. There is no significant relationship between type of mental illness and closure status: \( \chi^2 (2, \ n = 616) = .6627; \ p > .05; \text{ Cramer's } \nu = .03. \)
<table>
<thead>
<tr>
<th>Type of mental illness</th>
<th>Psychotic</th>
<th>Neurotic</th>
<th>Other mental/emotional disorder</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status 26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>142</td>
<td>105</td>
<td>61</td>
<td>308</td>
</tr>
<tr>
<td>Column %</td>
<td>46.1</td>
<td>34.1</td>
<td>19.8</td>
<td>50.0</td>
</tr>
<tr>
<td>ASRESID</td>
<td>0.8</td>
<td>-0.6</td>
<td>-0.3</td>
<td></td>
</tr>
<tr>
<td>Status 28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>132</td>
<td>112</td>
<td>64</td>
<td>308</td>
</tr>
<tr>
<td>Column %</td>
<td>42.9</td>
<td>36.4</td>
<td>20.8</td>
<td>50.0</td>
</tr>
<tr>
<td>ASRESID</td>
<td>-0.8</td>
<td>0.6</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>274</td>
<td>217</td>
<td>125</td>
<td>616a</td>
</tr>
<tr>
<td>Total %</td>
<td>44.5</td>
<td>35.2</td>
<td>20.3</td>
<td>100</td>
</tr>
</tbody>
</table>

Note. \( \chi^2 (2, n = 616) = .6627; \ p > .05; \) Cramer's \( V = .03. \)

a42 cases were not coded as receiving services.

Table 4
Types of Mental Illness by Closure Status (26 and 28)
Section 2 of the Findings

In this section variables examined consisted of those relevant to the first research question. Research questions related to vocational rehabilitation service patterns were:

(1a) Are there identifiable patterns of VR services for persons with serious mental illness (SMI) that can be specifically defined?; and (1b), Is there a relationship between VR service patterns and rehabilitation outcomes?

Cases closed successfully employed (Status 26) and those closed unsuccessfully employed (Status 28) after receiving VR services were used to answer the first research question (n = 658). These cases were drawn from the entire group of SMI cases closed Status 26 or Status 28 from the Ohio Rehabilitation Services Commission during FFY95 (n = 2198). A comparison of the sample population of 658 individuals used for the cluster analysis was compared to the 1,540 cases closed Status 26 and Status 28 that were not used in the cluster analysis to answer the first research question. This was done to ascertain the similarity of the groups.

Comparison of SMI Sample with SMI Population

To ascertain if the sample population of SMI individuals used in the cluster analyses and the remainder of the SMI cases closed post services were independent, crosstabulation tables were constructed as shown in Table 5.
Each cell in the table contains the number of persons in the cell, the percentage of persons in the column, and the adjusted standardized residual (ASRESID), a statistical criterion with a mean of 0 and a standard deviation of 1. Interpretation of the tables is enhanced by comparing the ASRESIDs. Because the ASRESID is normally distributed, it can be thought of as a z-score with the value plus or minus 2 as indicating the column deviates significantly from zero (i.e., departs markedly from the model of independence). Positive ASRESIDs indicate there are more persons in that cell than would be expected and vice versa (Reynolds, 1984).

In addition to the cell contents, chi-square test results are included.

Table 5 presents individuals with serious mental illness closed Status 26 or Status 28 (n = 2198); there is no significant difference between the SMI sample (n = 658) used in the cluster analysis and the remaining cases (n = 1540) not used in the cluster analysis.
<table>
<thead>
<tr>
<th>Individuals in cluster analysis sample</th>
<th>Type of mental illness</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Psychotic</td>
<td>Neurotic</td>
<td>Other mental/emotional disorder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>731</td>
<td>485</td>
<td>324</td>
<td>1540</td>
<td></td>
</tr>
<tr>
<td>Column %</td>
<td>71.1</td>
<td>68.9</td>
<td>69.5</td>
<td>70.1</td>
<td></td>
</tr>
<tr>
<td>ASRESID</td>
<td>1.0</td>
<td>-0.8</td>
<td>-0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>297</td>
<td>219</td>
<td>142</td>
<td>658</td>
<td></td>
</tr>
<tr>
<td>Column %</td>
<td>28.9</td>
<td>31.1</td>
<td>30.5</td>
<td>29.9</td>
<td></td>
</tr>
<tr>
<td>ASRESID</td>
<td>-1.0</td>
<td>0.8</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1028</td>
<td>704</td>
<td>466</td>
<td>2198</td>
<td></td>
</tr>
<tr>
<td>Total %</td>
<td>46.8</td>
<td>32.0</td>
<td>21.2</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Note. $\chi^2 (2, n = 2198) = 1.06002; p > .05.$
Cluster Analysis for Status 26 and Status 28 Cases

A cluster analysis was performed for the 658 cases who received one or more of the 13 vocational rehabilitation service and were closed employed (Status 26) or unsuccessful (Status 28). A cluster analysis was used to determine service patterns by clustering the VR services into logical groups based on frequency of services' occurrences. Within groups average linkage method was used as the clustering method. The resemblance coefficient used was the simple matching measure. Using the simple matching measure allows for equal consideration for a VR service's existence or nonexistence in determining a service pattern.

The cluster analysis was performed by SPSS for the mainframe and the "jump" method was used to determine the optimal numbers of clusters. Requesting the subcommand SCHEDULE in SPSS displays the order and distance at which clusters form new clusters (SPSS, 1990). Using this list, one looks for a "jump" in the value to these distances. A large jump indicates that two relatively dissimilar clusters have been joined "thus the number of clusters prior to the merger is the most probable solution" (Alenderfer & Blashfield, 1984, p. 57). A five-cluster solution was selected based on the size of the "jump" from the five- to the six-cluster solution.

The profile of the five-cluster solution for 26 and 28 closures of SMI cases is shown in Table 6. In the summary
of results, below, each cluster has been named by its predominate characteristics. The names are meant to quickly summarize the cluster's make-up and are not meant to exclude other names that might be equally appropriate. In looking at the clusters, it should be remembered that a one (1) indicates that the majority of persons received the service; it does not mean that all persons received the service.

**Overall cluster results.** For all five clusters some results are the same. The majority of consumers in all clusters received diagnostic service, but in none of the clusters was restoration, college, business/vocational training or on-the-job training rendered to the majority of consumers.

**Cluster 1—The "Minimalist" Cluster.** Consumers in this cluster received a small number of services. In addition to diagnostic services (received by all clusters), the majority of individuals received only adjustment training and counseling services.

**Cluster 2—The "Adjustment Only" Cluster.** In addition to diagnostic services, the only other service a majority of persons received was adjustment training, which was received by 60% of individuals in this cluster.

**Cluster 3—The "Counseling/Placement" Cluster.** Aside from diagnostic services, the majority of individuals in Cluster 3 received counseling and job placement. Counseling was received in four of five clusters.
Cluster 4--The "Job Placement Plus" Cluster. The majority of individuals in this cluster received a comprehensive package of services including diagnostic, miscellaneous training, counseling, job referral, job placement, and other services.

Cluster 5--The "Job Placement Plus Maintenance" Cluster. The same comprehensive services were received in Cluster 5 as in Cluster 4, with the addition of transportation and maintenance support services and the subtraction of other services. Aside from diagnostic services, persons in Cluster 5 received the following services: job placement services (93%), job referrals (89%), transportation (100%) and maintenance (61%).

Table 6 summarizes the services received by the majority of consumers in each of the five clusters. The number one (1) indicates that the majority of persons in that cluster received the service, and a zero (0) indicates that less than a majority of persons in that cluster received the service.
<table>
<thead>
<tr>
<th>Type of service</th>
<th>Cluster (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1(159)</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>1</td>
</tr>
<tr>
<td>Restoration</td>
<td>0</td>
</tr>
<tr>
<td>College</td>
<td>0</td>
</tr>
<tr>
<td>Business/voc. school</td>
<td>0</td>
</tr>
<tr>
<td>Adjustment training</td>
<td>1</td>
</tr>
<tr>
<td>On-the-job training</td>
<td>0</td>
</tr>
<tr>
<td>Misc. training</td>
<td>0</td>
</tr>
<tr>
<td>Counseling</td>
<td>1</td>
</tr>
<tr>
<td>Job referral</td>
<td>0</td>
</tr>
<tr>
<td>Job placement</td>
<td>0</td>
</tr>
<tr>
<td>Transportation</td>
<td>0</td>
</tr>
<tr>
<td>Maintenance</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>

*42 cases of n = 658 were not coded as receiving a service.

Table 6
Within Cluster Average Link Method
26 and 28 Closures of SMI Cases (n = 616)*
Table 7 presents the type of mental illness by cluster membership. This analysis was run after the cluster memberships were established and arose as a result of interest in cluster composition. There is a significant but not strong relationship between clusters and type of mental illness. There are more individuals coded psychotic in Cluster 4 than expected; fewer individuals coded psychotic in Cluster 1 than expected; and fewer individuals coded other mental/emotional disorders in Cluster 4 than expected.
<table>
<thead>
<tr>
<th>Cluster</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Psychotic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>59</td>
<td>85</td>
<td>46</td>
<td>51</td>
<td>33</td>
<td>274</td>
</tr>
<tr>
<td>Column %</td>
<td>37.1</td>
<td>44.0</td>
<td>44.2</td>
<td>58.0</td>
<td>45.8</td>
<td>44.5</td>
</tr>
<tr>
<td>ASRESID</td>
<td>-2.2</td>
<td>-0.1</td>
<td>-0.1</td>
<td>2.7</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td><strong>Neurotic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>66</td>
<td>63</td>
<td>40</td>
<td>29</td>
<td>19</td>
<td>217</td>
</tr>
<tr>
<td>Column %</td>
<td>41.5</td>
<td>32.6</td>
<td>38.5</td>
<td>33.0</td>
<td>26.4</td>
<td>35.2</td>
</tr>
<tr>
<td>ASRESID</td>
<td>1.9</td>
<td>-0.9</td>
<td>0.8</td>
<td>-0.5</td>
<td>-1.7</td>
<td></td>
</tr>
<tr>
<td><strong>Other mental/emotional disorder</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>34</td>
<td>45</td>
<td>18</td>
<td>8</td>
<td>20</td>
<td>125</td>
</tr>
<tr>
<td>Column %</td>
<td>21.4</td>
<td>23.3</td>
<td>17.3</td>
<td>9.1</td>
<td>27.8</td>
<td>20.3</td>
</tr>
<tr>
<td>ASRESID</td>
<td>0.4</td>
<td>1.3</td>
<td>-0.8</td>
<td>-2.8</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>159</td>
<td>193</td>
<td>104</td>
<td>88</td>
<td>72</td>
<td>616</td>
</tr>
<tr>
<td>Total %</td>
<td>25.8</td>
<td>31.3</td>
<td>16.9</td>
<td>14.3</td>
<td>11.7</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note. $\chi^2 (8, n = 616) = 18.60; p < .05; Cramer's V = .12.*

Table 7

Types of Mental Illness by Cluster Membership

(Status 26 and Status 28)
Table 8 presents crosstabulations, chi-square and Cramer's $V$ for cluster membership by closure status. The findings of this analysis are summarized in Table 8. The analysis suggests two findings. First, there is a significant relationship between Status 26 and Clusters 3, 4 and 5. Secondly, there is a significant relationship between Status 28 and Clusters 1 and 2.
<table>
<thead>
<tr>
<th>Cluster</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status 26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>54</td>
<td>64</td>
<td>67</td>
<td>66</td>
<td>57</td>
<td>308</td>
</tr>
<tr>
<td>Column %</td>
<td>34.0</td>
<td>33.2</td>
<td>64.4</td>
<td>75.0</td>
<td>79.2</td>
<td>50.0</td>
</tr>
<tr>
<td>ASRESID</td>
<td>-4.7</td>
<td>-5.6</td>
<td>3.2</td>
<td>5.1</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>Status 28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>105</td>
<td>129</td>
<td>37</td>
<td>22</td>
<td>15</td>
<td>308</td>
</tr>
<tr>
<td>Column %</td>
<td>66.0</td>
<td>66.8</td>
<td>35.6</td>
<td>25.0</td>
<td>20.8</td>
<td>50.0</td>
</tr>
<tr>
<td>ASRESID</td>
<td>4.7</td>
<td>5.6</td>
<td>-3.2</td>
<td>-5.1</td>
<td>-5.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>159</td>
<td>193</td>
<td>104</td>
<td>88</td>
<td>72</td>
<td>616</td>
</tr>
<tr>
<td>Total %</td>
<td>25.8</td>
<td>31.3</td>
<td>16.9</td>
<td>14.3</td>
<td>11.7</td>
<td>100</td>
</tr>
</tbody>
</table>

Note. χ² (4, n = 616) = 64.10; p < .0001; Cramer's V = .30.

Table 8
Crosstabulations, Chi-square, and Cramer's V for Cluster Membership by Closure Status (26 and 28)
Section 3 of the Findings

In this section variables examined consisted of those related to the second research question. The research questions concerning the quality of outcomes for persons with SMI who have received VR services and have become employed (Status 26) were: (2a) Is there a significant difference between the service groups and types of occupation?; and, (2b) Is there an association between the service pattern and the wages earned?

Cases closed successfully employed (Status 26) after received VR services were used to answer the second research question (n = 309). These cases were a subsample of cases taken from the entire group of SMI cases closed Status 26 for FFY95 (n = 976).

Cluster Analysis for Status 26 Cases

A cluster analysis was performed for the 305 cases who received one or more of the 13 vocational rehabilitation services and were closed successfully employed (Status 26). A cluster analysis was used with this group to determine if service patterns existed by the formation of logical groups based on frequency of service occurrences. The same clustering method (within groups average linkage) and resemblance coefficient (simple matching) were used as in the clustering procedure for both Status 26 and Status 28 cases previously reviewed.
Using the "jump" method to determine the best cluster solution, the five-cluster solution was considered optimal for cases closed successfully, Status 26. The profile of the five-cluster solution is shown in Table 9. In the summary of results, below, each cluster has been named based on its predominate characteristics. The names are meant to quickly summarize the cluster's make-up and are not meant to exclude other names that might be equally appropriate. In looking at the clusters, it should be remembered that the majority of persons received the service; it does not mean that all persons received the service.

Overall cluster results. For all five of the clusters, some results are the same. The majority of all individuals received diagnostic services, but in none of the clusters was restoration, college, business/vocational training, on-the-job training, or other services rendered to a majority of consumers.

Cluster 1—The "Counseling" Cluster. Consumers in this cluster received only counseling services in addition to diagnostic.

Cluster 2—The "Diagnostic" Cluster. The majority of individuals in this cluster received only diagnostic services.

Cluster 3—The "Adjustment/Placement" Cluster. The majority of consumers received a package of adjustment
training, counseling, placement services, and transportation.

Cluster 4—The "Job Placement" Cluster. Majority services in miscellaneous training, counseling, job referral, and job placement were received in Cluster 4. This could be seen as a standard job placement package.

Cluster 5—The "Job Placement Plus" Cluster. Consumers in Cluster 5 received counseling, job referral, job placement, transportation and maintenance services.

Table 9 represents the five clusters of cases closed successfully (Status 26) based on services received. The numeral one (1) indicates that the majority of persons in that cluster received the service.
<table>
<thead>
<tr>
<th>Type of service</th>
<th>Cluster (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1(54)</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>1</td>
</tr>
<tr>
<td>Restoration</td>
<td>0</td>
</tr>
<tr>
<td>College</td>
<td>0</td>
</tr>
<tr>
<td>Business/voc. school</td>
<td>0</td>
</tr>
<tr>
<td>Adjustment training</td>
<td>0</td>
</tr>
<tr>
<td>On-the-job training</td>
<td>0</td>
</tr>
<tr>
<td>Misc. training</td>
<td>0</td>
</tr>
<tr>
<td>Counseling</td>
<td>1</td>
</tr>
<tr>
<td>Job referral</td>
<td>0</td>
</tr>
<tr>
<td>Job placement</td>
<td>0</td>
</tr>
<tr>
<td>Transportation</td>
<td>0</td>
</tr>
<tr>
<td>Maintenance</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>

4 cases of n = 309 were not coded as receiving a service.

Table 9

**Within Cluster Average Link Method**

26 Closure of SMI Cases (n = 305)
Quality of Outcome

Two research questions related to the quality of outcomes remain to be answered: Is there a significant difference between the service groups and types of occupations?; and, Is there an association between the service patterns and the wages earned?

In order to answer the first question a chi-square was used with service groups and types of occupations. Cramer’s $V$ was the measure of association. Adjusted standardized residuals were examined to determine which cells in the crosstabulation added most to the chi-square statistics. A one-way analysis of variance (ANOVA) was used to determine if differences existed among the service groups as defined by the cluster analysis and income at case closure. An $F$ statistic was used to test differences. Eta was used as a measure of association between cluster membership and wages. Three planned contrasts were done to determine if there was significance among mean wages of the clusters.

Demographic Variables

Table 10 presents the distribution of the first digit (the Occupational Category) of the Dictionary of Occupational Titles (U.S. Department of Labor, 1991) for individuals with serious mental illness who are employed. The findings are summarized in Table 10.
<table>
<thead>
<tr>
<th>Type of occupation</th>
<th>Occupational Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional, technical, management</td>
<td>0/1</td>
<td>39</td>
<td>11</td>
</tr>
<tr>
<td>Clerical and sales</td>
<td>2</td>
<td>69</td>
<td>23</td>
</tr>
<tr>
<td>Services</td>
<td>3</td>
<td>96</td>
<td>32</td>
</tr>
<tr>
<td>Agricultural</td>
<td>4</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Processing</td>
<td>5</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Machine Trade</td>
<td>6</td>
<td>25</td>
<td>8</td>
</tr>
<tr>
<td>Benchwork</td>
<td>7</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Structural</td>
<td>8</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>Misc.</td>
<td>9</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>303</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 10

Sample Distribution of the Occupational Categories for Individuals with Serious Mental Illness Who Were Closed Status 26

82
Table 11 presents the relationship tendencies between clusters (service patterns) and occupational categories. There is a small relationship between service pattern and occupational category (Cramer's $V = .30$). More individuals than expected were in professional, technical/management occupations in Cluster 1; more individuals than expected were in machine trade occupations in Cluster 1; more individuals than expected in processing occupations were in Cluster 2; more individuals than expected were in benchwork occupations in Cluster 3; more individuals than expected were in service occupations in Cluster 4; fewer individuals than expected were in professional, technical/management occupations in Cluster 2.

Table 11 presents the relationship tendencies between cluster (service pattern) and the occupational categories.
<table>
<thead>
<tr>
<th>Occupational Categories</th>
<th>Count/Column %</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/1 Prof/tech/mgt</td>
<td>Count/Column %</td>
<td>17(43.6)</td>
<td>2(5.1)</td>
<td>8(20.5)</td>
<td>4(10.3)</td>
<td>0(12.3)</td>
<td>39(11.0)</td>
</tr>
<tr>
<td>ASRESID</td>
<td></td>
<td>3.9</td>
<td>-2.9</td>
<td>0.1</td>
<td>-1.6</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>2 Clerical, sales</td>
<td>Count/Column %</td>
<td>8(11.6)</td>
<td>15(21.7)</td>
<td>12(17.4)</td>
<td>16(23.2)</td>
<td>18(26.1)</td>
<td>69(23.0)</td>
</tr>
<tr>
<td>ASRESID</td>
<td></td>
<td>-1.5</td>
<td>0.2</td>
<td>-0.9</td>
<td>0.5</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>3 Service</td>
<td>Count/Column %</td>
<td>12(12.5)</td>
<td>24(25.0)</td>
<td>17(17.7)</td>
<td>30(31.3)</td>
<td>13(13.5)</td>
<td>96(32.0)</td>
</tr>
<tr>
<td>ASRESID</td>
<td></td>
<td>-1.6</td>
<td>1.2</td>
<td>-1.1</td>
<td>2.9</td>
<td>-1.6</td>
<td></td>
</tr>
<tr>
<td>4 Agricultural</td>
<td>Count/Column %</td>
<td>1(14.3)</td>
<td>3(42.9)</td>
<td>3(42.9)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>7(2.0)</td>
</tr>
<tr>
<td>ASRESID</td>
<td></td>
<td>-0.2</td>
<td>1.5</td>
<td>1.4</td>
<td>-1.4</td>
<td>-1.3</td>
<td></td>
</tr>
<tr>
<td>5 Processing</td>
<td>Count/Column %</td>
<td>0(0)</td>
<td>5(71.4)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>2(28.6)</td>
<td>7(2.0)</td>
</tr>
<tr>
<td>ASRESID</td>
<td></td>
<td>-1.2</td>
<td>3.3</td>
<td>-1.4</td>
<td>-1.4</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>6 Machine trade</td>
<td>Count/Column %</td>
<td>9(36.0)</td>
<td>5(20.0)</td>
<td>5(20.0)</td>
<td>2(8.0)</td>
<td>4(16.0)</td>
<td>25(8.0)</td>
</tr>
<tr>
<td>ASRESID</td>
<td></td>
<td>2.5</td>
<td>-0.1</td>
<td>0.2</td>
<td>-1.7</td>
<td>-0.4</td>
<td></td>
</tr>
<tr>
<td>7 Benchwork</td>
<td>Count/Column %</td>
<td>1(5.3)</td>
<td>3(15.8)</td>
<td>10(52.6)</td>
<td>1(5.3)</td>
<td>4(21.1)</td>
<td>19(6.0)</td>
</tr>
<tr>
<td>ASRESID</td>
<td></td>
<td>-1.5</td>
<td>-0.6</td>
<td>3.4</td>
<td>-1.7</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>8 Structural</td>
<td>Count/Column %</td>
<td>3(17.6)</td>
<td>3(17.6)</td>
<td>4(23.5)</td>
<td>3(17.6)</td>
<td>4(23.5)</td>
<td>17(6.0)</td>
</tr>
<tr>
<td>ASRESID</td>
<td></td>
<td>0</td>
<td>-0.3</td>
<td>0.2</td>
<td>-0.4</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>9 Misc.</td>
<td>Count/Column %</td>
<td>3(12.5)</td>
<td>3(12.5)</td>
<td>6(25.0)</td>
<td>8(33.3)</td>
<td>4(16.7)</td>
<td>24(8.0)</td>
</tr>
<tr>
<td>ASRESID</td>
<td></td>
<td>-0.7</td>
<td>-1.0</td>
<td>0.4</td>
<td>1.5</td>
<td>-0.3</td>
<td></td>
</tr>
<tr>
<td>Count/Total %</td>
<td></td>
<td>54(17.8)</td>
<td>63(20.8)</td>
<td>65(21.5)</td>
<td>64(21.1)</td>
<td>57(18.8)</td>
<td>303(100)</td>
</tr>
</tbody>
</table>

Note. $\chi^2 (36, n = 351) = 79.28; p < .05; \text{Cramer's } \hat{V} = .30.$

Table 11

Chi-square Between Cluster and Occupational Categories
Table 12 presents the distribution of earnings at closure for individuals with serious mental illness. For the 305 individuals of the sample closed successfully the mean earnings was $5.88 per hour (standard deviation = 2.41) with a range of $1.50 per hour to $25.00 per hour.

Table 13 presents the distribution of working hours per week for individuals with serious mental illness who received VR services and became employed. For the 305 individuals employed, hours worked ranged from 2 to 75 hours per week with a mean of 28.2 hours worked (standard deviation = 10.5).

Table 14 presents the mean weekly wage for each of the five clusters.
<table>
<thead>
<tr>
<th>Hourly wage interval</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00-3.00</td>
<td>7</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>3.01-5.00</td>
<td>21</td>
<td>15.0</td>
<td>52.0</td>
</tr>
<tr>
<td>5.01-7.00</td>
<td>24</td>
<td>26.0</td>
<td>81.3</td>
</tr>
<tr>
<td>7.01-9.00</td>
<td>18</td>
<td>1.3</td>
<td>92.5</td>
</tr>
<tr>
<td>9.01-11.00</td>
<td>7</td>
<td>0.3</td>
<td>95.7</td>
</tr>
<tr>
<td>11.01-13.00</td>
<td>4</td>
<td>0.7</td>
<td>99</td>
</tr>
<tr>
<td>13.01-15.00</td>
<td>2</td>
<td>0.3</td>
<td>99</td>
</tr>
<tr>
<td>15.01-17.00</td>
<td>0</td>
<td>0</td>
<td>99</td>
</tr>
<tr>
<td>17.01-19.00</td>
<td>1</td>
<td>0.3</td>
<td>99</td>
</tr>
<tr>
<td>19.01-21.00</td>
<td>0</td>
<td>0</td>
<td>99</td>
</tr>
<tr>
<td>21.01-22.00</td>
<td>0</td>
<td>0</td>
<td>99</td>
</tr>
<tr>
<td>22.01-24.00</td>
<td>0</td>
<td>0</td>
<td>99</td>
</tr>
<tr>
<td>24.01-26.01</td>
<td>1</td>
<td>0.3</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>305</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

*aMean = 5.88; standard deviation = 2.41; median = 5.05; minimum = $1.50; maximum = $25.00.*

Table 12

**Earnings at Closure for Individuals with Serious Mental Illness Who Received VR Services and Became Employed**

86
<table>
<thead>
<tr>
<th>Working hours interval</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-10</td>
<td>15</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>11-20</td>
<td>99</td>
<td>32</td>
<td>37</td>
</tr>
<tr>
<td>21-30</td>
<td>74</td>
<td>25</td>
<td>63</td>
</tr>
<tr>
<td>31-40</td>
<td>114</td>
<td>37</td>
<td>99</td>
</tr>
<tr>
<td>41+</td>
<td>3</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>305</strong></td>
<td><strong>100</strong></td>
<td><strong>93</strong></td>
</tr>
</tbody>
</table>

*aMean = 28.2; standard deviation = 10.5; median = 26; minimum = 2; maximum = 75.

Table 13

*Working Hours per Week at Closure for Individuals with Serious Mental Illness Who Received VR Services and Became Employed*
Table 14

Means of Weekly Wages for the Five Different Clusters of Status 26 Closures

<table>
<thead>
<tr>
<th>Cluster</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean wages&lt;sup&gt;a&lt;/sup&gt;</td>
<td>227.64</td>
<td>167.08</td>
<td>163.75</td>
<td>144.31</td>
<td>173.31</td>
<td></td>
</tr>
<tr>
<td>n =</td>
<td>54</td>
<td>63</td>
<td>67</td>
<td>64</td>
<td>57</td>
<td>305</td>
</tr>
</tbody>
</table>

<sup>a</sup>Dollars per week.
A one-way analysis of variance (ANOVA) was performed to determine if there is a difference in wage means based on cluster membership. This analysis is summarized in Table 15. The $F$ for the five clusters was statistically significant, $F(4, 300) = 4.426, p < .002$. An eta-square of .056 indicates that approximately 5.6% of the variance in wages is accounted for by cluster membership.
### Table 15

**Analysis of Variance (ANOVA) of Wages by the Five Different Clusters**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clusters</td>
<td>4</td>
<td>55444.690</td>
<td>4.426</td>
<td>.002</td>
</tr>
<tr>
<td>Residual</td>
<td>300</td>
<td>12526.227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>304</td>
<td>13090.944</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Eta = .236; eta-square = .056.*
Relationship Between Wages and Cluster Membership

The other part of research question two asked is there a relationship between wages and cluster membership? Analysis of Table 8 indicated that the clusters differed in number and type of services received. Consequently, a number of possible hypotheses of interest could be generated. Of particular concern were the following questions:

1. Is there a relationship between the number of services received and wages?

2. Do groups receiving a similar number but different types of services differ in wages?

These two questions were answered using three planned contrasts. Question 1 compared high service groups (Clusters 3, 4 and 5) to the low service groups (Clusters 1 and 2). Question 2 was answered by comparing the two low service groups to each other (Clusters 1 and 2), and the two highest service groups to each other (Clusters 4 and 5). For low service groups (Clusters 1 and 2), Was counseling related to wages?; and for the two high service groups, Was the addition of services beyond the core services of counseling, job referral and job placement related to average wage at closure?
Table 16 presents the results of these contrasts of wages by service cluster. Contrast 1 selected Cluster 1 and 2 contrasted with Clusters 3, 4, and 5. Contrast 2 selected Cluster 4 contrasted with Cluster 5. Contrast 3 selected Cluster 1 contrasted with Cluster 2. The results indicate that Contrast 1 and Contrast 3 are significant at the .05 level with 1.96 being the critical level.
Table 16

Post Hoc Contrasts of Wages by Clusters

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2 vs. 3,4,5</td>
<td>300</td>
<td>1.980</td>
<td>.049*</td>
</tr>
<tr>
<td>4 vs. 5</td>
<td>300</td>
<td>1.674</td>
<td>.095</td>
</tr>
<tr>
<td>1 vs. 2</td>
<td>300</td>
<td>2.868</td>
<td>.004*</td>
</tr>
</tbody>
</table>

*p < .05.
Summary

This study addressed two research questions:

1. Research questions related to vocational rehabilitation service patterns were:
   1a. Are there identifiable patterns of VR service for persons with SMI that can be empirically defined?
   1b. Is there a relationship between VR service patterns and rehabilitation outcomes?

2. The research questions concerning the quality of outcomes for persons with SMI who have received VR services and have been employed were:
   2a. Is there a significant difference between the service patterns and types of occupations?
   2b. Is there an association between the service patterns and the wages earned?

A sample of 658 cases of individuals with serious mental illness who received vocational rehabilitation services was taken from 2198 cases closed during FFY95 from the Ohio Rehabilitation Services Commission. A cluster analysis was performed that resulted in five clusters of service patterns formed, based on frequency of VR service usage. No difference was demonstrated between type of mental illness and case outcome. These service clusters through a chi-square were compared to closure status (26 and 28) with significance showing between service clusters and
case outcome status. Certain rehabilitation services were utilized more frequently than others with this population. For those who became employed, a five-cluster solution was determined based on frequency of service. A chi-square demonstrated a relationship between cluster membership (service patterns) and occupation. A one-way ANOVA exhibited a relationship between cluster membership (service patterns) and wages earned. A post hoc analysis of three contrasts among clusters, based on wages, demonstrated significance between VR services received and wages earned.
CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains three sections: (1) a summary of the study; (2) conclusions generated from data which are addressed by the research questions; and (3) recommendations for future research.

The purpose of this study was to investigate the types of vocational rehabilitation services provided through the federal/state vocational rehabilitation system to individuals with serious mental illness (SMI) and the relationship of these services to employment outcome. Specifically, this study sought to answer two research questions:

1. Research questions related to vocational rehabilitation service patterns:
   1a. Are there identifiable patterns of vocational rehabilitation (VR) services for persons with SMI that can be empirically defined?
   1b. Is there a relationship between VR service patterns and rehabilitation outcomes?
2. The research questions concerning the quality of outcomes for persons with SMI who have received VR services and have become employed (Status 26):

2a. Is there a significant difference between the service patterns and types of occupation?

2b. Is there an association between the service patterns and the wages earned?

Summary

The subjects in this study were clients in the Ohio Rehabilitation Services Commission who received vocational rehabilitation services during FFY95 through an Individualized Rehabilitation Plan (IWRP). Subjects were obtained through examination of 1995 client data through the RSA-911 federal/state reporting system. All clients were classified as having a diagnosis of serious mental illness. Results can be generalized to individuals with mental illness who participated in the Ohio federal/state vocational rehabilitation system and received rehabilitation services. Six hundred and fifty-eight individuals who received VR services and were closed successfully and unsuccessfully were randomly chosen as the sample. A subsample of 309 individuals whose cases were closed employed (Status 26) were chosen for the second research question.

Demographic information revealed that of the sample (n = 658) most individuals had a psychotic disorder (45%).
Individuals with a neurotic disorder (33%) and clients coded with other mental/emotional disorders (22%) comprised the remainder of the sample. Of the cases in the sample, 53% were closed unsuccessfully (Status 28) after receiving vocational rehabilitation services; 47% of the sample were able to gain employment and were closed successfully (Status 26). The SMI sample (n = 658) was compared to the SMI population of closed Status 26 and 28 cases not used in the cluster analysis and there was no significant difference between the two groups based on diagnosis. There was no relationship between type of mental illness and successful (26) or unsuccessful (28) closure. Types of vocational rehabilitation services were divided among thirteen services, with each client able to receive more than one service. Of the 13 services, 81% received diagnostic services, 77% received physical or mental restoration services, 47% received job placement services, 38% received transportation services, 34% received job referral services, 32% received adjustment training, and 32% received counseling services. Only 5% received on-the-job training, with the remaining services being miscellaneous training (26%), income maintenance (19%) and college training (12%).

Using a simple matching measure of association and within groups average linking as the clustering method, a five-cluster solution was reached for individuals closed successfully (26) and unsuccessfully (28) (n = 658). These
five clusters or groups were based on the number of individuals receiving and not receiving the thirteen vocational rehabilitation services. For all five clusters some results were the same, with the majority receiving diagnostic services in all clusters, but in no clusters were restoration services, college, business/vocational training or on-the-job training rendered to the majority of consumers. Cluster 1 was deemed the Minimalist Cluster as these consumers received minimal VR services. Cluster 2 was called the Adjustment Only Cluster with adjustment training being received by a majority of consumers. Counseling/placement were the primary services in Cluster 3. A more comprehensive package of services—including diagnostic, miscellaneous training, counseling, job referral, job placement, and other services—were in Cluster 4, the Job Placement Plus Cluster. Cluster 5 added transportation and maintenance to Cluster 4 services and was termed the Job Placement Plus Maintenance Cluster.

Comparing clusters to employment status showed a significant relationship between Clusters 3, 4, and 5 and successful employment (Status 26) as well as a significant relationship between unsuccessful closure (Status 28) and Clusters 1 and 2. Thus, it appears that service patterns or clusters of services that provide more comprehensive vocational rehabilitation services are yielding more successful employment outcomes (Status 26).
There was some relationship between cluster membership (service pattern) and type of mental illness. More individuals diagnosed as psychotic were in Cluster 4 (Job Placement Plus) than expected; fewer individuals diagnosed psychotic were in Cluster 1 (Minimalist) than expected; and fewer than expected individuals diagnosed with other mental/emotional disorders were in Cluster 4 (Job Placement).

Those cases with successful employment outcomes \( (n = 309) \) were also clustered into five groups called: (1) the Counseling Cluster, (2) the Diagnostic Cluster, (3) the Adjustment/Placement Cluster, (4) the Job Placement Cluster, and (5) the Job Placement Plus Cluster. There were similarities in the services received by a majority of individuals in the five service groups from cases closed successfully \( (n = 309) \) and not successfully \( (n = 658) \) and the five cluster service groups for those closed successfully \( (n = 309) \). In both groups all clusters included diagnostic services. Counseling was included in all but one cluster in both groups. Income maintenance was present in only one cluster grouping for both groups (Cluster 5). In both groups of individuals no service groupings included restoration, college, or on-the-job training services.

There was a relationship between type of occupation and cluster membership for those successfully closed. More
skilled occupational categories (professional, technical, management and machine trades) were provided more counseling services than expected. Service occupational categories individuals were given more Cluster 4 services (counseling, job referral, job placement, and miscellaneous training). Processing occupation receivers were getting minimal services while benchwork individuals received a mixture of services (Cluster 3).

Most successful SMI clients (Status 26) are working 33 - 40 hours per week (36%) with a mean of 28.2 and with a standard deviation of 10.5. Most successful SMI clients (Status 26) are earning between $4.15 - $5.00 per hour (47%) with a mean of $5.88 and a standard deviation of 2.41. A one-way analysis of variance (ANOVA) was performed to determine if there is a difference of wages earned based on cluster membership. 5.6% of the variance in wages is related to cluster membership. Post hoc tests determined there was some relationship among wages and clusters depending on the number of contrasts made.

Conclusions

The Relevance and Significance of Results by Research Questions

The first research question. The first research question posed by the study was: Related to vocational rehabilitation service patterns, (1a) Are there identifiable
patterns of VR services for persons with serious mental illness (SMI) that can be defined?; and, (b) Is there a relationship between VR service patterns and rehabilitation outcomes?

Patterns of rehabilitation service were ascertained through a cluster analysis of the sample SMI cases for those individuals receiving services who were closed successfully (Status 26) and unsuccessfully (Status 28). A sample of 658 cases closed during FFY95 by the Ohio Rehabilitation Services Commission were used. The clustering method allowed for equal weight to be given for those individuals within clusters who received a majority of a rehabilitation service as well as those who received less than a majority of a service in a cluster. Five clusters were ultimately designated based on points of departure between similarity and dissimilarity among the clusters.

For all five clusters some results were the same. The majority of all consumers in all clusters received diagnostic service, but in none of the clusters was restoration, college, business/vocational training or on-the-job training rendered to the majority of consumers.

Cluster 1 was called the Minimalist Cluster. Consumers in this cluster received minimal services. In addition to diagnostic services (received by all clusters), individuals received adjustment training and counseling services.
Cluster 2 was named the Adjustment Only Cluster. In addition to diagnostic services, the only other service persons received was adjustment training, which was received by 60% of individuals in this cluster.

Cluster 3 was named the Counseling/Placement Cluster. Aside from diagnostic services, individuals in Cluster 3 received counseling and job placement. Counseling was received in four of five clusters.

Cluster 4 was deemed the Job Placement Plus Cluster. Individuals in this cluster received a comprehensive package of services including diagnostic, miscellaneous training, counseling, job referral, job placement, and other services.

Cluster 5 was known as the Job Placement Plus Maintenance Cluster. The same comprehensive services were received in Cluster 5 as in Cluster 4, with the addition of transportation and maintenance support services. "Other" services were not received by a majority of consumers in this cluster; 93% received job placement services; 89%, job referral services; 100%, transportation; and 61%, maintenance services.

This cluster analysis demonstrated that, based on frequency of service, some clearly defined patterns of VR services were seen, ranging from minimal services to more comprehensive services focused on training and job placement. It is noteworthy that some services were received by less than 50% of individuals in all clusters.
These services were: restorations, college, business/vocational training or on-the-job training.

A chi-square analysis with a Cramer's $V$ as a measure of association were run to determine if a relationship existed between service patterns (clusters) and employment outcome (Status 26 and Status 28). There was a significant relationship between Clusters 3, 4, and 5 and successful employment (Status 26) as well as a significant relationship between unsuccessful closure (Status 28) and Clusters 1 and 2. Those clusters with more comprehensive VR services yielded more successfully employed clients.

The second research question. The second research question that was answered by this study was: Concerning the quality of outcomes for persons with serious mental illness who have received vocational rehabilitation services and have become employed (Status 26), (2a) Is there a significant difference between the VR service patterns and types of occupations?; and, (2b) Is there an association between the service groups and the wages earned?

Five cluster groups of service patterns were also established for only successfully employed clients using a cluster analysis. These five clusters or groups were based on the number of individuals receiving and not receiving the thirteen vocational rehabilitation services. A sample of 309 cases of individuals who had serious mental illness, received VR services, and became employed, were used.
The five-cluster solution was also considered optimal for cases closed successfully, Status 26. In the summary of results, below, each cluster has been named based on its predominate characteristics. The names are meant to quickly summarize the cluster’s make-up and are not meant to exclude other names that might also be equally appropriate. In looking at the clusters, it should be remembered that the majority of persons received the service; it does not mean that all persons received the service.

For all five of the clusters, some results are the same. The majority of all individuals received diagnostic services, but in none of the clusters was restoration, college, business/vocational training, on-the-job training, or other services rendered to a majority of consumers. This pattern parallels closely the lack of services found in the clustering of service groupings for those in the sample closed unsuccessfully and successfully.

Cluster 1 was called the Counseling Cluster. Consumers in this cluster received only counseling services in addition to diagnostic.

Cluster 2 was named the Diagnostic Cluster. Individuals in this cluster received a majority of any service other than diagnostic.

Cluster 3 was named the Adjustment/Placement Cluster. The majority of consumers received a package of adjustment, counseling, and placement services with transportation.
Cluster 4 was deemed the Job Placement Cluster. Majority services in miscellaneous training, counseling, job referral, and job placement were received in Cluster 4. This could be seen as a standard job placement package.

Cluster 5 was referred to as the Job Placement Plus Cluster. Consumers in Cluster 5 received counseling, job referral, job placement, transportation and maintenance services.

With this SMI population successful closures (Status 26) tended to receive minimal to more comprehensive services. It is of note that no clusters had a majority of consumers obtaining restoration, college, business/vocational school, on-the-job training, or other services. Appearing in only one cluster were adjustment training and income maintenance. In all but one cluster was counseling services. All clusters included diagnostic services. Diagnostic services are an important component of the state/federal eligibility process, with a mental illness diagnosis needed to be established for program admission.

There was a moderate relationship between service cluster and occupational category. More individuals than expected were in professional, technical/management occupations in Cluster 1; more individuals than expected were in machine trade occupations in Cluster 1; more processing occupations were in Cluster 2 than expected. More benchwork occupations were in Cluster 3 than expected.
More service occupations were in Cluster 4 than expected. Fewer individuals than expected were in professional, technical/management occupations in Cluster 2.

More skilled occupational categories such as professional and machine trades are being provided more counseling services than expected, with less skilled occupational categories like processing being provided minimal services. Service occupational categories were being provided more job placement type services than expected. To some degree, state/federal counselors in this sample of individuals with serious mental illness are focusing more on counseling services for more professional/technical and managerial occupations.

The data finds that 5.6% of the variance in wages is accounted for by cluster membership. Three planned contrasts demonstrated that significant difference in terms of wages existed between individuals receiving minimal services and individuals receiving more comprehensive service. A significant difference existed in mean wages between service Clusters 1 and 2 when compared to Clusters 3, 4 and 5. Those individuals with more comprehensive services were significantly different on wages than those individuals with fewer services. Significant difference also existed between Clusters 1 and 2 on mean wages. Cluster 1 individuals received the addition of counseling services to diagnostic services received in both Clusters 1 and 2.
No significant difference was noted between mean wages in Clusters 4 and 5. Thus, there was no significant difference in wages between the two high service groups that added services beyond the core group of counseling, job referral, and job placement. Cluster 4 had the lowest mean weekly wage (141.31). Cluster 1 had the highest mean weekly wage (227.64). Cluster 1 was the cluster with more professional/technical occupations than expected and Cluster 4 was the cluster with more service occupations than expected. Cluster 1 was deemed the Counseling Cluster. Cluster 4 was the Job Placement Cluster.

In summary, individuals in this sample of state/federal clients who are diagnosed as having a serious mental illness (SMI) who have received VR services tend to cluster in five service patterns ranging from less to more comprehensive services. Five groups of similar make-up cluster on service patterns regardless of successful or unsuccessful closure. There is a relationship between more comprehensive services and a successful employment outcome. For those successful individuals in this sample there is some difference between their service patterns and type of occupational outcome. In general, more-skilled workers tend to receive less comprehensive services than those in lesser-skilled occupations who tend to receive more comprehensive vocational services. Both successful and unsuccessful closures in this population are receiving less frequently
certain VR services. Job placement services, provided with other supportive services, may improve chances for employment. These findings are consistent with those in other studies that support more comprehensive job oriented rehabilitation services for individuals with serious mental illness (Anthony, Cohen & Danley, 1988; Tashijian, Hayward, Stoddard & Kraus, 1989; Danley, 1995; Lehman, 1995; Drake et al., 1996). Finally, types of service pattern reflect in the weekly wage differential among those in the sample successfully employed, with recipients of more comprehensive service earning a significant difference in weekly wages as opposed to individuals who receive less comprehensive services.

**General Discussion and Limitations**

The motivation for this study came from experience in models of vocational rehabilitation services to individuals with serious mental illness. In particular, it was noted that individuals with this disability have a high rate of unemployment despite their skills and desire for employment (Putnam, 1994).

This study was an effort to analyze data around the population of individuals with serious mental illness and the types of vocational services they received in the state/federal rehabilitation model in relationship to employment outcomes. Past research has shown a lower rate
of success in rehabilitation outcomes for those with mental disabilities compared to individuals with physical disabilities within the VR system (Putnam, 1992; Harris, 1986; Marshak, Bostic & Tinton, 1990).

The results of this study suggest that individuals with serious mental illness in this midwestern state who receive vocational rehabilitation services and become successfully employed, generally have a pattern of VR services that are more comprehensive. In particular, those individuals with SMI who receive job referral and placement services with supportive services such as adjustment training, counseling, income maintenance and transportation are more employed more frequently. The quality of the employment as measured by wages tends to be reflective of those individuals who receive more comprehensive vocational rehabilitation services and those who enter higher skilled occupations. It is noteworthy that several services are used more infrequently with individuals with serious mental illness, including: on-the-job training, business/vocational training, and college training. Work adjustment training was found to be used of a lesser amount than has been reported in previous studies (Tashijian, Hayward, Stoddard & Kraus, 1989). This would raise questions around why those type of services with this population would seem to be underutilized in their vocational rehabilitation planning. Certainly individuals with serious mental illness would be
capable of completing skill enhancement training provided by
college or vocational training. Likewise, efforts to
educate employers and develop individuals' job skills
through on-the-job training would seem to be a profitable
avenue for rehabilitation. The dearth of these services in
this study for individuals with serious mental illness
warrants further research and review by policy makers.
Understanding that each individual's plan is uniquely their
own, inclusion of some of these services as a part of a VR
package could enhance employment outcomes. Given the
underserved nature of this population by the federal/state
system, this study suggests optimal outcomes may be achieved
by more comprehensive services. This study also suggests
that with this sample the most severely diagnosed
individuals (psychotic) were receiving comprehensive type VR
services. Also of note was the finding that type of mental
illness was not associated with successful outcome. This
supports research that suggests that the type of mental
illness has minimal impact on functioning in an employment
setting (Anthony & Jansen, 1984). A frequent myth is that
serious mental illness prohibits employment.

As stated previously, there are several models of
vocational rehabilitation services for individuals with
serious mental illness. A limitation of this study was that
it focused on only one model: the federal/state vocational
rehabilitation system. Other models, including transitional
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employment, psychosocial rehabilitation, job clubs, and sheltered workshops, were not studied for their effectiveness. This study did not isolate on supported employment efforts within the VR system with this population either. The sample for this study were individuals who had been accepted, determined eligible, and received VR services. This study represents only individuals, then, who were able to seek out and become accepted by the federal/state VR program. While 43 percent of this sample were closed successfully employed, as noted in Chapter 4, these were individuals who had both been accepted into the VR process and had an Individualized Written Rehabilitation Plan (IWRP). This sample did not include individuals with mental illness who did not access the VR system to this degree. An additional limitation of this study is the use of diagnostic categories of the federal/state system which may interfere with successful outcomes with individuals who have mental illness (Rutman, 1994). In addition, there are other variables, not controlled for, that could support positive employment outcomes, other than services provided. This study was limited in that these other factors were not considered. Since this study reviewed existing data, there was no control group. Finally, given the self-selected nature of the sample, those who were most successful (employed) naturally were those who completed the program and received services.
Directions for Future Research

With the high rate of unemployment among individuals with serious mental illness, research is needed to facilitate access to successful vocational rehabilitation programs. There is evidence to suggest tentatively that many forms of vocational rehabilitation contribute to at least partial vocational restoration of persons disabled by serious and persistent mental illness (McGurrrin, 1994). Bond and McConel (1990) point out the lack of research in psychiatric vocational rehabilitation mirrors the low priority given to vocational issues in mental health programs. This study looked at only one model of vocational rehabilitation, the federal/state program. Within that model, research should be conducted to draw service comparisons among individuals with physical and mental disabilities—focusing specifically on what types of services with specific types of disability groups foster better employment outcomes. In addition, research needs to be conducted on how individuals with serious mental illness can better access the federal/state VR system. What efforts can be undertaken to improve linkage of VR programs to mental health services? In Ohio, the federal/state system is in its fourth year of a project to improve access and outcomes to this population through a program of collaboration with mental health boards and local nonprofit
agencies. Preliminary results suggest improved employment outcomes, greater numbers served, and less expensive case service costs (Ohio Rehabilitation Services Commission, 1995). One such program, called COVA's (Center of Vocational Alternatives for Mental Health, Inc.) Job Place, has melded improved vocational preparation through a mental health funded access center that seems to enhance employment outcomes in conjunction with the federal/state program (Finch, 1996). More research is needed in programs like these to pinpoint keys to improving employment outcomes.

Further research is needed to identify successful components of VR models. Comparison studies are often difficult because of differing operational definitions of successful outcomes (Lehman, 1995). But in this age of managed health care, studies that focus on models of achieving employment success will assist in allocation of scarce resources. Direct cost-benefit analyses would also facilitate determination of priorities in funding and ought to lead to greater consolidation of effective vocational rehabilitation programs for individuals with serious mental illness.

Finally, it is recommended that replication or confirmatory studies be undertaken using similar data from the federal/state vocational rehabilitation program. Emphasis should be on identifying in even more detail the kinds of services that are yielding optimal outcome.
Vocational rehabilitation services, while helpful to some, are underserving the mental health population. The extent to which service delivery models can be enhanced for maximum success remains a challenge.
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