

ABSTRACT

Title of Dissertation: VOCATIONAL REHABILITATION OUTCOMES: A STUDY ON
THE RELATIONSHIP BETWEEN REHABILITATION GOALS
AND EMPLOYMENT OUTCOMES

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The purpose of this study was to examine the relationship between vocational rehabilitation clients' Individualized Plan for Employment (IPE) rehabilitation goals and vocational rehabilitation employment outcomes. The study examined the relationship between participants' demographic and disability variables to determine the effect on employment outcomes. The study also explored whether attaining a job congruent with the (IPE) vocational rehabilitation goal increased the participant's vocational satisfaction and wages. Study participants were 171 vocational rehabilitation clients served by the Maryland State Department of Education Division of Rehabilitation Services (DORS) who were successfully rehabilitated and closed (Status 26) in 2002. Participants research data was obtained from the DORS computerized database.

Results generally supported the relationship between Holland's person-environment congruence constructs to employment outcomes for this population.

The IPE goal and employment outcome congruency was found to have a significant effect on participants' wages (at the .01 level). The mean weekly wage for participants who obtained an employment outcome congruent to the IPE rehabilitation goal earned \$529.88. Participants who obtained a related employment outcome earned \$343.85, and participants who obtained an employment outcome not related to the IPE goal earned \$286.22. In addition, educational attainment and disability category were also found to effect vocational rehabilitation employment outcomes (at the .01 level). However, person-environment congruence did not increase participants' vocational satisfaction.

This study adds to the literature on vocational rehabilitation employment outcomes by confirming the relationship between Holland's person-environment congruency to successful outcomes among this population. This study was the first to demonstrate a link between person-environment congruency and wages for the vocational rehabilitation population. Theoretical, applied, research implications, limitations of the study and directions for future research are discussed.

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BETWEEN REHABILITATION GOALS AND EMPLOYMENT OUTCOMES

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
2003

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ACKNOWLEDGMENTS

Anyone who has ever written a dissertation or observed the experience first hand knows the process can feel exhausting and overwhelming. I would like to sincerely thank those persons who made this research possible.

I first have to thank my advisor, Dr. Ellen Fabian, whose patience and encouragement assured me that I would finish this degree someday. Her expertise and editorial suggestions were very helpful. My experience with her has been a very supportive relationship that I hope to continue after my graduate school days.

Second, I have to thank Jean Jackson, who I have known for a very long time and whose guidance and support made this research possible. She always directed me to the right person to obtain research data and provided critical logistic and emotional assistance.

I am also grateful to Dr. Mitchell Dayton and Roy Levy who provided statistical expertise and assistance for my research and statistical analysis. They were extremely knowledgeable and supportive when I was struggling with statistical dilemmas.

But the most irrefutable fact related to this dissertation is that I could not have completed it without the support of my wife, Denise Beveridge. Her love and care have made this possible for me. During the times when I was challenged with statistical dilemmas her support was unfailing.

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CHAPTER 1

Introduction

Researchers have estimated that 53 million Americans have a disability (U.S. Census Bureau, 2003), and 26.4 million Americans of working age have a work related disability (U.S. Census Bureau, 2001). According to another recent study, 13 percent (or 21.3 million persons), of working-age Americans have a disability (National Health Interview Survey, 1994-1995). The 1994-1995 National Health Interview Survey found that 79% of American adults without disabilities were working, while only 37% of those with disabilities were employed.

The major available vocational assistance service for adults with disabilities in America is the federal vocational rehabilitation program (VR). This service system, legislatively established in 1917, provides services to an estimated 1.21 million individuals with disabilities each year. Researchers have estimated that as many as 3.3 million Americans might benefit from vocational rehabilitation services (Hayward & Schmidt-Davis, 2000). Recent changes to laws have mandated VR services for individuals with the most severe disabilities, defined by the Rehabilitation Services Administration (RSA) as:

A person has a severe disability if he or she has a physical or mental disability, or combination thereof, that (1) severely limits one or more functional capacities (e.g., mobility, communications, or self care) related to employment, (2) is expected to require multiple rehabilitation services, and (3) causes substantial functional limitations.

Background Legislation

For more than eighty years, rehabilitation legislation in the United States has assisted persons with disabilities to become employed and develop independence. Early Federal rehabilitation legislation began with the Smith-Hughes Act in 1917. This Act was the first legislation that provided federal matching funds for vocational education programs. In 1920, legislation was enacted that established the civilian vocational rehabilitation program as a temporary program. In 1935, the Social Security Act finally established vocational rehabilitation as a permanent program. The rehabilitation legislation under which vocational rehabilitation services are currently provided is the Rehabilitation Act of 1973 and its amendments. The 1992 amendments to the Rehabilitation Act of 1973 stresses, “respect for the individual dignity, personal responsibility, self-determination, and the pursuit of meaningful careers, based on informed choice” [1992 Rehabilitation Act Amendments, Sec. 2(1)]. The 1973 Act mandated that individuals with the most severe disabilities have priority for vocational rehabilitation services.

The 1998 Rehabilitation Act Amendments focused vocational rehabilitation services on obtaining employment outcomes consistent with the client’s Individualized Plan for Employment (IPE). As specified in section 103 of the 1998 Rehabilitation Act Amendments, vocational rehabilitation services for individuals are:

...any services described in an individualized plan for employment necessary to assist an individual with a disability in preparing for, securing, retaining, or regaining an employment outcome that is consistent with the strengths,

resources, priorities, concerns, abilities, capabilities, interests, and informed choice of the individual . . . (Section 103(a)).

Such vocational rehabilitation services can include a variety of medical, psychological, case management, vocational training, counseling and other types of rehabilitation services.

Since its earliest roots, vocational rehabilitation has been a case management and purchase of services program. Vocational rehabilitation counselors review applicants' medical and psychological documentation to determine eligibility for vocational rehabilitation services. If the applicant is determined to be eligible for rehabilitation services, the counselor assists the client in developing an Individualized Plan for Employment (IPE). The counselor then refers the applicant for the appropriate vocational rehabilitation services with the goal of obtaining employment.

Individualized Plan for Employment

The 1998 Rehabilitation Act Amendments mandate that every individual receiving vocational rehabilitation services must have an Individualized Plan for Employment (IPE). The guidelines for Individualized Plan for Employment are specified in the Rehabilitation Services Administration's VR Policies and Procedures. Section 600 mandates that every individual must complete an (IPE) before any VR services will be provided. Second, regulations state that an (IPE) shall be developed no later than 120 days after an individual has been determined eligible for VR services. Third, an (IPE) shall be "developed and implemented in a manner that affords eligible individuals the opportunity to exercise informed choice in selecting an employment outcome, the specific vocational rehabilitation services to be provided under the IPE, the entity that

will provide the vocational rehabilitation services, and the methods used to procure the services.” Fourth, an (IPE) shall be developed to achieve the employment goal of the individual, “consistent with the strengths, resources, priorities, concerns, abilities, capabilities, interests, and informed choice of the individual. The IPE shall be developed in the manner chosen by the individual and signed by the individual and, as appropriate, the individual’s representative.” (RSA, 2003).

Successful vocational rehabilitation closure (referred to as “Status 26”) in the federal program is defined as attaining and maintaining employment for 90 days. In 2000, the federal vocational rehabilitation program served approximately 1.21 million persons, and assisted 223,600 persons with disabilities to obtain employment (Status 26). The federal vocational rehabilitation program has averaged a 62% successful case closure rate from 1998-2000 (RSA-911 data, 2003). Successful closures tend to be higher for white Americans than minority groups (Moore, 2002; Wilson et al., 2002; Wheaton et al., 1996). In addition, disability type affects closure status, with the most severe disabling conditions (e.g., quadriplegia) having the poorest vocational rehabilitation outcomes (Longitudinal Study of the Vocational Rehabilitation Services Program, 2002; Bolton et al., 2000). The Maryland Division of Rehabilitation Services, the State VR program that provided the study sample for this investigation, has a slightly higher success rate than the federal program - 70.6 percent successful closures (DORS, 2003).

Although the VR program has demonstrated effectiveness by its percentage rate of successful closures, several concerns have been raised in recent years. The primary concern is about job retention. Although the public VR system is effective in assisting

people with disabilities to secure a job; job duration has been a notable problem, particularly for some disabled groups, such as individuals with psychiatric and developmental disabilities (Lehman, 2002; Roessler, 2003; Roessler, 1985). For example, studies that have examined work retention for clients of the public VR program have reported employment rates drop off to 75% three months following a successful (Status 26) closure. Of even greater concern, approximately 50% were not employed 12 months following closure.

A second concern that has been raised is the issue of client choice in vocational rehabilitation employment outcomes. The 1992 Amendments to the Rehabilitation Act of 1973 mandated consumer choice in the identification of a vocational goal. Decades of research in vocational psychology support the relationship between choice and employment; people are more likely to be satisfied and stay with jobs that are congruent or consistent with their vocational choice (Dawis, 1996; Holland, 1992). However, no studies have examined the issue of choice for clients of the vocational rehabilitation program, in regard to how well the job obtained matched the goal specified on their Individual Plan for Employment (IPE).

This issue is particularly important in vocational rehabilitation because follow up studies of employment outcomes for individuals with severe disabilities have found that clients most frequently acquire “secondary labor market jobs” that are elemental in nature such as food service, laundry, janitorial services, or clerical work (Fabian, Waterworth & Ripke, 1993; Rogers, 1998), unstable (49% retention rate) and unsatisfying for most individuals who obtained employment through vocational rehabilitation services (Roessler, 1985). This raises the issue of whether these types of

jobs are consistent with consumer choice, or of sufficient quality to encourage longer-term retention.

The primary issue that this research is designed to address is the relationship between congruence of the individual's IPE vocational rehabilitation goal and the (Status 26) employment outcome. Congruence refers to the degree of fit between the individual's personality and work environment and will be determined by an examination of the IPE goal and employment outcome Holland codes. Holland codes are arranged into a three-letter hierarchy (e.g., RIE) that describes a pattern of values, attitudes, and behaviors that represent distinctive ways people think and act. Although federal mandates have placed an emphasis on client choice in establishing a rehabilitation goal, there has been no research conducted to determine whether or not the job achieved through vocational rehabilitation services is congruent or consistent with the employment goal as stated on the IPE. As the literature review will indicate, research on variables influencing successful vocational rehabilitation outcomes has been extensive, however, client vocational rehabilitation goals have been ignored.

Statement of the Problem

The primary purpose of this research is to examine the relationship between (IPE) rehabilitation goals and VR (Status 26) employment outcomes. This study will examine client demographic and disability variables, such as, age, type of disability, educational background, gender, disability category, and race/ethnicity to determine their effect, if any, on the congruence of vocational rehabilitation goals and employment outcomes. This study will examine whether attainment of a job congruent with the

vocational goal increases a client's wages and job satisfaction at closure compared to those clients who obtained employment in occupations incongruent with their vocational rehabilitation goal.

The key question regarding vocational rehabilitation programs is the extent to which receipt of vocational rehabilitation services improves the labor force participation, vocational satisfaction and economic prospects of persons with disabilities. What makes this study unique is the examination of the relationship between the client (IPE) rehabilitation goals and vocational rehabilitation (Status 26) employment outcomes. Thus, this research will investigate what variables effect obtaining a vocational rehabilitation employment outcome congruent with the client's vocational rehabilitation goal as stated on the Individualized Plan for Employment (IPE). This research is notable due to the paucity of research available on the congruence between vocational rehabilitation goals and the vocational rehabilitation employment outcomes.

Research Questions

(1) For those clients who obtained a successful vocational rehabilitation employment outcome is there a relationship between disability and demographic variables and an outcome congruent with the vocational rehabilitation goal?

(2) For those clients who obtained a successful employment outcome congruent with the vocational rehabilitation goal were these clients more satisfied with their job than those clients who did not obtain their goal?

(3) For those clients who obtained a successful employment outcome congruent with their vocational rehabilitation goal did their weekly wages significantly differ from

those clients who did not obtain an outcome congruent with the vocational goal?

Definitions

Congruence - Is defined as the degree of fit between the individual's personality and work environment and will be determined by an examination of the IPE employment goal and employment outcome using Holland codes. An outcome is congruent if the 1st two letters of the Holland code for the IPE rehabilitation goal and employment outcome are identical (e.g., ESR & ESI).

Employment Goal - Is defined as the individual's stated employment goal on the IPE and, for the cases where the individual changed goals the most recent employment goal was utilized. According to RSA regulations, the employment goal is based on the individual's vocational assessment, vocational interests, capabilities, abilities, priorities, and informed choice. The employment goal may include self-employment/small business; the Business Enterprise Program for the Blind; supported employment; and employment for an individual or organization. In limited circumstances it may also include work as a homemaker or unpaid family worker. The employment goal may not be "extended employment," i.e., employment in a sheltered workshop (RSA Policies and Procedures Section 604.07).

Individualized Plan for Employment - Is defined as a vocational rehabilitation plan that is custom designed to provide any services necessary to assist an individual with a disability in preparing for, securing, retaining, or regaining an employment outcome that is congruent with the strengths, resources, concerns, abilities, capabilities, interests, and informed choice of the individual. The IPE specifies the employment goal, time line

to obtain employment, and vocational rehabilitation services required to obtain employment. The IPE is effective and services will begin after the rehabilitation counselor and client sign the IPE. This research utilized the most recent IPE (for the cases where the client changed the employment goal) for the IPE rehabilitation goals.

Rehabilitation Services Administration (RSA-911) - Is defined as the Rehabilitation Services Administration's database reporting system consisting of information about each person whose case was closed after receiving vocational rehabilitation services.

Status 26 - Is defined as: a) successful vocational rehabilitation case closure, b) occurs after a person with a disability completes a program of vocational rehabilitation and obtains suitable employment (competitive and noncompetitive employment) and c) maintains their employment for a minimum of 90 days (Rehabilitation Act Amendments of 1998).

CHAPTER 2

Literature Review

This study examined the congruency of the stated vocational rehabilitation goal with the actual vocational rehabilitation employment outcome in a sample of clients within the public VR system. This research examines the extent to which vocational rehabilitation demographic, disability, and background variables affect the congruency of the vocational rehabilitation outcome with the employment goal. This chapter lays the groundwork for the study through a review of the published literature on vocational rehabilitation (Status 26) employment outcomes for people with disabilities.

The first section of this review seeks to demonstrate the importance of the proposed research questions by discussing people with disabilities and their labor market participation. The second section discusses the literature on variables that research indicates influence a successful vocational rehabilitation employment outcome for people with disabilities in the public vocational rehabilitation system. The final section discusses the literature on measures of congruence and prior related research, which provides the theoretical framework for the study.

Persons with disabilities and their Labor Market Participation

Approximately 53 million Americans have a disability and these conditions include: psychiatric disabilities, orthopedic disabilities, mental retardation, learning disabilities, deaf or hard of hearing, blindness and visual impairment, epilepsy, heart and circulatory disorders, digestive system disorders, autism, speech impairment, and respiratory disorders (Rehabilitation Services Administration, 2003). In the United States there are approximately 26.4 million Americans of working age with a disability

(U.S. Census Bureau, 2001). Fifty-one percent of these people reported that they were prevented from working altogether (U.S. Bureau of Labor Statistics, 2002). People with disabilities may be particularly vulnerable to labor market downturns (Bellini, Bolton, & Neath, 1998), and recent data indicates that the majority of people with disabilities of working age are unemployed, yet want to work (Bolton, Bellini, & Brookings, 2000).

Americans with disabilities are unemployed at rates far exceeding those of the general population. According to the 2000 Harris Poll results reported by the National Organization on Disability (Louis Harris and Associates, 2000), 71% of adults with disabilities in the United States are unemployed, compared to only 20% of the general population. People with disabilities experience this employment differential for several reasons, including discrimination in hiring and difficulties in job retention (Roessler, 2002).

Despite this dismal employment picture, the labor market is changing and there may be more employment opportunities for people with disabilities. For example, the rapid expansion of the information and technology employment sector in the past several decades has provided millions of job opportunities that no longer require physical mobility (U.S. Bureau of Labor Statistics, 2003; Wise, 1988). Bowe (1995) believed that the growth in the information-processing industry is an opportunity for people with disabilities because adaptive software and hardware makes these jobs easily accessible.

Variables Influencing Successful Vocational Rehabilitation Employment Outcomes

Research on variables influencing successful vocational rehabilitation outcomes has been extensive, including examinations of numerous demographic, psychological,

social, and service variables for a wide variety of client populations (Bolton, Bellini, & Brookings, 2000). This section will review the literature on the variables for analysis in this study that research has shown to effect the success rate of vocational rehabilitation (Status 26) employment outcomes.

Client Variables

Several studies have examined the extent to which demographic variables, notably age, type and severity of disability, gender, race/ethnicity, and educational background relate to vocational rehabilitation employment outcomes. Such information is useful in a number of ways. These data can help assess if disability factors alone, or whether a combination of other factors (e.g., age, race), are related to a successful employment outcome. Demographic factors also define subgroups that have experienced employment discrimination, another factor that may confound employment outcomes (Moore, Price, & Alston, 2002). This section considers the influence of age, type and severity of disability, gender, race, and educational background on vocational rehabilitation employment outcomes.

Age

Studies that have examined the relationship between age and vocational rehabilitation employment outcomes have had consistent findings. Generally, younger age has been found to be predictive of successful vocational rehabilitation outcomes across all disability groups. For example, The Longitudinal Study of the Vocational Rehabilitation Services Program (2002), was initiated to assess the performance of the state-federal vocational (RSA) rehabilitation services program in assisting eligible individuals with disabilities to achieve positive employment outcomes as a result of their

receipt of vocational rehabilitation services. This study examined the extent to which demographic and other characteristics of individuals with disabilities affects their receipt of services, as well as the outcomes of vocational rehabilitation services. This study found younger age predictive of vocational rehabilitation employment success, and determined age to be a robust predictor of a competitive vocational rehabilitation employment outcome. Similar studies on demographic factors that effect the vocational rehabilitation employment outcomes have found age to be predictive of successful VR outcomes (Bellini, Neath, & Bolton, 1995; Bolton, Bellini, & Brookings, 2000; Capella, 2002; Mc Guire-Kuletz, 2000; Thompson, Boeringa, & Thornby, 1995).

For example, in several studies examining vocational rehabilitation employment outcomes for individuals who are deaf or hearing impaired, younger age has been associated with successful vocational rehabilitation case closures (Larigoitia, 1997; Moore, 2002; Moore, 2001). Similar studies have been found for vocational rehabilitation clients who are blind and visually impaired (Beadles, McDaniel, & Walters, 2000; Cavanaugh & Pierce, 1998; Giesen, 1997; Godley et al., 1984; Hill, 1989; Malakpa, 1994). Taheri-Araghi (1994) examined successful vocational rehabilitation outcomes for 76 clients who were visually impaired. This study utilized RSA-911 data for clients who were rehabilitated and found younger age at time VR referral was predictive of a successful case closure and wages at closure.

Studies examining vocational rehabilitation outcomes for persons with serious mental illness have determined younger age is associated with successful vocational rehabilitation employment outcomes (Accordino & Herbert, 2000; Bedell & Draving, 1998; Collins, Mowbray, & Bybee, 2000; Finch & Wheaton, 1999). Similar studies have

been found for vocational rehabilitation clients with mental retardation (Moore, 2000; Platt, 1995; Wehman & Targett, 2002). Moore, Feist-Price, and Alston (2002) examined indicators of successful vocational rehabilitation outcomes for 188 persons with mental retardation and determined younger age to be a predictor of successful case closure and client weekly wages.

Rogers (1997) examined vocational rehabilitation outcomes for 275 persons with psychiatric disabilities utilizing demographic and clinical variables. This study determined that younger age is predictive of employment success for vocational rehabilitation consumers with psychiatric disabilities. Cook et al. (1996) completed a canonical correlation analysis of 212 vocational rehabilitation outcomes following psychiatric rehabilitation and determined younger age to be a strong predictor a positive outcome. Similar studies have found younger age to be associated with positive VR outcomes for persons with psychiatric disabilities (Drew, 2001; Drake et al., 1994; Jacobs, Wissusik, & Collier, 1992; Vostanis, 1990).

Brooks et al. (2002) examined successful vocational rehabilitation employment outcomes for persons with learning disabilities. This study determined younger age was predictive of employment success. Mardis et al. (1999) examined vocational rehabilitation outcomes for 613 persons with learning disabilities and determined age at referral was a factor in successful vocational rehabilitation outcomes.

Magna et al. (1993) examined the post injury vocational rehabilitation outcomes for 1,238 persons with spinal cord injuries. This study examined factors that influence successful VR employment outcomes for African-American and White Americans of working age with spinal cord injuries. This research determined younger age to be a

robust predictor of employment outcomes for both racial groups. James, DeVivo, and Richards (1993) compared the employment outcomes of VR consumers after spinal cord injury and found younger age predictive of a positive employment outcome.

The fact that younger age is associated with better employment outcomes across all disability groups is consistent with general labor market information. However, the effect of age on employment rates for persons with disabilities is more significant. The Bureau of Labor Statistics (2003) data indicates the employment rate for persons 25-44 is 79.4% and for those with a disability it is 51.3%. For persons 45-54 the employment rate is 77.4% and for those with a disability it is 33.9%. For persons 55-64 the employment rate is 56.1% and for those with a disability it is 23.4%. In addition, younger individuals with disabilities may be more likely to benefit from the latest treatment advances (The Longitudinal Study of the Vocational Rehabilitation Services Program, 2002), as well as be more readily able to use assistive technologies to improve their employment options (Bowe, 1995).

Type and Severity of Disability

Findings regarding the type of disability and severity of impairment have been consistent. Severity of disability and resulting impairment are strong predictors of vocational rehabilitation employment outcomes. For example, The Longitudinal Study of the Vocational Rehabilitation Services Program (2002), examined vocational rehabilitation outcomes for VR consumers utilizing RSA-911 data. This study determined a client's disability and severity of impairment were characteristics that either increased or decreased the likelihood of obtaining a successful VR employment outcome. Specifically, clients with vision impairments, hearing impairments, learning

disability, or orthopedic impairments were more likely than consumers with psychiatric, mental retardation or traumatic brain injury to achieve a successful vocational rehabilitation employment outcome at closure.

Olney and Kennedy (2002) examined disparities in vocational rehabilitation employment outcomes for adults with disabilities. Using data from the VR aggregated data base files, they determined that disability diagnosis was a predictor of successful vocational rehabilitation employment outcomes, with severity of disability being associated with poor VR employment outcomes. Similarly, Capella (2002) determined that the more severe the disability and impairment, the less likely it was the individual would obtain a job in a sample of 10,000 clients from the VR system. Bolton and colleagues (2000) examined RSA-911 employment outcomes for 4,603 individuals who were closed as rehabilitated (Status 26) and investigated five disability categories: orthopedic, chronic medical, psychiatric, mental retardation, and learning disabilities. Their findings indicated each group had substantially different profiles of functional limitations, however, the more severe the disabling condition and resulting impairment, the lower the probability of a successful vocational rehabilitation employment outcome. Bolton et al. (2000) concluded that functional limitations were important in predicting vocational rehabilitation employment outcomes, and salary at closure was strongly influenced by severity of functional limitations. Walls and Fullmer (1997) examined vocational rehabilitation outcomes for 103,417 clients and determined that severity of impairment was a predictor of employment outcomes.

Severity of disability has also been examined within specific disabling conditions. For individuals who are deaf or hearing impaired, Moore (2001) examined disparities in

job placement outcomes among 15,248 deaf and hard-of-hearing VR consumers. Findings indicate severity of hearing loss was a predictor of a competitive employment outcome. This research determined that consumers who were late-deafened achieved competitive jobs at a significantly lower rate than other hard of hearing consumers of vocational rehabilitation services. Larisgoitia (1997) examined factors that affect the vocational rehabilitation employment of adults who are deaf and hearing impaired and determined that severity of hearing impairment was a significant factor of a successful case closure. Similar studies have been found for vocational rehabilitation clients who are blind and visually impaired (Cavanaugh & Pierce, 1998; Giesen, 1997; Hill, 1989; Malakpa, 1994), and findings indicate severity of impairment influenced vocational rehabilitation employment outcomes.

Beadles, McDaniel, and Walters (2000) examined the vocational rehabilitation outcomes of 80 sensory impaired clients. Findings indicate that disability type was a significant variable in predicting successful VR employment outcomes. The researchers determined that clients who were visually impaired were less likely to be employed than were clients who were hearing impaired.

Moore, Feist-Price, and Alston (2002) examined vocational rehabilitation employment outcomes for persons with severe mental retardation. Findings indicated that persons with severe/profound mental retardation achieved closure success at significantly lower proportions when compared to persons with less severe mental retardation. Moore (2000) examined indicators of successful vocational rehabilitation for persons with mental retardation and determined severity to be a significant predictor of successful VR case closure and also correlated with wages at closure.

Accordino and Herbert (2000) examined vocational rehabilitation outcomes for 70 persons with serious mental illness and determined severity of mental illness was related to employment outcomes and hospitalization frequency. Collins et al. (2000) examined client characteristics predicting successful employment outcomes for 147 clients with severe mental illness and determined that severity of mental illness was a predictor of employment outcomes. Finch and Wheaton (1999) examined vocational rehabilitation outcomes for 10,253 consumers with serious mental illness and determined that severity of mental illness was a predictor of vocational rehabilitation employment outcomes and was correlated with weekly wages earned at closure. Findings indicate mean weekly earnings for persons with less severe mental illness was \$228, compared to a mean weekly wage of \$144 for persons with severe mental illness.

Similar studies (Jacobs et al., 1992; Rogers, 1997) have examined correlations between psychiatric disabilities and vocational rehabilitation outcomes and determined severity of psychiatric disability was a predictor of employment outcomes. The findings determined that those individuals with non psychotic diagnoses were more likely to find employment compared to those individuals with psychotic diagnoses.

Mardis et al. (1999) examined vocational rehabilitation outcomes for 613 persons with learning disabilities and determined severity of learning disability was a predictor of VR employment outcomes. Dunham et al. (1998) examined vocational rehabilitation outcomes for 119 adults with learning disabilities and utilized stepwise regression analysis to predict closure status. Findings determined that severity of the learning disability was a significant predictor of a successful vocational rehabilitation employment outcome.

In summary, research has shown severity of disability and resulting impairment is a predictor of a vocational rehabilitation employment outcome. It appears the more severe the disabling condition and resulting impairment the less likely the individual will obtain a positive employment outcome (Bolton, Bellini, & Brookings, 2000; Moore, Feist-Price, & Alston, 2002; Olney & Kennedy, 2002; Walls & Fullmer, 1997). In addition, a number of studies have determined severity of disability and resulting impairment correlates with the individual's wages (Bolton et al., 2000; Finch & Wheaton, 1999; Moore, 2000).

Gender

Findings regarding the effect of gender on vocational rehabilitation employment outcomes tend to be equivocal. For example, Johnstone et al. (2003) investigated differences in vocational rehabilitation outcomes for clients with traumatic brain injury (TBI) and found no differences in employment outcomes for gender among 186 VR clients. The Longitudinal Study of the Vocational Rehabilitation Services Program (2002), determined that gender was not a significant predictor of employment outcomes. Capella (2002) analyzed data from the RSA-911 reporting system, consisting of 181,225 persons who were successfully closed in 1997 and found that gender was not significantly associated with VR outcome. Profaca (2000) examined vocational rehabilitation outcomes for 233 persons with mental retardation and again found no differences for gender.

Several other studies (Bolton, Bellini, & Brookings, 2000; Cavanaugh & Price, 1998; Hempleman & Longhi, 1996; McGuire-Kuletz, 2000) across various disability groups did not find gender associated with successful vocational rehabilitation

employment outcomes.

However, some studies have found gender to be associated with successful VR employment outcomes. Bounds et al. (2003) examined gender differences for vocational rehabilitation clients with traumatic brain injury (TBI). This study investigated differences in injury severity, demographics, and vocational rehabilitation outcomes for 78 persons with TBI. Results indicate only 4.4% (1 of 23) of the females obtained a successful employment outcome, compared to 23.6% (13 of 55) of the males. Bounds et al. suggest that females are one group that needs more attention after experiencing TBI and indicate it is difficult to draw conclusions from their data given that only one female participant in the study was successfully rehabilitated. Moore (2002) found deaf males more likely to be employed than deaf females, and that they achieved significantly higher wages than deaf females. In addition, Moore also determined that gender had an effect on the type of vocational rehabilitation services received. Results indicated males were provided with a significantly greater proportion of job placement services than were females who were deaf. Wheaton and Wilson (1996) examined the relationship between VR services and the consumer's race, gender, and closure status. This study utilized RSA-911 data and found males more likely to be employed after completion of a vocational rehabilitation program. In addition, findings determined that the patterns and type of VR services differed between males and females and that males received more on the job training, job referrals, and job placement services than females.

The Social Security Administration's (1995) research on the variables influencing a successful vocational rehabilitation employment outcome determined gender to have

“a positive and significant coefficient,” indicating that male beneficiaries have a higher tendency to go back to work. This result was consistent with past Social Security Administration’s research on SSI beneficiaries (Hennessey & Muller, 1995). Results indicated earnings of female SSI beneficiaries were lower than males, a finding consistent with general labor market wage data (U.S. Bureau of Labor Statistics, 2003).

Mentz et al. (1989) examined the impact of gender in the vocational rehabilitation system. The results indicate that the acceptance rates and economic benefits females gained from VR services were not comparable to those for males. Female’s weekly earnings were significantly less, and more females were closed into low paying or nonpaying occupations. Mentz at al. found that 9.4% fewer females than males were closed successfully. Danek and Lawrence (1985) also found that the males in their study had higher acceptance rates for services and a higher rate of successful case closures.

Race and Ethnicity

Findings regarding the importance of race and ethnicity, both in terms of predicting (Status 26) employment outcomes and the vocational rehabilitation services received, have been extensively examined. Olney and Kennedy (2002) examined racial disparities in vocational rehabilitation employment outcomes for 2,467 successfully closed cases. Findings indicated significant racial differences in the VR services received and employment outcomes. European Americans were the most likely to obtain a successful vocational rehabilitation employment outcome (60%), followed by Hispanic Americans (47%), and African Americans were the least likely to obtain employment (41%). This study also found differences in the type of VR services clients

receive. Results indicate that European Americans were more likely to receive educational services (e.g., college education), and African Americans were more likely to receive short term training services (e.g., adjustment training).

Similar studies have examined the effect of race on VR outcomes and services received (Capella, 2002; Fiest-Price, 1995; The Longitudinal Study of the Vocational Rehabilitation Services Program, 2002; Moore, Feist-Price, & Alston, 2002; Morgan & O'Connell, 1987; Wheaton & Wilson, 1996; Wilson, Turner, & Jackson, 2002; Wilson, 1999; Wise, 1998). Findings consistently indicate that the three vocational rehabilitation services most commonly received by African Americans were maintenance, transportation, and adjustment training. The three services most commonly received by White Americans were college or university training, physical and mental restoration, and diagnostic or assessment processes. Findings consistently indicate that White Americans were more likely to achieve a successful vocational rehabilitation employment outcome and had higher weekly wages than African Americans. Other research of inequities in the VR system has indicated that African Americans and other minorities tend to have lower acceptance rates for vocational rehabilitation services (Wilson, 1999; Finch & Wheaton, 1999), and are generally under represented in the vocational rehabilitation system compared to White Americans (Capella, 2002).

One study had contradictory findings. Dunham et al. (1998) examined vocational rehabilitation outcomes of African American adults with learning disabilities. Their research investigated 144 African American and 2225 Caucasian clients with learning disabilities and determined race was not a significant predictor of successful vocational rehabilitation employment outcomes. However, the sample size may have seriously

compromised their research.

In summary, the preponderance of evidence indicates race is a factor in influencing successful vocational rehabilitation employment outcomes. Only in one study (e.g., Dunham, 1998) race was not a significant predictor of vocational rehabilitation services and employment outcomes. Certainly, race is a factor in labor force participation rates in the general population and there is little reason to believe it would not be a factor for people with disabilities (Olney & Kennedy, 2002). Such differences in employment outcomes may also be the result of discrimination that exists in the labor market. For example, in 2002 in the general population, unemployment rates for African Americans were substantially higher than for European Americans (10.2% versus 5.1%; U.S. Bureau of Labor Statistics, 2003). However, there is strong evidence that minorities receive different vocational rehabilitation services (e.g., short term training versus college training) which may affect the employment outcomes.

Educational background

Educational background is a factor that has been studied with consistent results. A higher level of educational attainment has been associated with successful vocational rehabilitation outcomes across all disability groups (Beck, 1989; Bellini, Neath, & Bolton, 1995; Bolton, Bellini, & Brookings, 2000; Capella, 2002; Hayward, 1998; LaPlante & Miller, 1992; The Longitudinal Study of the Vocational Rehabilitation Services Program, 2002; Olney & Kennedy, 2002; Rogers, 1997; Social Security Administration, 1995; Wilson, Turner, & Jackson, 2002).

For example, in several studies examining VR outcomes for individuals who are blind or have visual impairments, a higher level of education has been associated with

successful case closures (Beadles, McDaniel, & Walters, 2000; Cavanaugh & Pierce, 1998; Crews & Long, 1997; Giesen et al., 1997; Hill, 1989; Malakpa; 1994; Taheri-Araghi, 1994). Results determined client's level of education was a significant factor that predicted vocational rehabilitation employment outcomes.

James, DeVivo, and Richards (1993) compared the vocational rehabilitation employment outcomes of VR consumers after spinal cord injury. Results found education level was the best predictor of a successful employment outcome. In this sample of vocational rehabilitation clients, individuals with a high school diploma were more than five times as likely to be closed successfully, and those individuals with a college degree were more than twenty-one times as likely to be employed after a program of vocational rehabilitation. Magna et al. (1993) also examined vocational rehabilitation employment outcomes for persons with spinal cord injuries. This study determined educational background was a robust predictor of employment outcomes. This research indicated educational background was an especially strong predictor of employment outcomes for African American clients.

A few studies (Brooks et al., 2002; Dunham & Holliday, 1998; Mardis et al., 1999) have examined the relationship between educational attainment and vocational rehabilitation employment outcomes for persons with learning disabilities. Findings determined educational attainment at time of referral for VR services was predictive of employment success.

In summary, research indicates educational background is a robust and unique predictor of vocational rehabilitation employment outcomes (Beadles, McDaniel, & Walters, 2000; Cavanaugh & Pierce, 1998; Giesen et al., 1997; Olney & Kennedy,

2002; Wilson, Turner, & Jackson, 2002;). It appears a higher level of educational attainment permits the client to learn new job skills, accept new occupational opportunities and increases the probability of a successful vocational rehabilitation employment outcome (Longitudinal Study of the Vocational Rehabilitation Services Program, 2002).

Measures of Congruence and Prior Related Research

The conceptual model for this study is based on Holland's (1966, 1973, 1985, 1992, 1997) theory of vocational choice. Holland's typological theory advances the hypothesis that career choice represents an extension of the individual's personality. Holland recognized that a person's vocational interests are associated with a great range of personal and background variables. He believes people express their values and interests through their work choices. Holland states,

The choice of an occupation is an expressive act which reflects the person's motivation, knowledge, personality and ability. Occupations represent a way of life, an environment rather than a set of isolated work functions or skills. To work as a carpenter means not only to use hand tools but also to have a certain status, community role, and a special pattern of living (Holland, 1985, p.8).

According to Holland's theory there is a strong relationship between a person's personality and choice of occupation. Holland proposes that patterns of development for an occupation reflects the intensity and distinctiveness of the individual's personality type and will help predict the potential success of a person in a particular vocation. Holland also assumes that the degree of fit between a person's Holland type and their occupation influences job satisfaction. Holland predicted that congruent individuals will

be reinforced, satisfied, and less likely to change work environments (Holland, 1992).

Holland assigns both people and work environments to specific personality categories (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional). The Realistic type (mechanics, farmers) prefer activities that require physical strength, motor coordination, and the handling of objects such as machines and tools. Investigative types (chemists, biologists) prefer thinking, problem solving, and scientific activity. Artistic types (musicians, artists) prefer free, unstructured pursuits that require the creation of art, music, writing, and drama. Social types (social workers, teachers) seek close contact with people in teaching and helping situations. Enterprising types (salespeople, managers) prefer situations where they can persuade, dominate, and manipulate people to attain personal or organizational goals. Conventional types (accountants, secretaries) prefer work environments that are orderly, systematic, and directed by others in authority (Holland, 1985).

The Holland personality types are arranged into a hierarchy called a personality pattern (e.g., RIE) that describes a pattern of values, attitudes, and behaviors that represent distinctive ways people think and act. Holland offers a hexagonal model to explain the relationships among the six personality types and environments. The rule of thumb is the shorter the distance between any two types, the greater their similarity or psychological resemblance (Holland, 1992).

Four important constructs for conceptualizing and using Holland's theory are: congruence, differentiation, consistency, and identity. These refer to the relationship between a person's personality and work environment (congruence), the relationship between the relative importance of types (differentiation), the relationship to each other

(consistency), and the clarity and stability of a person's goals (identity). This review will focus on the construct of congruency.

Congruence

The term congruence refers to the degree of fit between the personality and environment (Holland, 1985). Holland's theory suggests that the choice of a vocation is an expression of personality and that vocational satisfaction and achievement depend on the congruence between an individual's personality and work environment (Holland, 1985). According to Holland's theory, "People search for environments that will let them exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles" (Holland, 1985, p.4). Congruence is an expression of such a match. It can be measured by noting the degree of consistency between a person's scores on the six personality types and those of an occupational environment, as measured by several measures (e.g., Self Directed Search, Dictionary of Holland Occupational Codes). The more similar the individual's personality to the work environment the more congruent the relationship.

Holland's typology classifies the level of congruence by the hexagonal match of the personality and work environment. The highest level of congruence is defined as a perfect match between the three-letter personality Holland code and the occupational code. For example, using Holland's three letter codes, a SRA personality would be most congruent in a SRA work environment and slightly less congruent in an SRC environment. Thus, congruence decreases as the similarity of the three-letter code of the person and the work environment decreases.

Holland's Self Directed Search (SDS) is an instrument that is frequently utilized to obtain a person's three letter personality code and provides descriptions of occupations. The Dictionary of Holland Occupational Codes (DHOC) is another instrument frequently utilized to obtain the three letter Holland environment codes. The first letter in a Holland code refers to that scale for which the person receives the highest score on the Self Directed Search (SDS). The second letter refers to the second highest scale, and (in the case of 3-point codes) the third letter to the third highest score on the SDS. For example, the code ESC for Business Manager means that business managers resemble people in Enterprising occupations most of all, that they resemble people in Social occupations somewhat less, and they resemble people in Conventional occupations still less. In this way, the codes provide a brief summary of what an occupation is like by showing its degrees of resemblance to three occupational groups (Holland, 1992).

Prior Research

Many studies that have examined the concept of congruence have used Holland's typology as a means of assessing the association between the person and the job. Many of these studies have found a positive, but modest, relationship between person-environment congruence and job satisfaction. The following section will discuss prior research examining Holland's person-environment congruence and vocational satisfaction. This section will be organized as follows: measures of person-environment congruence, studies of the correlation between person-environment congruence and job satisfaction, and the limited prior research on person-environment congruence involving Dictionary of Occupational Titles (DOT) codes and Holland codes.

Measures of Person-Environment Congruence

Hoile (2000) and Wiggins (1984, 1983) defined person-environment congruence on the basis of the correspondence among the first two letters in a person's Holland personality code and his or her occupational code (e.g., SR). Leong et al., (1998); Thompson and Flynn (1994); and Tranberg et al., (1992) defined congruence by the match between the participant's three letter Holland personality code (e.g., SRA), and the three letter classification of the participant's stated choice of college major. Studies by Grabowski (1995); Segal (1986); Smart, Elton, and McLaughlin (1986); Gati and Meir (1981); Walsh and Osipow (1973); and Holland (1968), defined congruence only on the basis of a match between the first letter in a person's Holland personality code and their occupational code (e.g., S).

Hoeglund and Hansen (1999); Tokar and Subich (1997); Miller (1992); Gottfredson and Holland (1989); and Elton and Smart (1988) utilized a model developed by Iachan (1984) for determining the degree of congruency between a student's personality code and his or her college concentration area. The Iachan Index involves assigning a Holland congruence score ranging from 0 to 28, depending on the presence of and respective order of matching letters in the three letter Holland code relative to the person's three letter personality code. For example, a student's code of ACE who is paired in an occupation of CER shows two letters in common, C and E. The C is in positions 2 and 1, with a weight of 10. The E is in positions 3 and 2, with a weight of 2. Therefore, the person has a congruence score of 12.

Person-Environment Congruence and Job Satisfaction

Most studies examining the concept of person-environment congruence have used Holland's typology derived from Holland's theory of vocational choice. Most of these studies have been successful in obtaining a weak but positive relationship between person-environment congruence and job satisfaction. However, a number of studies have found mixed results, and a few found no support for Holland's theory.

Cook (1997) examined the relationship between Holland's concept of person-environment congruence and job satisfaction for 116 employees. This study utilized the SDS and the Dictionary of Holland Occupational Codes (DHOC) to determine the participant's Holland codes and used a satisfaction survey to measure employee job satisfaction. The results found a correlation between congruence and job satisfaction ($r = .37$) and also found a correlation between wages and job satisfaction ($r = .28$).

Tranberg (1992) examined the relationship between job satisfaction and person-environment congruence for 321 employees. Results indicated weak support for Holland's theory that congruence can be measured by matching person-environment Holland personality codes ($r = .21, p < .01$).

Gottfredson and Holland (1990) completed a longitudinal study of person-job congruence and job satisfaction. This research examined person-environment congruence for 345 bank tellers. Results indicated a correlation between person-job congruence and job satisfaction of ($r = .36$) in their sample of bank tellers. Gottfredson and Holland indicated that although the correlation was not large it was high enough to be useful in a career counseling applications and supported the hypothesis of person-environment congruence.

Meir and Melamed (1986) examined person-environment congruence and job satisfaction for a sample of teachers. This study distinguished between three types of congruence: vocational congruence (which is the type described in Holland's theory), avocational congruence (correspondence level between personality type and avocational activities), and abilities congruence (correspondence level between skills and job requirements). In this sample of teachers they found these three measures of congruence were unrelated and the correlations between the three types were not significant. However, findings did determine a correlation between vocational congruence and job satisfaction ($r = .32$).

Tranberg, Slane, and Ekeberg (1993) completed a meta analysis between person-environment congruence and job satisfaction. This meta analysis consisted of 77 correlations resulting from 45 previous studies published over the last thirty years. The results revealed a mean correlation between person-environment congruence and job satisfaction to be in the range of ($r = .20$ to $.38$). The authors indicated the primary reason for differing results was the different methods of measuring congruence and vocational satisfaction.

Assouline and Meir (1987) completed a meta analysis on the relationship between person-environment congruence and vocational satisfaction measures. They found 16 different methods of measuring congruence. This meta analysis examined 71 correlations resulting from 41 previous studies, and found a mean correlation range between P-E congruence and vocational satisfaction of ($r = .21$ and $r = .35$).

Jagger and Neukrug (1992) examined congruence between personality traits and chosen occupation as a predictor of job satisfaction for 97 people with disabilities. This research examined job satisfaction by utilizing the Minnesota Satisfaction Questionnaire (MSQ). Three instruments were utilized to determine the Holland Occupational Codes: the Self Directed Search (SDS), the Career Assessment Inventory (CAI), and the Strong Interest Inventory (SCII). Statistical analysis indicated a significant positive correlation ($r = .26, p < .05$) between job satisfaction as measured by the MSQ and congruence as measured by the SDS. Jagger and Neukrug (1992) recommended that vocational rehabilitation counselors include an assessment of the congruence between the vocational rehabilitation client's personality and their potential work environments during vocational evaluations. Although a number of studies have examined the relationship between congruence and job satisfaction, this was the only study that examined the congruence-job satisfaction relationship for individuals with disabilities.

Although much of the research on the relationship between person-environment congruence and job satisfaction has found a weak but positive relationship between P-E congruence and job satisfaction, a number of studies have produced mixed results. For example, Hoeglund and Hansen (1999) examined Holland measures of congruence to predict job satisfaction for 16 occupational samples. Results indicated no correlation for 12 samples and very small relationships ($r = .09$ to $.21$) for the other 4 samples. Hoeglund and Hansen stated that using congruence measures to predict job satisfaction may be more efficacious for workers entering new fields than for more experienced workers.

Young, Tokar, and Subich (1998) examined the person-job congruence and job satisfaction relationship. Results found that none of the correlations between congruence indices and job satisfaction measures were significant. Results also indicated the person-environment congruence-satisfaction relationship varied according to Holland personality type.

Tokar and Subich (1997) examined the relationship between personality-environment congruence and vocational satisfaction for 172 employees. Congruence was measured on two indices (e.g., Iachan Index), however, did not predict vocational satisfaction.

Heesacker, Elliott, and Howe (1988) examined the relationship between personality-environment congruence and job satisfaction for a sample of 318 clothing factory workers. This study utilized the SDS to obtain Holland codes and obtained data on job satisfaction, work productivity, absenteeism, and wages. Results of this study were mixed. Job satisfaction was predicted by Holland codes on one satisfaction measure ($p < .03$) and weakly predicted on a second satisfaction measure ($p < .09$). In a similar study, Aranya and Barak (1981) examined the SDS scales and work attitudes of 1,952 accountants. However, they found no correlation between the SDS scales for accountants and vocational satisfaction.

In summary, most of the research examining the relationship between person-environment congruence and vocational satisfaction has utilized Holland's typology (See Table 1). Most of this research has demonstrated a weak but positive correlation between measures of vocational satisfaction and person-environment congruence. A close examination of this research indicates that these weak relationships may be due

to the ways in which congruence is coded. The range of correlation between person-environment congruence and vocational satisfaction ranged from ($r = .09$ to $.38$). In most of the studies, the person-environment congruence examination involved a global person-type to a job-type match and the strength of the congruence-satisfaction relationship varied with the type of measurement. Only one prior study, Cook (1997) examined person-environment congruence and wages. This study involved 116 municipal employees and found a correlation ($r = .28$) between the participant's weekly wages and vocational satisfaction.

(INSERT TABLE ONE HERE - 4 PAGES)

Prior Research involving the DOT and Holland Codes

There have been a few studies examining person-environment congruence utilizing the Dictionary of Occupational Titles (DOT) codes and Holland codes. In this study, the Dictionary of Occupational codes will be translated into Holland codes using the Dictionary of Holland Occupational Codes (DHOC). Hoile (2000) examined the relationship between person-environment job satisfaction and employees' optimal levels of arousal (e.g., preferred levels of arousal where boredom/stress do not occur). This study examined person-environment congruence by administering the Holland SDS and by converting the participant's Dictionary of Occupational Titles code into a Holland code to examine P-E congruence. The hypothesis was that the prediction of job satisfaction accounted for by personality and job congruence on Holland's SDS would be improved by adding congruence between arousal preferences and job complexity. The results did not support the hypothesis, although a small amount of statistical support ($r = .24$) was found for Holland's measure of person-environment congruence when a measure of job satisfaction was used.

Grabowski (1995) examined Holland's theory of person-environment interaction and congruence was examined in relationship to occupational change, occupational stability, job satisfaction, and life satisfaction in a sample of females (Sisters of St. Francis). A work history of the participants was coded into Holland codes by converting DOT codes via DOHC. The personality code was obtained by administering the SDS. Findings revealed that, overall, sisters who change occupations shift to more congruent environments, as predicted by Holland's theory. The results indicated a correlation between person-environment congruence and job satisfaction ($r = .28$).

Thomas and Robbins (1979) examined two hypotheses from Holland's theory of vocational choice: that persons will move toward work environments more congruent with their personality type, and that persons working in environments congruent with their personality will be more satisfied than those whose personality-environment congruence is low. This research coded work environments by converting DOT codes into Holland codes via the DOHC. Three letter Holland personality codes were obtained by administering the Strong Campbell Interest Inventory. Findings revealed most participants moved into careers more congruent with their personality types. However, most participants who entered more congruent occupations were not more satisfied with their new careers than those whose new careers were less congruent.

Most of the limited research examining the relationship between Holland's personality-environment congruence and job satisfaction utilizing converted *Dictionary of Occupational Titles (DOT)* codes provide support for Holland's theory. However, a study by Robbins et al. (1978) examined Holland's theory of person-environment congruence by analyzing the career redirection of 62 men of managerial and professional occupations between the ages of 33 and 54. Three letter Holland codes were obtained by administering the Strong Campbell Interest Inventory. DOT codes were obtained for the first and second occupations and were translated into Holland codes using the DOHC. These were compared to the personality code for each participant to determine whether the first or second occupation was more congruent. Findings indicate that 26 participants changed to careers more congruent with their personality, 25 participants to careers less congruent, and 11 made no career change. The researchers posit that the lack of support for Holland's theory is related to the

imprecision of DOT categories for research purposes. However, this research by Robbins et al. (1978) was completed prior to the revision of the *Dictionary of Occupational Titles* in 1991, and the DOT was refined and expanded with updated occupational research and labor market data.

Summary

Research on variables influencing successful vocational rehabilitation outcomes has been extensive, including examinations of numerous demographic, psychological, social, and service variables for a wide variety of client populations, however, client (IPE) vocational rehabilitation goals have been ignored. Despite the fact that rehabilitation outcomes have been extensively researched, no studies that this researcher was aware of have attempted to assess whether the job the individual achieves is congruent with the (IPE) rehabilitation goal. Ideally, a comprehensive, quantitative investigation of successful vocational rehabilitation (Status 26) employment outcomes should include an assessment of the congruence between the client's vocational rehabilitation goal to the employment outcome. Although numerous studies have investigated vocational rehabilitation outcomes, none that this researcher was aware of have examined the relationship between (IPE) vocational rehabilitation goals, vocational satisfaction, wages and vocational rehabilitation employment outcomes.

This study sought to add to the current literature by examining client (IPE) rehabilitation goals and client variables that may contribute to congruent vocational rehabilitation employment outcomes. More extensive research on the relationship between (IPE) vocational rehabilitation goals, client variables, vocational satisfaction and successful VR outcomes needs to be completed to objectively determine what

factors effect obtaining a successful (Status 26) VR outcome that is congruent to the client's rehabilitation goal.

CHAPTER 3

Methodology

Participants

The population utilized for this study was 2,972 persons with disabilities who received vocational rehabilitation services through the Maryland State Department of Education's Division of Rehabilitation Services (DORS) and obtained employment. The participants were randomly selected across all five regions in Maryland from the total number of individuals who were successfully rehabilitated by DORS and achieved an employment outcome (Status 26) in 2002.

For the research questions examining differences in demographic variables, disability variables, job satisfaction, IPE goals, weekly wages and employment congruency, a random sample of 200 participants was obtained. This sample was collected utilizing a random numbers table to acquire a sample of vocational rehabilitation clients for an analysis of the effect of obtaining (IPE) rehabilitation goals on the dependent variables (e.g., wages, satisfaction). Of the 200 randomly selected cases, 171 had all of the independent and dependent variables for data analysis. The remaining 29 cases that were missing data (e.g., satisfaction survey) were discarded and not utilized for the data analysis. All of the 171 participants in this sample completed vocational rehabilitation services in the state of Maryland, obtained employment and were successfully closed in the DORS fiscal year 2002. Table 1 shows a comparison of demographic, disability characteristics, and occupations at closure for the research sample and the total DORS Status 26 population.

Table 1

Comparison of Research Sample to DORS 2002 Status 26 Population

Variable	Research Sample		DORS Status 26 Population	
	Number	Percentage	Number	Percentage
Gender				
Male	91	53.2%	1,618	54.44%
Female	80	46.8%	1,354	45.56%
Race				
Caucasian	106	62.0%	1,514	50.94%
African American	65	38.0%	1,349	45.39%
Other	0	0%	109	3.66%
Disability				
Sensory	26	15.2%	407	13.69%
Physical	66	38.6%	712	23.97%
Mental	79	46.2%	1,853	62.34%
Work Status				
Employed	171	100%	2,972	100%
Occupations				
Prof/Tech/Mgmt	50	29.24%	513	17.26%
Clerical/Sales	48	28.07%	825	27.75%
Service	41	23.97%	980	32.97%
Miscellaneous	11	6.43%	219	7.36%
Structural	10	5.84%	132	4.44%
Machine	5	2.92%	97	3.26%
Bench Work	4	2.33%	65	2.19%
Farming/Forestry & Fishery Processing	1	0.058%	63	2.11%
	1	0.058%	32	1.07%

Procedures

The research design selected for this study was a descriptive design. This research design did not involve random assignment to groups, nor was there any manipulation of an independent variable. Generally, descriptive research is an attempt to describe characteristics or the effects of events for an identified population (Houser, 1998). This researcher had the assistance of computer specialists from the DORS Technical Assistance Branch to obtain the research data without any information that could be used to identify any of the participants of the study. The Technical Assistance Branch obtained all relevant vocational rehabilitation data for this research (except IPE vocational rehabilitation employment goals) including: disability/impairment category, gender, race, age, years of education attained at referral, weekly wages at closure, job satisfaction, and occupation at closure. The data was obtained from the DORS database via a Microsoft Excel spreadsheet and was coded into an SPSS 11.0 format.

The data on the client IPE vocational rehabilitation goals were obtained by contacting each participant's rehabilitation counselor. The DORS counselor examined each participant's Individualized Plan for Employment (IPE) and provided the most recent IPE employment goal for the data analysis. This involved contacting 115 DORS rehabilitation counselors and supervisors via telephone, e-mail, and facsimile. DORS staff reviewed each participant's file to retrieve this data, as the DORS database did not have the IPE data on file. This was the only data that had to be obtained from DORS staff and required special authorization for DORS staff to review client files and provide the IPE employment goal data. First, authorization was obtained from Mr. Robert Burns the Assistant State Superintendent in the Maryland State Department of Education's

Division of Rehabilitation Services (DORS) to complete this research (Appendix J). Second, DORS field rehabilitation counselors were requested via e-mail to provide the participants' IPE employment goal data by Mr. Harvey Davis the DORS Director of Field Services (Appendix K). The IPE employment goal data was then obtained by contacting each participant's rehabilitation counselor via telephone. If the counselor did not respond to the telephone contacts an e-mail with a copy of Mr. Davis's e-mail was sent. Finally, if the rehabilitation counselor failed to respond the supervisor was contacted. These efforts resulted in a 91.3% response rate.

The determination of the congruency between a participant's vocational rehabilitation goal and vocational rehabilitation (Status 26) employment outcome involved a review of the participant's (IPE) rehabilitation plan goal, and the occupation obtained after completing a program of vocational rehabilitation. The DORS vocational rehabilitation employment outcomes were indicated by the participant's *Dictionary of Occupational Titles (DOT)* code numbers (e.g., 033.362-010) in the DORS database and were translated into Holland codes (e.g., ESR) using the *Dictionary of Holland Occupational Codes (DHOC)*. Each participant's (IPE) rehabilitation goal was obtained and coded in DOT code numbers and was also translated into *Dictionary of Holland Occupational Codes* (e.g., ESI). Congruency was determined by this researcher via an examination of the VR IPE employment goal and employment outcome Holland codes. An employment outcome was determined to be congruent if the 1st two letters of the Holland code match for the (IPE) vocational rehabilitation goal and VR employment outcome. An employment outcome was determined to be related if the 1st letter of the

IPE goal and employment outcome Holland codes matched. Since the determination of congruency did not involve any rating or evaluation of an individuals' behavior by different observers or raters, only an examination of the IPE employment goal and employment outcome Holland codes (e.g., ESR & ESI) inter-rater reliability was not an issue (Bellini & Rumrill, 1999).

For example, a client trained to become a Computer Programmer (DOT # 030.162-010 / Holland code IRE) who obtained employment as a Microsoft Certified Networking Engineer, (DOT# 033.362-010 / Holland code IRE) would be counted as employment in an occupation congruent to the vocational rehabilitation goal, as the first two Holland letters are in agreement. If the same client obtained employment as a Computer Consultant (DOT# 189.167-010 / Holland code IER), the outcome would be coded as an occupation related to the vocational goal as the first letter of the VR goal and employment outcome Holland codes match (e.g., "I" indicates employment in one of the "Investigative" occupations). However, if the same client obtained employment as an Insurance Claim Adjuster (DOT# 241.217-010 / Holland code ESR), the outcome would be counted as employment in an occupation not congruent with the vocational rehabilitation goal, as there is no agreement in the Holland code letters (IRE vs. ESR).

Measures

The data on the participant's job satisfaction was obtained from the DORS "How did we do?" client satisfaction survey. This survey is sent to every client who has been successfully closed (Status 26). This survey is sent via first class mail and participants complete the survey and respond to five questions. This study utilized question four, "Are you working now? If yes, are you satisfied with your job?" The response is

indicated on a six-point scale and coded from: (6) “Extremely Satisfied,” (5) “Very Satisfied,” (4) “Satisfied,” (3) “Dissatisfied,” (2) “Very Dissatisfied,” to (1) “Extremely Dissatisfied.” (Appendix G)

Variables

Three sets of variables were measured for this research: demographic, disability, and rehabilitation outcome variables. The measurement procedures for each set of variables are described in this section. The two sets of independent variables were used to predict employment outcome variables.

Dependent variables. There were three dependent variables in this study. Employment congruence, job satisfaction, and weekly earnings. The dependent variable for analysis depended on each research question.

For the employment congruence dependent variable, participants’ rehabilitation goal and employment outcomes were coded according to the match of the Holland three letter personality-environment codes (e.g., IRE vs. IER). This resulted in an ordinal scale variable for congruence (e.g., 1,2,3). An outcome was determined to be congruent if the 1st two letters of the Holland code for the rehabilitation goal and employment outcome were identical, and would be coded (1) congruent. An outcome was determined to be related if the 1st letter of the Holland personality codes for the rehabilitation goal and employment outcome match, and was coded (2) related. An outcome was determined to be not congruent if there was no match of the 1st or 2nd letter of the Holland codes, and would be coded (3) not congruent.

For the job satisfaction dependent variable, participants’ satisfaction was coded according to the DORS “How did we do?” satisfaction survey. This resulted in an ordinal

scale variable for job satisfaction (e.g., 1,2,3,4,5,6). The job satisfaction data is coded from: (6) “Extremely Satisfied,” (5) “Very Satisfied,” (4) “Satisfied,” (3) “Dissatisfied,” (2) “Very Dissatisfied,” to (1) “Extremely Dissatisfied.”

For the weekly earnings dependent variable, participants weekly wages at case closure were coded in dollars and cents as stated on the DORS AWARE Case Management System. This resulted in a continuous interval scale variable for weekly wages (e.g., \$400.00).

Independent variables. The independent variables for vocational rehabilitation employment outcomes included: (1) IPE vocational rehabilitation goal, (2) disability impairment category, (3) race, (4) age, (5) gender, and (6) years of education at referral. These variables were hypothesized to be related to the employment outcomes from prior research (The Longitudinal Study of the Vocational Rehabilitation Services Program, 2002; Capella, 2002; Wilson, et al., 2002; Bolton et al., 2000; Wheaton et al., 1996).

For the independent variable of (IPE) vocational rehabilitation goal, participants were coded according to the rehabilitation goal as stated on their Individualized Plan for Employment (IPE). This resulted in a nominal scale variable for IPE. This involved DORS VR counselors reviewing the participant’s IPE to obtain this data (e.g., Computer Programmer). This occupation was classified under the DOT code # (030.162-010) and then translated via (DOHC) into the Holland code (IRE) for data analysis.

For the independent variable, disability impairment, the participant’s impairment and primary disability diagnosis consisted of a four-digit RSA-911 code representing different impairment categories and types of disabilities (consisting of a two-digit

impairment code and a two-digit cause/source code). This resulted in a nominal scale variable for disability/impairment category. The participant's impairment code was then taken from the first two disability code numbers and classified according to the three RSA-911 Disability Impairment categories that are utilized by DORS for data collection. The three RSA/DORS disability categories were coded according to the RSA Codes for Impairments as follows: (1) Sensory, (2) Physical, (3) Mental. Refer to Appendix H for the RSA-911 Codes for Impairments.

For the independent variable of race, the participants were coded according to their race as indicated on the DORS database. This resulted in a dichotomous nominal scale variable for race. The two racial categories utilized in the research sample were coded as follows: (1) Caucasian, (2) African American.

For the independent variable of age, the participants were coded in whole years as stated on the DORS database. This resulted in a continuous interval scale variable for age (e.g., 25 years old).

For the independent variable of gender, the participants were coded as: (1) male or (2) female, as stated on the DORS database. This resulted in a dichotomous nominal scale variable for gender.

For the independent variable of years of education attained at referral, the participants were coded according to RSA-911/DORS educational categories as stated on the DORS database. This resulted in an ordinal scale variable for education attained at referral. The data was coded as: (0) No formal schooling, (1) Elementary Education, (2) Secondary Education, (3) Special Education (e.g., moderate to severely disabled students who exit with a certificate), (4) High School graduate, (5) Post Secondary

Education, no degree, (6) Associate Degree or Vocational/Technical Certificate, (7) Bachelor's Degree, (8) Master's Degree or higher. Refer to appendix I for the RSA-911 Educational Attainment Level Codes.

Data Analysis Procedures

For the categorical dependent variables in this study, logistic regression analysis was used to assess the predictive relationships between the sets of variables and the dependent variable. Pedhazur (1997) indicates this type of multilevel analysis is useful for research designs in which the dependent variable is categorical. Pedhazur recommended utilizing this type of regression analysis when examining social and behavioral research with a categorical outcome. Pedhazur (1997) presented statuses (e.g., employment) as an example of an appropriate time to utilize this type of multiple regression analysis. Although logistic regression analysis and discriminant analysis are both statistical procedures that are appropriate for use with categorical outcome variables, logistic regression analysis requires fewer assumptions than does discriminant analysis and is more robust even when those assumptions are not met. Logistic is appropriate when the criterion variable is categorical and the predictor variables are measured on various scales (i.e., categorical or continuous). After determining that the data met the assumptions for logistic multiple regression analysis specified by Pedhazur (i.e., a categorical dependent variable, statistically independent outcomes, correct specificity of the model, and mutually exclusive and exhaustive outcome categories), logistic regression analysis was judged to be appropriate for data analysis.

Power Analysis. It was necessary to conduct a series of a priori power analyses to ensure that the sample size was adequate to support hierarchical multiple regression analysis. The first step, suggested by Hosmer and Lemeshow (2000), was to carry out a series of simple linear regressions using the dependent variable as the Y variable and each of the hypothesized covariates as the X variable. These regressions yielded a coefficient of determination for each covariate. The next step was to use SPSS 11.0 to conduct the power analysis.

Following Cohen's (1992) conventions of small, medium, and large effect sizes, the power analysis for each dependent variable and covariate used a small-to-medium effect size of .30 and the appropriate r^2 for each covariate. With a sample size of 150 and a significance level of .05, the power estimations ranged from 95% to 97% for two tailed tests of significance. Power may be increased by using a one-tailed significance test, which in some cases may be appropriate when there is a strong basis for assuming that error will occur in a particular direction. Cohen (1992) suggested researchers attempt to achieve 80% power, the results of the a priori power analysis indicated that a sample size of 150 participants was sufficient to proceed with the data collection and statistical analyses.

The data was then collected for 171 participants and coded in SPSS 11.0 format. Logistical regression analysis was utilized to assess the predictive relationships between the successive sets of variables representing the demographic variables, disability variables, and outcome variables (e.g., employment congruency, vocational satisfaction). This type of regression analysis involved analyzing each variable separately, as well as analyzing each variable with every other variable for significance.

The first set, demographic factors consisted of four variables (e.g., gender, race, age, years of education attained at referral). The second set, disability category included three disability impairment categories (e.g., Sensory, Physical, Mental). The two sets of independent variables (e.g., gender, race, age, education, disability category) were used to predict the dependent variable (e.g., congruence, vocational satisfaction, weekly wages) depending on the research question.

For research question one, the two sets of independent variables were used to predict outcome congruency (e.g., employment congruent with vocational rehabilitation goals, employment related to vocational rehabilitation goals, and employment not congruent with vocational rehabilitation goals). For research question two, the two sets of independent variables were used to predict vocational satisfaction (e.g., extremely satisfied, very satisfied, satisfied, dissatisfied, very dissatisfied, extremely dissatisfied). For research question three, the two sets of independent variables were used to predict weekly wages.

Model-fitting procedures. The logistic regression analyses followed Hosmer and Lemeshow's (2000) recommendations for fitting logistic regression models. Briefly, these steps include:

1. A univariate analysis of each variable, using two-sample t-tests for continuous variables and contingency tables with chi-square statistics for normal variables.

2. Selecting variables for the multivariable logistic regression analysis and fitting an initial model. Hosmer and Lemeshow (2000) recommend using all variables with a univariate p less than .25, in order to avoid excluding important variables. In addition, the authors recommend including all clinically or theoretically important variables in the

initial model, regardless of their univariate association with the dependent variable.

3. Verifying the importance of each variable in the initial model. As necessary, the researcher eliminates variables and fits the new model, using the likelihood ratio (LR) test to compare the new model with the initial model and eventually adding the excluded variables back into the model to determine whether they improved it. The resulting model is called the preliminary main effects model.

4. Close examination of the variables included in the model. For continuous variables, this involves checking the assumption of linearity in the logit. In this study, the linearity assumption was checked by fitting a Lowess plot of the relationship between the logit and each continuous variable. The resulting model is referred to as the main effects model.

5. Checking for interaction effects. This step involves creating a list of possible interactions based on the theory and the correlation matrix, adding them one at a time to the main effects model, and assessing their significance using the LR test. Hosmer and Lemshaw (2000) recommend that researchers add only those interaction effects that contribute to the model at traditional significance levels. The resulting model is called the preliminary final model.

6. Assessing the fit of the model. These analyses included five methods of checking the model fit: the Pearson chi-square statistic as the omnibus test of model coefficients, the -2 log likelihood (deviance), the Hosmer-Lemeshow goodness of fit test, the classification table for each model, and plotting the area under the ROC curve for each model. Hosmer and Lemshaw (2000) recommend using the classification table primarily as an adjunct to other measures.

CHAPTER 4

Results

This chapter begins with a description of the univariate analyses used to select the covariates for each of the three regression models and presents the covariates included in each initial model. Appendixes A through C include correlation tables for each multivariate analysis, showing the univariate associations for all of the variables considered for inclusion in the first two logistic regression models and the final linear regression model. As recommended by Hosmer and Lemeshow (2000), each of the initial regression models included all of the variables with a p level less than .25, and variables that had higher p levels but were hypothesized to affect the results.

The second section of the chapter presents the results of the regression models for each of the three dependent variables. (Appendixes D through F includes correlation matrices showing the variables included in the final model for each analysis).

Subsequent sections describe the results of confirmatory analyses.

Univariate Analyses

Selection of covariates for each initial regression model began with chi-square analyses for nominal independent variables, using appropriate measures of association for each type of data (e.g., the phi coefficient for relationships between dichotomous independent variables). For continuous variables, Hosmer and Lemeshow (2000) recommend conducting t tests for group comparisons of the mean on continuous independent variables, using Levene's test for equality of variances. Where variances

are not equal, the “equal variances not assumed” a t-test statistic was used to determine whether to include the variable in the initial model.

Congruence

The univariate analyses for the first outcome variable, congruence, yielded six covariates for the initial logistic regression model. Table 1 lists the categorical covariates for the initial model; Table 2 lists the continuous covariate for the congruence model. Because some categorical variables perform better in logistic regression models and are easier to interpret when they are dichotomized (Hosmer & Lemeshow, 2000), the disability category variable was dichotomized via dummy coding for each of the categories of disability. Appendix A includes a full correlation table for all of the variables considered for the initial Congruence logistic regression model.

Table 1

Categorical Covariates for Initial Congruence Model (N = 171)

<u>Variable</u>	<u>Chi-Square</u>	<u>df</u>	<u>p</u>
Gender	3.756	2	.153
Race	1.595	2	.450
Education	5.554	2	.062
Disability 1	.989	2	.610
Disability 2	4.083	2	.130

Note. Disability 1 = Sensory Disability; Disability 2 = Physical Disability.

Table 2

Continuous Covariate for Initial Congruence Model (N = 171)

Variable	F	<i>t</i>	<i>df</i>	<i>p</i>
Age	1.787	38.052	33	.100

Job Satisfaction

The univariate analyses for the second outcome variable, job satisfaction, yielded 11 covariates for the second logistic regression model. Table 3 lists the categorical covariates for the second model. Table 4 lists the continuous covariate. Because some categorical variables perform better in logistic regression models and are easier to interpret when they are dichotomized (Hosmer & Lemeshow, 2000), the disability category variable was again dichotomized via dummy coding for each of the categories of disability. Appendix B includes a full correlation table for all of the variables considered for the initial Job Satisfaction logistic regression model.

Table 3

Categorical Covariates for Job Satisfaction Model (N = 101)

Variable	Chi Square	df	p
Job Satisfaction 1	6.289	1	.012
Job Satisfaction 2	5.365	1	.021
Job Satisfaction 3	1.730	1	.188
Job Satisfaction 4	.131	1	.717
Job Satisfaction 5	2.402	1	.121
Job Satisfaction 6	8.708	1	.003
Gender	1.580	1	.209
Race	.013	1	.908
Education	.019	1	.890
Disability 1	4.857	1	.028
Disability 2	1.349	1	.245

Note. Disability 1 = Sensory Disability Category; Disability 2 = Physical Disability Category. Job Satisfaction ratings were made on a 6-point scale (1 = Extremely Dissatisfied, 6 = Very Satisfied).

Table 4

Continuous Covariate for Job Satisfaction Model (N = 101)

Variable	F	<i>t</i>	<i>df</i>	<i>p</i>
Age	1.778	36.712	33	.182

Wages

Table 5 shows the six coefficients for the Weekly Wages linear regression model. The linear regression model was selected to examine the relationship between the categorical independent variables and a continuous interval scale dependent variable (e.g., wages). Pedhazur (1997) recommended linear regression for predicting a dependent variable (wages) from a set of independent variables (race, gender, education, age). In the Weekly Wages linear regression model, the independent variable disability category was again dichotomized for each of the categories of disability.

Table 5

Coefficients for Weekly Wages Linear Regression Model (N = 171)

<i>Variable</i>	<i>t</i>	<i>Beta</i>	<i>p</i>
Gender	-.165	-.011	.869
Race	-1.282	-.089	.202
Age	.964	.070	.337
Education	6.011	.421	.000
Disability 1	.432	.032	.666
Disability 2	3.026	.223	.003

Note. Disability 1 = Sensory Disability Category; Disability 2 = Physical Disability Category.

Multivariate Analyses

Research Question 1: For those clients who obtained a successful vocational rehabilitation employment outcome is there a relationship between disability and demographic variables and an outcome congruent with the vocational rehabilitation goal?

Hypothesis 1: There will be a positive relationship between disability and demographic variables and an outcome congruent with the vocational rehabilitation goal.

The results of the initial logistic regression model that treated congruency (congruent, related, not congruent) as an ordinal variable resulted in a model fit that was not significant (.378), and no independent variables were significant. Thus, congruency was treated as a nominal variable that improved the model fit significantly (.048). Treating congruency as a nominal variable improved the fit of the new model as indicated by the higher chi square (21.172 for the new model versus 5.32 for the old model). The resulting multinomial logistic regression model was a good fit for predicting congruency. The independent variable of education was not significant at (.058). However, there is a substantive relationship between education and congruence and it appears to be the best predictor of congruent VR outcomes (see table 6). The more education the client attained increased the likelihood of obtaining a job congruent to the IPE vocational rehabilitation goal. Table 7 shows the educational attainment and congruency crosstabulation table. Appendix D includes the correlation matrix.

Table 6

Multinomial Logistic Regression Model for Congruence (N = 171)

Variable	<i>B</i>	<i>SE</i>	Wald	<i>p</i>	Exp(<i>B</i>)
Age	-9.327E-04	.017	.003	.956	.999
Education	-4.246E-04	.125	.000	.058	1.00
Race	.132	.434	.093	.761	1.141
Gender	-.760	.405	3.521	.061	.468
Disability 1	.598	.618	.935	.334	1.818
Disability 2	.257	.465	.305	.063	1.293

Note. Disability 1 = Sensory Disability Category; Disability 2 = Physical Disability Category.

Table 7

Educational Attainment and Congruency Crosstabulation (N = 171)

<u>Educational Attainment</u>	<u>Congruent</u>	<u>Related</u>	<u>NotCongruent</u>
None (N=1)	1 (100%)	0 (0%)	0 (0%)
Elementary (N=4)	3 (75%)	1 (25%)	0 (0%)
Secondary (N=16)	8 (50%)	7 (43.75%)	1 (6.25%)
Special Education* (N=19)	12 (63.16%)	4 (21.05%)	3 (15.79%)
HS graduate (N=73)	36 (49.31%)	15 (20.54%)	22 (30.15%)
Post Secondary (N=17)	13 (76.48%)	2 (11.76%)	2 (11.76%)
AA Deg/Voc Cert. (N=16)	8 (50%)	3 (18.75%)	5 (31.25%)
Bachelor's Degree (N=13)	10 (76.92%)	2 (15.38%)	1 (7.69%)
<u>Masters/Higher (N=12)</u>	<u>10 (83.33%)</u>	<u>0 (0%)</u>	<u>2 (16.67%)</u>

Note. Special Education = Special Education Certificate Students; Post Secondary = Post Secondary Education, No Degree.

Table 8

Gender and Congruency Crosstabulation (N = 171)

Gender	Congruent	Related	Not Congruent
_Male (N=91)	57 (62.64%)	20 (21.97%)	14 (15.38%)
Female (N=80)	44 (55.0%)	14 (17.50%)	22 (27.50%)

Table 9

Disability Category and Congruency Crosstabulation (N = 171)

Disability Category	Congruent	Related	Not Congruent
Sensory (N=26)	18 (69.23%)	3 (11.53%)	5 (19.23%)
Physical (N=66)	38 (57.57%)	16 (24.24%)	12 (18.18%)
Mental (N=79)	45 (56.96%)	15 (18.98%)	19 (24.05%)

The independent variable of gender at (.061) was not significant, but there appears to be a relationship between gender and congruence. Table 8 shows the gender and congruency crosstabulation table. Males were more likely to obtain a congruent employment outcome (62.6% verses 55%). Conversely, findings indicate that females were more likely to obtain an employment outcome that was not congruent to the rehabilitation goal (27.5% verses 15.3%). Table 9 shows the disability category and congruency crosstabulation table. The other independent variables in this logistic regression model were not significant (see table 6).

Research Question 2: For those clients who obtained a successful employment outcome congruent to the vocational rehabilitation goal were these clients more satisfied with their job than those clients who did not obtain their goal?

Hypothesis 2: There will be a positive relationship between job satisfaction and obtaining an employment outcome congruent to the vocational rehabilitation goal.

The results of the multinomial logistic regression analysis for this research question provided no support for hypothesis 2. The only variable that was found to be statistically significant was disability category. The multinomial logistic regression analysis included all 101 congruent cases and excluded the 70 cases that were not congruent because the research question was only examining the cases that obtained

congruent employment outcomes. The independent variables for this model included: gender, race, age, education, and disability category. The dependent variable for this model was job satisfaction and each job satisfaction rating was treated as a discrete variable. Each job satisfaction rating represented a point on a likert scale ranging from 1 (extremely dissatisfied) to 6 (extremely satisfied). The multinomial logistic regression analysis indicated that participants with disability dummy category 1 that represented persons with a sensory disability had a statistically significant coefficient of .028. This finding indicates that persons within the sensory disability category were less satisfied than persons within the physical and mental disability categories. Table 10 shows the multinomial logistic regression model for congruence. Stepwise analyses confirmed that all multinomial logistic regression models provided no support for hypothesis 2. In each case the chi square statistic was not significant.

Table 10

Multinomial Logistic Regression Model for Job Satisfaction (N = 101)

Variable	<i>B</i>	<i>SE</i>	Wald	<i>p</i>
Job Satisfaction 1	-3.552	1.416	6.289	.012
Job Satisfaction 2	-2.848	1.230	5.365	.021
Job Satisfaction 3	-1.408	1.071	1.730	.188
Job Satisfaction 4	.376	1.036	.131	.717
Job Satisfaction 5	1.625	1.049	2.402	.121
Job Satisfaction 6	3.214	1.089	8.708	.003
Gender	.492	.392	1.508	.209
Race	-4.632E-02	.403	.013	.908
Age	2.135E-02	.016	1.778	.182
Education	1.483E-02	.107	.019	.890
Disability 1	-1.299	.590	4.857	.028
Disability 2	-.494	.425	1.349	.245

Note. Disability 1 = Sensory Disability Category; Disability 2 = Physical Disability Category. Job Satisfaction ratings were made on a 6-point scale (1 = Extremely Dissatisfied, 6 = Very Satisfied).

Research Question 3: For those clients who obtained a successful employment outcome congruent to their vocational goal did their weekly wages significantly differ from those clients who did not obtain an outcome congruent with the vocational goal?

Hypothesis 3: There will be a positive relationship between weekly wages and obtaining an employment outcome congruent to the vocational rehabilitation goal.

The results of the weekly wages linear regression model provided support for hypothesis 3. The linear regression model was a good fit and had a significance level of .000 and R^2 of .294. The linear regression analysis included all 101 congruent cases and excluded the 70 cases that were not congruent because the research question was only examining the cases that obtained congruent employment outcomes. The independent variable of education in the wages model had a significance level of .000 (see table 11). More education increased the participant's weekly wages. Table 13 shows the mean weekly wages for each educational attainment category. The linear regression analysis indicated that participants with disability dummy category 2, which represented persons with a physical disability had a statistically significant value of .003. This finding indicates that persons within the physical disability category earned higher weekly wages than persons within the sensory and mental disability categories. Table 12 shows the mean weekly wages for each disability category. The person-environment congruency variable was also found to significantly effect the participant's weekly wages. The mean weekly wage for participants who obtained an employment outcome congruent to the VR goal was \$529.88. For participants who obtained an

employment outcome related to the VR goal the mean weekly wage was \$343.85. For participants who obtained an employment outcome not congruent to the VR goal the mean weekly wage was \$286.22. Table 14 shows the person-environment congruency and weekly wages table.

Table 11

Linear Regression Model for Weekly Wages (N = 101)

Variable	<i>B</i>	<i>SE</i>	Beta	<i>t</i>	<i>p</i>
Gender	-6.176	37.354	-.011	-.165	.869
Race	-51.017	39.785	-.089	-1.282	.202
Age	1.480	1.535	.070	.964	.337
Education	68.747	11.436	.421	6.011	.000
Disability 1	25.098	58.132	.032	.432	.666
Disability 2	127.617	42.169	.223	3.026	.003

Note. Disability 1 = Sensory Disability Category; Disability 2 = Physical Disability Category.

Table 12

Disability Category and Weekly Wages (N = 171)

Disability Category	Mean Weekly Wage	N	%
Mental	\$352.75	79	46.2
Sensory	\$463.57	26	15.2
Physical	\$539.29	66	38.6

Table 13

Educational Attainment and Wages (N = 171)

Educational Attainment	Mean Weekly Wage	N	%
None	\$584.00	1	.60
Elementary	\$295.50	4	2.3
Secondary	\$364.44	16	9.4
Special Education	\$325.63	19	11.1
HS graduate	\$364.76	73	42.7
Post Secondary	\$490.94	17	9.9
AA Deg/Voc Cert.	\$378.16	16	9.4
Bachelor's Degree	\$716.69	13	7.6
Masters/Higher	\$949.00	12	7.0

Note. Special Education = Special Education Certificate Students.

Table 14

Person - Environment Congruency and Weekly Wages (N = 171)

Congruency Category	Mean Weekly Wage	N	%
Congruent	\$529.88	101	59.1
Related	\$343.22	34	19.9
Not Congruent	\$286.22	36	21.1

Confirmatory Analyses

Hosmer and Lemeshow (2000) recommend stepwise logistic regression analysis as a “useful and effective data analysis tool” (p. 116). In this case, stepwise logistic regression analyses confirmed that these models provided the best fit for each set of hypotheses.

The analyses used the SPSS forward stepwise procedure with the likelihood ratio as the test for variable removal. Entry of a covariate is based on the significance of the model score statistic; the p value for entry was .05. Removal is based on the probability of a likelihood-ratio statistic based on the maximum partial likelihood estimates. The p value for removal was .10.

For each of the two multinomial logistic regression models hypotheses, the results of the stepwise analyses confirmed that the previously specified model provided the best fit for the data. In the first logistic regression model, chi square statistic was significant and increased at each step, the log -2 likelihood was smallest at the final step, and the Hosmer and Lemeshow test statistic was not significant. In the second model, the chi square statistic was not significant and did not increase at each step.

Plotting the area under the ROC curve for each model confirmed the fit. The ROC curve plots the probability of detecting true sensitivity in the analysis; the more area under the curve the better the fit of the model. The percentage of the area under the curve ranged from 98% for the congruence model to 82% for the job satisfaction model, indicating an appropriate fit for the models using the standards recommended by Hosmer and Lemeshow (2000).

CHAPTER 5

Discussion

The purpose of this research was to examine the relationship between Individualized Plan for Employment (IPE) goals and vocational rehabilitation employment outcomes to determine if obtaining a job congruent to the IPE goal increased vocational satisfaction and wages. Findings indicate if a vocational rehabilitation client obtains employment congruent with his or her IPE rehabilitation goal they earn significantly higher wages. However, the study also yielded a number of other interesting findings. The first section of this chapter is organized around the research questions and hypotheses investigated for this study.

For each research question and its attendant hypothesis, this section summarizes and discusses key findings. It also places each finding in the context of the vocational rehabilitation literature, discussing its consistency with past research and looking at possible reasons for any divergence from previous studies. Next, this section looks at any major limitations specific to a given result and suggests how research might clarify or extend the findings. Subsequent sections of the chapter review the general limitations of the study; discuss the study's theoretical, applied, and research implications; and suggest ideas for future research.

Summary and Interpretation of Results

Research Question 1

The first research question asked whether disability and demographic variables are related to congruent vocational rehabilitation employment outcomes for persons

with disabilities. Specifically, Hypothesis 1 predicted a positive relationship between disability and demographic variables and an employment outcome congruent with the IPE vocational rehabilitation goal.

The data analysis in the first logistic regression model found some support for this hypothesis. The independent variable of education attained at referral for vocational rehabilitation services was not significant at .058. However, there is a substantive relationship between education and congruence and education was determined to be the best predictor of congruent vocational rehabilitation outcomes. The chi square analysis for education and congruence was 24.427. The crosstabulation analysis indicated the more education the participant had attained, the more likely he or she was to obtain an employment outcome congruent to the IPE rehabilitation goal. For example, participants with an educational level of a Master's degree or higher obtained VR employment outcomes congruent to the IPE goal 83.33% of the time. Participants with a Bachelor's degree obtained congruent employment outcomes 76.92% of the time, and high school graduates obtained a congruent employment outcome only 49.31% of the time. However, special education participants (e.g., special education certificate students) achieved a surprisingly high rate of congruent employment outcomes 63.16%. This finding may be attributable to the process of developing the IPE goal and review of prior assessments for special education students. The VR Policies and Procedures Section 1301 states, "In development of the IPE, the employment goal will be as specific as possible. Consideration will be given to assessments which may have been completed as part of the (school program) as well as the interests, capabilities and informed choice of the individual."

There has been no prior research that this researcher is aware of examining the relationship between educational attainment and obtaining a vocational rehabilitation employment outcome congruent to the client's IPE goal. However, these results make sense. The more an individual prepares for employment through an educational program, the more likely it is that the job eventually obtained will match their educational pursuits. This finding adds to the literature by supporting the existing studies demonstrating a relationship between a vocational rehabilitation client's level of educational attainment and positive vocational rehabilitation employment outcomes (Beadles, McDaniel, & Walters, 2000; Giesen et al., 1997; Wilson, Turner, & Jackson, 2002).

The independent variable of education attained at referral for vocational rehabilitation services was also related to the participant's disability category. In this study, the largest disability category was the mental disability category with 79 of 171 participants (46.2%). This group achieved advanced educational degrees (e.g., Bachelor's & Master's degrees) at a significantly lower proportion (16%) than did participants from the other two disability categories. Clients with mental disabilities were also more likely to obtain a job that was not congruent to the IPE goal (24.05%), and obtained the lowest rate of congruent VR outcomes (56.96%). This finding is consistent with prior research that determined vocational rehabilitation consumers with mental and psychiatric disabilities have the poorest VR employment outcomes and job retention rates (The Longitudinal Study of the Vocational Rehabilitation Services Program, 2002; Accordino & Herbert, 2000; Roessler, 1985). The poor vocational rehabilitation outcomes for consumers with mental and psychiatric disabilities may in part be due to

the incongruent fit between the person and the work environment. Holland's theory suggests that the choice of a vocation is an expression of personality and that vocational satisfaction and achievement depend on the congruence between an individual's personality and work environment (Holland, 1985).

Research Question 2

The second research question investigated whether Holland's person-environment congruence was related to job satisfaction. Hypothesis 2 predicted a positive relationship between job satisfaction and obtaining an employment outcome congruent to the vocational rehabilitation goal. The data provided no support for this hypothesis. This finding may be the result of the multinomial logistic regression model (N = 101) utilized to examine the relationship between congruence and job satisfaction. The analysis was only completed for participants who met a certain criterion (e.g., congruent employment outcome) and may have lost power in the analysis. Most of the prior research on the relationship between vocational satisfaction and personality-environment congruence has shown a weak but positive relationship between congruence and job satisfaction (Cook, 1997; Gottfredson & Holland, 1990; Meir & Melamed, 1986; Tranberg, 1992). A smaller number of studies failed to find any significant relationship between person-environment congruence and job satisfaction (Hoeglund & Hansen, 1999; Young, Tokar, & Subich, 1998).

Only one prior study examined Holland's person-environment congruence for people with disabilities who were clients of the public vocational rehabilitation population. Jagger and Neukrug (1992) examined congruence between personality traits and chosen occupation as a predictor of job satisfaction for VR clients. They

found a positive correlation ($r = .26, p < .05$) using the Minnesota Satisfaction Questionnaire. It is possible this study's finding of no support for Holland's theory in the second logistic regression model may be the result of the instrument used to measure job satisfaction. In this study the DORS "How did we do?" satisfaction survey was utilized (see Appendix G). This DORS satisfaction survey consists of six questions, only one which measures vocational satisfaction and does not have any data available on reliability or validity. Utilizing a vocational satisfaction measure with additional questions to measure job satisfaction (e.g., Job Satisfaction Index) would have increased the reliability (Daftuar, 2001). Generally, the more items on a test increases the consistency of measurement (Bellini & Rumrill, 1999). Most of the prior research that has found support for Holland's theory has utilized vocational satisfaction instruments that have relatively strong psychometric properties (Cook, 1997; Holie, 2000; Jagger & Neukrug, 1992).

Research Question 3

The third research question sought to determine whether obtaining a vocational rehabilitation employment outcome congruent to the vocational rehabilitation goal increased the participant's weekly wages. Hypothesis 3 posited a positive relationship between weekly wages and obtaining an employment outcome congruent to the IPE vocational rehabilitation goal. The data analyses provided strong support for this hypothesis. Specifically, obtaining an employment outcome congruent to the vocational rehabilitation goal significantly increased the participant's earnings capacity. The financial effect of IPE goal-employment outcome congruency on wages was more significant than the participant's disability category. Participants who obtained a

congruent VR employment outcome earned a mean weekly wage of \$529.88, participants who obtained a related outcome earned \$343.22, and participants who obtained an employment outcome that was not congruent to the IPE goal earned \$286.22. Participants with physical disabilities earned a mean weekly wage of \$539.29, participants with sensory disabilities earned \$463.57, and participants with mental disabilities earned \$352.75. There were no prior studies examining the effect of IPE goal-employment outcome congruence on wages for people with disabilities. Two variables in the linear regression model, educational attainment and disability category were significantly related to weekly wages (at the .01 level). The weekly wages linear regression model was a good fit and had a significance level of .000 and R^2 of .294.

The independent variable of education attained at referral for vocational rehabilitation services was determined to be the best predictor of weekly wages, and was statistically significant at .000. The higher the participant's educational attainment at time of referral for vocational rehabilitation services, the higher the participant's weekly wages after completing VR services. For example, a participant with a Master's degree earned a mean weekly wage of \$949.00, a participant with a Bachelor's degree earned \$716.69, and a high school graduate earned \$364.76. This finding adds to the literature by supporting the established relationship between a vocational rehabilitation consumer's level of educational attainment and weekly wages after a successful case closure (Beadles, McDaniel, & Walters, 2000; Capella, 2002; Hayward, 1998; Longitudinal Study of the Vocational Rehabilitation Services Program, 2002; Malakpa, 1994).

A finding of interest regarding the third hypothesis was the relationship between the independent variable of disability category and weekly wages. The linear regression analysis showed that persons with a physical disability had a statistically significant value of .003. This finding indicates that these participants earned higher weekly wages (\$539.29) than participants with sensory (\$463.57) and mental disabilities (\$352.75). This finding on the significant effect of an individual's type of disability on wages is consistent with prior research on vocational rehabilitation employment outcomes (Bolton, Bellini, & Brookings, 2000; Finch & Wheaton, 1999; Moore, 2000).

The other independent variables in the weekly wages linear regression model were not statistically significant, however, race and gender did affect the participant's mean weekly wages. Caucasians earned \$470.65 a week, compared to average weekly earnings of \$394.21 for African Americans. This finding is consistent with prior vocational rehabilitation research on the effect of race on wages (LSVRSP, 2002; Moore, Feist-Price, & Alston, 2002; Olney & Kennedy, 2002; Wilson, 1999; Wise, 1998). In terms of gender, mean weekly wages for males was \$452.43, and for females the mean was \$429.26. This finding is consistent with prior vocational rehabilitation research on the effect of gender on wages (Bounds et al., 2003; Mentz et al., 1989; Wheaton & Wilson, 1996).

These findings are significant and have practical implications for vocational rehabilitation counselors and consumers. Rehabilitation counselors and consumers should be aware of the economic effect of a client obtaining their IPE rehabilitation goal. There were no prior studies that this researcher was aware of investigating IPE goal-employment outcome congruency and wages for vocational rehabilitation consumers,

however, this result is not difficult to interpret. By earning substantially higher wages (\$529.88 verses \$286.22), may have an effect on the participant's motivation to remain employed. This would have a positive effect on job retention rates, a serious problem for consumers of vocational rehabilitation services (Roessler, 2002).

Limitations

The study described here had a number of methodological limitations that make it necessary to interpret the results with caution. Major limitations were related to sample concerns, instrumentation, and study design.

Sample Concerns

A limitation of this study is the sample size. Cohen (1992) suggested researchers attempt to achieve 80% power and the results of the power analysis indicated a sample size of (N = 150) would be sufficient to proceed with the data collection and data analysis. A sample size of 200 participants was requested from DORS (as closed records are occasionally incomplete), and the final number of records with all data for the independent and dependent variables found (N = 171) participants for this research. This sample size represents 5.75% (171 of 2,972) of all of the successfully closed (Status 26) cases in 2002. It should be noted, that the response rate of the "How did we do?" satisfaction survey utilized by DORS is approximately 65%, and this data was missing for the 29 files that were not utilized. Only successfully closed cases where the vocational rehabilitation consumer completed the satisfaction survey were selected for this study. For this reason, the sample may have been biased toward subjects who

were more satisfied with vocational rehabilitation services. In the same way, potential participants who were more satisfied with the vocational rehabilitation employment outcome or had a strong relationship with their rehabilitation counselor may have been more likely to complete the DORS satisfaction survey.

A second limitation related to the research sample concerns the study's external validity. This sample only included participants from one state vocational rehabilitation agency and is only applicable to the public vocational rehabilitation population. This raises the question about the study's external validity to other populations. Thus, the results may not be generalized to other populations with disabilities (e.g., workers' compensation clients).

A final limitation related to the research sample concerns the feasibility of the participant's IPE employment goal. This may be a factor for participants with mental, cognitive or psychological disabilities. However, the Rehabilitation Services Administration mandates self-determination, a collaborative relationship and informed choice regarding the selection of an individual's IPE employment goal. The guidelines for selecting an employment goal are specified in the RSA's VR Policies and Procedures. Section 601 states,

The counselor will develop a collaborative relationship with the individual and will assist the individual in identifying possible employment goals, services and service providers and assessing relevant factors related to each option. DORS staff shall provide information and support services to eligible individuals, particularly individuals with cognitive disabilities to enable and enhance informed choice. The counselor will provide or assist the individual in acquiring information

necessary to make informed choices regarding the selection of an employment goal, consistent with the strengths, resources, priorities, concerns, abilities, capabilities and interests of the individual.

Instrumentation and Measurement

A significant limitation of this study is related to the instrumentation and measurement of the participants' vocational satisfaction. The data on the participants' vocational satisfaction was obtained from the DORS "How did we do?" satisfaction survey. As indicated this survey only had one question measuring vocational satisfaction and may not have had enough job satisfaction questions to adequately capture the participants' vocational satisfaction. This instrument did not have any psychometric data available for review. Other studies using established instruments have found that person-environment congruence predicts satisfaction. Thus, failure to find significance in this study may have been related to the vocational satisfaction measure. The use of an established instrument of vocational satisfaction with strong psychometric qualities and additional vocational satisfaction questions (e.g., Job Satisfaction Index) would have increased the reliability (Daftuar, 2001). The use of more reliable and valid instruments measuring vocational satisfaction may have found a correlation between person-environment congruence and job satisfaction and would have improved the study.

Design

The research design selected for this study was a descriptive design. In addition, this ex post facto design did not permit any manipulation of the independent variables, additional data collection or contact with study participants. The research design could be improved by taking a longitudinal approach to data collection. It would have been beneficial to contact participants one year after closure to obtain additional vocational satisfaction data. This would also permit an examination of person-environment congruence to job retention, a significant problem for the vocational rehabilitation population that was not examined.

A final limitation related to the research design, was the fact that DORS vocational rehabilitation client case files were not available for review. DORS provided electronic data but not physical files for review and data analyses. It would have been beneficial to have the participant's case records available for review to determine if the participants who did not achieve a congruent vocational rehabilitation employment outcome had other factors in common (e.g., frequently changing IPE goals). However, since authorization from DORS was only obtained for a review of electronic data on successfully closed cases, this was impossible.

Implications of Findings

The results of this study have a number of implications for vocational rehabilitation counselors and consumers. This portion of the chapter discusses the study's implications for theory, practice, and directions for future research.

Theoretical Implications

The present study aimed to fill a gap in the existing vocational rehabilitation literature by taking a Holland person-environment theory driven approach to explaining employment outcomes for this population. Although research examining the variables influencing successful vocational rehabilitation outcomes has been extensive, the client (IPE) vocational rehabilitation goals have been ignored. This is surprising as federal mandates have placed an emphasis on client choice in establishing vocational rehabilitation goals since 1992.

From a Holland theoretical prospective, the finding that vocational rehabilitation participant's wages are strongly related to person-environment congruence offers a new and useful perspective for understanding vocational rehabilitation employment outcomes. Holland's theory of vocational choice posits a relationship between person-environment congruence and job satisfaction, but does not address an individual's wages. No research has examined the relationship between IPE goal and employment outcome congruence and wages for vocational rehabilitation consumers. This relationship between IPE goal and employment outcome congruence and wages should be explored in future research. The association between variables such as educational attainment and wages is in line with theoretical expectations, since Holland person-environment congruence and education have a reciprocal relationship (Elton & Smart, 1988; Hoeglund & Hansen, 1999; Tokar & Subich, 1997). This study demonstrated a link between Holland's person-environment congruence and the vocational rehabilitation participant's weekly wages, providing initial evidence that person-environment congruence is a factor that relates to employment outcomes for this

population.

Applied Implications

What do these findings mean for service providers? To begin with, they point out the economic importance of obtaining an employment outcome congruent to the client's IPE vocational rehabilitation goal. While rehabilitation counselors probably have an intuitive understanding of this relationship, this study provides empirical evidence on the substantial economic benefit realized by the vocational rehabilitation consumer when the employment outcome is congruent to the IPE goal (e.g., \$ 529.88 verses \$286.22). Obtaining a congruent vocational rehabilitation employment outcome may increase job retention rates for VR consumers. Holland's theory posits that the degree of fit between a person's personality type and their occupation influences job satisfaction. Holland predicted that congruent individuals will be reinforced, satisfied, and less likely to change work environments (Holland, 1992).

This finding supports additional training of vocational rehabilitation counselors in career theory and career counseling. For example, in service training programs covering Holland's theory of vocational choice could encourage counselors to pay more attention to the process of making a vocational choice and establishing an employment goal. The fact that only 59% of the participants in this study found employment congruent with the IPE goal indicates that counselors are not spending sufficient time on this issue. This is especially important for persons with mental, cognitive and psychiatric disabilities who are most likely to obtain a incongruent employment outcome, earn the lowest wages, have the poorest retention rates, and experience the poorest vocational rehabilitation outcomes. Rehabilitation counselors may not be

spending sufficient time working with very severely disabled individuals to obtain employment outcomes congruent to the IPE goal. In addition, independent vendors who frequently provide job placement services may be not attending to the individual's rehabilitation goals, since they are only compensated for obtaining employment with no evaluation of IPE goals to the employment outcome. By strengthening the vocational rehabilitation counselor's understanding of career theory and attempting to increase the congruence between the IPE goal and employment outcome may have a significant effect on vocational rehabilitation outcomes, vocational satisfaction and job retention.

Another applied implication is for job development and job placement. Vocational rehabilitation counselors should focus their job placement efforts on obtaining an employment outcome congruent to the IPE goal. Counselors should be more creative when developing rehabilitation plans and design the client's VR services to not only obtain a job, but a job consistent to the client's rehabilitation goal. In addition, VR counselors should explain the economic effect of obtaining IPE goals and encourage the client to obtain their IPE goal, rather than just obtaining a job so the case can be closed successfully (Status 26).

Redefining outcomes. As part of these efforts, service providers may need to reconsider how they define vocational rehabilitation outcomes. The use of traditional outcome measures (e.g., Status 26) is problematic because it only examines if the vocational rehabilitation consumer obtains employment and does not examine the client's IPE goal-employment outcome congruence, client wages, job satisfaction, and job retention. The employment outcome assessment should also take into account the relationship between the participant's IPE rehabilitation goal to the employment

outcome. Congruence is an excellent way to examine this relationship. The DORS employment outcome (Status 26) could be modified to incorporate a measure of IPE employment goal-employment outcome congruence. In addition, independent vendors who provide job placement services should have additional oversight by DORS on obtaining VR employment outcomes congruent to IPE employment goals. Vendors could receive a bonus if they obtained an employment outcome congruent to the individual's rehabilitation goal, and conversely incur a penalty if the employment outcome was not congruent to the IPE employment goal.

The federal vocational rehabilitation program has adequate informed consent procedures at the beginning of the VR process when selecting a vocational rehabilitation employment goal. However, at the end of the VR process when the individual obtains employment there is no informed consent procedures or assessment of how the job relates to the VR goal. This again is especially important for persons with mental, cognitive and psychiatric disabilities who have the poorest vocational rehabilitation employment outcomes. For example, in this study one participant exemplifies this issue. This individual had a mental disability (mental retardation) and obtained an employment outcome (janitorial - RES) earning \$78.00 a week, that was not congruent with the employment goal (salesperson - ESR). There should have been a discussion with the individual explaining the job they are about to accept was not congruent to the IPE goal, the specific duties, earnings, and related issues to adequately inform the VR consumer. In some cases a job simulation or tryout would provide the individual with valuable information to determine if they would like the job. Obtaining a vocational rehabilitation employment outcome that is not congruent to the

IPE rehabilitation goal may be related to employment retention, a significant problem for this population (Roessler, 2002).

Research Implications and Direction for Future Research

Much of the previous work on predicting vocational rehabilitation employment outcomes has focused on demographic variables (e.g., Bolton, Bellini, & Brookings, 2000; Capella, 2002; Moore, Price, & Alston, 2002), racial variables (e.g., Olney & Kennedy, 2002; Wilson, Turner, & Jackson, 2002; Wise, 1998), and service variables (e.g., Bellini, Neath, & Bolton, 1995; Finch & Wheaton, 1999; The Longitudinal Study of the Vocational Rehabilitation Services Program, 2002). This study departed from the traditional avenues of research by taking a Holland person-environment theory-based approach and investigating the relationship between client IPE goal and employment outcome congruence. Future research should build on these findings and utilize RSA-911 data from other states to determine if the IPE goal-employment outcome congruency relationship effects other rehabilitation agencies' employment outcomes. Future research should examine other factors that may be related to IPE goal and employment outcome congruency (e.g., frequently changing IPE goals). Finally, future research could examine if this person-environment congruency effects wages for other populations (e.g., college students).

The results of this study suggest a number of directions for future research. Some of these emphasize redefining employment outcomes, while others focus on use of additional data collections or analyses to supplement or extend the findings of the current study. Additional theory-based research offers another direction for future work. Each of these areas of research will be discussed below.

Changes in the definition and measurement outcomes. As rehabilitation practitioners and researchers reconsider how they define a successful vocational rehabilitation employment outcome (e.g., Status 26), they will also need to reconsider how they measure success. The DORS Status 26 outcome measurement should be modified to incorporate a measure of employment goal-employment outcome congruence. Both providers and researchers could emphasize and examine the congruency of the vocational rehabilitation IPE goal to the employment outcome, to other related issues such as employment retention, wages and vocational satisfaction. These variables may effect the vocational rehabilitation employment outcome, however, have not been examined. Additional research demonstrating the link between these variables and vocational rehabilitation outcomes may lead to a refinement of the definition of a successful case closure. Research indicates the vocational rehabilitation population has a significant problem with job retention (Gibbs, 1990; Roessler, 1985). This may be related to obtaining employment outcomes that do not “fit” the VR consumer’s personality, lowering job retention rates. In addition to the research opportunities afforded by more redefined definitions and measurements of vocational rehabilitation employment outcomes, the findings of this study suggest several other directions for future investigation.

Measurement of vocational satisfaction. The study findings seem to suggest that vocational rehabilitation consumers who obtain an employment outcome congruent to their IPE goal earn significantly higher weekly wages. However, there was no direct correlation found between obtaining a congruent employment outcome and vocational satisfaction. Completing a similar study with a measure of vocational satisfaction that

has been standardized and examined for reliability and validity (e.g., Job Satisfaction Index, Minnesota Satisfaction Questionnaire) would improve the research design and may show a correlation between person-environment congruence and vocational satisfaction. In addition, a longitudinal study contacting vocational rehabilitation consumers one year after obtaining employment who are working in the labor market would provide useful vocational satisfaction information. For example, a longitudinal study would also provide data relative person-environment congruency and job retention, a significant problem for the vocational rehabilitation population (Roessler, 2002).

Additional psychologically oriented research. Finally, although demographic variables were associated with the employment outcomes in this study, other psychological factors that were not explored undoubtedly contribute to the vocational rehabilitation outcomes as well. Future research might explore constructs such as the vocational rehabilitation consumer's personality pattern utilizing the Holland Self Directed Search, or vocational interests utilizing such measures such as the Strong Vocational Interest Inventory. Like outcome expectations, many of these variables may prove to offer both explanations of vocational rehabilitation employment outcomes and promising avenues of intervention.

Appendix A

Correlation Table for the Congruence Logistic Regression Model

Table 15

Correlations of Independent Variables with Employment Congruence

<u>Variable</u>	<u>Correlation</u>	<u><i>p</i></u>
Age	-.059	.445
Disability Category	.072	.352
Education	-.058	.449
Gender	.122	.113
Race	-.034	.658

Appendix B

Correlation Table for the Job Satisfaction Logistic Regression Model

Table 16

Correlations of Independent Variables with Job Satisfaction

	Correlation	<i>p</i>
Age	.139	.087
Disability Category	-.026	.737
Education	-.001	.993
Gender	.033	.672
Race	-.128	.095

Appendix C

Correlation Table for the Weekly Wages Linear Regression Model

Table 17

Correlations of Independent Variables with Weekly Wages

	Correlation	<i>p</i>
Age	.186*	.015
Disability Category	-.221**	.004
Education	-.489**	.000
Gender	-.042	.590
Race	-.133	.082

Note. * Correlation is significant at the 0.05 level.

**Correlation is significant at the 0.01 level.

Appendix D

Correlation Matrix for the Congruence Logistic Regression Model

Table 18

Correlation Matrix for Congruence Model

	1	2	3	4	5
1. Age	----				
2. Disability	.072	----			
3. Education	-.058	-.141	----		
4. Gender	.122	-.094	-.043	----	
5. Race	-.034	.048	-.185	.038	----

Appendix E

Correlation Matrix for the Job Satisfaction Logistic Regression Model

Table 19

Correlation Matrix for the Job Satisfaction Model

	1	2	3	4	5
1. Age	----				
2. Disability	-.026	----			
3. Education	-.001	-.129	----		
4. Gender	.033	-.094	-.079	----	
5. Race	.128	.048	-.018	.038	----

Appendix F

Correlation Matrix for the Weekly Wages Linear Regression Model

Table 20

Correlation Matrix for the Weekly Wages Model

	1	2	3	4	5
1. Age	----				
2. Disability	-.221	----			
3. Education	.489	-.221	----		
4. Gender	-.042	-.034	-.043	----	
5. Race	-.133	.054	-.135	.103	----

Appendix I

RSA - 911 Educational Attainment Codes

Table 21

Code	Attainment Level	Years
00	No Formal Schooling	0
01	Elementary Education (grades 1-8)	8
02	Secondary Education (grades 9-12)	12
03	Special Education Certificate of Completion	Special Ed.
04	High school graduate or GED	12
05	Post-secondary education, no degree	13
06	Associate degree or Vocational/Tech Certificate	15
07	Bachelor's degree	16
08	Master's degree or higher	17

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